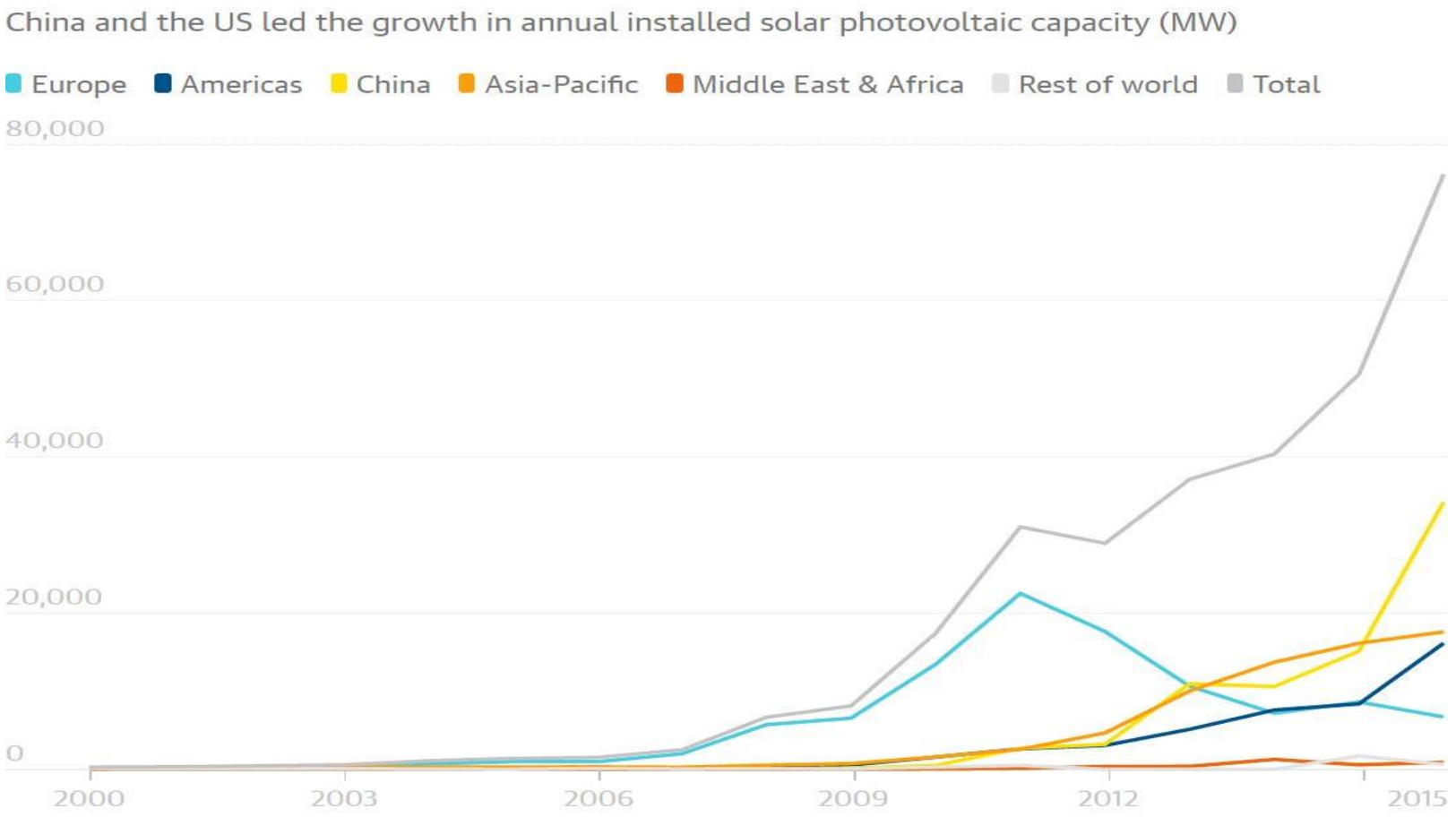
# Everything Under the Sun: Brownfields to Brightfields

# Panel Agenda

- Potential for, and benefits of, Brightfields development
- Brownfield funding opportunities
- Step-by-step description of how solar projects are developed
- Pulling it all together – A New Pathway for Solar Success

# Grand Perspective: Renewable Power, While Still a Small Fraction of Carbon-Driven Power, is Here to Stay. For Example, New Solar Capacity Rose 50% in 2016.




