

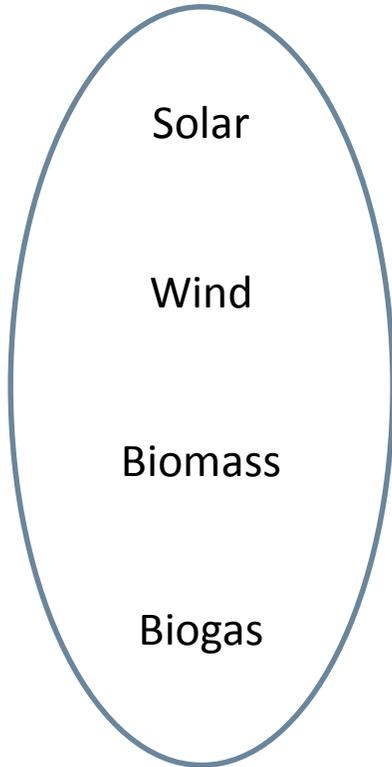
CONTRA COSTA COUNTY | RENEWABLE ENERGY RESOURCES PROJECT UPDATE



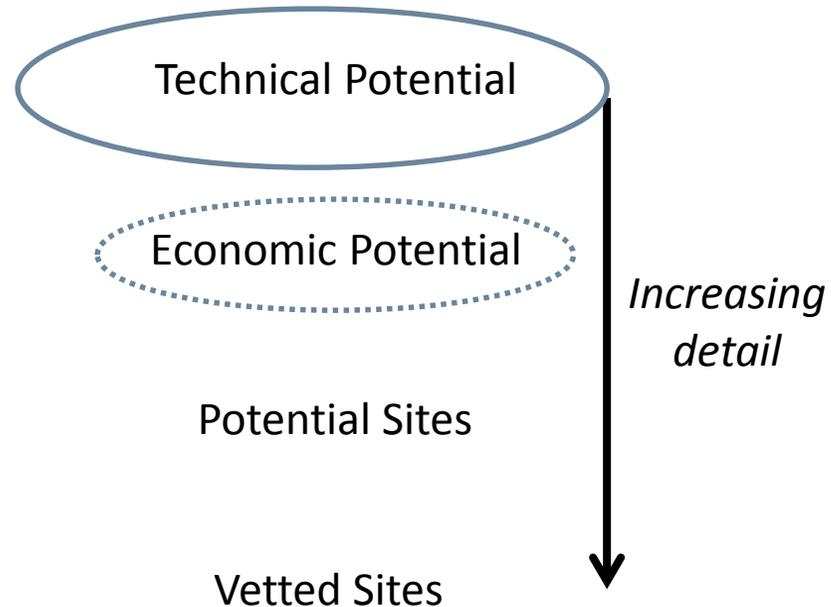
Philip Kreycik
September 27, 2018

Scope

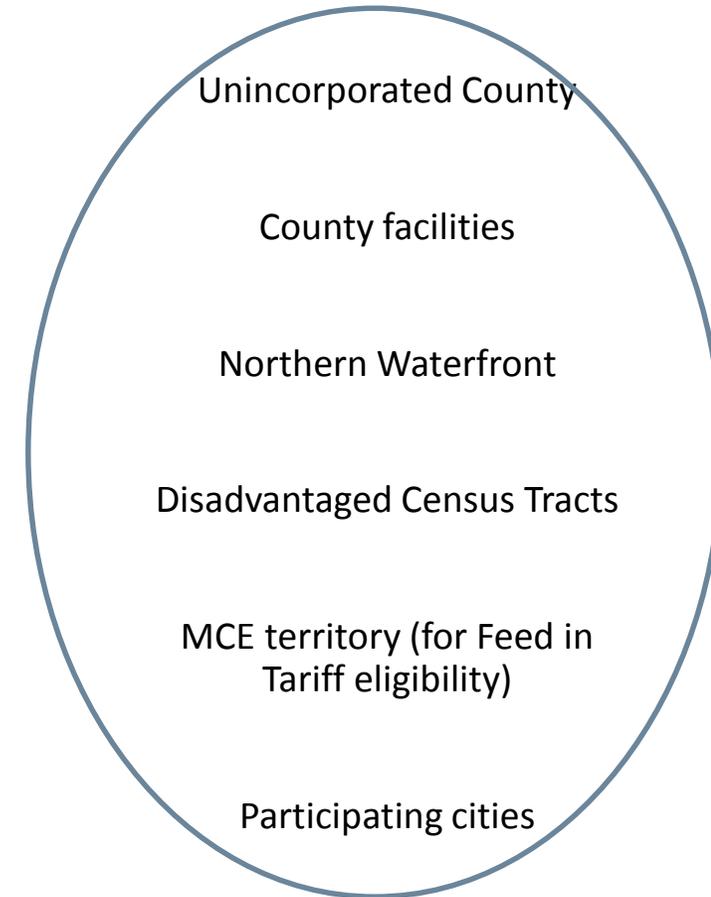
Technologies:



Level of Detail:



Key areas of interest:



NEW Renewable Resources Identified – Summary

Type		MW Capacity		Annual MWh	
		Low	High	Low	High
Solar	Rooftops	1,450	2,600	2,290,000	4,100,000
	Parking Lots	180	530	280,000	840,000
	Urban Land Unlikely to be Developed	130	330	200,000	520,000
	Agricultural Land with Least Constraints	Pending			
	Total Solar (Excluding Ag Land)	1,760	3,460	2,770,000	5,460,000
Wind	Total Wind	Pending			
Biomass	Agricultural	3	6	24,100	48,200
	Wood Waste	4	17	31,500	126,000
	Landfill	78	103	580,500	765,300
	Total Biomass	85	126	636,100	939,500
Biogas	Food Waste	2.4	3	18,000	22,000
	Waste Water	4	5	32,500	39,700
	Landfill Gas:	11	14	83,400	104,200
	Total Biogas	18	22	133,900	165,900
Grand Total		1,863	3,608	3,540,000	6,565,400

Context:

1MW of solar is roughly enough to power **250 homes**

This solar could power **450,000 to 850,000 homes**

Electricity demand across the whole county is roughly **9.6 million MWh**

Contra Costa has the **most RPS-eligible¹ solar** of all the Bay Area counties (31MW)

¹ Renewable Portfolio Standard

Costs – “Levelized Cost of Electricity” (LCOE)

Generation Source	PG&E 2016 Actual Power Mix	California 2013 LCOE ¹ (\$/MWh)	National 2017 LCOE ² (\$/MWh)	National 2022 LCOE ³ (\$/MWh)
Solar	13%	116-119	43-53	59
Wind	8%	87-89	30-60	48
Biomass and Waste	4%	126	55-114	102.2

¹ California Energy Commission Mid-Case

² Lazard v11

³ U.S. Energy Information Administration

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Solar costs dropped **60-80%** between 2009 and 2016, according to National Renewable Energy Labs.

