



# Residential Solar and Energy Storage Possible Cross Border Partnerships Clean Energy Across the Border

Robert Rogan | December 17th, 2015

# SunPower

We Change the Way our World is Powered



**\$3.0B**  
2014 Revenue

**>6K**  
SunPower Employees

**5+ GW**  
Solar PV Deployed

**22.4%**  
Record Efficiency<sup>1</sup>

**>200**  
Patents Secured

**6**  
Continents Covered

<sup>1</sup> SunPower holds the world-record large Silicon panel efficiency (22.4%). Green, M. A., et. al. "Solar Cell Efficiency Tables (version 43)," Progress in Photovoltaics, 2014.

# Clean from start to finish....to start

SunPower Environmental Advantage: First solar panels to become Cradle to Cradle Certified™ Silver

- SunPower solar panels, manufactured in Mexicali, Mexico are the first and only solar panels to be awarded this certification.
- What is Cradle to Cradle certification and what does it mean to you? It's a certification that is based on 5 categories and the only eco-label that assesses the full life cycle of a product." Our Silver certification reflects our commitment to sustainability.
- SunPower is a global thought leader – the only solar company to be a Circular Economy 100 member



Material Health

Use of materials that are safe for humans and the environment.



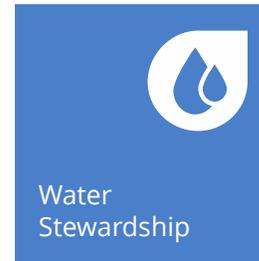
Material Reutilization

Use of materials that are recyclable or compostable at the end of the product's life.



Renewable Energy & Carbon Management

Products that are manufactured through a sustainable process with renewable energy and carbon neutrality in mind.



Water Stewardship

Minimizing the use of water in the manufacturing process.



Social Fairness

Promoting social fairness and diversity in the workplace.

Cradle to Cradle Certified™ is a certification mark licensed by the Cradle to Cradle Products Innovation Institute. Cradle to Cradle Certified™ is a multi-attribute certification program that assesses products and materials for safety to human & environmental health, design for future use cycles, and sustainable manufacturing.

# Customer-sited Solar

## Overview

Customer-sited, retail solar programs are designed to create value for load serving entities, by offsetting peak-load at an affordable cost.

## Load Serving Entity Benefits

- Cost effective, reliable energy solution
- Flexible models for partnering
- Allows for targeted deployment by service areas and customer demographics
- Provides option to supplement with storage
- Provides option for co-branded programs

### Customer Recruitment

SunPower and/or  
Load Serving Entity

### Program Implementation

SunPower and/or  
Load Serving Entity

### System Ownership

SunPower and/or  
Load Serving Entity and/or  
Institutional Investor



# Community Solar

## Overview

Community solar can take many forms, but the common denominator remains a centrally located solar installation that community members can use to offset energy use by subscribing to a portion of system output.

- Tariffs—The utility builds community-based solar installations that are offered to customers at a special rate, or tariff.
- Direct Ownership—The utility engages in a PPA for the output of a centralized project, while customers directly commit to a portion of the power generated from the project.

## Load Serving Entity Benefits

Provides customers an alternative to rooftop installation

Enables low-cost electricity and the environmental benefits of solar to reach more customers

Alleviates coordination of smaller, distributed systems across their service territory

Allows load serving entity to retain customer relationship



# Customer-sited Solar

Con Edison Solutions | New York, USA

Con Edison offers New York homeowners the opportunity to lease high efficiency SunPower solar power systems. Together, the two companies co-market to prospective customers. Con Edison's experience deliver a solar solution that customers can value and benefit from.

- Co-branded, residential lease offer
- ConEdison owns systems, collecting monthly payments for terms up to 20 years
- SunPower provides sales, servicing and O&M, production guarantee for each system



# Community Solar

Salt River Project | Florence, AZ, USA

Salt River Project, Iberdrola Renewables and SunPower created the 25 MWdc Copper Crossing Solar Ranch in 2011, one of the largest community solar initiative in the country. As an alternative to distributed residential installations, this centralized project enables 3,700 local homes, businesses and schools to offset their energy usage with solar.

- Customers can purchase blocks of power from the 20 MW project
- No upfront costs to the customer for installation; No maintenance or repair costs
- 54 million kWh annually spread over 3,700 customers



# Integrated Energy Storage

## Overview

Paired with PV installations, customer-sited storage assets can be aggregated to create a Virtual Power Plant which can be centrally controlled, configured to meet capacity requirements, and dispatched to meet utility needs such as smoothing loads or supplementing local generation.