*Source: SolarPower Europe*

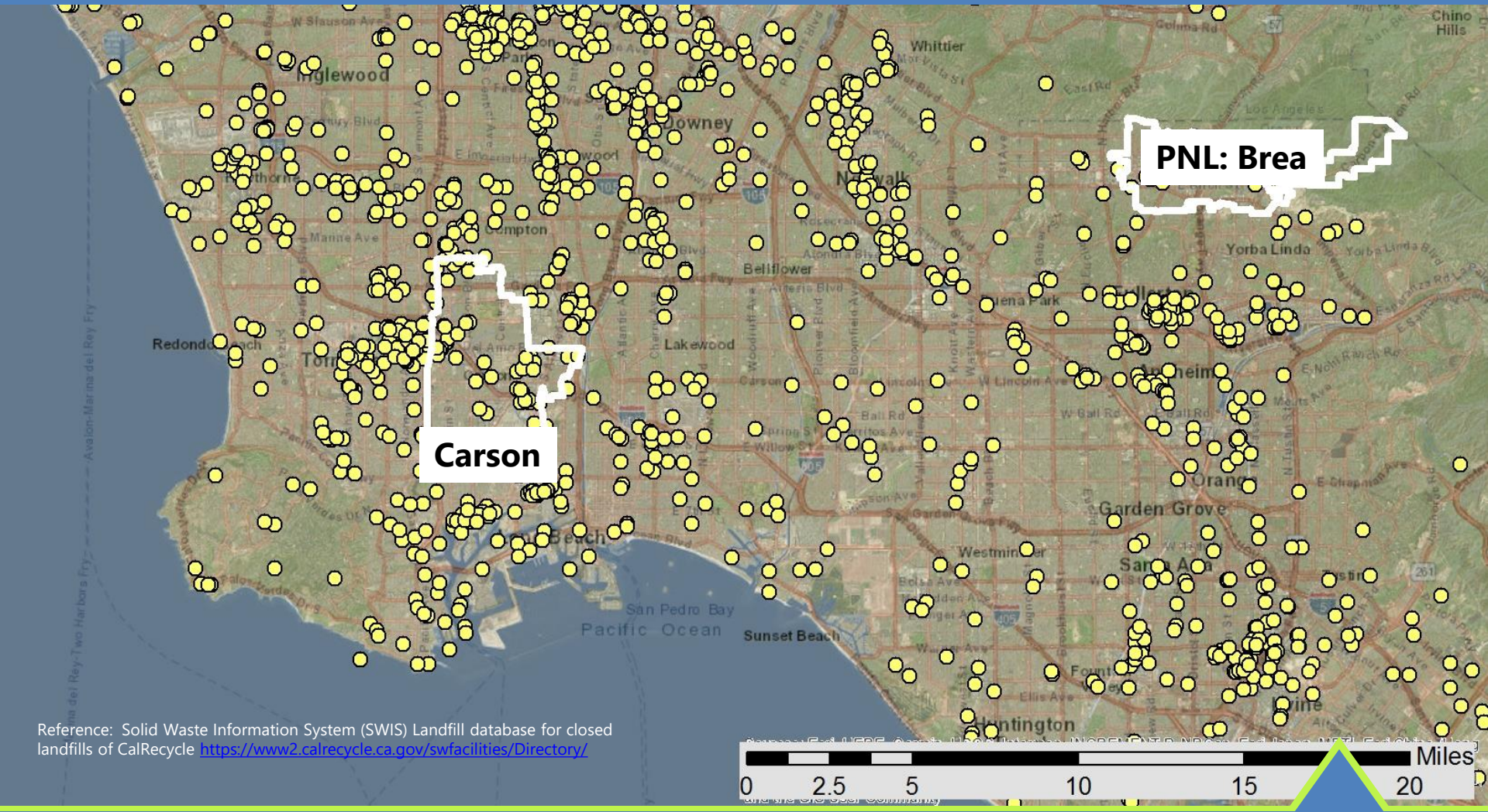
# There Is No Shortage of Brownfield and Landfill Site Acreage Which Could Be Suitable for Renewable Energy

- Over 400,000 identified Brownfield sites in the United States
- 16 million acres are available for development of renewable energy
- That's enough land to generate approximately 3,175,000 MW
- (For reference, the Hoover Dam generates about 2,000 MW)

# Solar Potential of CA Brownfields

- 150,000-200,000 brownfields in CA
- Average 1 acre in size, and 1/3 are not contaminated
- Up to 65,000 brownfields acres in CA immediately available for redevelopment
- Does NOT include closed landfills or sites undergoing remediation with available surface area

# Point of Reference: Near Our Current Carson Location There Are Scores of Brownfield Sites… Which Ones Might Be "Solar Suitable?"




Reference: Solid Waste Information System (SWIS) Landfill database for closed landfills of CalRecycle https://www2.calrecycle.ca.gov/swfacilities/Directory/

# Definition of “Brownfield” and “Brightfield” (federal)

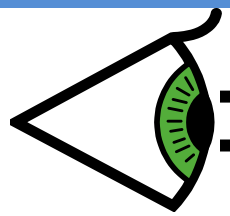
**Brownfield:** real property, the expansion, redevelopment, or reuse of which ***may be*** complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

**Brightfield:** an abandoned or contaminated property that is redeveloped through the incorporation of solar energy, which can be many different types of solar applications including photovoltaic arrays.


Does it make sense to make my site a Brightfield?

