



Solar Gardens for Municipalities

Joy Hughes – Solar Gardens Institute

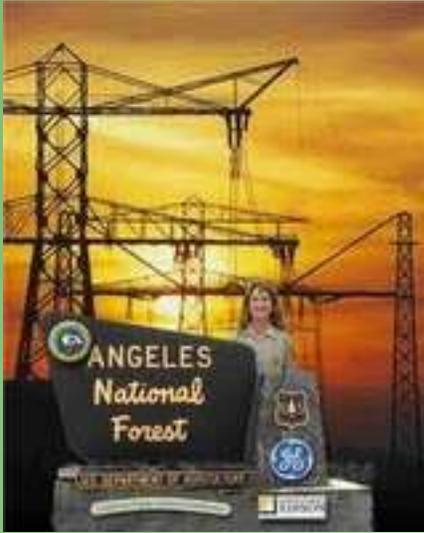


What is a Solar Garden?



- **Subscription model** - Suitable for HOA's, renters, affordable housing, shaded locations, and historic districts
- **Distributed Generation** – Rooftop or ground mount system connects to local power lines or substation
- **Virtual Net Metering** – Credit directly on the subscribers bill for subscriber's portion of the array

Why Distributed Solar?



Make it a
community
decision



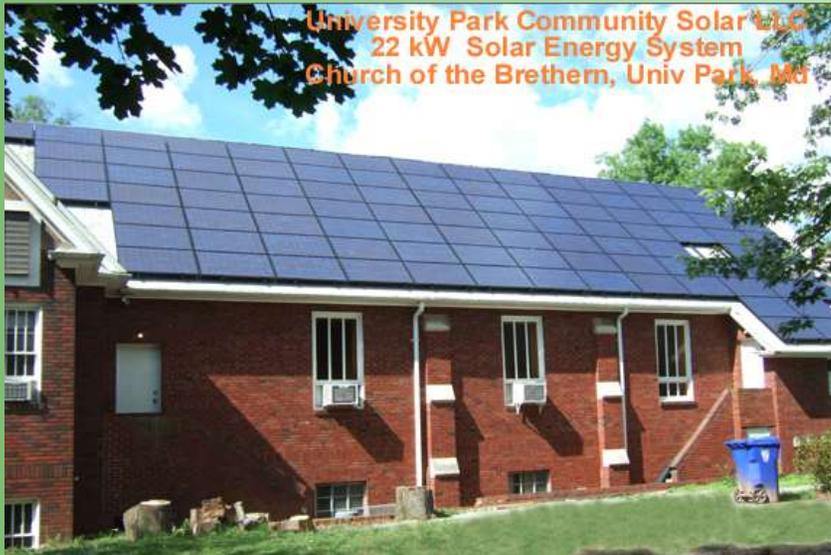
Sprouting up Everywhere



Maps showing community solar interest

Community Supported Energy

University Park, Maryland

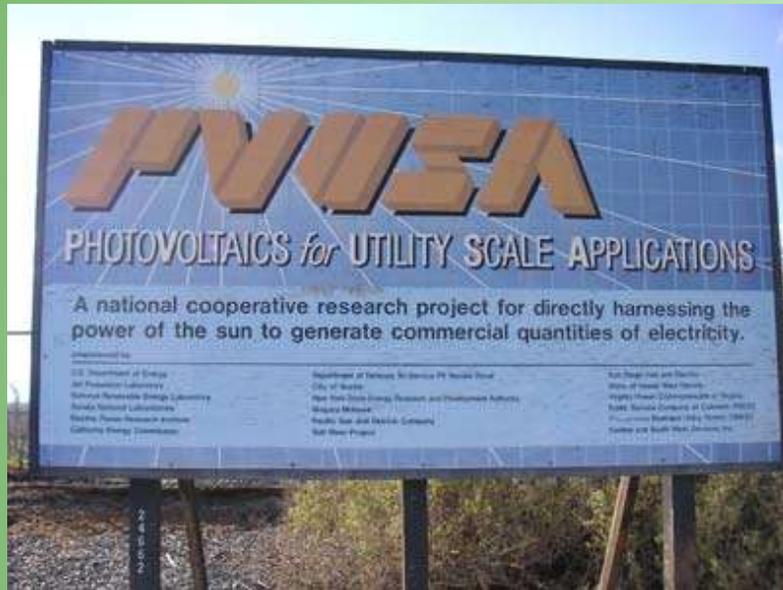


- Good for houses of worship, municipal buildings, nonprofits
- A group of small investors owns the array and sells power to the church
- Sample Legal documents available FREE