## Load Serving Entity Benefits

Offers greater grid reliability and resiliency

Enables better understanding of customer usage data

Increases system reliability with local and network control architecture

Provides customers with access to back-up power

Strengthens customer relationships

Designed to utility-grade standards for safe, reliable, high-performance use

### Customer Recruitment

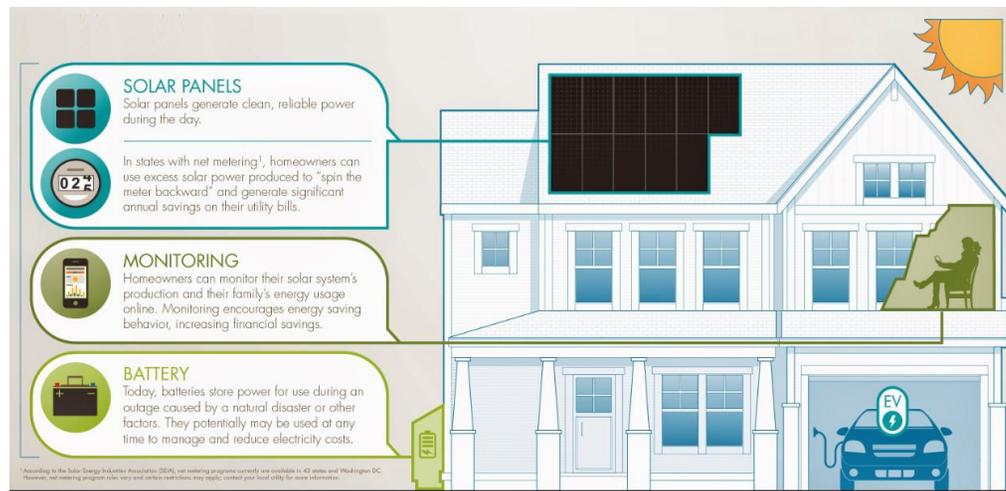
SunPower and/or  
Load Serving Entity

### Program Implementation

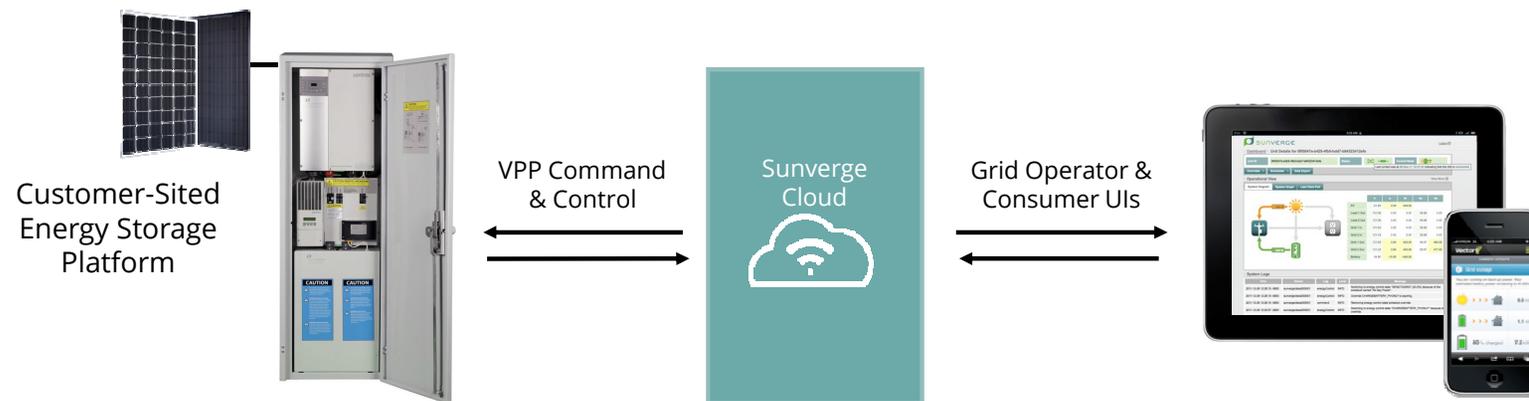
SunPower and  
Technology Partners

### System Ownership

SunPower and/or  
Load Serving Entity



# Sunverge – Distributed Virtual Power Plant



Sunverge has developed a renewable energy platform that enables utilities to:

- Improve efficiency and resiliency of the grid
- Plan for high penetration of renewables for environmental, economic, and public relations benefits
- Generate additional revenue through end customer retention and wholesale market services

# Models for Delivering Residential Solar Systems

## Channel Value Chain – Who does what?