# As a Brownfield Site Owner with Land That Requires Some Remediation, How Could the Solar Power Option Assist Me?

**What are my options?**



## Route 1: "Traditional" Through Investigation & Dev.

Phase I: Assessment → Phase II: Site Characterization → Remediation → Development

## Route 2: "Innovative" leveraging "Interim Solar" Idea

Assess solar feasibility as Route 1 (above) plays out →

**Key Criteria:**

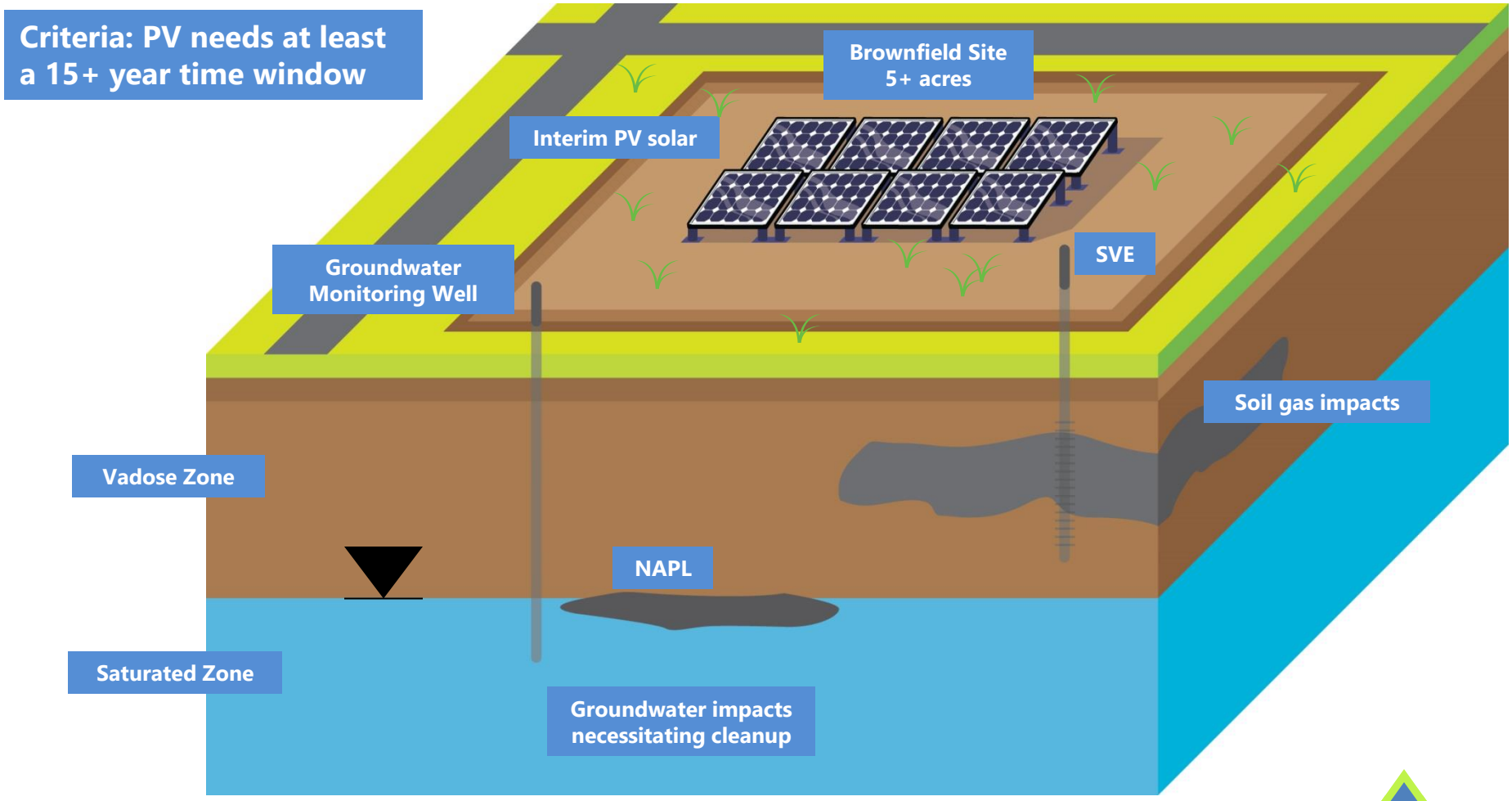
- Understanding of Route 1's timeline
  - >15 years is a must
- 5+ acres (larger, better)
- Interconnect feasibility
- Regulatory concurrence
- Land lease (favorable terms)

# Some Examples of Brownfields Potentially Suitable for Solar

Sites where:

- Cleanup costs exceed anticipated profits from "standard" redevelopment
- Long-term remediation is underway *($ opportunity for owner*); closed landfills
  - Solar project lease could align with anticipated remediation timetable AND lifespan of PV system
- Only a portion of site has planned redevelopment
- Traditional redevelopment is distant; e.g. 15 + years

# An Interim Condition For Your Brownfields Site?... As Sub-Surface Remediation Occurs, Install Solar



# Advantages of Brownfields PV Installations (1 of 3)

- Innovative, untapped approach for property owners to generate substantial income from underutilized properties
- Opportunities for public-private partnerships, active investment community ($1B at recent workshop) – no capital needed from property owner
- Less restrictive cleanup requirements due to less human exposure compared to typical redevelopment options
  - This opens the door to revitalizing challenging sites!

