Report and Recommendation to City Council:

Participation of Woodland in a Community Choice Energy Program

Community Choice Energy Technical Advisory Committee

April 18, 2017

Table of Contents

Executive Summary

The Woodland Community Choice Energy (CCE) Technical Advisory Committee was appointed by the City Council to consider the benefits and risks of Woodland participation in CCE and make a recommendation to the City Council in early 2017.

CCE enables local governments to procure and/or develop power on behalf of their public facilities, residents, and businesses. The aims are to increase local choice in energy supply and provide electricity with high renewable energy content at electric rates that are competitive with those of the incumbent investor-owned utility (IOU), such as PG&E. While a CCE determines the sources of its power supply, sets customer rates, and develops programs and incentives, the IOU continues to deliver the energy, maintain infrastructure, read meters, and bill the customers. Participation in CCE has the potential to provide substantial economic benefits through the provision of favorable electricity rates and incentive programs tailored to local needs.

The CCE Technical Advisory Committee met biweekly from January 9, 2017, through April 3, 2017, and developed its recommendation by considering Woodland's objectives, reviewing many sources of information, consulting with staff members of existing CCEs, attending relevant meetings of the California Public Utilities Commission (CPUC) and the Valley Clean Energy Alliance (VCEA), receiving technical study results from The Energy Authority (TEA), and gathering input during public presentations.

The committee began by considering a range of options, including participating with Davis and Yolo County in the VCEA CCE, joining another northern California CCE, forming a Woodland CCE, and maintaining the status quo by not participating in a CCE. The options were eventually narrowed down to the following three:

- Option 1 – No CCE participation
- Option 2 – Join VCEA in time to be included in its February 2018 launch
- Option 3 – Join VCEA at an unspecified time subsequent to the February 2018 launch

The evaluation efforts culminated in an exercise of eight committee members in which they rated these three options in relation to considerations in three main categories of comparative criteria – Cost-competitiveness Governance and Local Control, and Risk – which was followed by a vote. The rating exercise resulted in favorable outcomes for Options 2 and 3, with Option 2 slightly favored. Although Option 2 was considered to entail more risk to the City, the participants determined that the risks are outweighed by the benefits of being part of the VCEA decision-making processes before program launch, when VCEA priorities and policies are being developed.

The participants unanimously agreed to recommend Option 2 to the City Council.

This report provides background information on the committee, CCE, and evaluation of the options and explains the recommended action in the following sections:

I. Committee Purpose and Role – Describes the committee's purpose, objectives, and work plan and schedule

II. Community Choice Energy – Explains the background and organization of CCEs, how CCEs operate, the extent of CCEs in California, and describes VCEA.

III. Evaluation of Woodland's Options – Provides the rationale for the range of options considered, summarizes the results of the TEA technical study, expands on the potential benefits and risks of the options, and provides details about the evaluation process conducted by the committee.

IV. Recommendation – Presents the committee's recommendation to the City Council and explains the reasoning behind the recommendation.

I. COMMITTEE PURPOSE AND ROLE

The Woodland Community Choice Energy (CCE) Technical Advisory Committee was created by City Council resolution in November 2016. The committee's role is to evaluate the benefits and risks associated with Woodland's potential participation in CCE and to make recommendations to the City Council. In addition, the committee provides a forum for public input and feedback.

A. Woodland's Objectives

CCEs are not-for-profit programs formed by local governments to acquire electricity supply for their communities. They work in partnership with the incumbent investor-owned utility (IOU), such as PG&E, which continues to deliver the electricity and maintain energy infrastructure. CCEs in California have stated goals of supplying electricity with higher renewable energy content and thus lower associated greenhouse gas (GHG) emissions, improving local control over energy supply, and reinvesting revenues in their local communities, while providing electricity at rates that are competitive with those of the IOU.

The Woodland City Council has expressed interest in reducing customer electricity rates, returning savings to the local economy, and increasing the renewable energy content of the local electricity supply through CCE participation. These outcomes would support several of the goals and objectives put forth in the City's 2035 General Plan Update (GPU) and 2035 Climate Action Plan (CAP).

The GPU envisions Woodland as a vibrant, sustainable community with a variety of business interests. Local investment of revenues in renewable energy projects and the provisions of price-competitive electricity with a high renewable energy content could spur local economic development by attracting new businesses, lead to new "green" energy jobs, and diversify the economic base. Offering electricity rates that are lower than PG&E's would provide economic benefits to the community in general.

The 2035 CAP, a companion planning document to the GPU, is the culmination of a decade of commitments by the City to promoting actions to address climate change by reducing GHG emissions; the CAP strategies are aimed at reducing GHG emissions 15% below 2005 levels by 2020 and approximately 53% below 2005 levels by 2035. Providing community electricity supply with a higher content of renewable energy than provided by PG&E could significantly accelerate Woodland's progress toward these targets.

The committee considered these objectives in evaluating the benefits and risks of CCE participation.

B. Advisory Committee Membership

The City Council appointed the following community members to the CCE Technical Advisory Committee to provide a mix of expertise and interest in energy and local economic and environmental issues. Members include representatives of large energy users and Woodland citizens with knowledge of the community.

Tom Flynn, Chair – Staff member, California Energy Commission

Christine Shewmaker, Vice-Chair – Retired plant biologist / molecular biologist

Maria Armstrong – (former) Superintendent, Woodland Joint Unified School District

Mark Aulman – Retired marketing communications consultant; Vice-Chair, Woodland Historical Preservation Commission; Secretary, Woodland Tree Foundation; and President, Kiwanis Club of Woodland

Kevin Cowan – Financial service provider and President, Woodland Chamber of Commerce

Jim Gillette – Finance Director, Yolo County Housing and Co-Chairman, Woodland Chamber of Commerce Public Policy Committee

Phil Hogan – District Conservationist, USDA Natural Resource Conservation Service and Immediate Past-President, Woodland Chamber of Commerce

Mark James – Director of Facilities, Dignity Health

Elisabeth Robbins – Retired family therapist

Ralph Solorio* – Facility Manager, Rite Aid Distribution

Erick Watkins – Environmental Health & Safety, Pacific Coast Producers

*Ralph Solorio was appointed to the committee by the City Council but was subsequently unable to participate.

C. Committee Work Plan and Schedule

The committee met biweekly from January 9, 2017, until April 3, 2017. Below is a summary of the committee's activities and approach.

- *Used a comprehensive approach to information gathering*: Multiple sources of information were used in the consideration of CCE benefits and risks. Committee members reviewed publicly available studies and reports. Links to many of these are now listed on the City's CCE webpage that was created as a part of this effort (www.cityofwoodland.org/cce). A key document was the technical study commissioned by the City of Davis and prepared by The Energy Authority (TEA) to evaluate Davis-only and Davis-Yolo County CCE options [1].

  Committee representatives attended relevant outside meetings, including a California Public Utilities Commission (CPUC) En Banc hearing on CCE issues and meetings of the Board of Directors of the Valley Clean Energy Alliance (VCEA), the CCE initiated by Davis and Yolo County, which is discussed below.

  The committee sought information from the Davis and Yolo County staff members involved in the formation of VCEA and other CCEs. Presentations were received at the January 23 meeting from Gerry Braun, Vice Chair of the Davis CCE Advisory Committee, on the evaluation of CCE participation options conducted by that committee and from Davis Sustainability Program Manager Mitch Sears on VCEA formation. The committee chair also discussed growth plans of MCE (formerly Marin Clean Energy) and Sonoma Clean Power with the chief executive officers of those agencies.

[1] TEA, "City of Davis and Yolo County Technical Study – Final Report," http://documents.cityofdavis.org/Media/CityCouncil/Documents/PDF/CityCouncil/Community-Choice-Energy-Advisory-Committee/Documents/City-of-Davis-and-Yolo-County-Technical-Study-Final-3-11-16.pdf

- *Identified options for consideration and developed a framework for evaluation*: The committee began its evaluation of Woodland's potential participation in a CCE by considering a broad range of options including joining VCEA, joining another CCE, forming a Woodland-only CCE, and staying with the status quo. This range was narrowed down to the following options for closer consideration, for the reasons described in Section III (Evaluation of Woodland's Options) of this report:
    - Option 1 – No CCE participation
    - Option 2 – Join VCEA in time to be included in its February 2018 launch
    - Option 3 – Join VCEA subsequent to the February 2018 launch

  The committee developed an extensive list of questions related to CCE participation, including Woodland's electrical demand levels and load profile, potential benefits and risks of various types, related power infrastructure issues, energy markets, the treatment of solar projects by CCEs, VCEA operations, and other issues, and researched answers through consultation with local energy specialists and available documentation. The committee determined that a basic framework for evaluating the options should entail considerations in three major categories:
    - Cost competitiveness;
    - Governance and local control; and
    - Risks that could affect financial viability.

- *Determined a timeframe for the decision process:* To have the ability to keep Option 2 under consideration, the committee established a work plan schedule by calculating backward from VCEA's anticipated August 2017 submittal of its Implementation Plan to the CPUC, by which time Woodland would need to have formally been accepted as a VCEA member. The resulting timeline necessitated that the committee submit its recommendation to the City Council by April 18, 2017.

- *Engaged TEA to perform a technical study*: The committee requested that the City engage TEA to conduct a short technical study supplementing the technical study prepared for the City of Davis (referenced above) and focusing on benefits and risks of Woodland participation in VCEA. A number of factors were considered, such as Woodland's electricity demand and customer classes compared with those of Davis and Yolo County and how the addition of Woodland to VCEA could affect both financial considerations and risks to the parties. The study was delivered as a presentation to the committee on March 20, 2017. The results of the study are discussed in Section III of this report (Evaluation of Woodland's Options). The TEA work products are attached to this report.

- *Conducted public outreach and presentations*: In addition to providing information on the City's website, committee members have conducted the following outreach and presentations to date, both to provide information and to solicit questions:
    - March 13, 2017, presentation to Woodland Kiwanis
    - March 21, 2017, update to City Council
    - March 23, 2017, presentation to Woodland Joint Unified School District Board
    - March 29, 2017, public outreach meeting at the Woodland Community and Senior Center

In addition to the outreach and presentations listed above, city staff has maintained a webpage (www.cityofwoodland.org/cce) with links to CCE information, committee meeting agendas and notes, and additional resources and has publicized the committee's efforts and this webpage through social media, press releases, and e-newsletters.

