Local Clean Energy Vision for Southern California

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Clients

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Objectives

This project aims to demonstrate pathways to achieving cost-effective, environmentally responsible local clean energy development in Los Angeles and Ventura counties. A partnership between Bren, the Clean Power Alliance (CPA), and The Nature Conservancy (TNC) combines expertise in the energy field, conservation planning, and resource management to maximize the benefits of this development opportunity. Specifically, this project will answer the following question: What land-use scenarios for the development of in front of the meter[1] solar photovoltaics (PV) systems provide CPA with the least-cost path to achieve their local clean energy supply targets in a way that maximizes benefits to nature and local communities?

Significance

There is an urgent need to reduce greenhouse gas emissions globally to address climate change. The electric power sector accounted for approximately 15% of California's greenhouse gas emissions in 2017[1] and has been identified as an important sector in the state's efforts to tackle global warming[2]. In 2018, California set a target of supplying 50% zero-emission electricity by 2025 and 100% by 2045[3]. Many CCAs are leading California's procurement of clean energy resources and have ambitious targets that go beyond the state mandate. Several members of Clean Power Alliance have selected that customers receive 100% renewable energy by default. In addition, CPA member jurisdictions have a strong interest in advancing local clean energy development that can provide clean energy jobs to their constituents. However, Los Angeles and Ventura counties are already intensely developed. There is an urgent need to proactively plan for deployment of local in-front-of-the-meter solar facilities that maximize benefits to nature and local communities.

Disturbance of undeveloped land for any purpose, including renewable energy development, can have negative consequences for biodiversity and ecosystem function. Areas outside of the Los Angeles Basin, such as Antelope Valley of the west Mojave[4], have experienced the negative impacts renewable energy expansion may have on ecological values. Additional analysis of land use, development impacts, and economic benefits are needed to develop local clean energy and meet the demands associated with CPA's energy targets. These analyses would benefit CPA's staff, board and stakeholders when informing procurement strategies for renewable energy. In

[1] In front of the meter refers to electricity generation facilities that feed into the power grid before it reaches the customer's utility meter.

addition, these analyses further a priority strategy for The Conservancy by proactively planning for renewable energy in a way that minimizes impacts to biodiversity and maximizes the benefits to local communities.

This project would also benefit other power purchasing entities (CCAs, corporations, utilities) that face similar challenges of balancing the demand for new local clean energy resources with limited land availability. In addition, jurisdictions that are in the process of forming a new CCA could use a tool like this to develop a strategy for energy expansion and assess the availability of ecologically suitable land for the development of local renewable energy.

Background

Clean Power Alliance is a Community Choice Aggregation (CCA) program that launched in June 2017. CPA was established as a Joint Powers Authority consisting of 32 agencies across Los Angeles and Ventura counties. These 32 agencies collaborate to provide clean electricity options at competitive rates to over 1 million customer accounts across the region. CPA is the fifth largest Load Serving Entity (LSE) in the state of California, competing in electricity generation with Southern California Edison (SoCal Edison) and projected to reach $750 million in revenue during the 2019-2020 fiscal year. CPA strives to develop an electricity portfolio with lower Greenhouse Gas (GHG) emissions than SoCal Edison's bundled service. Additionally, CPA encourages the use and development of cost-effective renewable and distributed energy resources and promotes public health in areas impacted by energy production.

The Nature Conservancy (TNC) is focused on conserving the lands and waters on which all life depends, while supporting economy-wide electrification and decarbonization to combat climate change. TNC has over a decade of investment and influence in promoting deployment of clean energy in a manner that minimizes impacts to biodiversity. TNC uses conservation science, planning, policy and strategic partnerships to advance towards a future that meets mutual climate and biodiversity conservation goals. TNC has been supporting CPA for the last two years on an approach to integrating conservation information into procurement decision-making.

Equity

This study will provide pathways for local clean energy development that maximize benefits to nature and local communities, including disadvantaged and indigenous groups. Three equity components include:

- Workforce development: Assess the potential for workforce and economic development opportunities within CPA's service territory.
- Disadvantaged communities: Quantify the amount of renewable energy development opportunity available in Disadvantaged Communities (DAC)[2]. Illustrate this by layering DAC census tracts on CPA's service territory map.
- Public health: Numerous fossil fuel power plants exist in CPA's service territory. Quantify the amount of electricity displaced by expanding solar and the associated air quality improvements for the surrounding communities.