University Park Solar

Virtual Net Metering

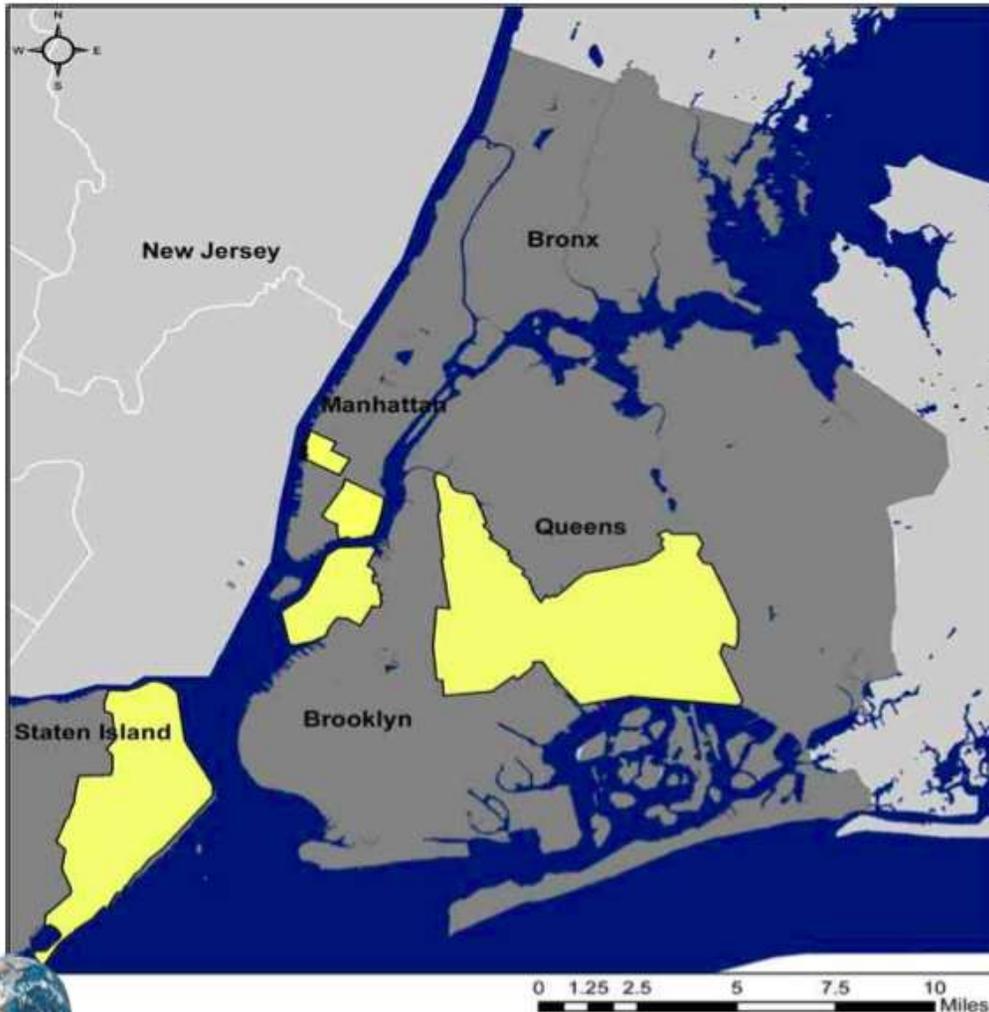
Davis, CA



- Constructed 1986, recommissioned 2003
- Bill credits transferred to 31 city owned meters
- Special legislation passed in 2003

- ◉ SB843 could make VNM available throughout California
- ◉ Can be implemented in Colorado under Community Solar Gardens Act

NYC Solar Empowerment Zones

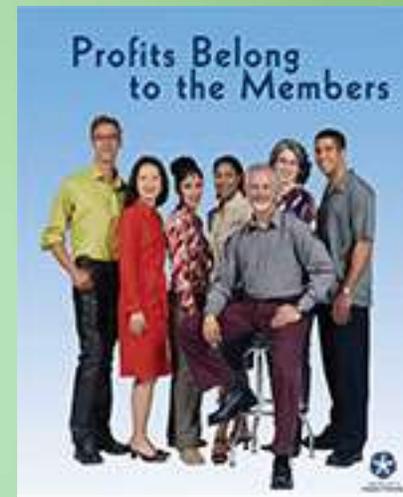
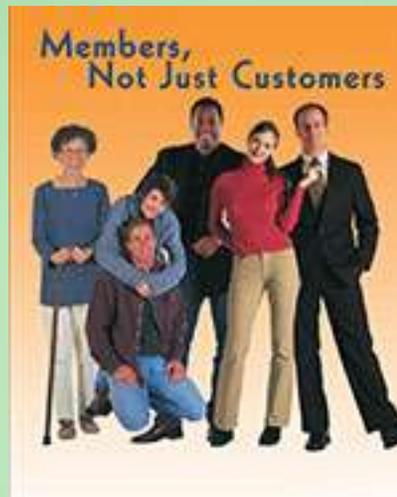


Zone Identification

- Con Edison networks
- Day-peaking profile
- Infrastructure upgrades needed
- OR, solar to defer the “tipping point”
- Rooftop potential