II. COMMUNITY CHOICE ENERGY

A. Background and Organization

Context for CCE in California

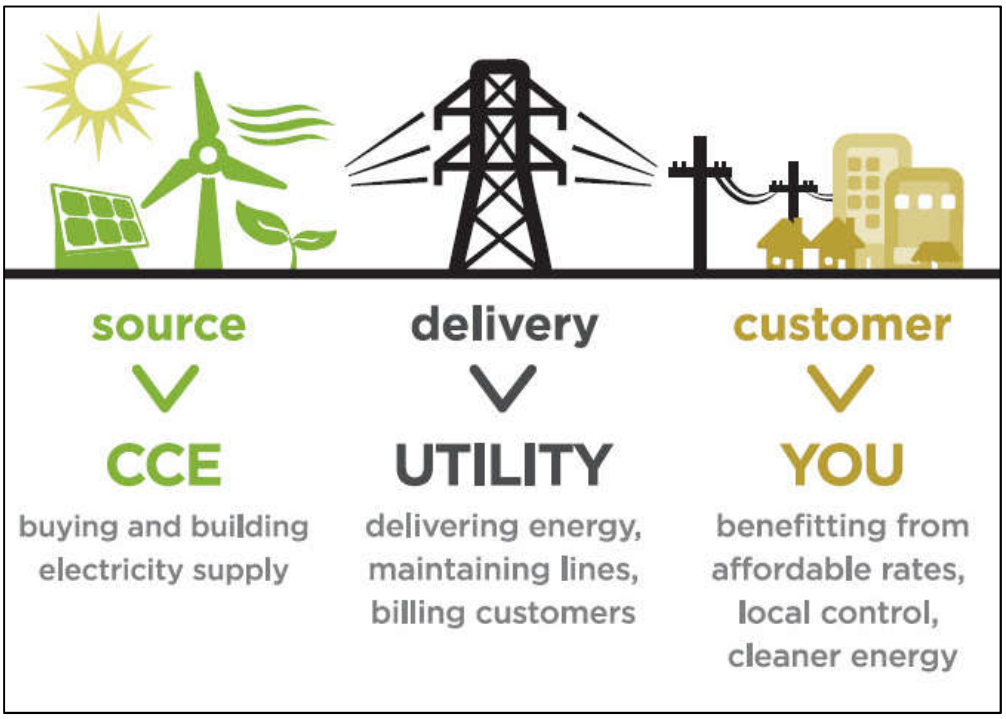
In brief, CCEs allows cities and counties to partner with their IOU (e.g., PG&E) and become the default electricity supplier.

California enacted legislation in 2002 permitting local governments (i.e., cities and counties) the opportunity to aggregate energy procurement on behalf of the citizens and businesses in their communities. This legislation – Assembly Bill (AB) 117 (Chapter 838, September 24, 2002) – authorizes the creation of Community Choice Aggregation (also known, and referred to herein, as Community Choice Energy, or CCE), describes essential CCE program elements, requires the IOUs to provide certain services to CCEs, and requires the CPUC to determine a cost recovery mechanism to be imposed on the CCE to prevent a shifting of costs to an IOU's bundled customers (this latter requirement pertains to the Power Charge Indifference Adjustment[2] or "PCIA" which is discussed in more depth later in this report).

The statute by necessity requires CCEs to rely on the incumbent IOU for a variety of services, such as metering and billing. This ongoing relationship between the CCE and the utility is essential partly because the IOU retains the obligation to provide the CCE's energy customers with distribution and transmission services as shown in Figure I on the next page.

[2] The PCIA is the charge paid by former bundled IOU customers that receive electricity from a supplier other than the IOU – that is, Direct Access customers and CCE customers. The purpose of the PCIA is to ensure that costs that the IOU incurred in the past to serve customers now taking service from Direct Access or CCE do not unfairly affect remaining IOU customers. It is intended to keep bundled IOU customers financially "indifferent" to the departure of the Direct Access and CCE load.

Figure I. How Community Choice Energy Works



Source: City of Davis, "Community Choice Energy," http://cityofdavis.org/city-hall/community-development-and-sustainability/sustainability-program/community-choice-energy

Legislative History

Following is a summary of state legislation and related efforts relevant to CCE.

- *AB 117 (2002)*. Authorized formation of CCEs in California and mandates that customers be automatically enrolled in their local CCE, with an option to opt-out.
- *Proposition 16, rejected by the voters in 2010*. This proposition, supported by over $44 million from PG&E[3], would have amended the state constitution to require two-thirds supermajority voter approval before local governments could use public funds or issue bonds to establish or expand public electricity service or CCE.
- *Senate Bill (SB) 790 (2011)*. Created a "code of conduct, associated rules, and enforcement procedures, to govern the conduct of an electrical corporation relative to the consideration, formation, and implementation of community choice aggregation programs."[4]
- *AB 1110 (2016)*. Established a framework for disclosing GHG emissions for all electrical suppliers, which also applies to CCEs.

[3] California Secretary of State, "Campaign Finance: Yes on 16," http://cal-access.sos.ca.gov/Campaign/Committees/Detail.aspx?id=1318623&session=2009&view=received

[4] Official California Legislative Information, "SB 790," http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0751-0800/sb_790_bill_20111008_chaptered.html

- *AB 2145 (Bradford) (2014), not enacted*. Would have limited the ability of CCEs to enroll customers. Passed in the Assembly but died in the Senate.
- *SB 618 (Bradford), introduced in 2017*. Would require that the CPUC approve the integrated resource plans of CCEs.
- *SB 692 (Hueso), introduced in 2017*. Would change the Transmission Access Charge by assessing transmission access charges only on energy delivered through the transmission system.

The California Alliance for Community Energy and other CCE advocacy groups oppose SB 618 and support SB 692.

CCE Structures

The three basic CCE structures in California are summarized below.

- *Joint Powers Agency (JPA) Model* – In a JPA structure, several jurisdictions equally or proportionally share decisions and operational control of the CCE. Forming a JPA helps to insulate the member agencies financially.
- *Enterprise Model* – In this model, a single entity (city or county) forms a CCE. An advantage can be that the single entity has more control than if it were sharing governance as part of a JPA. Disadvantages can be that administrative costs can be greater, and the entity assumes all the financial and legal liability of the CCE.
- *Third party option* – Some organizations have been established in California with the stated goal of allowing outsourcing of most or all of a CCE's operational functions and services.

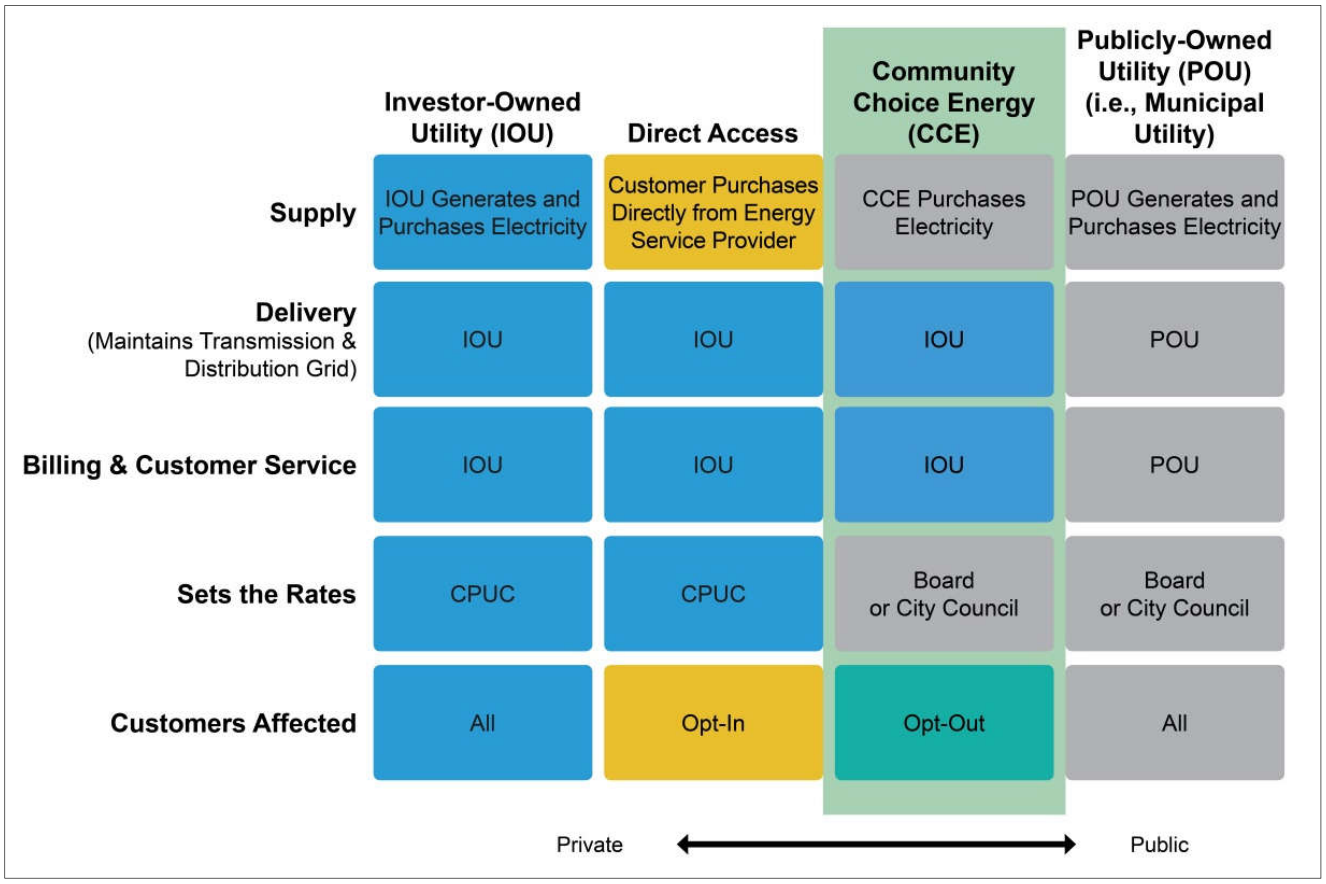
A CCE operating under an enterprise or JPA model may consider some partial outsourcing of operational functions and services once formed.

B. CCE Operations

Comparison of Electric Supply Structures

CCEs share some operational characteristics with IOUs, Direct Access, and publicly-owned (i.e., municipal) utilities. (Direct Access customers are businesses that purchase electricity directly from the wholesale market rather than through the IOU). Figure II highlights the common characteristics and differences between IOUs, Direct Access, CCEs, and publicly owned utilities.