The International Renewable Energy Agency forecasts that costs for solar and wind electricity will continue to fall by **59%** and **26%**, respectively between 2015 and 2025

¹ California Energy Commission Mid-Case

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Costs

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Solar: Cost per kW of labor and parts	
Rooftop	High (\$3.23/W[1], \$0.17/kWh)
Parking lot	Highest (\$3.53/W, \$0.15/kWh)
Urban land unlikely to be developed	Lowest (\$1.66/W, \$0.10/kWh) if no mitigation /cleanup costs
Agricultural land with least constraints	Lowest (\$1.66/W, \$0.10/kWh) excluding any mitigation required

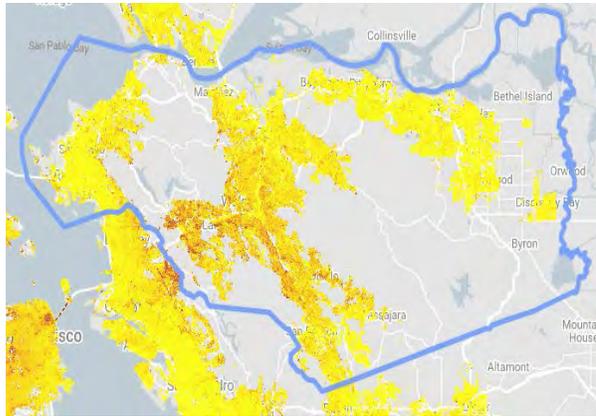
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Renewable Resources Identified – Types of Solar

Rooftop



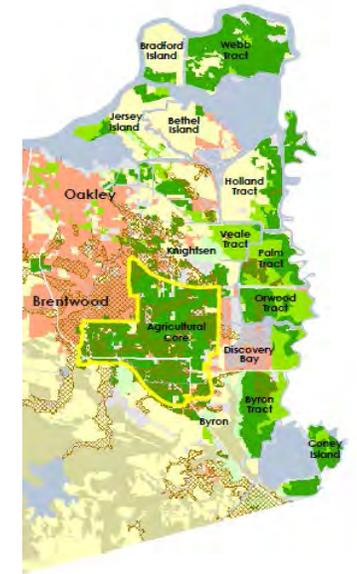
Parking lot



Urban land

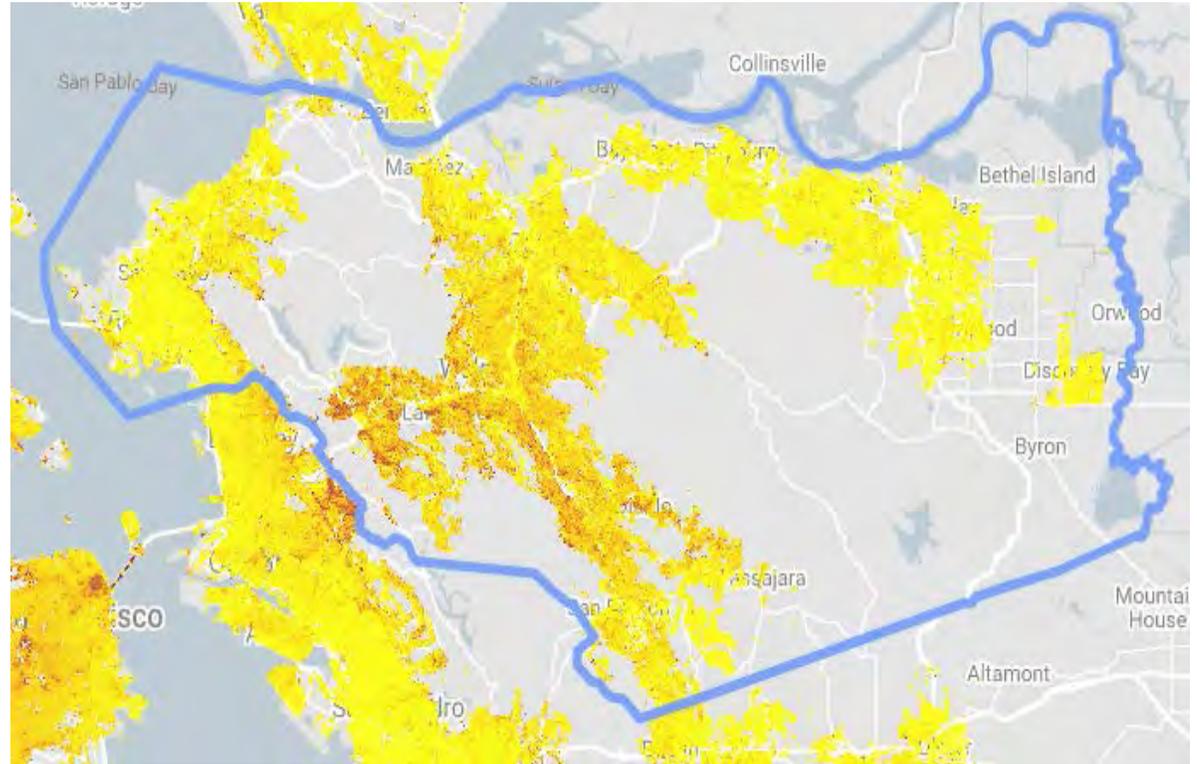


Non-urban land?



Potential Low Impact Locations for Solar: Rooftops

- » Low estimate: **1450 MW**
(flat and south-facing roofs only)
- » High estimate: **2600 MW**
(all roofs other than north facing)
- » 15% of the resource is in Disadvantaged Census Tracts*
- » 85% of the resource is in MCE service territory



*As defined by being in top 25% most disadvantaged according to CalEnviroScreen 3.0

Potential Low Impact Locations for Solar: Parking Lots

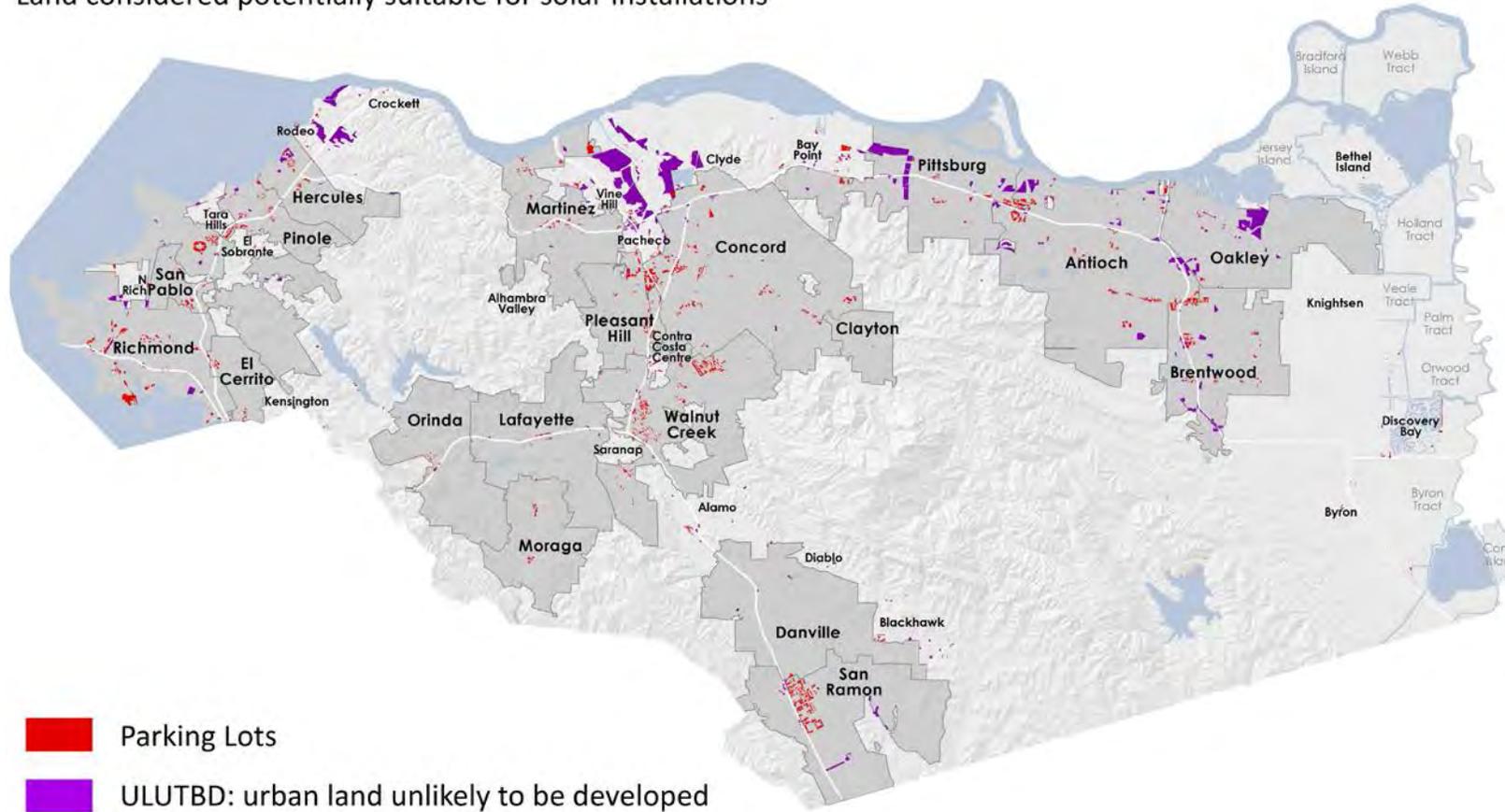
- » Low estimate: **180 MW**
- » High estimate: **530 MW**
- » 15% of the resource is in Disadvantaged Census Tracts*
- » 81% is in MCE territory