Cooperatives

Ontario, Washington and Colorado



- Tangerine Power – Edmonds, WA
- Small investors together provide capital for community solar arrays
- “sponsorship” for subscribers in any solar garden

The Solar CD



- Park View Federal Credit Union, Virginia
- New Resources Bank, San Francisco
- McGraw Hill Federal Credit Union

- Asset-backed instrument offers 2-3.5%
- Loans to solar projects at 4.5-6%
- Credit union can be a subscriber as well



Solar Gardener Program



Original Gardener **Gary Nystedt** –
Ellensburg Community Renewable Park

- Community organizer and project manager
- Find host sites and subscribers for solar gardens and community supported energy
- Organize for policy, cooperatives, solar CDs
- Work with local nonprofits, apply for grants

SGL's Mission



- To educate the public about community solar energy.
- To promote community solar energy legislation at the federal level and in each state
- To assist local organizations in organizing, developing, and managing community-owned solar energy projects everywhere.
- To make affordable solar energy available for all humanity

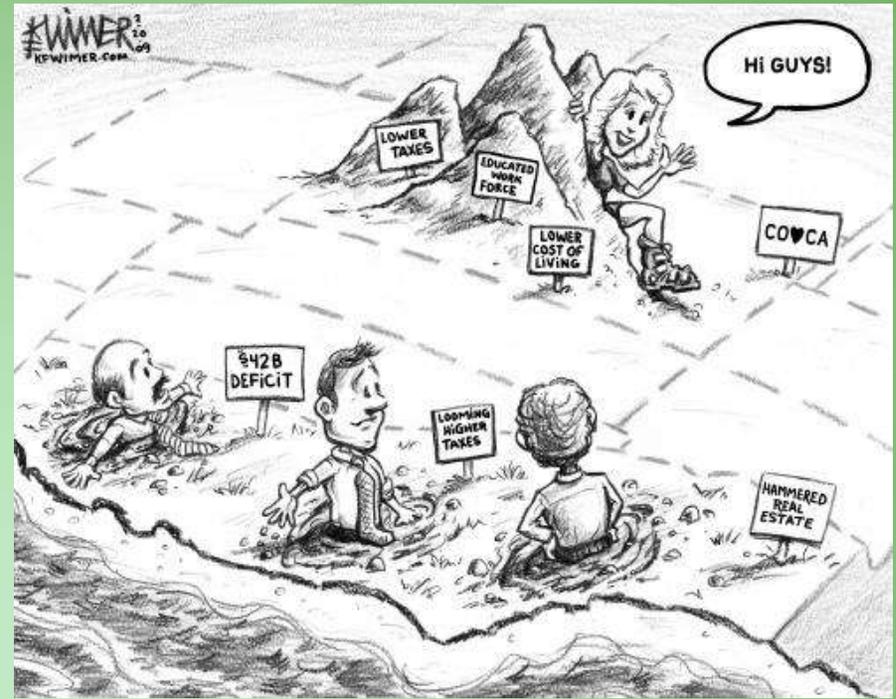
Voluntary Programs (Municipal and Rural Utilities)

Ellensburg WA, United Power - CO, Sacramento, CA

- Usually owned by municipal utility, subscribers lease panels
- A third-party model can allow for access to capital and tax incentives
- A separate program from Community Solar Gardens Act

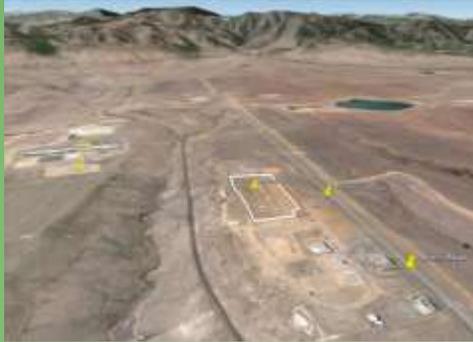


Solar Gardens Laws for Investor Owned Utilities CO, WA, MA, VT, DE, ME Proposed in CA, MD, DC



	Colorado	California (Proposed)
Maximum Size	2 Megawatts (15 acres)	20 Megawatts (150 acres)
Minimum Subscription	1 kilowatt (low income exempt)	1 kilowatt
Maximum Subscription	40% of capacity	2 Megawatts
Low income requirement	5% of capacity	None
Program Maximum	6 Megawatts per year for first three years	None
Subscriber may purchase	capacity	capacity or power
Utility must purchase?	mandatory	optional

Host Sites



- Near 3-Phase distribution line, transformer, or substation
- About 120-150 kilowatts per acre
- Industrial sites
- Retired farmland/corners
- Reclaimed landfills and mines
- Parking lots, storage
- Large roofs
- Water treatment plants
- Airports

Aurora Solar Garden



- 1 megawatt = 1 million Watts
- Enough to power 300 average homes
- Anyone in Aurora or Adams County may subscribe

Subscribers

“Anyone who is still on the grid”



- Must be within
- same county (CO)
- same utility (WA) 50 miles (CA)
- Residential – affluent and moderate income
- Local Businesses and Industry
- Farmers
- Nonprofits, libraries, schools, hospitals, churches
- Municipal and county buildings

Subscribers- Community Supported Energy



- Ownership of panels
- Cost – about \$1500-2000
- Up front payment or loan
- Pay-back time 12-14 years

Subscribers- Solar Savings Now



- Power purchase agreement
- Little or no up front cost
- Electricity savings 5-10% on monthly bill



Thank you!