Figure II. Comparison of Electric Supply Structures



CCE is an "Opt-Out" Program by Default

Once a city or county in California forms or joins a CCE, state law (AB117) requires that residential electricity customers within a CCE member's jurisdictions be enrolled in CCE service unless they choose to opt out. A CCE may also choose to include commercial, industrial, or agricultural customers as well. AB 117 requires that at least twice within 60 days before beginning automatic enrollment of customers, CCEs notify the customers that they are to be automatically enrolled, that they have the right to opt out, and the terms and conditions of service they will receive. They must also send at least two additional notices during a 60-day period after CCE service commencement. Once the 60-day post-commencement of service time has passed, customers can opt-out of the CCE and then may opt back in after 12 months.

Backup Procurement

A question that is frequently asked is what happens in the event that a CCE does not procure sufficient electric energy supplies to meet the electric demand of its customers and whether the incumbent utility must "back up" the CCE. The short answer is "no." Once a CCE is in operation and thus takes on the responsibility of procuring electric energy supplies for its customers, the incumbent IOU (e.g., PG&E) no longer has the responsibility to

procure electric energy for the CCE's customers. Like any other load serving entity[5] (LSE), a CCE has the responsibility to procure the electric energy supplies for its customers. Also like some LSEs, the CCE schedules its load and supply through the California Independent System Operator or "California ISO" day-ahead and real-time wholesale markets. Any difference that occurs in each hour between scheduled load and the final metered load is settled by the California ISO as real-time imbalance energy and the CCE pays (or is paid) the hourly real-time price for the difference. Thus, it is the California ISO wholesale market that provides the balancing supply. Like IOUs, CCEs will contract for most of their customer's needs with contracts of varying lengths, and then procure a small amount of imbalance energy via the California ISO market.

Existing PG&E Programs

Questions are also frequently asked about whether PG&E low-income assistance, energy efficiency incentive and rebate programs, and solar net energy metering are continued in jurisdictions with CCEs.

Assistance programs for income-qualifying rate payers, such as California Alternate Rates for Energy (CARE) and Family Electric Rate Assistance (FERA), are administered by the CPUC and are funded through the Public Purpose Programs surcharge on customers' PG&E bills. These programs continue to be provided by PG&E to qualifying rate payers under CCEs.

Similarly, energy efficiency and other public benefit programs are funded through the Public Purpose Programs surcharge and continue to be administered by PG&E. In addition, a CCE can apply to serve as an Energy Efficiency Program Administrator for the cities and counties within its service territory to use energy efficiency program funds to develop new locally based programs and provide incentives targeted to meet local community needs. Examples of energy efficiency programs include demand-response plans, incentives for additional energy storage, and development of electric vehicle charging stations.

In addition to energy efficiency programs, the local CCE may administer innovative tariffs designed to encourage electric generation from renewable sources. CCEs have adopted policies to incentivize rooftop solar, including net metering rates that may be more attractive than rates offered by PG&E.

Regulatory Role of the CPUC

AB 117 directs the CPUC to establish the rules and procedures for the implementation of CCE. The CPUC determines the terms and conditions under which the IOU provides services to the CCE. Nothing in the statute directs the CPUC to regulate CCEs except to the extent that its program elements may affect utility operations and the rates and services to other customers. The statute does not authorize the CPUC to set CCE rates.

[5] In California, LSEs consist of IOUs (there are six IOUs in California of which PG&E is an example), publicly owned load-serving entities (there are 46 of these in California of which the Sacramento Municipal Utility District or "SMUD" is an example), rural electric cooperatives (there are four in California of which the Plumas-Sierra Rural Electric Cooperative in Portola, California is an example), community choice aggregators (CCEs) (at present there are five operating CCEs in California – Marin Clean Energy, Lancaster Power Authority, Sonoma Clean Power, Clean Power San Francisco, and Peninsula Clean Energy – while Valley Clean Energy Alliance or "VCEA" is an example of one in the formative stages), and electric service providers or "ESPs" (there are 22 in California of which Shell Energy North America is an example). An ESP is a non-utility entity that offers "Direct Access" electric service to customers located within the service territory of an investor-owned utility. ESPs are required to register with the CPUC.

The statute requires the CPUC to certify receipt of a CCE implementation plan within 90 days of its filing by the CCE. The CPUC must also provide the CCE with its findings regarding any cost recovery mechanism that must be paid by the CCE customers to prevent a shifting of costs to bundled IOU customers (i.e., the PCIA).

CCEs are Subject to Certain State Regulations

Similar to other LSEs, CCEs are subject to California's Renewables Portfolio Standard (RPS). Under this requirement, a CCE must procure a certain percentage of renewable energy. For example, by 2020 one-third of a CCE's electricity sales on an annual basis must be from renewable resources. In 2030 this requirement increases to 50%. More specifically, the total qualified renewable energy delivered to customers divided by the total energy delivered to customers on an annual basis must be equal to or greater than 33% by 2020 and 50% by 2030.

C. CCE Expansion in California

As shown in Figure III on the next page, CCE is expanding in California. There are multiple factors fueling the growth of CCE in California. Some of the factors cited are that CCE:

- Offers the potential for more competitive rates,
- Provides local communities with more control over their electricity supply (for example, the ability to set higher renewable energy content and to set rates locally),
- Serves community goals and local policy objectives (for example, a city's or county's climate action plan), and
- Offers the ability to reinvest earnings into the local community and create local "green" jobs.

D. Valley Clean Energy Alliance (VCEA)

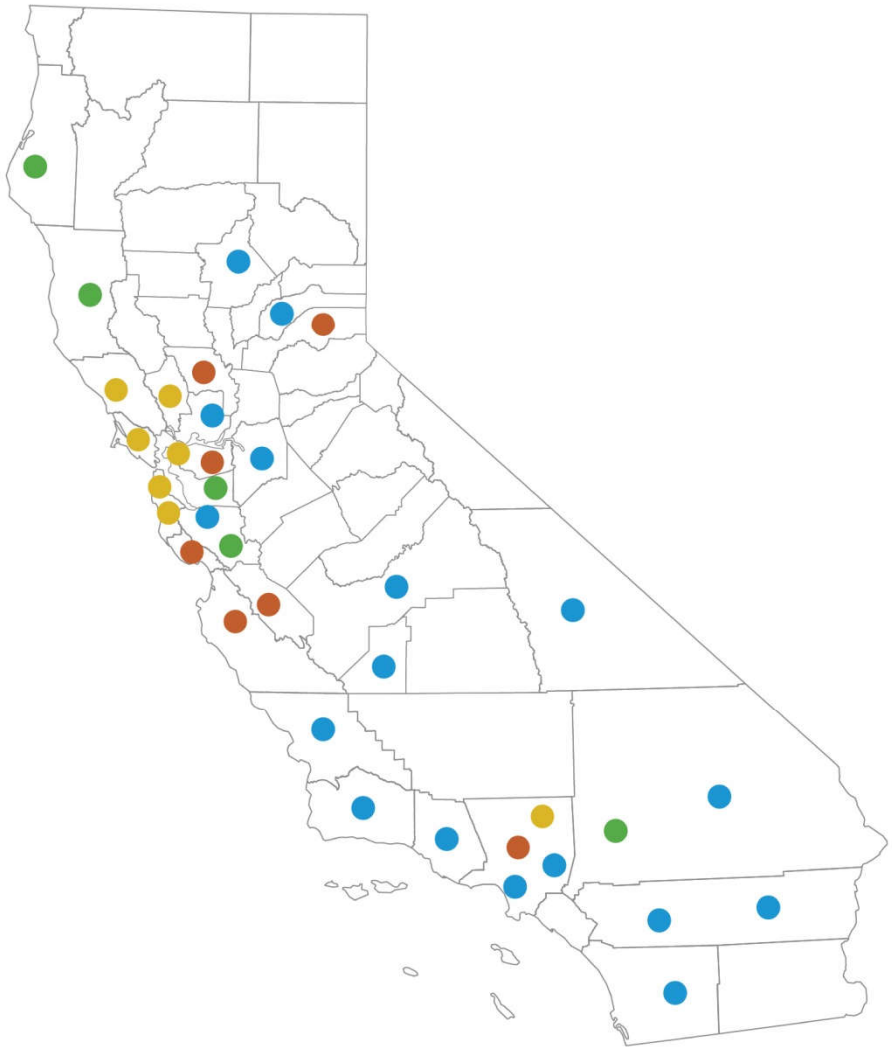
The VCEA was formed by the City of Davis and County of Yolo in 2016 to develop and implement a local CCE. VCEA is a JPA designed to serve electricity customers within the participating jurisdictions. The mission of VCEA is "to deliver cost-competitive clean electricity, product choice, price stability, energy efficiency, and greenhouse gas reduction emission reductions to its customers."[6]

The VCEA board meets monthly and is comprised of two representatives from each of the member agencies. Board members include Mayor Robb Davis and Councilmember Lucas Frerichs from the City of Davis and Supervisors Duane Chamberlain and Don Saylor representing the County of Yolo. If additional member agencies join VCEA, each will be given two seats on the board, until there are five member agencies, at which time representation would be reduced to one board member representing each agency. As long as VCEA consists of only two or three members, all board actions must include an affirmative vote from at least one representative of each member agency. This requirement ensures that each agency is represented in the approval of any action.

VCEA is currently conducting recruitment for a chief executive officer and procuring vendor services. The agency is scheduled to submit its implementation plan to the CPUC in August 2017, with the goal of commencing commercial operation in February 2018.