Type	Percent of Total
Shopping Center Parking	36%
Facility Parking	17%
Business Park Parking	13%
Auto Yard Parking	11%
Misc Parking	11%
Transit Parking	4%
Industrial Parking	4%
RV Parking	2%
Rural Parking	2%

*As defined by being in top 25% most disadvantaged according to CalEnviroScreen 3.0

Potential Low Impact Locations for Solar: Urban land

Land considered potentially suitable for solar installations



Exercise to find land unlikely to be developed

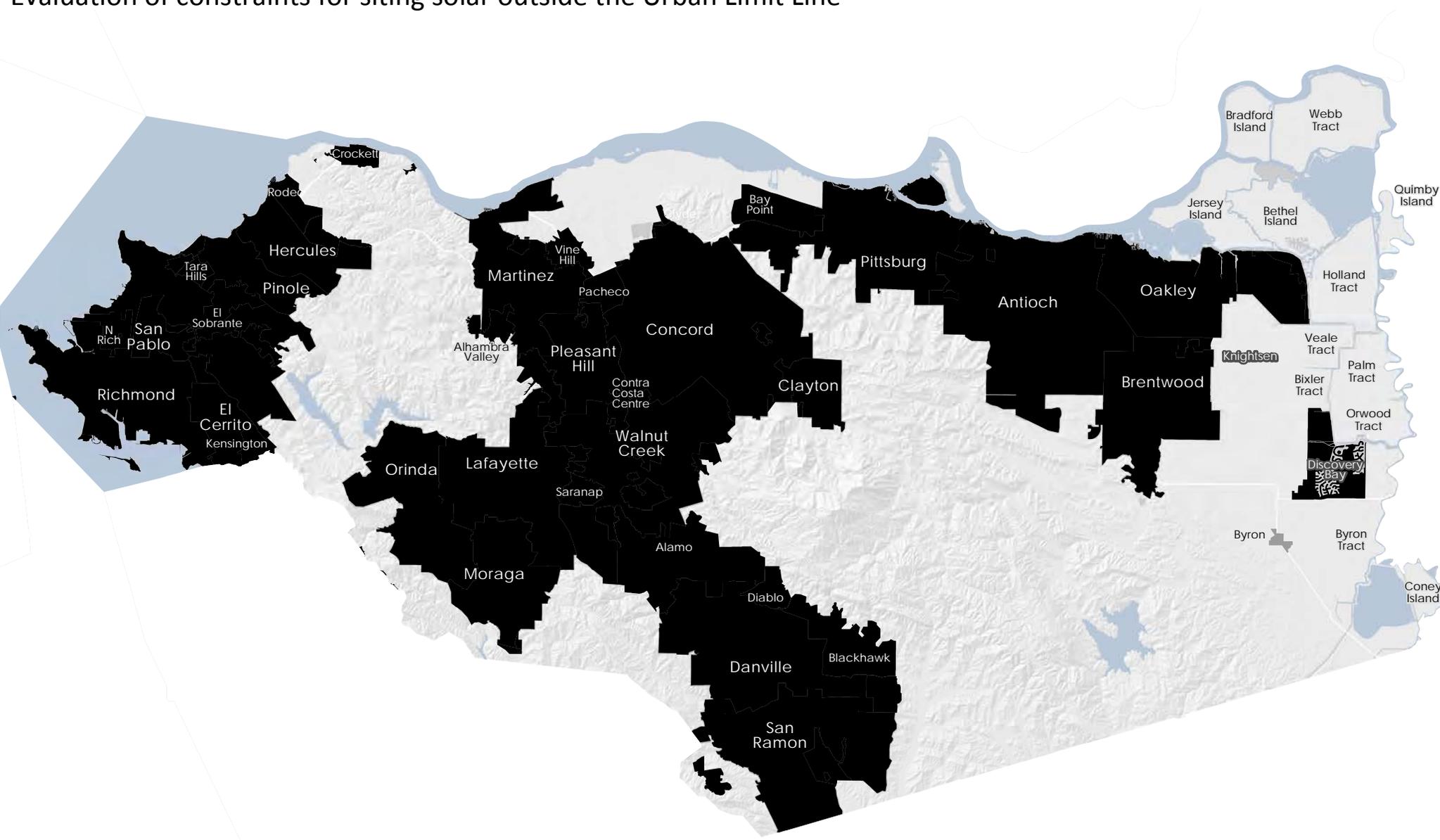
Parking lots, and 'urban land unlikely to be developed' (ULUTBD*) shown with Res/Com/Ind land use designations
 * Land with limited development potential for jobs or housing, theoretically suitable for solar installations.