Contact Us



solargardens.org

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Robyn Lydick – Media Relations –
robyn@solargardens.org

Please sign up for the mailing list



Solar in the Town of Breckenridge

Breck's PPA – Promises and Problems


INNOVATIVE ENERGY

Breckenridge Solar Project – Aerial Views
Site 9: Golf Course Clubhouse – 104.94 kW

In My Backyard® - National Renewable Energy Laboratory (NREL)



Image and renderings created using the National Renewable Energy Laboratory (NREL)'s "In My Backyard (IMBY)" tool at: <http://www.nrel.gov/efsc/imby/>.

Innovative Energy – P.O. Box 6538 – Breckenridge, CO – 80424 – (970) 453-5388 – www.renewablepower.com
Please consider this information confidential. We respectfully ask that the contents not be shared with our competitors.

Breck's PPA – Promises and Problems


INNOVATIVE ENERGY

Breckenridge Solar Project – Aerial Views
Site 11: Riverwalk Center – 77.88 KW

is My backyard - national renewable energy Laboratory (NREL)



No image was available showing the recently remodelled Riverwalk Center and therefore the proposed array could not be shown.

Image and renderings created using the National Renewable Energy Laboratory (NREL)'s "is My Backyard (IMBY)" tool at: <https://www.nrel.gov/isis/Imby/>

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Breck's PPA – Promises and Problems



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Breck's PPA – Promises and Problems