[6] City of Davis, "Valley Clean Energy Alliance," http://cityofdavis.org/city-hall/commissions-and-committees/valley-clean-energy-alliance

Figure III. CCEs in California



Operational CCEs

MCE Clean Energy
(includes Marin and Napa Counties, parts of Contra Costa and Solano Counties)
Sonoma Clean Power
Lancaster Choice Energy
Clean Power San Francisco
Peninsula Clean Energy
(San Mateo County)

2017 Launch

East Bay Community Energy
(Alameda County)
Mendocino County
(as member of Sonoma Clean Power)
Redwood Coast Energy Authority
(Humboldt County)
Silicon Valley Clean Energy
(Santa Clara County)
Town of Apple Valley

2018 Launch (anticipated)

Contra Costa County
Monterey Bay Community Power
(Monterey, Santa Cruz and San Benito Counties)
Los Angeles County *(Phase 1)*
Placer County
Valley Clean Energy Alliance
(Yolo County and City of Davis)

Exploring / In Process

Butte County
City of Hermosa Beach
City of Pico Rivera
City of San Jacinto
City of San Jose
Fresno County
Inyo County
Kings County
Nevada County
Riverside County
San Bernardino County
San Diego County
San Joaquin County
San Luis Obispo County*
Santa Barbara County*
Solano County
Ventura County*
**Central Coast Tri-County*

III. EVALUATION OF WOODLAND'S OPTIONS

A. Range of Options Evaluated

As it considered potential options for Woodland, the CCE Technical Advisory Committee considered a broad range of options. First was the potential of joining VCEA. However, the committee also considered the option of joining another CCE currently operating in northern California, such as Marin Clean Energy (MCE) or Sonoma Clean Power. The committee chair contacted the chief executive officers of these CCEs, who responded that they are not currently interested in expanding beyond their local jurisdictions. Both urged Woodland to consider joining VCEA, the Yolo County-based CCE, since one of the primary benefits of a CCE is local governance and control.

The committee also considered the option of Woodland forming its own CCE. It was determined that this "go it alone" approach would not offer the economies of scale necessary to deliver cost-competitive electric power at optimal rates, would overtax staff resources, and would expose the City to too great a financial risk.

The committee therefore narrowed the potential choices to the following three options:

- *Option 1 – No CCE participation by Woodland*: Under this option, PG&E would continue serving as the electric power supplier for Woodland residents and businesses. Electricity rates for Woodland would continue to be regulated by the California Public Utilities Commission.
- *Option 2 – Woodland joins VCEA in time to be included in the February 2018 launch:* This scenario would provide Woodland with representation on the VCEA board from the commencement of the CCE's staff organization and business operations. To be included in the implementation plan VCEA will file with the California PUC in August 2017, Woodland must apply to join VCEA and be accepted by the VCEA board by July 2017, following several administrative steps that would need to be initiated by the first weeks of May.
- *Option 3 – Woodland joins VCEA following its February 2018 launch:* This scenario would provide Woodland residents and businesses with the benefits of VCEA participation, and would also provide the City of Woodland a "seat at the table" with the City of Davis and Yolo County as a member of the joint powers authority, although Woodland would not be represented on the VCEA board during the CCE's formative period.

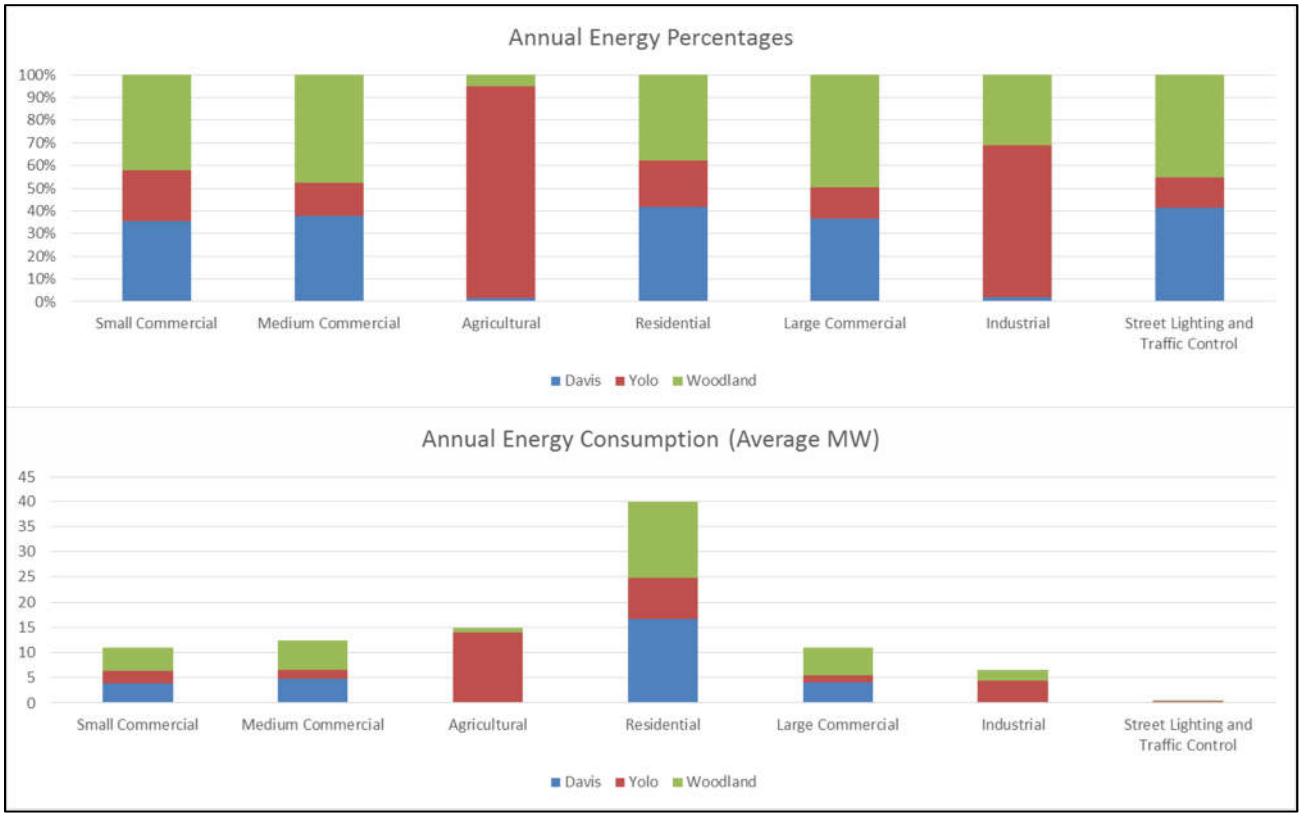
B. Results of TEA Technical Study

TEA is a leading public-power utility consulting firm that was contracted by the City of Davis and County of Yolo in 2015-2016 to perform a technical study of the benefits and risks of forming a CCE. At the request of the CCE Technical Advisory Committee, the City of Woodland contracted with TEA in February 2017 to supplement the prior technical study with updated data, focusing on an analysis of the potential impacts of Woodland joining VCEA. The resulting Woodland-VCEA Impact Analysis is based on updated data, including the following:

- New prices for energy, capacity, and renewables
- New PG&E generation and Power Charge Indifference Adjustment (PCIA) rates and forecasts
- City of Woodland electric load for residential, commercial, and industrial users

The analysis focuses on key issues relating to Woodland's potential participation in VCEA, including the impact of the increased energy load and load diversification that Woodland would bring to the VCEA (Figure IV).

Figure IV. Historical Load for Davis, Yolo County, and Woodland -- by Class



Source: The Energy Authority, Woodland-VCEA Impact Analysis, March 20, 2017 – Revised

The updated Impact Analysis by TEA focuses on key issues relating to Woodland's potential participation in VCEA. The most recent available data shows that Woodland adds significant load in commercial, residential, and industrial load classes, while adding to overall load diversification.

TEA calculated the financial viability, or "headroom" for VCEA with Woodland added. The headroom calculation is equal to the difference between PG&E's costs for electricity generation for its bundled customers and the cost paid by VCEA customers to cover electricity generation, overhead costs, and the PCIA. As explained below, the headroom can be applied by VCEA to financial reserves, rate discounts, or CCE programs. The analysis provides headroom comparisons for VCEA with and without Woodland's participation. The headroom analysis includes VCEA's overhead and supply costs in addition to the PG&E PCIA (exit fee) charged to VCEA customers. The headroom calculation was based on the following assumptions:

- Comparison between PG&E bundled load and CCE costs
- No direct access customers included
- Opt-out rate assumed at 10% (though actual experience of other CCEs is less than 5%)

- Portfolio mix of 50 percent renewable sources, with lower greenhouse gas emissions than currently available from PG&E
- No local or customer-owned supply
- No specific financial reserves
- No funding for local programs
- Overhead (fixed operating cost) assumptions from the Davis/Yolo County study (10-20 percent of CCE-specific costs)
- Base case, including updated PG&E rates and current market prices

Figure V summarizes TEA's headroom calculations.

The totals in Figure V reflect "surplus" funds which can remain in the local economy in the form of rate discounts for customers, VCEA financial reserves, investment in local renewable power generation, and local programs for energy conservation. Headroom funds may be used to refund the startup capital contributions of participating jurisdictions and to purchase electric power with lower associated GHG emissions, thereby assisting local jurisdictions in meeting State of California mandates and climate action plan goals. TEA estimates that the addition of Woodland to the VCEA could create an additional $7.1 million per year in VCEA headroom in 2018 and $7.7 million in 2020.

Figure V: Headroom Comparison for VCEA with Woodland Added

	Davis + Yolo	Davis + Yolo + Woodland	Notes on Differences
2018			
Load (MWh)	495k	772k	
Supply Cost ($/MWh)	$42.58	$42.68	Larger % of peaking (Res/Com) load
Overhead ($/MWh)	$9.49	$6.88	Costs spread over more customers
Headroom ($/MWh)	***$15.39***	***$18.97***	Difference between PG&E generation rates & CCE customer costs (= supply + overhead + PCIA)
Headroom ($)	***$7.6mm***	***$14.7mm***	Greater headroom per customer multiplied by more customers
2020			
Load (MWh)	505k	788k	
Supply Cost ($/MWh)	$45.66	$45.75	
Overhead ($/MWh)	$10.82	$7.74	
Headroom ($/MWh)	***$15.71***	***$19.84***	
Headroom ($)	***$7.9mm***	***$15.6mm***	

Source: The Energy Authority, Woodland-VCEA Impact Analysis, March 20, 2017 – Revised

TEA's headroom calculation shows the difference between PG&E power generation costs for its bundled customers compared to VCEA costs. The table illustrates the effect of spreading operating overhead over a larger customer base made possible by Woodland's entry into the program. The headroom total represents surplus revenue that can remain in the local community.

The TEA analysis concludes that adding Woodland to VCEA would have the following impacts:

- For VCEA, the addition of Woodland will spread overhead cost over a significantly larger customer base, effectively reducing the cost per customer.
- Woodland joining VCEA would have little impact on electric power supply cost and revenue for VCEA (measured in dollars per megawatt-hour).

Questions have arisen about the relationship of certain classes of utility customers to CCE enrollment:

- Direct Access customers would not be auto-enrolled in VCEA. They would be free to join if they desire, based on rates or environmental objectives.
- VCEA would have the option to continue net metering arrangements with owners of rooftop solar installations, including tariffs designed to incentivize customer-owned solar.