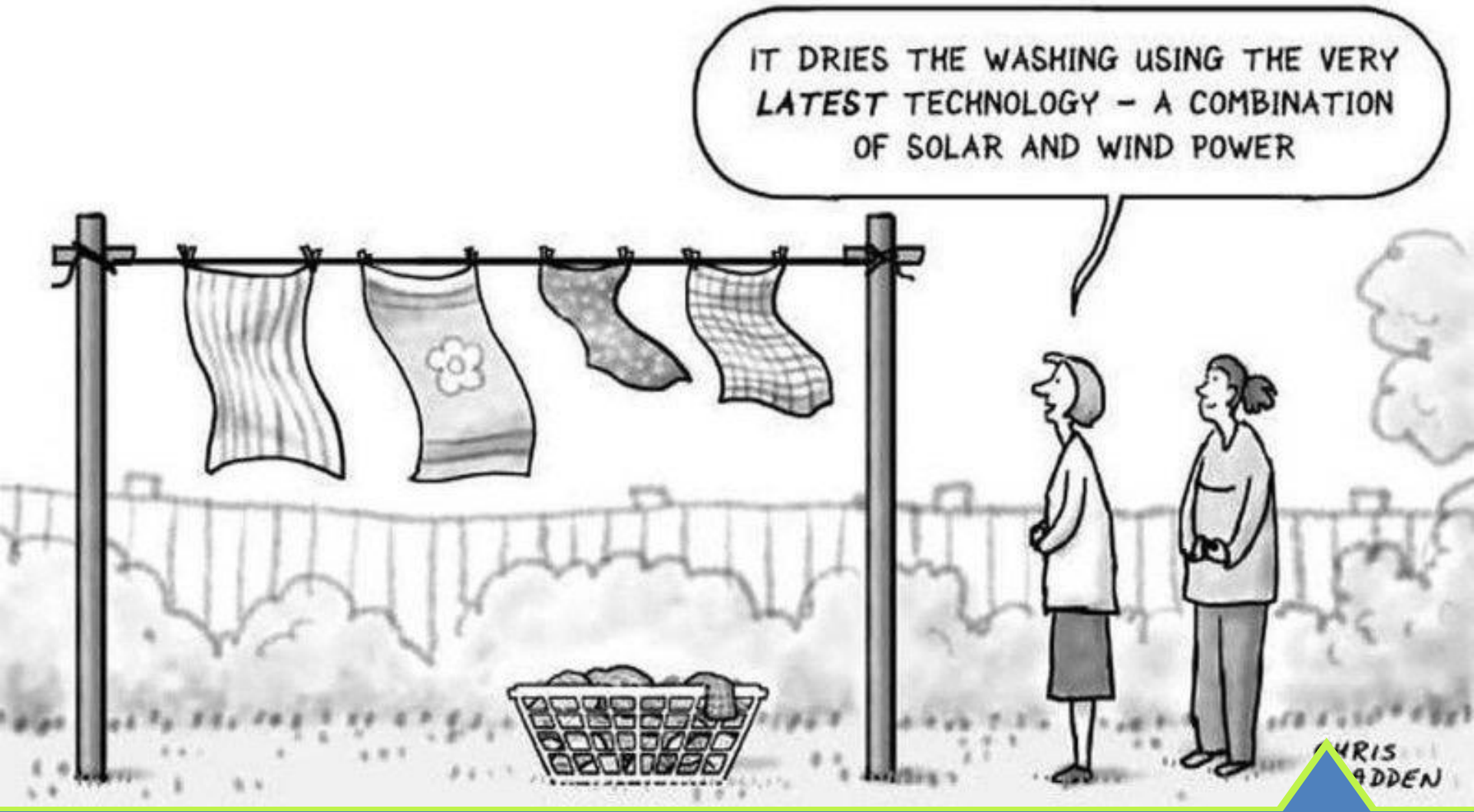
# Advantages of Brownfields PV Installations (2 of 3)

- Positive environmental impacts
  - Substantial GHG benefits compared to “greenfield” development, opportunities for Renewable Energy Credits
- Easier permitting requirements due to simplified NEPA/CEQA process
- Local, sustainable power production (typical CCA priority), strong public support
- Energy independence, resilience through distributed power generation

# Advantages of Brownfields PV Installations (3 of 3)

- Increased value of surrounding properties
- Increased tax revenue for local governments
- EPA Brownfields funding is available to support challenging initial stages of project development (more on this later)

# CCLR: Reusing Brownfield Sites with the Latest Technologies



# Racking Systems for PV Solar

## Landowner Can Be Assured That Land Surface Will Not Be Compromised

**Fixed solar structures on piles with two or three rows of panels**. Foundations using piles, which optimizes the volume of concrete and system modulation.

HFP-2P

**Adjustable solar structure on piles.** Enables inclination angle adjustment of piles with two summer-winter positions.

HRP-2P

# Self-Ballasted Racking at Project Navigator, Ltd.'s 3 MW PV Installation at the Milliken Landfill, Ontario, CA

# New BUILD Act (Brownfields Law)

- Amended March 2018
- Created new statutory ranking criteria that would provide extra points for those that will:
  - Facilitate location of a facility generating **renewable** energy from wind/solar/geothermal, or any energy efficiency improvement project at a brownfield site

# The Brownfield Program: Types of Grants

- Targeted Brownfields Assessments
- Assessment Grants
- Cleanup Grants
- Multipurpose Grants
- Revolving Loan Fund
- Environmental Workforce Development Job Training

# The Brownfield Program: Assessment Grants

- Funding to plan, inventory, conduct assessments, market feasibility studies, cleanup and reuse planning
- Use the funds to get you to the point where cleanup can commence
- Amount (*anticipated, unofficial*):
  - Coalitions up to $750,000
  - Site-specific up to $350,000
  - Community-Wide up to $300,000
- Who is eligible?
  - State, local (incl JPAs), nonprofit, tribal government

Next Solicitation:
Late Nov 2018

# Targeted Brownfields Assessments

- EPA conducts assessments
- Must have leveraged funds for redevelopment
- Requests on a rolling basis
- Must be able to provide access to the site

# The Brownfield Program: Cleanup Grants

- Who is eligible?