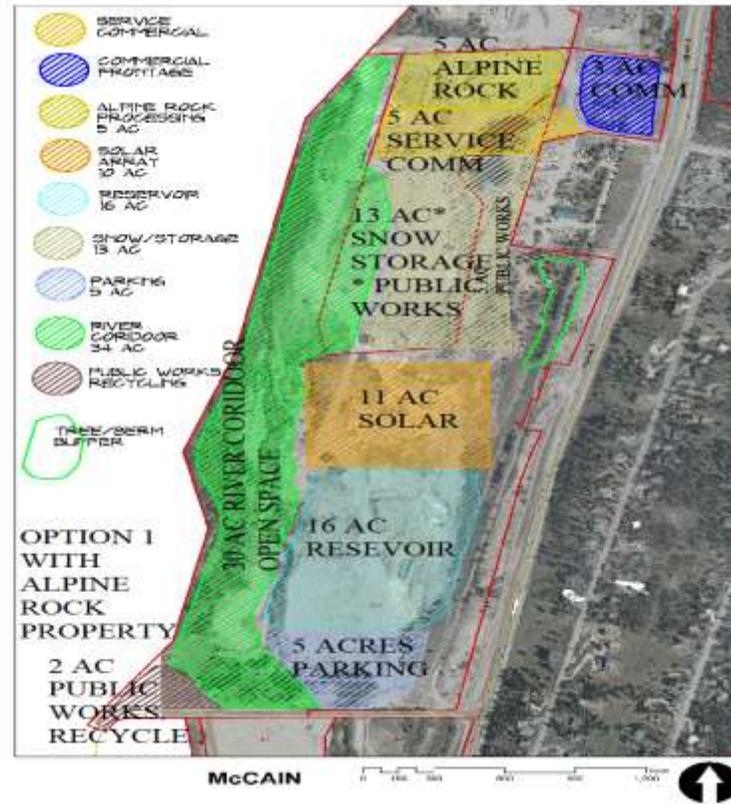
Our next project – Solar Gardens

DRAFT
November 13, 2003

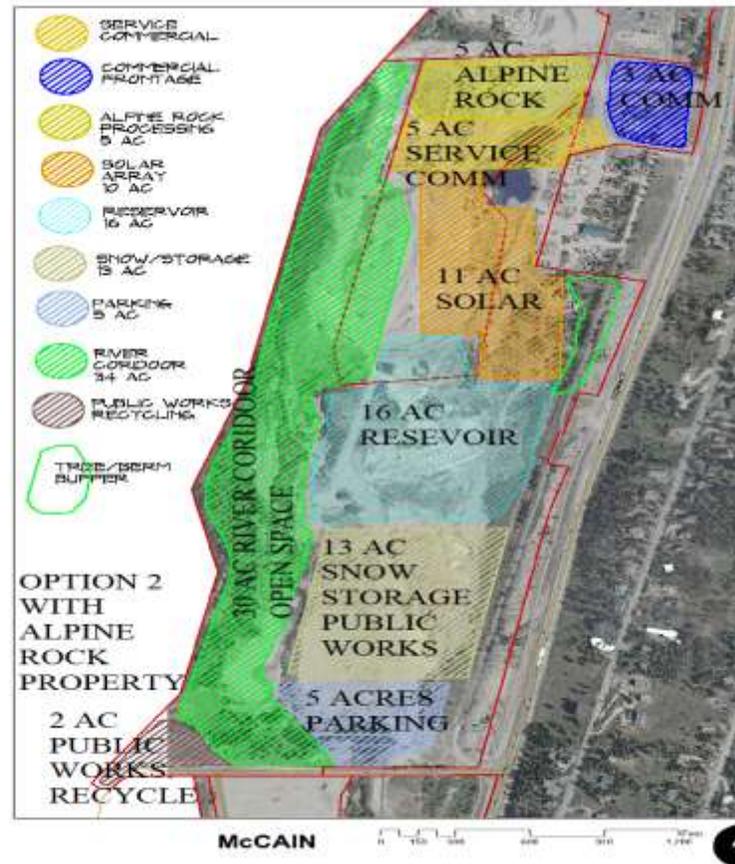
BLOCK 11 - McCAIN PROPERTY



Our next project – Solar Gardens



Our next project – Solar Gardens



Our next project – Solar Gardens



Town of Breckenridge - Stillson Property
Proposed 517 kW Solar Garden



Templeton Gap Landfill Infill Renewable Energy Park

Templeton Gap Landfill



*Jesse Silverstein
Executive Director
Colorado Brownfields Foundation*

Infill Sites, Brownfields Redevelopment & Sustainability

- Energy Conservation and Energy Harvest opportunities
- Replacing or upgrading buildings for energy efficiency
- Redesigning landscape to be environmentally friendly
- Reusing sites for renewable energy



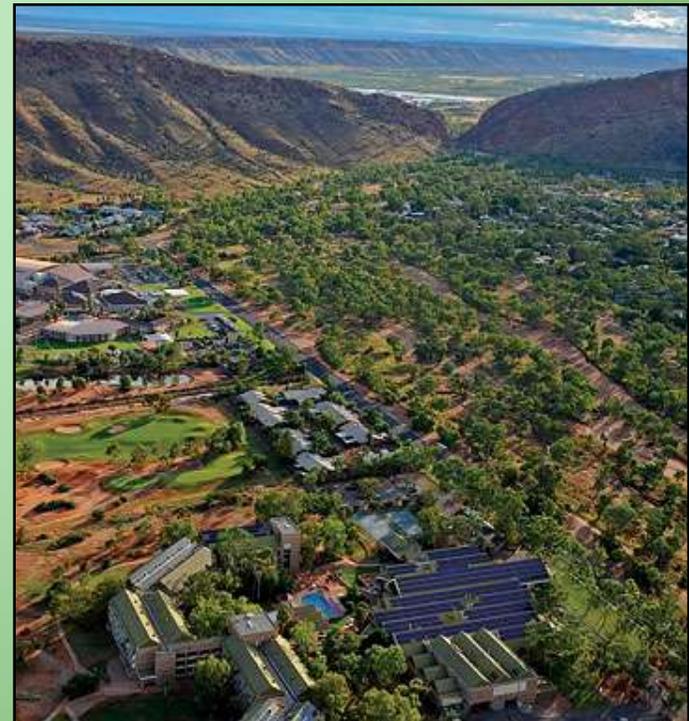
Utility Scale versus Infill Scale

- “Distributed Generation”
 - Connection to a distribution network; and
 - Proximity to the end consumer
- Net metering versus direct utility purchase
- Consumer driven development versus utility driven development