C. Benefits and Risks

There are potential benefits and risks for Woodland associated with either the status quo (i.e., staying with PG&E electricity supply) or joining the VCEA CCE. The potential CCE benefits include providing Woodland with more renewable energy options, a greater degree of local control, competitive pricing, rate stability, and additional opportunities for local reinvestment, compared to staying with PG&E. Benefits of the status quo essentially entail avoiding certain risks associated with joining VCEA.

Potential Benefits

- *Competitive pricing*: Experience in CCEs currently in operation shows that CCE electricity prices are competitive with rates charged by incumbent IOUs while also providing funding for local investment.
- *Choice and market competition*: VCEA would offer Woodland residents and businesses a choice of electricity providers and create a competitive market environment for electricity supply. Market competition would allow Woodland's energy customers to choose providers based on electric power rates, renewables content, GHG reduction benefit, and the potential to create innovative local energy infrastructure for energy efficiency.
- *Governance and local control*: Historically, electric rates are set by the CPUC and are not under the governance of local communities. Joining VCEA would provide Woodland with more local control and accountability with respect to rate structure and investment in local production capacity. PG&E programs, such as energy efficiency incentives, are developed for customers throughout the company's service territory. Community input and local administration of these types of programs with a CCE can tailor them more effectively to local needs and interests.
- *Climate action / GHG emission reduction goals*: CCEs are typically designed to purchase a cleaner mix of electricity and provide consumers with energy choices that can include higher percentages of renewable energy, including electricity generated from local renewable generation sources. Maximizing

renewable "green energy" is an important strategy for local governments striving to satisfy California's GHG emission reduction goals and achieve their local climate action plan goals. In addition to reducing GHG emissions, renewable energy sources such as solar and wind contribute to less air pollution than fossil fuel derived electricity. The VCEA JPA formation document states a goal of reducing GHG emissions related to the use of power locally.

Joining VCEA should allow Woodland to meet and possibly exceed the GHG emission reduction objectives for renewable energy in the Climate Action Plan (CAP) for 2020 and 2035. The CAP assumes that PG&E's energy portfolio will include 33% renewables by 2020, as required by the State RPS. If VCEA were to set a base portfolio with 50% of its supply from renewable sources, fewer GHG emissions would be attributed to the use of the CCE supply than to the use of PG&E's supply. Using values supplied by city staff, it is estimated that if 90% of Woodland's electricity demand in 2020 is supplied by an electricity mix that includes 50% from renewable sources, about 170% of the GHG reduction target for renewable energy, or about 28% of the total GHG reduction target for 2020 will be met. Due to the high number of variables involved in 2035 GHG emission reduction estimates, a similar estimate was not attempted for the 2035 CAP targets. VCEA programs could also enhance progress toward CAP targets through local reinvestment, as described below.

- *Local reinvestment*: Joining VCEA has the potential to contribute to the Woodland area economy through direct consumer cost savings and job growth. Similar to MCE, Sonoma Clean Power, and other existing CCEs, VCEA can elect to use accumulated financial reserves to develop local renewable power generation capacity, promote energy efficiency programs, and install electric vehicle charging facilities, among other options. In addition to supporting local economic development goals, these options can all contribute to enhancing progress toward meeting Woodland's CAP targets for reducing GHG emissions.

  Under existing IOU arrangements, the money required to pay for electric generation leaves the community, with surplus revenues going to the IOU's shareholders. By contrast, cost savings ("headroom") for customers under a CCE arrangement remain in the community, which can result in an immediate economic benefit. Going forward, a CCE policy to obtain power from local generation sources, including customer-owned rooftop solar, wind, and biomass, can help stimulate local job creation as well.

Risk Factors

Like any new business organization, a start-up CCE must carefully assess risks associated with its operations, such as a rise in future market prices, personnel decisions, and greater than expected opposition from the local community and/or the incumbent IOU. The CCE business model and experience with currently functioning CCEs shows approaches to mitigate or eliminate each of these risks.

The potential risks for Woodland as a VCEA participant fall into three principal categories: financial, regulatory, and operational, as described below.

- *Financial risks and mitigation.* Financial risks include start-up costs charged to the City by the CCE for working capital and the availability of credit for power procurement. Following a successful launch, the CCE would repay borrowed funds to the City and or financial institution according to a schedule determined by the VCEA Board. If the CCE should fail for any reason during this period, however, the City may forfeit these funds directly or, in the case of credit financing, the City would be responsible for

repayment to a lending institution. Davis and Yolo County have estimated that VCEA's start-up expenses will total approximately $1 million and have each committed $500,000 toward these costs. It is assumed that if Woodland joined VCEA, its contribution to start-up costs would be in the range of $350,000 to $500,000.

A CCE also faces the risk of customers choosing to opt out of the program. To mitigate such opt-out risks, the CCE must focus on maintaining rate competitiveness with PG&E and building brand loyalty for greener power and GHG emission reductions. Customer opt-out rates will likely be affected by prevailing PG&E retail rates for various customer classes. An increase or decrease in PG&E generation-related rates relative to CCE rates is likely to have a corresponding inverse impact on the CCE's opt-out rate.

It is important to note that for purposes of the conservative cost-benefit analysis performed by TEA for this evaluation of Woodland's options, the opt-out rate for Woodland's potential participation in the VCEA CCE has been arbitrarily set at 10 percent – a level in excess of the expected opt-out rate if Woodland were to join VCEA. This rate substantially exceeds the observed opt-out rate of less than 5% for CCEs currently operating in northern California.

Under the CCE approach, PG&E continues to provide all non-generation related services, including billing, most customer service, and end-to-end power delivery services (poles and wires). An increase or decrease in non-generation related PG&E costs should have no significant impact on CCE opt-out rates, since price changes in this area apply equally to customers of PG&E and the CCE. It is important to note that by law, PG&E is not allowed to charge CCE customers more for non-generation related costs than it charges PG&E bundled power customers. In addition to the cost of electric power generation itself, the most important PG&E cost component from a CCE perspective is the Power Charge Indifference Adjustment (PCIA), which is discussed under "regulatory risks" below.

When the CCE begins operations, the generation-related costs traditionally charged to ratepayers by PG&E are replaced by the CCE's power supply and operating costs. Some cost factors, such as future costs for renewable and non-renewable electric supply, are outside of the CCE's direct control. There is a risk to the CCE if its supply costs become expensive relative to PG&E's. This supply cost imbalance can occur if the CPUC allows incumbent utilities to charge high exit fees (see PCIA discussion below), or if the CCE becomes locked into relatively high-priced power contracts, and market prices subsequently decline. Risk mitigation alternatives available to the CCE include analyzing financial exposure to changing market prices, identifying opportunities to hedge those exposures, and building financial reserves.

In addition, the CCE has the ability to construct a diversified portfolio as a way to manage long-term price risk.

Key risk management measures include:

- Maintaining a low-cost structure;
- Actively managing a diversified supply portfolio with multiple resource types, locations, and time horizons; and
- Partnering with entities that have proven experience and capabilities in the electricity sector.

- *Regulatory risks – PCIA*. PG&E's PCIA is applicable to all VCEA customers and is set by the CPUC. The PCIA, also known as an "exit fee," is designed to compensate PG&E. As the incumbent utility, PG&E has made power procurement arrangements for its expected electric load. The PCIA is designed to protect PG&E's bundled power customers from paying the costs associated with the "departing load" due to the formation of the CCE. PCIA rates have risen by approximately $20 per megawatt-hour over the past two years. If these charges continue to increase significantly, or are expanded by the CPUC, CCEs will find it more difficult to maintain rate competitiveness with PG&E.

  Mitigation opportunities for VCEA include maintenance of flexible cost structures, moderating the number of long-term supply contracts, and accumulating financial reserves. Minimizing the proportion of long-term supply contracts can be especially important for CCEs, in light of the continuing decline in renewable energy prices.

  The energy sector is highly regulated, and other future legislative and regulatory changes may adversely affect CCEs. For example, SB 618, mentioned above this report, is currently being considered in the legislature and, if passed, could limit CCEs' ability to operate as intended in the enabling legislation (AB 117). One of the most effective ways to minimize legislative and regulatory risk, in addition to minimizing utility PCIA fee increases, is for the CCE to actively monitor and participate in applicable CPUC proceedings to protect CCE interests. VCEA can join with other CCE organizations to improve effectiveness of these efforts and share costs.

- *Operational risks*: Operational risks are a part of doing business for any organization that participates in electric power markets. These risks can include the following:

  - Performance of counterparties to CCE contracts
  - Balancing power load with power supply
  - Adequacy of CCE staffing
  - Market price volatility
  - Market settlements and interactions required by the California ISO

  Managing such operational risks depends on the adoption and implementation of sound business policies, practices, and procedures:

  - Implementing a robust governance and management structure
  - Maintaining strong power supplier/marketer relationships
  - Power project availability
  - Accurate load forecasting and power planning
  - Internal staff capability and retention
  - Arranging for quality consulting services
  - Contracting with a dependable scheduling coordinator and validating California ISO settlements
  - Accurate and timely invoicing and revenue receipts
  - Accurate and timely payments to vendors

D. Evaluation of the Options

Eight CCE Technical Advisory Committee members participated in the final evaluation of options at the April 3 committee meeting. The participants developed an evaluation matrix to quantify the impacts of the factors, or "Considerations," taken into account during evaluation of the options and to use in forming a recommendation to City Council. The Considerations were grouped in terms of three major criteria: Cost-competitiveness, Governance and Local Control, and Risk, as follows:

- *Cost-Competitiveness*: Considers costs to ratepayers and accretion of financial reserves.
- *Governance and Local Control*
    - *Transparency and community input*: Considers community access to information relevant to decision making and ability of community members to influence decisions.
    - *Impact on CAP goals / GHG emission reductions*: Considers ability to enhance Woodland's progress toward achieving CAP goals and reducing GHG emissions.
    - *Ability to direct energy investments to meet local objectives*: Considers ability to direct energy investments to meet local economic, environmental, and quality of life objectives.
- *Risk*
    - *Start-up cost / financial liability*: Considers the potential for the City to experience financial losses.
    - *Regulatory risk*: Considers uncertainties associated with the PCIA and future regulations imposed by legislation or directed by the CPUC.
    - *Operational risk*: Considers risks associated with the administration of operational functions and services.