  **Applicants must own the property at time of application**

  – State, local and tribal governments
  – Regional councils
  – Non-profit organizations

- Funding:

  – Up to $500,000
  – Requires a 20% cost share

Next Solicitation:
Late November 2018!

# The Brownfield Program: Multipurpose Grants

- Carry out inventory, assessment, planning, and remediation activities for 1 or more sites

  **Applicants must own the property for cleanups**

  - 5-year period of performance
  - Demonstrate overall plan for revitalization
  - Demonstrate capacity

- Funding:
  - Up to $800,000

Next Solicitation:
Late November 2018!

# The Brownfield Program: Revolving Loan Fund (RLF) Grants

- Funding to provide loans and subgrants for remediation
- Who is eligible?
  - State, local, and tribal governments
  - General purpose units of local governments
  - CA DTSC currently has RLF grant with available funding

Next Solicitation:
RLF: Fall 2019

- Funding:
  - Up to $1,000,000 (typically ~$800,000 in past years)
  - Requires a 20% cost share

# Environmental Workforce Development


# The Brownfield Program:

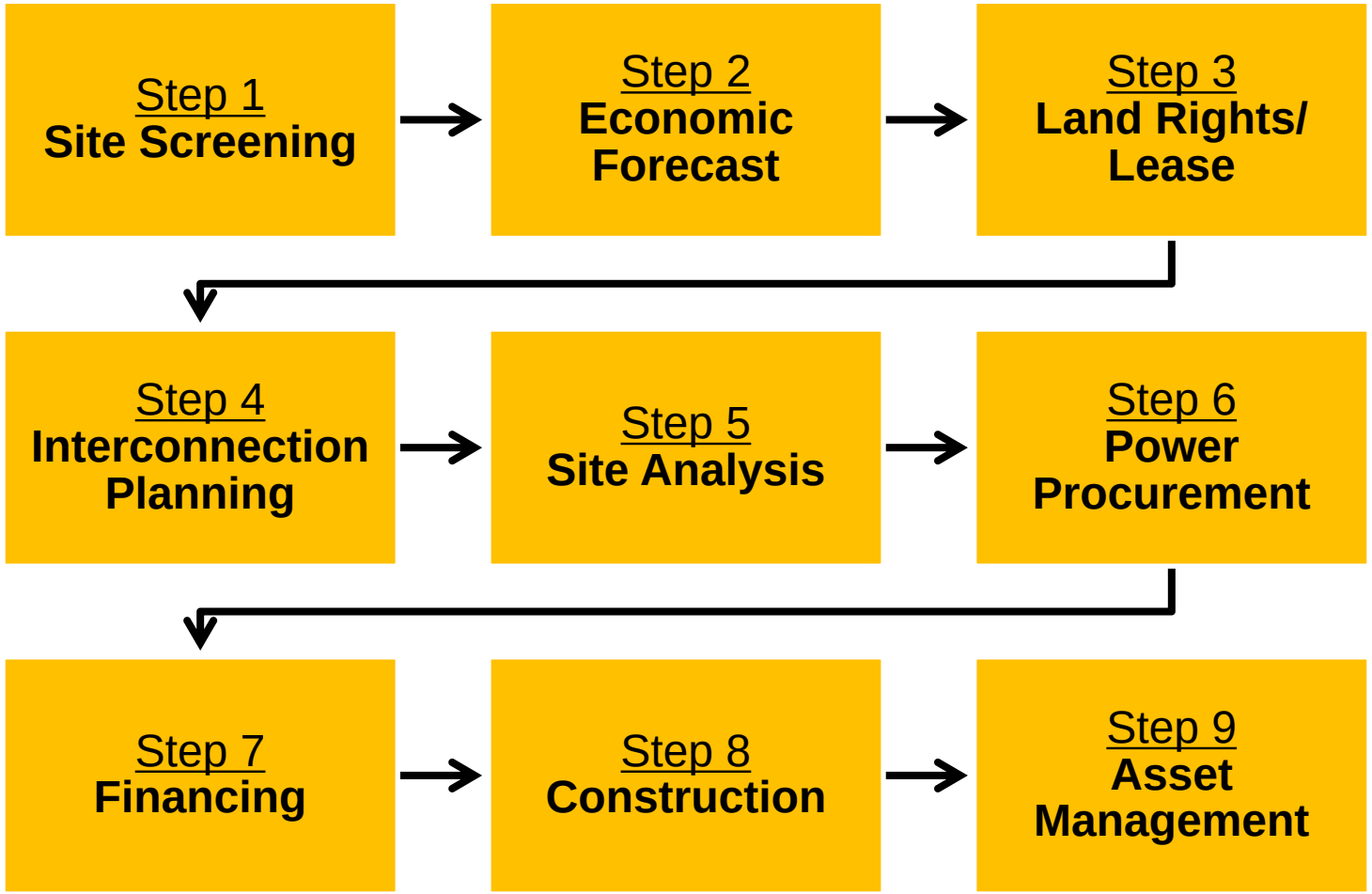
## Environmental Workforce Development and Job Training (EWDJT) Grants