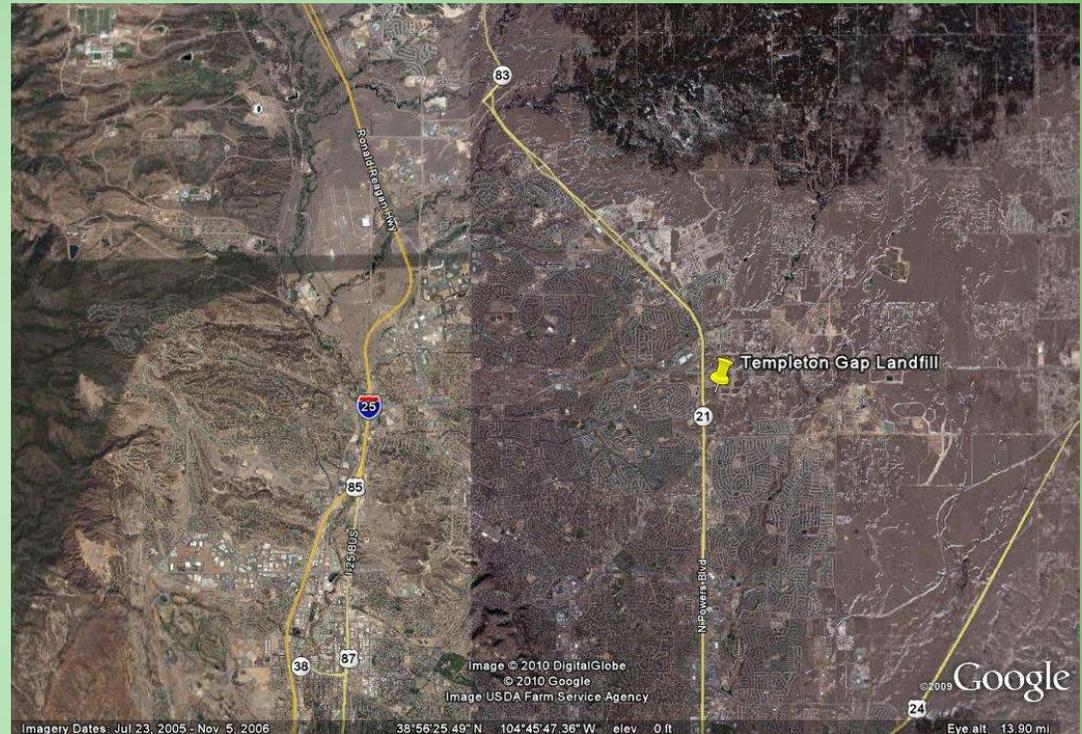
Site Criteria for Renewable Energy

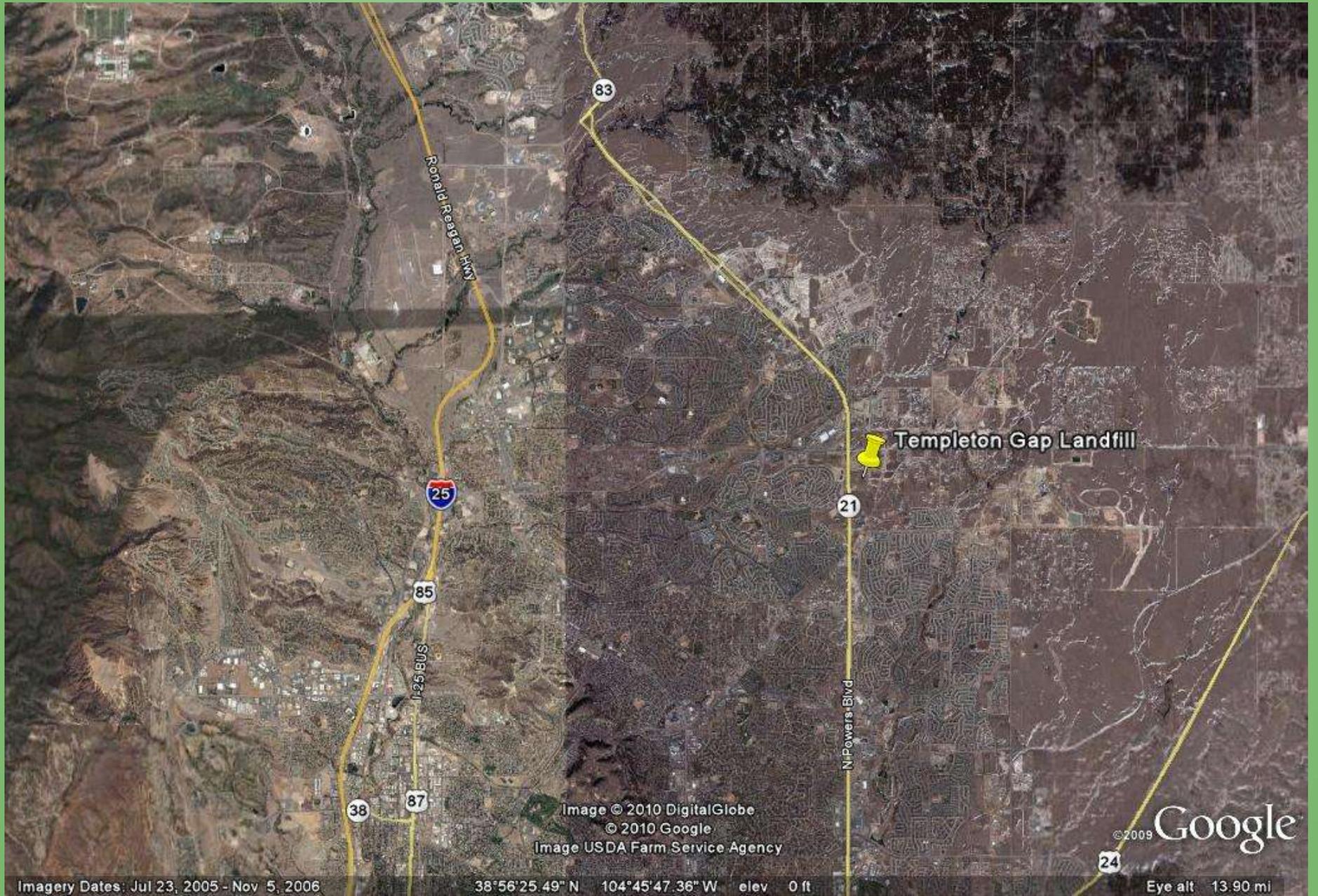
- Buildable Land
- Resource Quality
- Transmission Infrastructure
- Permitting / Zoning
- Market for Energy
- Land Cost
 - Highest & Best Use?
- Limited Liability