[2] DACs are defined as communities that are identified in the CalEnviroScreen 3.0 as among the top 25 percent of census tracts statewide, plus the census tracts in the highest five percent of CalEnviroScreen's Pollution Burden that do not have an overall CalEnviroScreen score because of unreliable socioeconomic or health data.

Available Data

- Suitability of land for development: 1) the County of Los Angeles GIS department which contains data sets on land use, land cover, land status, buildings, parking lots and a solar potential tool for rooftops. 2) The County of Ventura GIS department, 3) Google resources such as project sunroof, maps, and earth, 4) Building footprints via Microsoft 5) California protected areas and conservation easements databases, 5) TNC Power of Place environmental constraint layers and potentially modeled preferred resource areas, and 6) TNC Biodiversity Assessment in Los Angeles (BAILA)
- Energy datasets: 1) CPA electricity generation and supply data, 2) CPA's service territory map, 3) Southern California Edison's Distributed Energy Resource interconnection data, 4) California Independent Service Operator database, 5) California power plant spatial data, and 6) Electricity datasets from the California Natural Resources Agency
- Community impact: California Enviroscreen Disadvantaged Community data, California Environmental Justice Alliance

Potential Scope:

1. Estimate potential for clean energy development in CPA's service territory
    a. Define scenarios of renewable energy demand
    b. Map CPA's service territory using ArcGIS or comparable mapping tool.
        i. Remove from the analysis National Monuments, State Parks, and land where development would negatively impact ecological values.
        ii. Create mapping layers including DAC census tracts, land zoning, undeveloped versus developed land, rooftops suitable for solar PV, etc.
    c. Estimate how much land is suitable for in-front-of-the-meter Solar PV using the mapping tool created in part 1b.
    d. Estimate the land area requirements for the solar PV demand estimated in part 1a
    e. Calculate the surface area of open land, rooftops, and parking lots in LA County that could be used for in-front-of-the-meter solar PV.
    f. Distribution line analysis – cross-reference sites available for development with the interconnection availability on the distribution system using SoCal Edison's interconnection data.
    g. Assess the least-cost siting scenarios to meet the renewable energy demand in CPA's service territory. Run scenarios of land, parking lot, and rooftop areas that could be used to meet the local project scenarios below. Identify total land use in acres for each.
        i. 20%, 10%, 5% of energy coming from local solar PV
    h. Address the need for stakeholder engagement to gauge acceptance of the proposed projects and any competing interests
2. Analyze the land conservation, economic, and equity impacts of the described scenarios.
    a. Identify how much land will be impacted in Antelope Valley.
    b. Estimate the costs associated with each scenario based on the best available pricing information for local solar PV vs. utility-scale/remote PV and rooftop/parking lot PV vs. ground-mount PV.
    c. Assess workforce development outcomes
    d. Quantify renewable energy development opportunities in DAC census tracts.

3. Policy & Practice
    a. Identify recommended policies that could be implemented by CPA or other member jurisdictions to provide incentives for local clean energy development to proceed in a way that minimizes impacts to urban biodiversity and maximizes benefits to local communities.

Deliverables

In addition to a final report, policy brief, poster, and oral presentation, the group will provide:

- A detailed map of CPA's service territory identifying all potential sites for in-front-of-the-meter solar PV, taking into consideration availability, land use, and interconnection constraints.
- An Excel-based tool calculating various local procurement scenarios and associated metrics with each (acres of land use, Antelope Valley land, cost of development, workforce impact, and DACs).

Internships

Clean Power Alliance will provide $10,000 for one summer paid internship located at CPA's downtown Los Angeles office. The Nature Conservancy may be able to offer either a volunteer position or a temporary, short-term employment opportunity at their downtown Los Angeles office.