- Provide funding to recruit, train, and place graduates
- Support training in various environmental programs
- Who is eligible?
  - States, counties, municipalities, tribes, and U.S. territories
  - Colleges and universities
  - Non-profits
- Funding:
  - Up to $200,000 each

Next Solicitation:
Spring 2019

# Key Criteria for Renewable Power Installation Development

# Solar Development Lifecycle



# Evolution of Site Area Requirements for Solar Projects

- Historic model of solar arrays…
  - ➔ Individual, large sites needed
- Historic model of brownfields…
  - ➔ Small, urban sites
- Innovative distributed energy generation model shatters traditional models

# Vision: Develop Tiny, Grid-Interconnected, Distributed PV Solar + Storage Power (Microgrid) Installations on Low Acreage, Environmentally-Impacted, Urban Brownfields

**The Evolution of PV Solar Installation Development Started with 100's of MW-Scale Facilities in Desert Locations…**

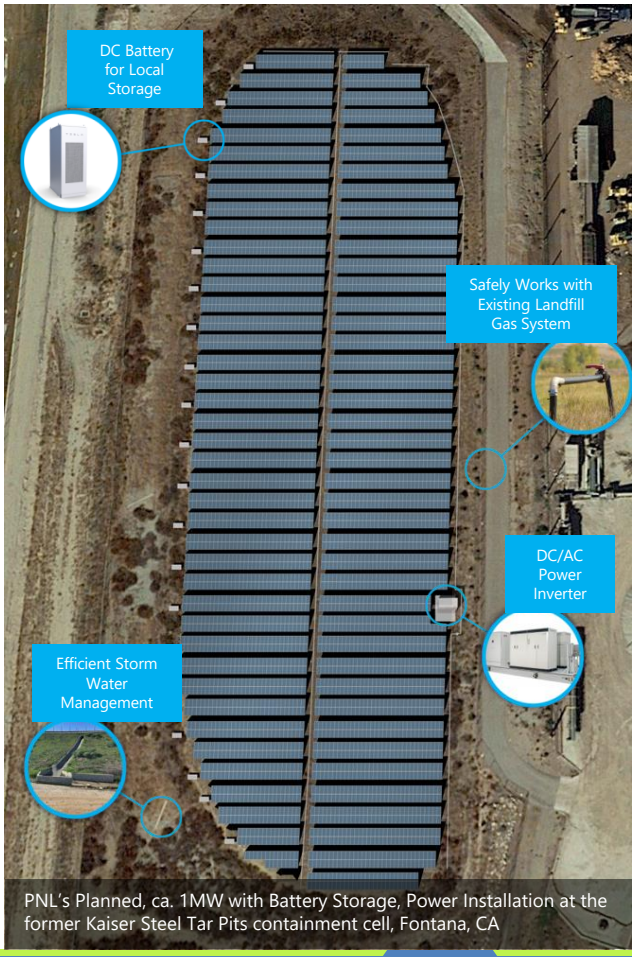
**…and has Progressed via Smaller 3-10 MW Utility Scale Projects on Environmentally Impacted Sites such as Urban Landfills…**

**…to the Opportunity to Site Very Small-Scale PV with Battery Storage on "Single-Acre Sized Locations", Such as Urban Brownfield Sites.**

A Utility-Scale SunEdison Solar Farm, CA

Project Navigator, Ltd.'s 3.1MW Installation at the Milliken Sanitary Landfill, Ontario, CA

Project Navigator, Ltd.'s 3 MW Installation at the Somerdale Road Landfill, Gloucester Township, NJ




PNL's Planned, ca. 1MW with Battery Storage, Power Installation at the former Kaiser Steel Tar Pits containment cell, Fontana, CA


Project Navigator, Ltd. working with U.S. EPA, Center for Creative Land Recycling (CCLR) and Tesla.