The members took the following steps to develop the final version of the Evaluation Matrix and to rate each Consideration:

1. The Comparative Criteria and Considerations were agreed upon.
2. Comparative Criteria and Considerations were given weights of emphasis.
3. Each member rated the Considerations for each of the options with a whole value between +2 and -2, where:

    +2 = Highly favorable
    +1 = Moderately favorable
    0 = Neutral
    -1 = Moderately unfavorable
    -2 = Highly unfavorable

4. The eight members' ratings were added up and averaged for each Consideration. Ratings for each Consideration were then multiplied by the agreed upon weight and added for a total rating for each Comparative Criterion.
5. Total ratings for each Comparative Criterion were multiplied by the agreed upon weight and added for a total overall rating for each of the options.

The weighting of Comparative Criteria and Considerations was based on the committee's understanding of Woodland's priorities and related benefits and risks. Cost-Competitiveness was given the highest weighting out of the three Comparative Criteria. This was based on an understanding that ratepayer costs may greatly influence opt-out rates in a CCE, and accretion of financial reserves can determine rate savings and opportunities for reinvestment in local infrastructure.

Factors such as operational management oversight and the ability to construct a diversified portfolio as a way to manage long-term price risk are within a CCE's control. Since that control is directly related to the VCEA Board and staffing decisions, the committee assigned a higher weighting to Governance and Local Control considerations than it did to the related Risk factors.

The results of the evaluation are shown in Figure VI.

Figure VI. Evaluation Matrix

Comparative Criteria	Considerations	Weight	Options		
			1	2	3
			Status Quo (PG&E)	Join VCEA Now	Join VCEA Later
Cost-Competitiveness	Cost-competitiveness	100%	-1.38	1.75	1.75
	Score - Cost-Competitiveness	**50%**	**-0.69**	**0.88**	**0.88**
Governance & Local Control	Transparency and community input	34%	-2.00	1.88	1.13
	Impact on Climate Action Plan Goals / GHG emission reductions	33%	-1.25	1.88	0.88
	Ability to direct energy investments to meet local objectives	33%	-2.00	2.00	1.13
	Score - Governance & Local Control	**30%**	**-0.53**	**0.57**	**0.31**
Risk	Start-up cost / financial liability	34%	1.88	-0.63	0.50
	Regulatory risk	33%	-0.13	-0.63	0.38
	Operational risk	33%	0.25	-0.63	0.50
	Score - Risk	**20%**	**0.14**	**-0.13**	**0.09**
	Overall Rating	**100%**	**-1.08**	**1.32**	**1.28**

Key:

Rounds to +2	Rounds to +1	Rounds to 0	Rounds to -1	Rounds to -2
Highly Favorable	Moderately Favorable	Neutral	Moderately Unfavorable	Highly Unfavorable

The Evaluation Matrix serves as a basis for the committee's recommendation to City Council. As shown in Figure VI, Option 2 (Woodland joins VCEA in time to be included in its February 2018 launch) was rated the highest, with Option 3 (Woodland joins VCEA subsequent to the February 2018 launch) rated the next highest and Option 1 (no CCE participation by Woodland) rated unfavorably.

IV. RECOMMENDATION

Following the completion of the evaluation matrix and discussion of the results, the participants voted on a recommendation to City Council based on these results, information gathered throughout the committee's 12-week process, and understanding of the benefits and risks of the options. The committee voted unanimously in an 8-0 vote to recommend Option 2 - Join VCEA in time to be included in its February 2018 launch - to City Council.

All of the participants agreed on the importance of governance and local control in the consideration of the options and agreed that it outweighed potential risks in their decision-making process. Option 3 would entail joining VCEA at an unspecified future date, which could mean that concerns of Woodland residents and businesses would not be officially represented when the VCEA commences operations. Option 2 would provide Woodland with representation on the VCEA Board from the commencement of CCE's staff organization and business operations. This level of representation would help ensure that VCEA satisfies the interests of Woodland residents and businesses. Although the scoring exercise resulted in only a small difference in the overall rating between the two VCEA options, there was consensus on the importance of Woodland participating in VCEA decision making at the time of program development rather than joining after development decisions have already been made.

Consequently, the CCE Technical Advisory Committee recommends to the Woodland City Council that Option 2 be pursued by the City and that the City Council take immediate steps to request VCEA membership and initiate related administrative activities that would be necessary for the City to join by July 2017.

Attachment: Methodology for Evaluating Financial Feasibility of Woodland Participation in VCEA

Methodology for Evaluating Financial Feasibility of Woodland Participation in VCEA

Basis of the Evaluation

The evaluation of the financial impact of the City of Woodland joining VCEA is based on a 10-year pro forma which forecasts VCEA costs with and without Woodland and compares them to PG&E's projected rates. The original Pro Forma was developed for a similar analysis done for the City of Davis and Yolo County. The key financial metric used in the evaluation is the difference between the rates paid by PG&E's bundled customers and the costs faced by a prospective VCEA customer. This difference, called "Headroom", includes the cost to run the CCE program and the rates that PG&E charges to CCE customers through the Power Charge Indifference Adjustment (as well as the much smaller Franchise Fee).

The Pro Forma analysis forecasts VCEA's economics over a ten year time horizon. In order to be representative of a CCE located within the California Independent System Operator ("CAISO"), the Pro Forma analysis has been built to simulate financial outcomes at an hourly level of granularity In the CAISO market. All loads are charged at the market price for energy at the location of the load on the CAISO transmission system, and supply is paid the market price for energy at the location of the generation on the system. Given the movement of the supply stack[1] within California and the West as a whole towards variable, renewable energy resources, the hourly and daily shape of both demand and prices is changing and is expected to continue changing in the future. Therefore, the shape of a CCE's load – as well as the shape and location of a CCE's supply – will significantly impact the prices that are paid and received, which in turn will help determine the overall financial viability of the CCA.

Components

The Pro Forma models the following components of the CCE's costs and revenues.

- Wholesale purchases from CAISO to meet load
- Procurement of Resource Adequacy capacity
- Congestion Revenue Rights
- Supply Costs and Revenues paid by CAISO
- Cost of RPS-eligible Renewable Energy Credits
- Impact of Retail Programs on Revenue and Costs
- Retail Revenue by Rate Class
- Impact on Revenue and Costs from Customer Product Adoption

[1] The supply-stack is all of the generation resources within an area, "stacked up" in order of their cost to operate. In the West, renewables would be at the bottom of the stack since they don't cost anything to operate, while natural gas "peaker" plants would be at the top of the stack.

- CCE Program Overhead
- PG&E & Regulatory Charges to the CCE
- Startup and Financing Costs
- Cost of PG&E Billing Services

The model also includes the following additional charges faced by CCE customers directly from PG&E, in order to determine the overall rate competitiveness with PG&E.

- Power Cost Indifference Adjustment Charges
- Franchise Fee

The model was designed to be flexible and dynamic in order to test many different scenarios and answer a number of questions posed through the initial Davis/Yolo process. The dynamic nature of the model allowed for relatively easy inclusion of Woodland and for analysis of the specific questions posed in the present study. Most of the components described above are easily varied, and goal seek is used to solve for individual scenarios. In the headroom results included in the report, the model was set up so that the rates faced by a PG&E bundled customer and a CCE customer were the same, so that the calculation of the CCE's reserves represents the surplus or headroom available to the CCE.

Load Forecast

TEA created a 10-year load forecast by hour and by rate class based on two years of historical meter-level data from PG&E (only one year was available for Woodland) and hourly load profiles by rate class for the last several years. The rate of load growth was assumed to be one percent per year, although it is adjustable within the model. Agricultural load was decreased by 25% from the two year average due to the impact of the drought on pumping loads. Direct Access loads in each area were also forecast and kept separate in order to be able to include or not include them in the Pro Forma calculations. The default cases do not include the Direct Access loads since it is unknown whether Direct Access customers would choose to join the CCE. No incremental energy efficiency, rooftop solar, demand response or electric vehicle penetration was assumed in the base case.

Figure 1 shows average monthly historical load for Davis and Yolo County (top) and with Woodland included (bottom), by rate class. The charts show the shift in composition from a larger proportion of agricultural load without Woodland, towards larger shares from residential and commercial customers with Woodland. Figure 2 (top) shows the percentage breakdown in each rate class between Davis, Yolo and Woodland. The diversity of the usage among the three entities should make for a more balanced customer mix and demand profile than the two would separately. The bottom chart shows the same data in absolute terms which shows the relative contributions of each road class for each entity. Figure 3 shows the total Davis, Yolo and Woodland loads separately.

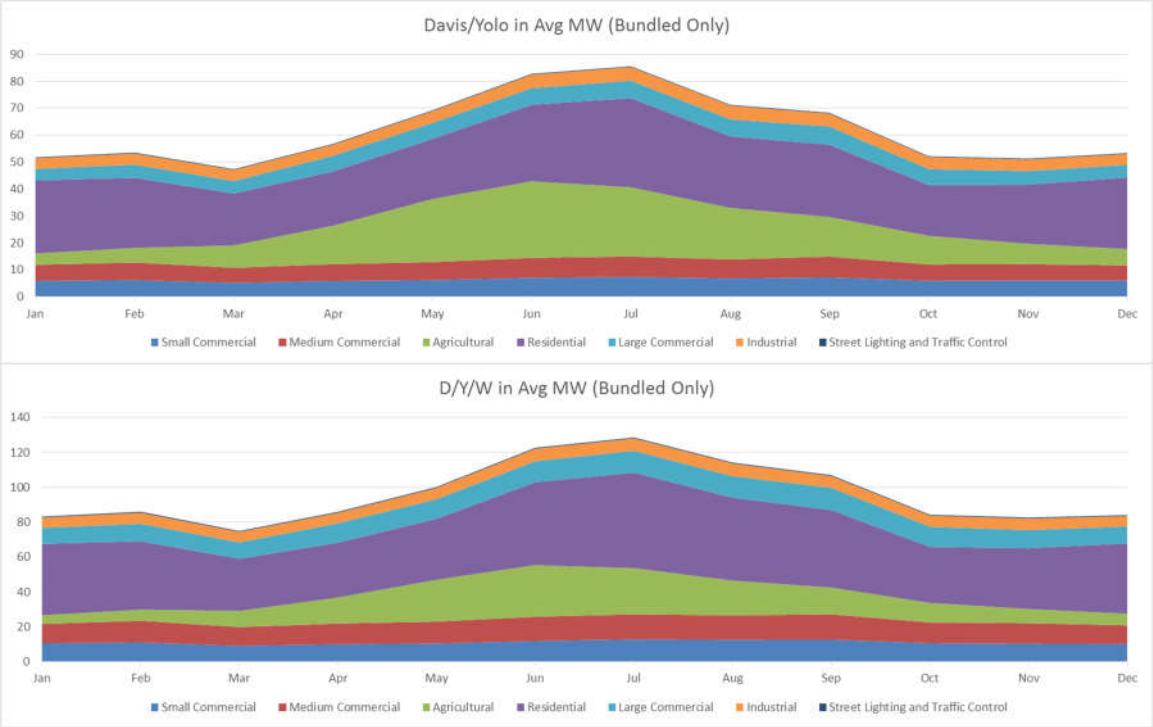


Figure 1: Total City of Davis and Yolo County Historical Monthly Load by Rate Class (top) and including Woodland (bottom)[2]

[2] *Small Commercial* has load < 17.1 avg kW and demand not > 75 kW for 3 consecutive months. *Medium Commercial* has demand < 499 kW for 3 consecutive months. *Large Commercial* has demand > 499 kW for 3 consecutive months.