Contra Costa County Renewable Resource Potential Study

DRAFT Analysis

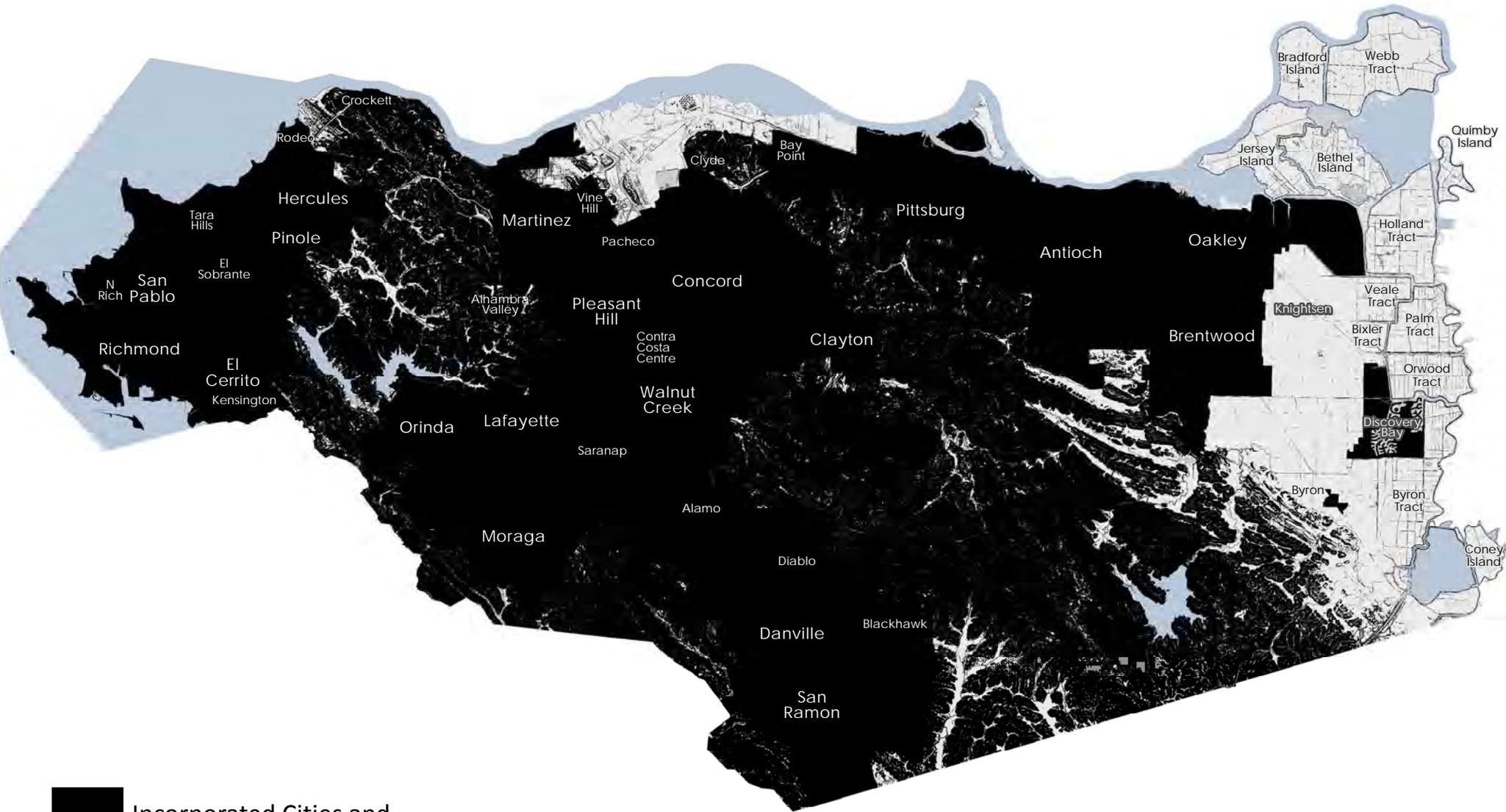
Evaluation of constraints for siting solar outside the Urban Limit Line*



 Incorporated Cities and unincorporated communities inside the Urban Limit Line*

* exceptions: Bethel Island and the Byron Airport area were studied.

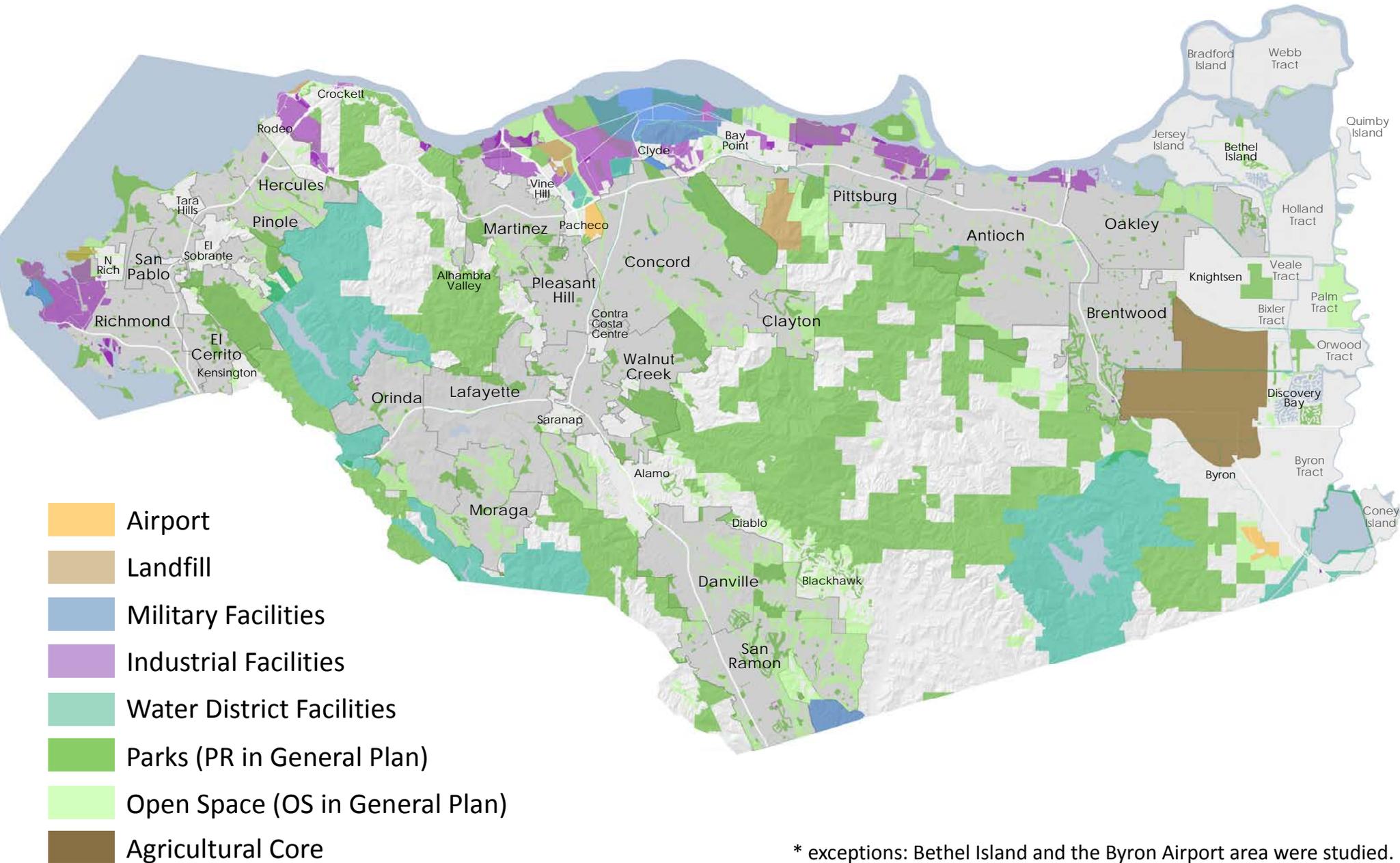
Evaluation of constraints for siting solar outside the Urban Limit Line*



■ Incorporated Cities and unincorporated communities inside the Urban Limit Line* and slopes greater than 10%

* exceptions: Bethel Island and the Byron Airport area were studied.