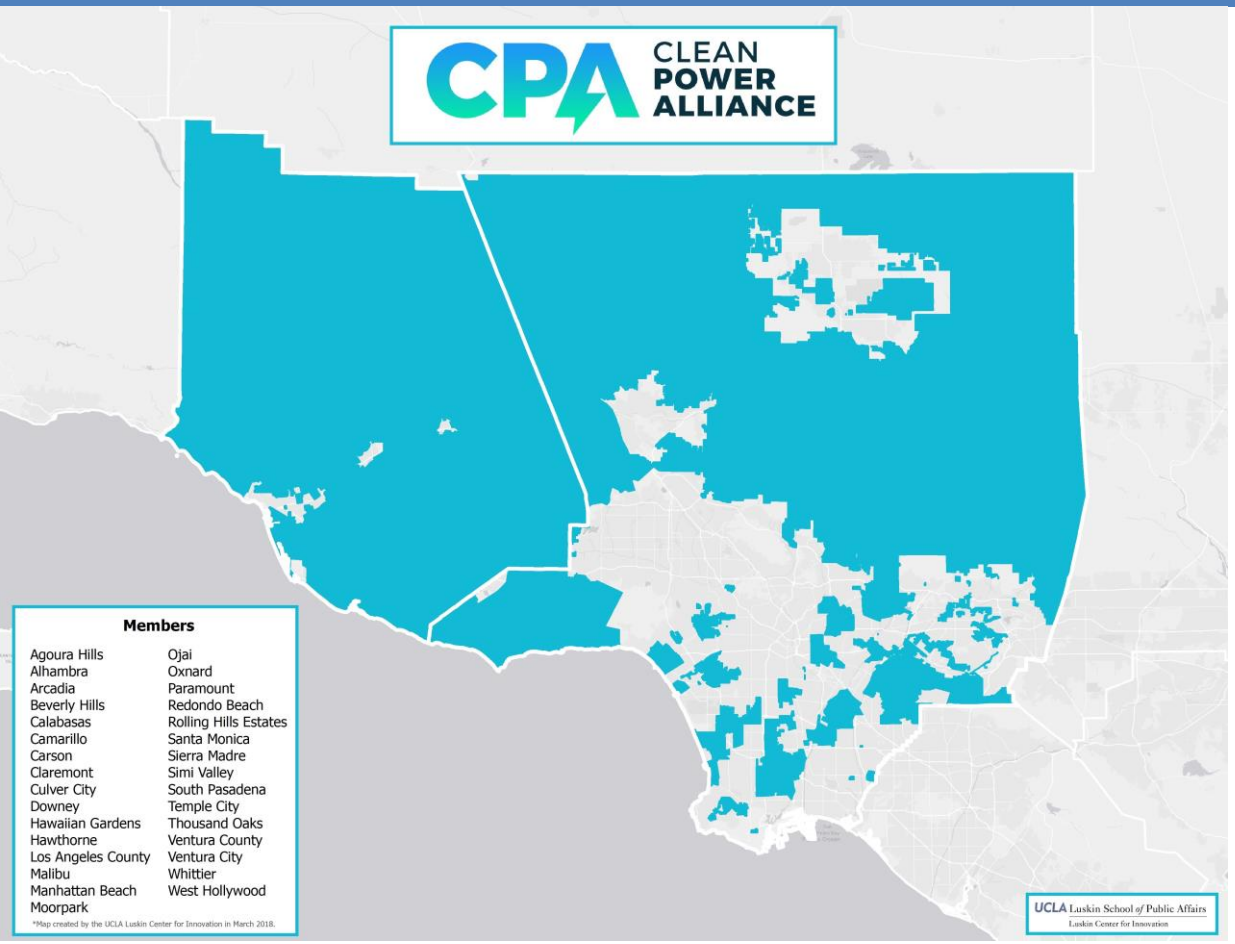
# Current Site Area Requirements for Solar Projects

- Net metering: <5 acres
- Selling power to IOUs/Power Purchase Agreements: 5+ acres

# Community Choice Aggregation (CCA)


- There are 19 operational CCA programs serving approximately 8 million customers in CA
- CCAs can provide their communities with competitively priced, clean energy choices while reinvesting revenues into projects and programs, supporting the local economy
- CCAs are established by local communities, either through the creation of a joint powers authority or enterprise fund

# Who is Clean Power Alliance




- A Joint Powers Authority, CPA has 31 member jurisdictions within Los Angeles and Ventura counties
- CPA launched service to select customers in February 2018
- Once customer enrollment is completed in May 2019, CPA will serve over 1 million customer accounts and be the largest CCA in the state

# CPA Long-term RFO

- CPA recently launched a Request for Offer (RFO) to solicit long-term renewable energy and energy storage contracts
- CPA is committed to be an environmental leader by providing customers with energy that delivers multiple benefits for air, water, and nature and avoids impacts to important lands, species, and waters
- Projects that demonstrate multiple benefits will be prioritized
  - Multiple benefit projects provide additional societal, health, economic, water saving, or environmental benefits beyond the climate and GHG reduction benefits of renewable energy
  - Projects located on an EPA RE-Powering America's Land site are considered multiple benefit
- Bids are due on November 9th at 5:00PM PST
- More information can be found at: https://cleanpoweralliance.org/request-for-offer-rfo/

# Resources!

- Mapping Tools to identify potential sites for solar projects
  - EPA RE-Powering America's Lands
  - CA Dept of Toxic Substances Control – EnviroSTOR database
  - CA State Water Resource Control Board – GeoTracker database

# RE-Powering Site Database

## Pre-screening info for approx. 10,000 sites in CA

Tracked by EPA Programs

Tracked by State Programs

| Abandoned Mines | Brown fields | Super fund | Land fills | RCRA Corrective Action | Total EPA | State Data | Total |
|---|---|---|---|---|---|---|---|
| 44 | 1,800 | 129 | 283 | 260 | 2516 | 7,622 | **10,138** |