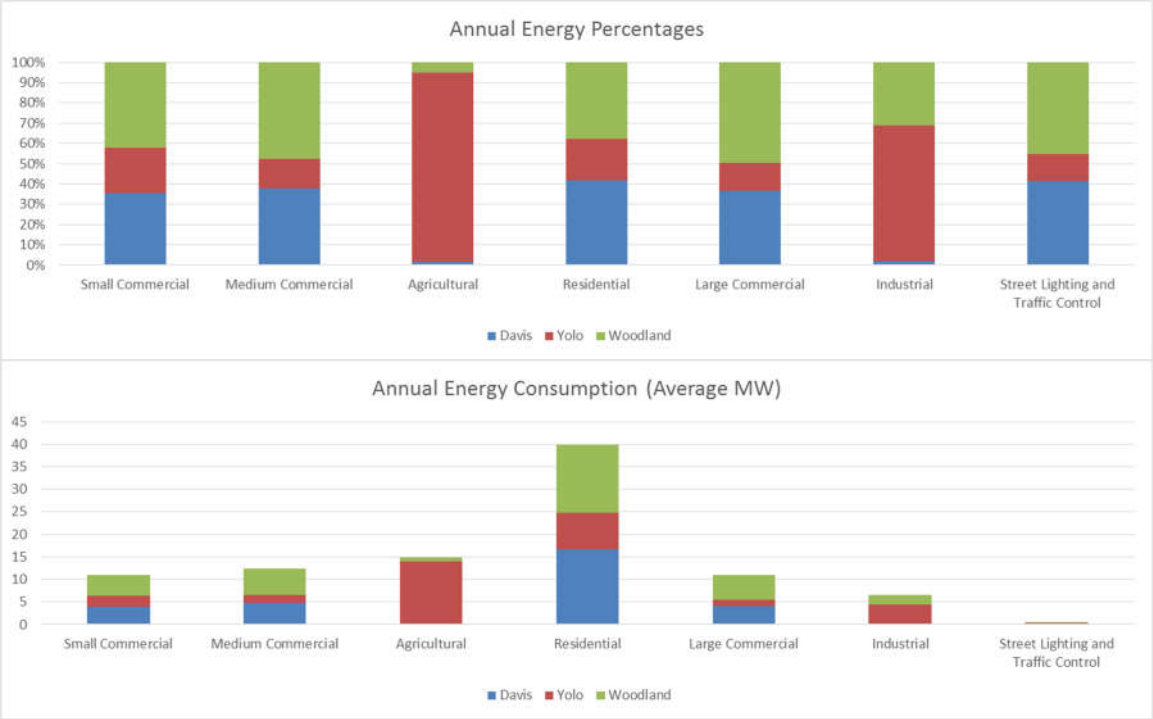


Figure 2: Historical Consumption Percentage Breakdown by Rate Class between City of Davis, Unincorporated Yolo County and City of Woodland (top), and absolute contributions (bottom)

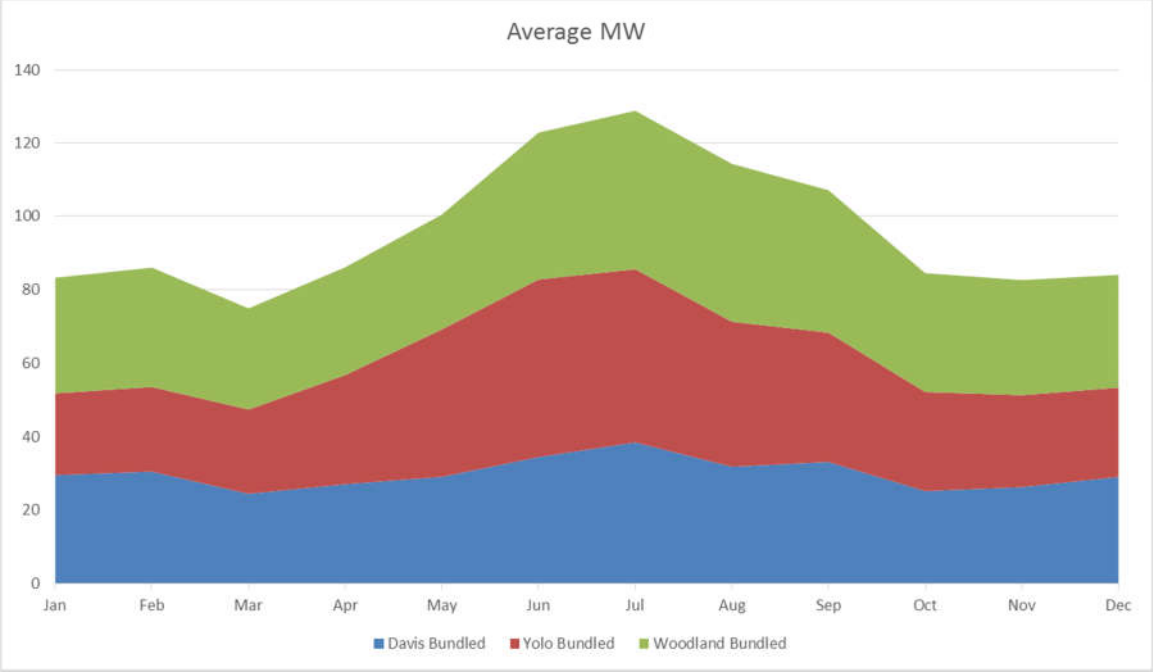


Figure 3: Historical Davis, Yolo and Woodland Bundled loads

Price Simulations

Hourly prices for ten years in the Western interconnect, including CAISO, were simulated using the Aurora XMP® production cost model. The model includes all the electric generators in the

Western Electric Coordinating Council ("WECC") area. It then adds supply to the stack (and retires supply from the stack) over the study period based upon load growth assumptions, RPS and carbon constraint assumptions, carbon and gas price assumptions, and assumptions about the costs and economic viability of different generating technologies. Finally, future prices are simulated based on commitment and dispatch of the generation stack. The base case price forecast used in the analysis is shown in Figure 4.[3]

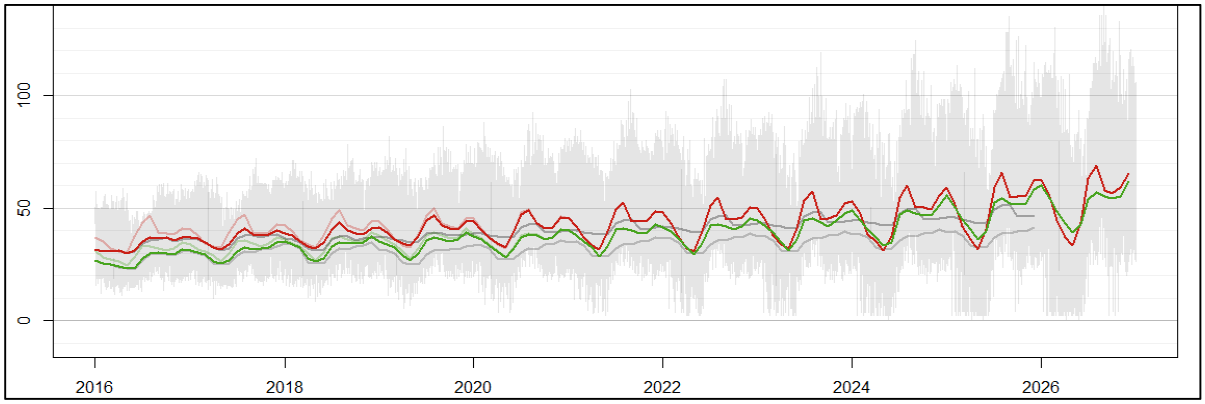


Figure 4: Base case monthly price forecasts for Northern California in $/MWh (red is for Peak hour pricing, green is off-peak, dark gray are peak & off-peak forward prices and light gray are hourly prices)[4]

Portfolio Construction

The CCE supply portfolio within the Pro Forma for the present analysis consisted of the following components

- System Power (purchased or indexed to CAISO Day-Ahead prices)
- In-state (Bucket 1) and Out-of-state (Bucket 2) Renewable Energy Credits (priced at premium to CAISO DA prices)
- Large Hydro generation (priced at premium to CAISO DA prices)

The present analysis is intended to compare VCEA's finances with and without the City of Woodland. The supply cost, on a $/MWh basis does not change appreciably with and without Woodland. The primary impact on VCEA's finances derives from spreading overhead costs over a larger customer base. Therefore, only one supply scenario was evaluated. The overhead

---

[3] The forward prices used in this chart are from the original Davis/Yolo analysis. For the Woodland analysis the prices have been refreshed based on the most current forward prices at the time.

[4] Peak prices are for 6am to 10pm, Monday through Saturday. Off-peak prices are the other hours.

benefits will apply to any supply scenario, while the supply costs (again, on a $/MWh basis) will be essentially unchanged with or without Woodland.

The supply scenario used in the analysis was the one termed "Least Cost" in the *City of Davis and Yolo County Technical Study*. It achieves 50% renewable energy percentage through the procurement of California-based renewables (RPS Bucket 1 Renewable Energy Credits) and regional renewables (Bucket 2 RECs) beginning in the first year of VCEA operation. It also includes sufficient large hydro generation supply to reduce VCEA's forecasted greenhouse gas emissions rate to 5% lower than PG&E's forecasted rate on an annual basis. This is likely the approach VCEA will take to supply procurement in the beginning years of the CCE until sufficient financial reserves are procured to be able to invest in longer-term generation assets.