Evaluation of constraints for siting solar outside the Urban Limit Line*



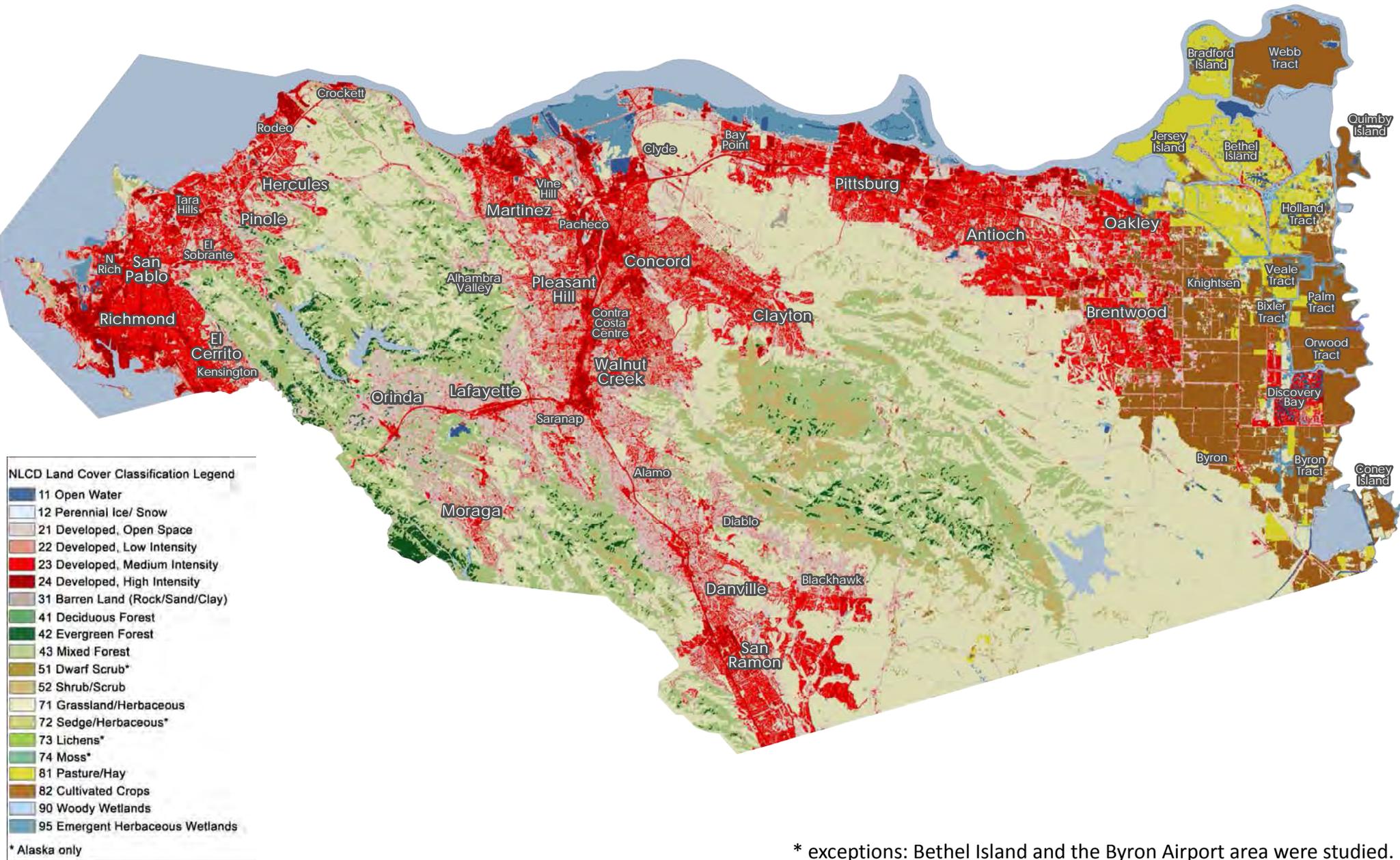
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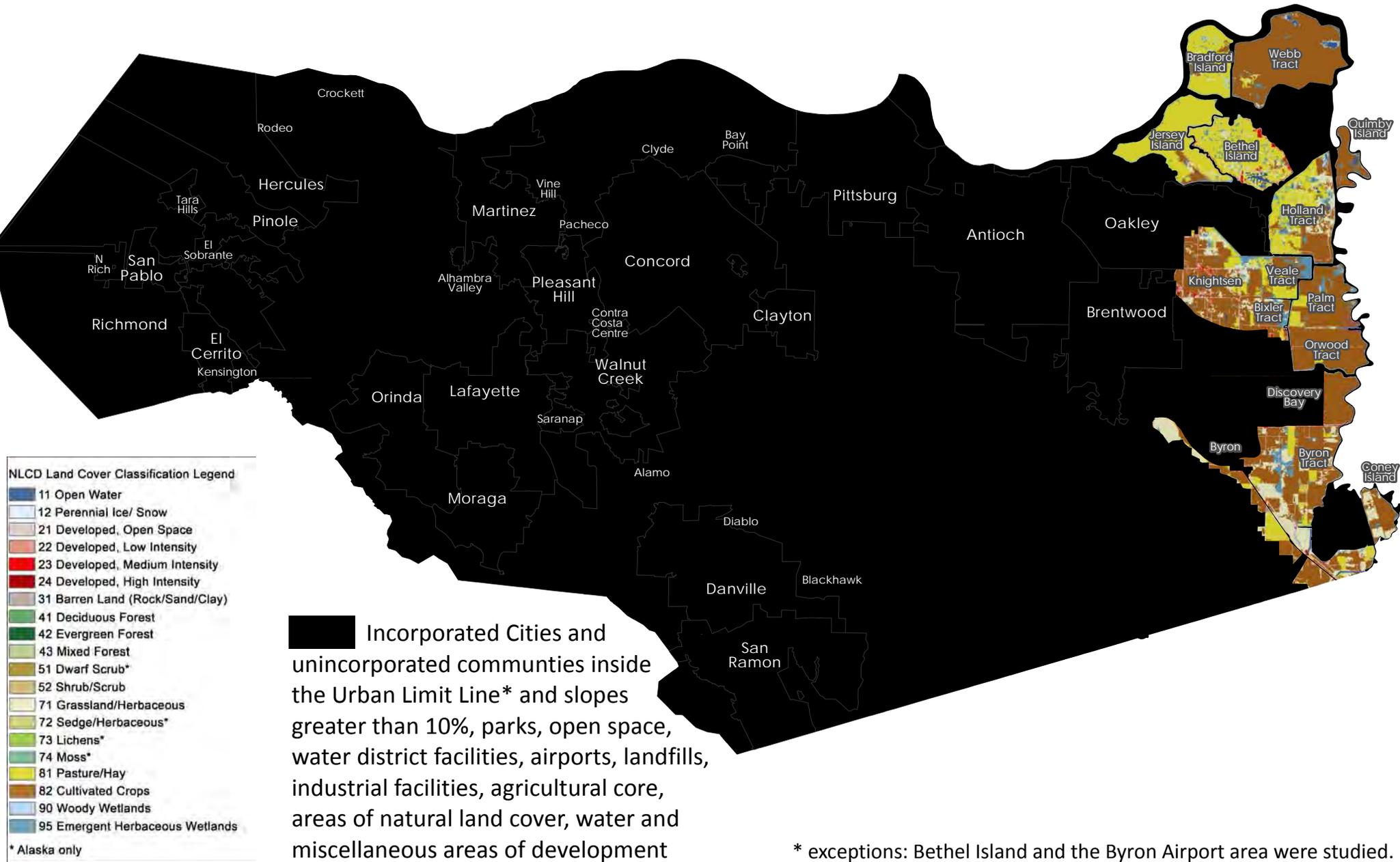
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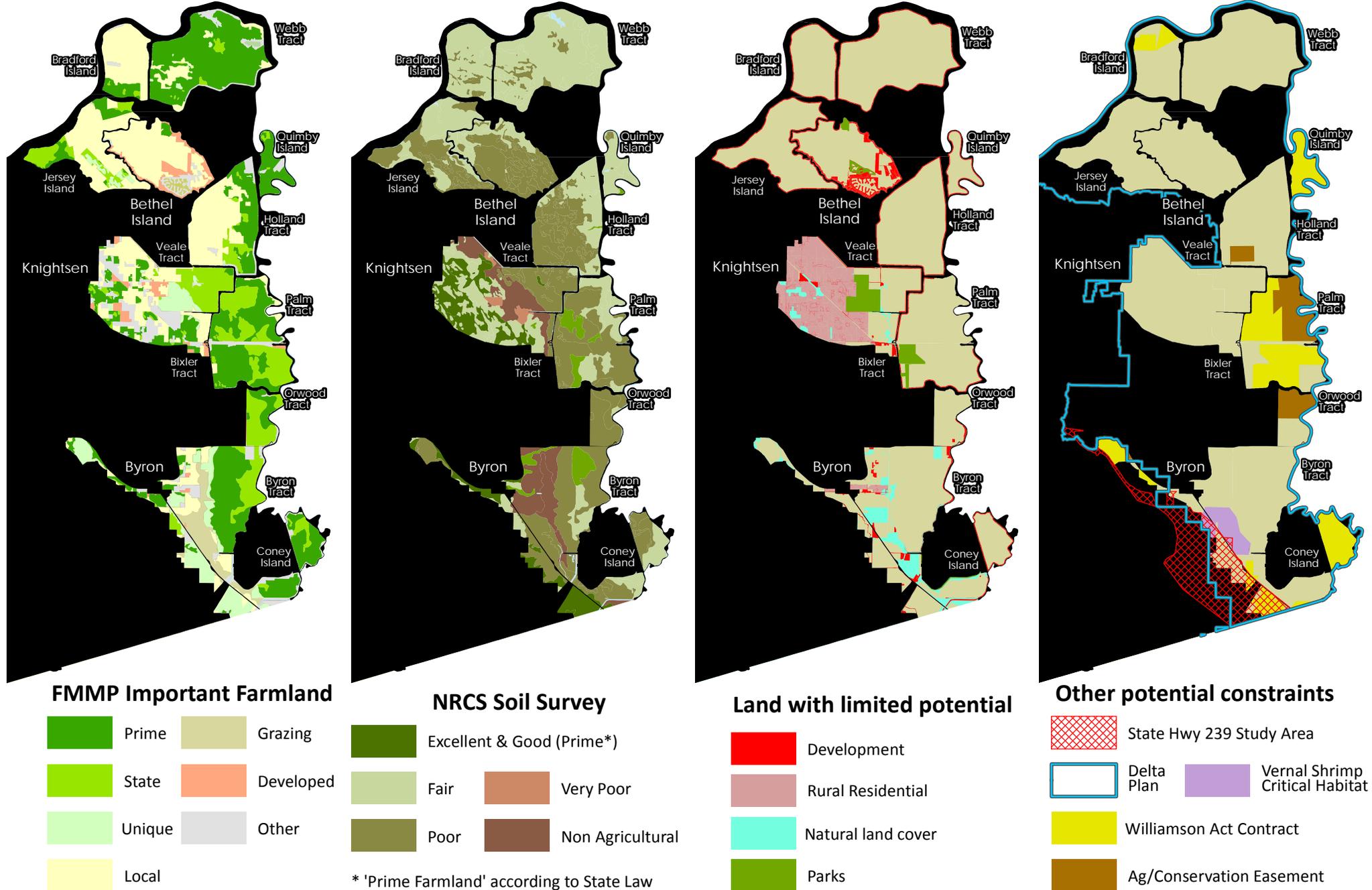
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Contra Costa County Renewable Resource Potential Study