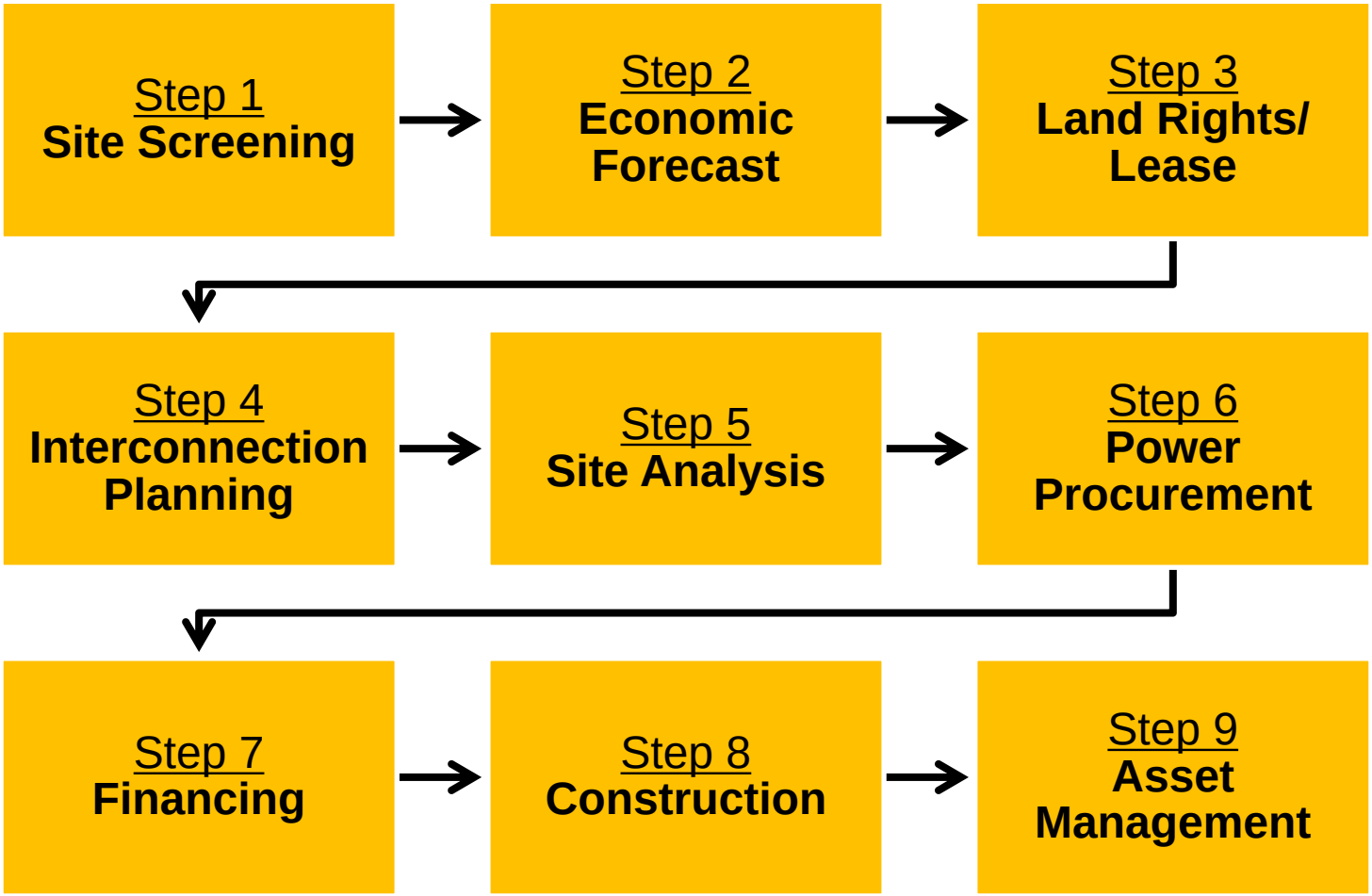
www.epa.gov/re-powering/re-powering-mapping-and-screening-tools

Dept. of Toxic Substances Control
www.envirostor.dtsc.ca.gov/public/

State Water Resources Control Board
http://geotracker.waterboards.ca.gov/

CalRecycle
www.calrecycle.ca.gov/SwFacilities/Directory/

# Pulling It All Together: A New Pathway to Solar Success



# Resources! – Brownfields Coalition Assessment Grants

- Coalition Grant approach lends itself to public-private partnerships – no capital from property owner
- Counties, Cities, and CCAs (and others) can apply for Coalition Assessment Grant
- Coalition assessment grants can complete early steps in the process that typically falls on landowners, developers and/or investors
  - *This is high-risk funding that can make or break a project*

# Resources! – Brownfields Coalition Assessment Grants

Coalition Grants can:

- Identify brownfields for potential solar projects based on critical site criteria (size, solar potential, proximity to grid, owner interest, etc.)
- Create an interactive inventory of potential site, and develop a site priority process
- Conduct public outreach/advertising and contact property owners to discuss solar and take the initial steps to secure sites
- Conduct Phase I and Phase II (*when needed*) assessments

# Resources! – Brownfields Coalition Assessment Grants

Coalition Grants can:

- Complete a wide array of reuse planning activities
- Research liability issues and purchase liability insurance
- Develop toxicological assessments based on specific site conditions
- Develop cleanup plan and/or justification for conditional site use based on the toxicological assessments
- Other activities to promote site reuse up to point of construction

# Resources! – Brownfields Cleanup Funding

When necessary, cleanup funding is available through Cleanup Grants, Multipurpose Grants, and Revolving Loan Funds (CA DTSC or new applications)

# Discussion

- Questions?
- Topics/concerns you wanted to hear about that we didn’t cover
- Feedback on session
- Interest in full-day Brightfields workshop being planned for early 2019?

# Contact Information

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