Supplemental Materials

References

[1] California Air Resources Board. (2019). California Greenhouse Gas Emission Inventory: 2000-2017. Retrieved from https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf

[2] A.B. 32, Pavley. California Global Warming Solutions Act of 2006. (2005-2006). Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32

[3] S.B. 100, De León. California Renewables Portfolio Standard Program: emissions of greenhouse gases. Retrieved from https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

[4] Parker, Thomas & Berger, Steven & Manson, William & Mcconnell, & d'Aquino, Patrick & August, Peter & Balmann, Alfons & Berger, Thomas & Bousquet, François & Brondízio, Eduardo & Brown, Daniel & Couclelis, Helen & Deadman, Peter & Goodchild, Michael & Gotts, Nick & Gumerman, George & Hoffmann, Matthew & Huigen, Marco & Irwin, Elena & Warren, Keith. (2001). Agent-Based Models of Land-Use and Land-Cover Change.

Budget and Justification

Beyond the $1,300 already allocated to student group, The Nature Conservancy commits to providing up to $10,000 towards achievement of the Bren Group Project objectives and Clean Power Alliance commits to providing up to $10,000 to cover at least one Bren School student intern.

Client Letter of Support

See attached letters from each client.

The Nature Conservancy

Client Letter of Support

TO: Group Project Committee at The Bren School of Environmental Science and Management, University of California, Santa Barbara
FROM: Stephanie Dashiell, The Nature Conservancy in California
SUBJECT: Letter of Support for Bren Group Project: "Local Clean Energy Vision for Southern California"

The Nature Conservancy in California and Clean Power Alliance of Southern California are writing to express our support for the proposed student group project "Local Clean Energy Vision for Southern California." The aforementioned work, to be completed by Bren School graduate students, is critical to advancing mutual goals of renewable energy deployment and biodiversity conservation in Southern California and more broadly across the US to accelerate The Conservancy's climate and energy work.

Student work will support our strategy to support Community Choice Aggregators (CCAs) to be environmental leaders by giving them tools, data and resources to purchase the most conservation-compatible renewable energy. The project completed by the students will help demonstrate different pathways to local renewable energy development, the potential implications of those pathways, and the importance of an approach to local renewable energy buildout that integrates conservation upfront. In collaboration with Clean Power Alliance of Southern California, the work will be used to inform CPA's approach to incentivizing local clean energy that maximizes benefits to nature, local communities and disadvantaged communities. This work will make a significant contribution to advancing a priority strategy for The Nature Conservancy and will be applicable to other CCAs and clean energy procurement entities statewide.

The Conservancy commits to providing all necessary guidance, available data, coordination, and technical review to the students, as well as supporting the technical and professional development of the group members. The Nature Conservancy commits to providing up to $10,000 to the advancement of the Group Project objectives which could include temporary, short-term summer employment with The Nature Conservancy in our Los Angeles office.

We are excited to work with Bren School students on this project and look forward to your review of the attached proposal. Please don't hesitate to contact us for further information about our support for this project.

Sincerely,

Stephanie Dashiell

Stephanie Dashiell
Project Director, Energy & Land Use
The Nature Conservancy in California

CPA CLEAN POWER ALLIANCE

To: Group Project Committee at The Bren School of Environmental Science and Management, University of California, Santa Barbara

Re: Letter of Support for Bren Group Project: "Local Clean Energy Vision for Southern California"

January 24, 2020

To whom it may concern,

Clean Power Alliance (CPA) is writing to express our support for the proposed student group project "Local Clean Energy Vision for Southern California." The aforementioned work, to be completed by Bren School graduate students, is critical to advancing renewable energy deployment and local development opportunities in Southern California.

The student work will support CPA's strategy to develop local clean energy resources within its service territory in Los Angeles and Ventura counties. The students' work will help demonstrate different pathways to local renewable energy development, the potential implications of those pathways, and the importance of an approach to local renewable energy buildout that balances conservation, development, and equity.

In collaboration with The Nature Conservancy, CPA is hoping to leverage this work to advancing a priority strategy for its communities as well as be a model for other CCAs and clean energy procurement entities statewide.

CPA commits to providing all necessary guidance, available data, coordination, and technical review to the students, as well as supporting the technical and professional development of the group members. CPA also commits to providing a paid, summer internship opportunity in our Los Angeles office to a member of the student team dedicated to this project, up to $10,000.

We are excited to work with Bren School students on this project and look forward to your review of the attached proposal. Please don't hesitate to contact us for further information about our support for this project.

Sincerely,

Natasha Keefer
Director, Power Planning & Procurement
Clean Power Alliance
(213) 713-1101
nkeefer@cleanpoweralliance.org

CC: Ted Bardacke, Executive Director, Clean Power Alliance