Templeton Gap Landfill

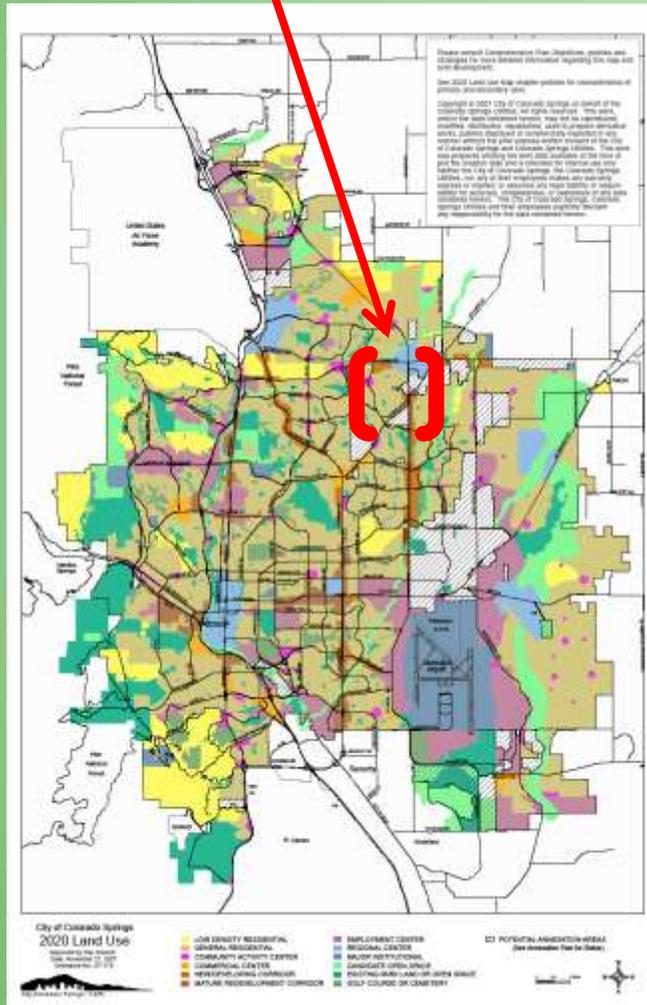
- CBF equity project/
CBF project lead
- Privately Owned
- El Paso County
- 44 Acre Footprint
- Landfill served the
community from 1957
until 1980
- Now under Cleanup
Order with the State



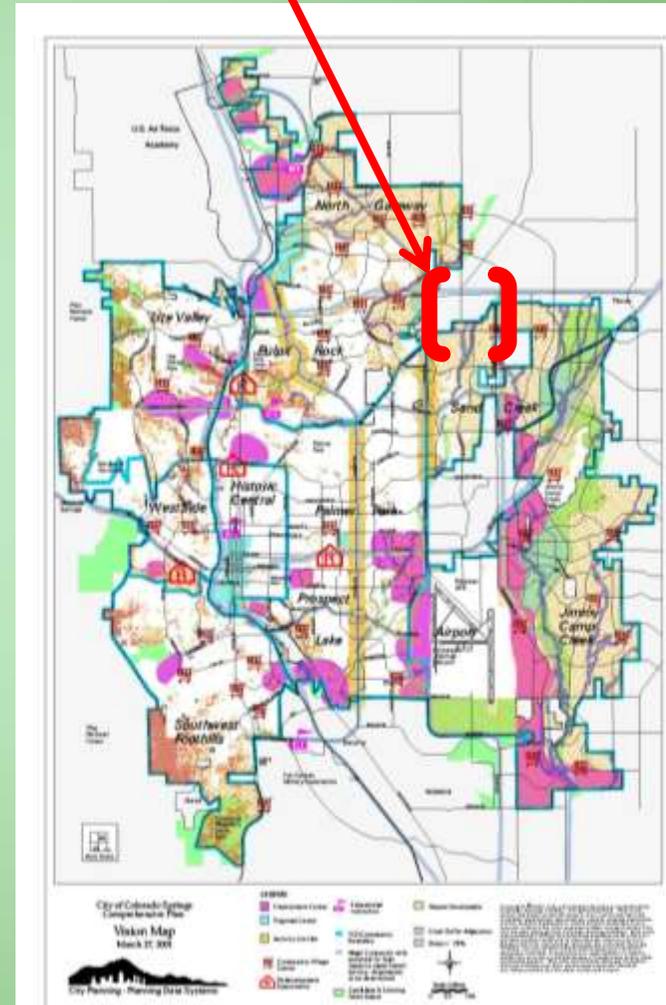


COLORADO SPRINGS LAND USE MASTER PLAN

- Regional Center
- Potential Annexation Area

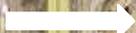


- Surrounded by Buildable Parcels





**PENROSE
ST. FRANCIS
HOSPITAL**



TGAP

TGap Opportunity

- Environmental Stewardship to maintain pollution prevention systems
- Minimize future fiscal burden on local, state, and federal agencies to maintain systems
- Integrate renewable energy into local markets
- Enhance ability to attract new businesses seeking to locate in sustainable communities