DRAFT Analysis

Land potentially suitable for solar installations on agricultural land with the least constraints



FMMP Important Farmland

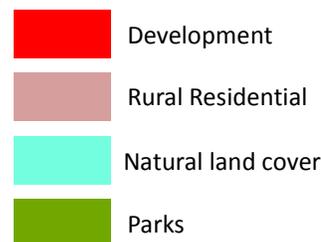


NRCS Soil Survey

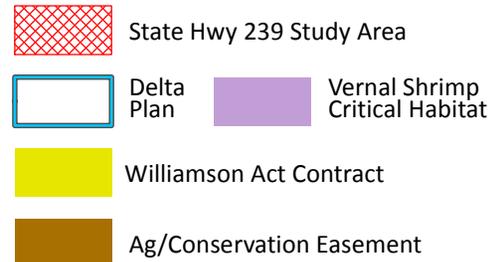


* 'Prime Farmland' according to State Law

Land with limited potential



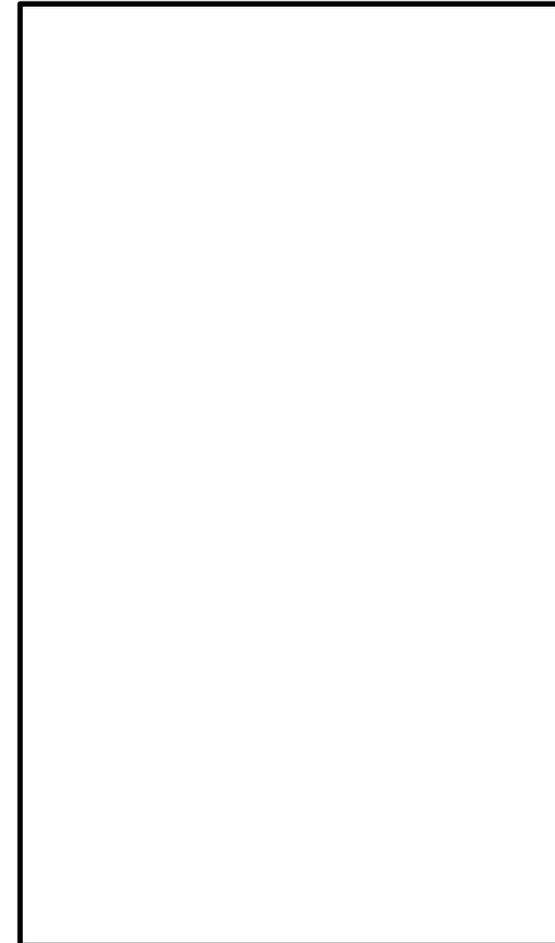
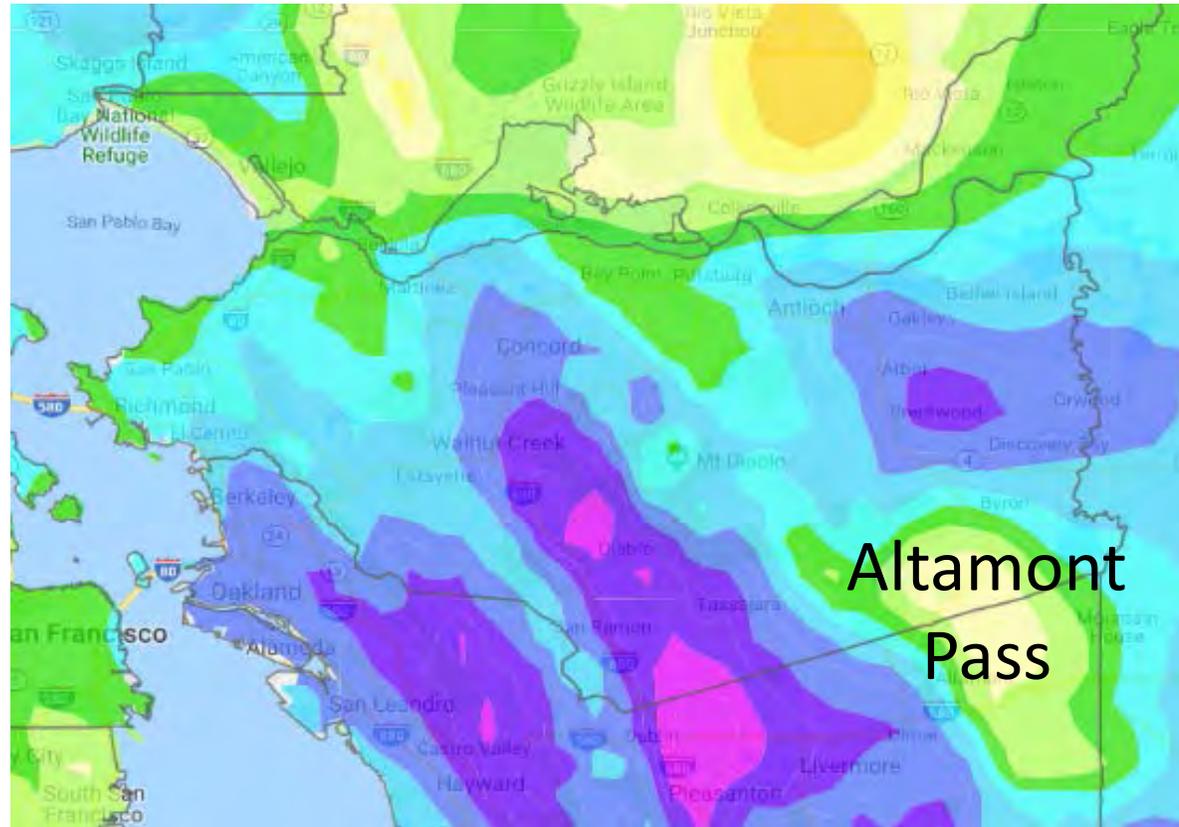
Other potential constraints