Pollution Prevention



Reduce Carbon Footprint



Locally Generated Energy



Existing Load



Multiple Market Opportunities

5.6 ACRES

NAI HIGHLAND COMMERCIAL GROUP, LLC
COMMERCIAL REAL ESTATE SERVICES, INC.

AVAILABLE
719 577-0044

ANDERSON/DOWIS

TUTT BUSINESS CENTER
WWW.TUTTBUSINESSCENTER.COM

Business/Flex and Garage Storage

DAVE 303.888.7117
TONY 303.810.4332

7.8 ACRE SITE AVAILABLE

Assisted Living
Skilled Nursing Facility

STONELEIGH PROPERTIES, LLC
SALLY A. CHRISTIANSEN 719-440-8473



Pad Sites From 1 to 30 Acres Available and Built to Suit
719-963-7007
DALLAS, TEXAS 75243

Retail
Big Box
Restaurants
Medical Office

Implementation Plan



Development Prospectus as RFP

- Written Investment Prospectus
- Inform market; overcome initial market investigation costs
- Identify renewable energy opportunities
- Identifies energy “loads”
- Identify development incentives
- Lays out environmental, entitlement, and utility challenges & solution
- Recommends stakeholder resolutions
- Introduces environmental liability management plan





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Littleton, Colorado 80127



Solar*Rewards Community



Agenda

- Introduction to Solar*Rewards Community
 - Program offering
 - Definition of roles
 - How it works
- Program Status
- Questions

Introduction

- Solar*Rewards Community (S*RC) was designed to provide more customers with the opportunity to purchase renewable energy
- Works for customers who cannot or wish not to participate in Solar*Rewards
- Based on House Bill 10-134



Program Offering

- 6 MW of solar gardens each year (2011-2013)
 - 3 MW from standard offer (10-500 kW)
 - 3 MW from large RFP offering (501 kW-3 MW)
- Performance-based incentive
- 20 year contract for system owners

REC Incentive Levels (as proposed)

- PBI incentive similar to Solar*Rewards program
REC price levels (for subscribed energy)

SRC Small Program (10-50kW)		SRC Medium Program (50.1-500kW)		Acquisition	
Year	Price per kWh (PBI)	Year	Price per kWh (PBI)	MW per Year	Cumulative MW
2011	\$0.14	2011	\$0.11	3	3
2012	\$0.13	2012	\$0.10	3	6
2013	\$0.11	2013	\$0.08	3	9
2014	\$0.09	2014	\$0.06	3	12
2015	\$0.07	2015	\$0.04	3	15
2016	\$0.05	2016	\$0.02	3	18
2017	\$0.03	2017	\$0.01	3	21
2018	\$0.01	2018	\$0.01	3	24
2019	\$0.01	2019	\$0.01	3	27
2020	\$0.01	2020	\$0.01	3	30
2021	\$0.01	2021	\$0.01	3	33

Definition of Roles

- **Subscriber Organization**
 - Develops/owns a solar garden
 - Manages application process
 - Receives production incentives
 - Sells/leases shares to subscribing customers
- **Subscribing Customers**
 - Purchases/leases a share of a solar garden developed in their community



How It Works- Subscriber Organizations

- Successful solar garden developers reserve a place in the queue
 - Must have 10 valid subscribers
 - Must pay deposit and escrow fees
 - REC price is set at time of successful application
 - Only first 6 MW will be allowed to participate

How It Works- Subscriber Organizations

- 1 year to complete installation
- 5% of total garden must be allocated to low income subscribers
- No single subscriber can be allocated more than 40% of total garden capacity
- Production meter is used to pay monthly incentives
- Manage relationship with subscribing customers

How It Works- Subscribing Customers

- Can participate in up to 5 gardens
- Must be in same county as garden
- Share in garden can be no greater than 120% of their usage from previous 12 months
- Must sign an agency agreement



Monthly Production Credit

- Subscribing customers receive monthly production credit on their bill
 - Expressed in dollars
 - Equal to customer's share of total garden production times the Company's total aggregate retail rate
 - Less T&D charge



Program Status

- Waiting on PUC final decision on 2012 RES Compliance Plan
- Expecting a decision sometime in May (June at the latest)
- Xcel is ready to open the program shortly after PUC order
- Xcel is holding S*RC trainings around the state at the end of May

Questions?

- You can contact me at:
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303-294-2633