Renewable Resources Identified – Wind

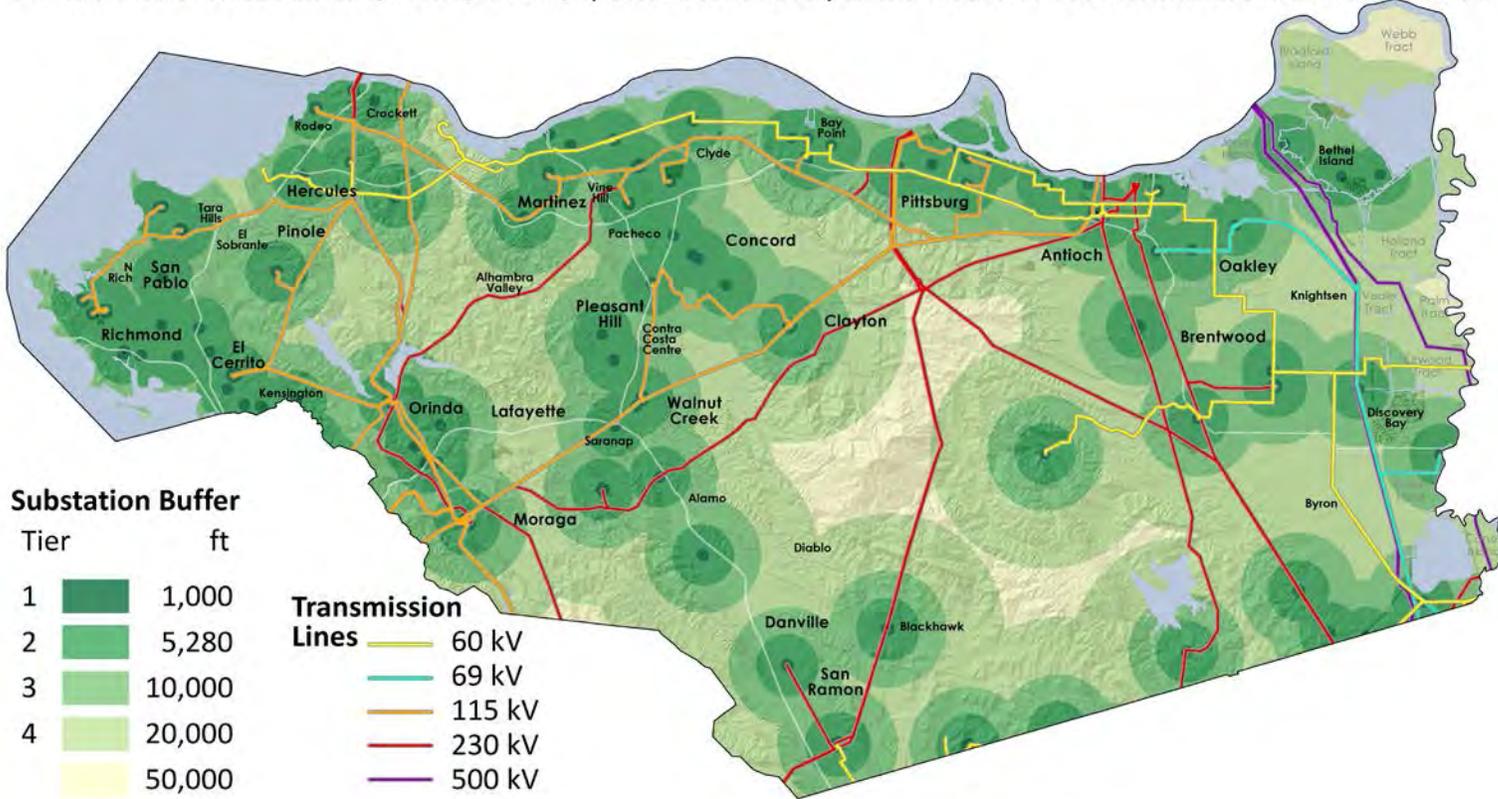
Types

- » Large wind
- » Small wind (including vertical axis and other new technologies)



Cost driver - interconnection

Electrical Grid Infrastructure; PG&E, WAPA, special district and private industrial substations and transmission lines



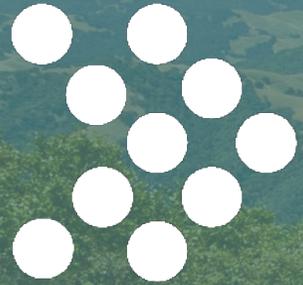
- » Substation proximity used as proxy for cost
- » Much of the land within the urban limit line is near substations
- » Detailed study required for any specific site

Solar by interconnection distance

Increasing distance ↓

	Urban land	Parking lot
Total Resource	330 MW	530 MW
Proximity Tier	% in each distance threshold	
1 (up to 1,000 ft)	39%	34%
2 (up to 5,000 ft)	55%	45%
3 (up to 10,000 ft)	6%	17%
4 (up to 20,000 ft)	0%	4%

Approximately **half** of all identified urban and parking lot capacity is within 1-mile of a substation.
 <5% of the resources are over approx. 4 miles from a substation.



PLANNING AND ZONING

Presentation by the
MCG Project Team

September 27, 2018



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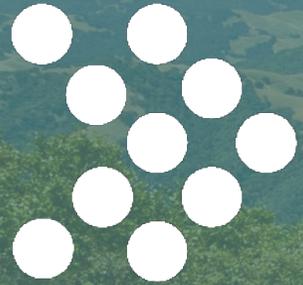
A CADMUS COMPANY

Planning and Zoning Research

- » County and municipal ordinances
- » County general plans
- » County energy plans
- » State and expert guidance documents and best practices
- » Data on CA county renewable deployment

Looking for examples from counties that face significant development pressure and that are careful to preserve habitat, farmland, and open space resources.

Specific counties examined: **Alameda, Marin, Sonoma, Solano, San Joaquin**



WIND PLANNING AND ZONING

Presentation by the
MCG Project Team

September 27, 2018



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Example planning concerns for wind

- » Small wind (stand-alone or building-mounted)
 - › Noise
 - › Flicker and glare
 - › Vibration
 - › Localized bird and wildlife issues
 - › Aesthetics
- » Large wind
 - › Noise
 - › Flicker and glare
 - › Site security
 - › Birds & wildlife
 - › Structural and setbacks
 - › Aesthetics
 - › Decommissioning

Definitions: U.S. Department of Energy defines small wind as under 100kW capacity. Contra Costa County considers any wind >50kW capacity to be “commercial.”

Wind Zoning: Contra Costa Chapter 88-3

Example provisions:

- » Land use permit required if commercial (>50kW)
- » Commercial systems only permitted in agricultural districts
- » Setback requirement – 3x machine height or 500 feet, whichever greater
- » Building permit required if residential
- » Lower decibel limit for residential (<60dB)
- » Decommissioning plans are required - financial surety, reclamation plan, etc.



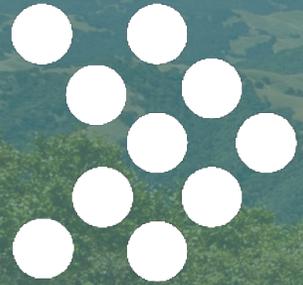
Wind Planning and Zoning Actions to Consider

Large scale wind

- » Reduced or adjusted setback requirements from property lines (to align with technology advancement in recent decades)
- » Convening industry, PG&E, MCE, developers, and investors (to assess options for overcoming project development and siting barriers)
- » Anticipatory planning around environmental impacts and transmission (to help guide prospective developers)

Small scale wind

- » Learn from pilot projects and monitor new technologies



BIOENERGY PLANNING AND ZONING

Presentation by the
MCG Project Team

September 27, 2018



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Example planning concerns for bioenergy

» Biomass

- › Air pollution & emissions (primarily particulates, also other criteria pollutants)
- › Traffic/transportation of feedstocks
- › Aesthetics
- › Is it carbon neutral?

» Biogas

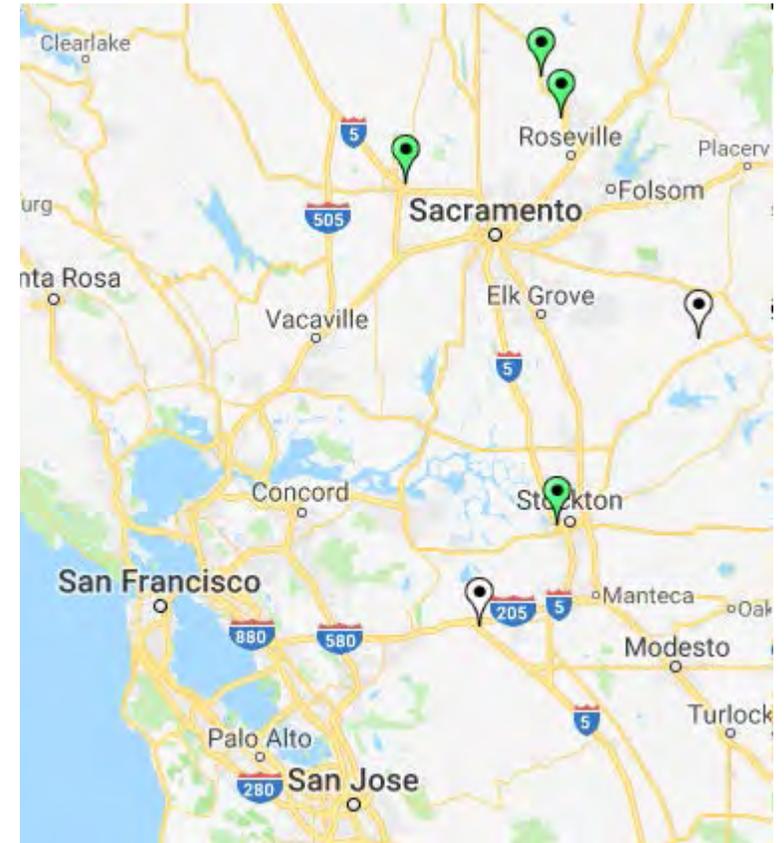
- › Air pollution & emissions
- › Traffic/transportation of feedstocks
- › Storage of slurries
- › Aesthetics
- › Use of residuals/byproducts
- › Odors

Biomass is defined as biological feedstocks that could be combusted to produce electricity (e.g. wood chips, ag waste, food waste, forest slash, and landfill waste).

Biogas refers to resources that produce methane gas through anaerobic digestion which can be collected, processed, and combusted.

Bioenergy Zoning: Biomass

- » Economics are causing more plants to idle and/or shut down
- » Currently less than half the facilities in the state still operate
- » Discussions could revolve around how biomass could be sent to an existing site
 - › Plant in Tracy is idled
 - › Plant in Stockton is operating



Source: CA Biomass Energy Alliance

Bioenergy Zoning: Biogas

- » Existing sites
 - › What is the **incremental** nuisance associated with harvesting biogas from sites that are already collecting waste?
 - › E.g. Wastewater treatment plants, landfills, farm-based anaerobic digestion
 - Drill methane wells, add digesters on the facility
 - › Wastewater plants have indicated an interest in expanding biogas collection

- » New sites
 - › Significant review needed to assuage concerns about nuisance and odor

- » All likely require CA Air Resources Board (CARB) review

Bioenergy Planning and Zoning Actions to Consider

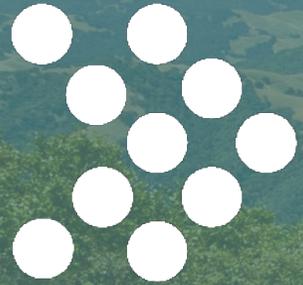
Biomass

- » Export to existing plants

Biogas

- » At wastewater treatment plants: Consider incentives and permitting strategies to encourage usage of biogas resources
- » Consider biogas collection for transportation fuel

Monitor economic trends and interest from project developers prior to investing energy in any zoning text updates



SOLAR PLANNING AND ZONING

Presentation by the
MCG Project Team

September 27, 2018



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Example planning concerns for solar

- » Parking lot canopies
 - › ADA-accessible parking
 - › Clearance for emergency vehicles
 - › Co-benefits (e.g. heat island, shade)
 - › Aesthetics and property-owner concerns
- » Rooftop
 - › Consistency with CA requirements
 - › Height
 - › Aesthetics (not a factor in CA)
 - › Setbacks
 - › Historic districts
- » Land unlikely to be developed
 - › Are sites actually unlikely to be developed?
 - › Aesthetics and property-owner concerns
- » Ag land
 - › How to identify least-conflict areas
 - › Highest and best use
 - › Habitat and agriculture preservation
 - › Aesthetics
 - › Property-owner concerns
 - › Potential mitigation requirements

Rooftop Solar Planning and Zoning Actions to Consider

- » Continue to strive for consistency and efficiency in the County and its cities to reduce solar “soft costs”
- » Work on County-wide market development
- » Lead by example on high visibility facilities



County facilities with significant solar arrays in Martinez

Ground Mounted Solar Planning and Zoning Actions to Consider

Urban Land

- » Parking lot solar requirement
- » Incentives for solar on urban land unlikely to be developed
- » Coordinated PG&E studies to determine area-wide grid constraints



Agricultural Land

- » Consider whether to allow solar in “low constraint” agricultural areas
- » Monitor farmland preservation and habitat preservation progress
- » Look for opportunities to evaluate co-location of agriculture and solar (e.g. Pittsburg Unified project)
- » Coordinated PG&E studies to determine area-wide grid constraints

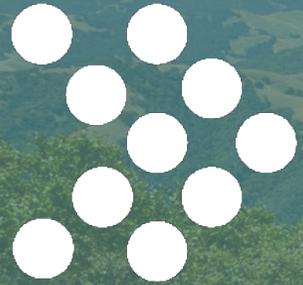
Next Steps

October

- » Preliminary draft to be circulated
- » 4th and final stakeholder meeting for feedback

Date to be determined

- » Draft presented to board



DISCUSSION