PG&E Rates Forecast

The Pro Forma includes a forecast for PG&E rates for bundled customers and a forecast for charges that apply to CCE customers, including the Power Charge Indifference Adjustment (PCIA). The load-weighted average[5] PG&E generation rate and PCIA forecasts are shown in Figure 5.

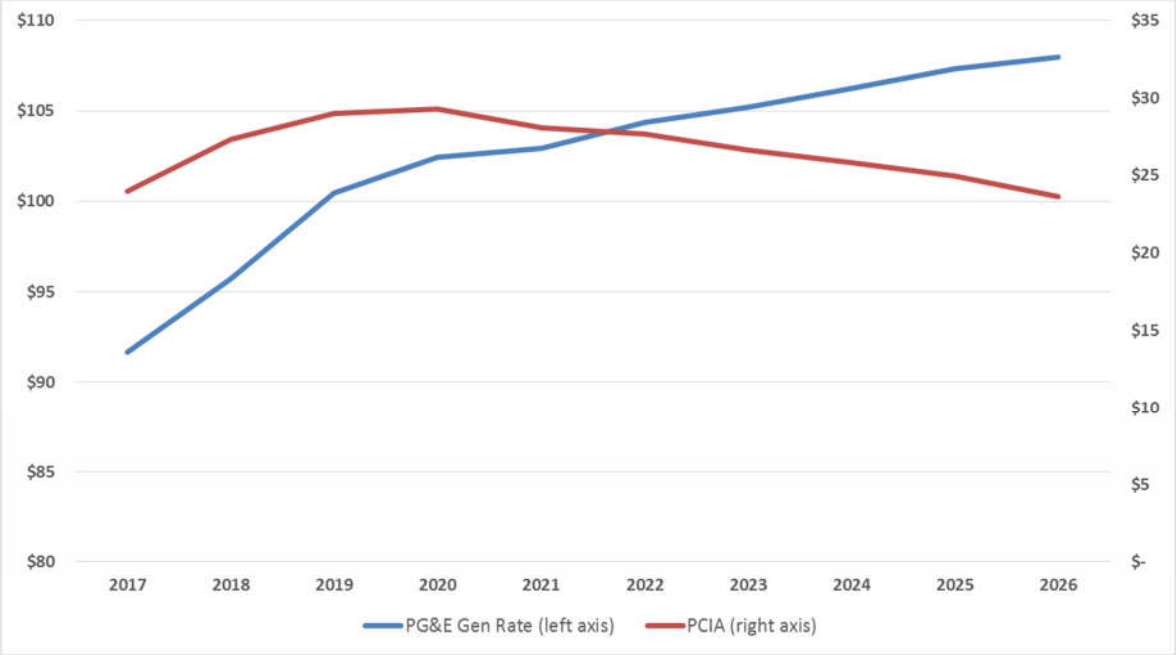


Figure 5: PG&E Generation and PCIA Rate Forecasts – Davis+Yolo+Woodland Load Weighted

Headroom Calculation

[5] The load-weighted average is calculated by multiplying the rate for each load class by the percentage of load in that load class.

The analysis focuses on the "Headroom" between the rates a bundled PG&E customer would pay and the costs faced by a CCE customer. The rates faced by a CCE customer will depend upon the ultimate supply portfolio chosen and the rate discount offered by the CCE. In this analysis, we just consider the supply and overhead costs and the additional charges which a CCE customer must pay to PG&E – the PCIA and Franchise Fees – that a bundled customer does not. The difference – the PG&E Generation Rate minus the CCE Supply and Overhead Cost and the PCIA and Franchise Fee – is the headroom. The headroom represents the amount of surplus revenue which the CCE will ultimately be able to allocate to various purposes including: rate discounts, reserves, local programs and investments in long-term supply.

The supply portfolio used in this case is the one described earlier. The Pro Forma calculates the headroom by adjusting the CCE rates so that the CCE customer costs equal the bundled customer costs. Then, the amount that accumulates as reserves in that case represents the total headroom (and the reserves/MWh of load represents the headroom on a $/MWh basis). Figure 6 shows the accumulated headroom for VCEA with and without Woodland. To reiterate, this represents the potential surplus revenues for the particular supply portfolio included here before any allocations to rate discounts, reserves, and other spending or investments.

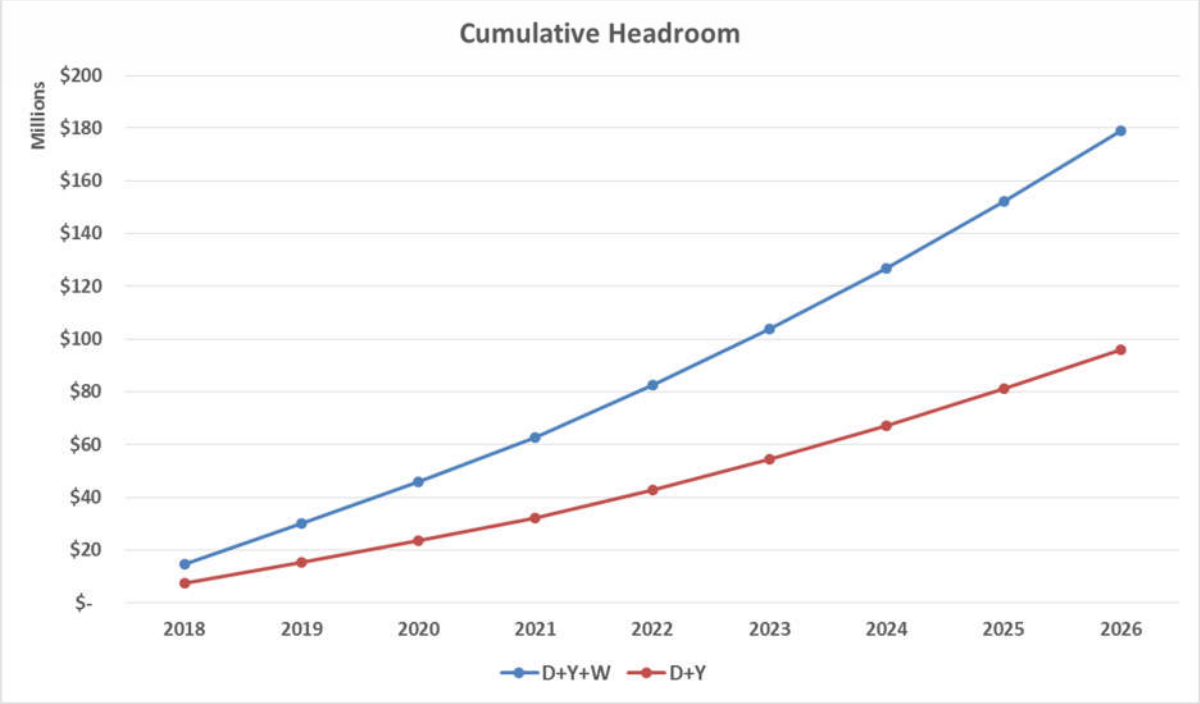


Figure 6: Cumulative headroom for VCEA with and without Woodland.

Attachment: Pro Forma

Davis + Yolo + Woodland	2018	2019	2020	2021	2022	2023	2024	2025	2026
Customer Accounts									
Residential	42,773	43,200	43,632	44,069	44,509	44,954	45,404	45,858	46,317
Low Income Residential	13,311	13,444	13,578	13,714	13,851	13,990	14,130	14,271	14,414
Agriculture	1,984	2,004	2,024	2,044	2,064	2,085	2,106	2,127	2,148
Small Commercial	5,090	5,141	5,193	5,244	5,297	5,350	5,403	5,457	5,512
Medium Commercial	476	481	486	491	496	501	506	511	516
Large Commercial	221	223	225	228	230	232	234	237	239
Industrial	7	7	7	7	7	7	7	7	8
Street Lightting	659	666	673	679	686	693	700	707	714
Total	64,521	65,166	65,818	66,476	67,141	67,812	68,490	69,175	69,867
Customer Load (MWh)									
Residential	242,914	245,343	247,797	250,275	252,777	255,305	257,858	260,437	263,041
Low Income Residential	77,597	78,373	79,157	79,948	80,748	81,555	82,371	83,194	84,026
Agriculture	111,112	112,224	113,346	114,479	115,624	116,780	117,948	119,128	120,319
Small Commercial	88,894	89,783	90,681	91,588	92,504	93,429	94,363	95,307	96,260
Medium Commercial	100,296	101,299	102,312	103,335	104,368	105,412	106,466	107,531	108,606
Large Commercial	90,297	91,200	92,112	93,033	93,963	94,903	95,852	96,811	97,779
Industrial	56,547	57,112	57,684	58,260	58,843	59,431	60,026	60,626	61,232
Street Lightting	4,820	4,868	4,917	4,966	5,015	5,066	5,116	5,167	5,219
Total Retail Load	772,478	780,203	788,005	795,885	803,843	811,882	820,001	828,201	836,483
Distribution Losses	36,306	36,670	37,036	37,407	37,781	38,158	38,540	38,925	39,315
Total Wholesale Load	808,784	816,872	825,041	833,291	841,624	850,040	858,541	867,126	875,797
Power Supply Costs									
Market Purchases	$ 24,869,040	$ 25,555,785	$ 27,200,344	$ 29,030,963	$ 30,110,044	$ 31,651,438	$ 32,744,594	$ 33,825,849	$ 35,958,630
Net Renewable Energy	$ 4,074,253	$ 4,334,939	$ 4,622,836	$ 4,842,942	$ 5,100,156	$ 5,366,745	$ 5,682,722	$ 5,929,284	$ 6,225,879
Retail Programs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Resource Adequacy	$ 3,045,818	$ 3,135,733	$ 3,219,090	$ 3,327,465	$ 3,428,979	$ 3,542,902	$ 3,627,701	$ 3,747,754	$ 3,859,919
RPS	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CAISO Charges	$ 976,737	$ 994,044	$ 1,011,828	$ 1,030,106	$ 1,048,895	$ 1,068,215	$ 1,088,083	$ 1,108,520	$ 1,129,547
Staff and Other Operational	$ 2,914,115	$ 3,570,635	$ 3,642,047	$ 3,714,888	$ 3,789,186	$ 3,864,970	$ 3,942,269	$ 4,021,114	$ 4,101,537
Startup Financing	$ 646,873	$ 646,873	$ 646,873	$ 646,873	$ -	$ -	$ -	$ -	$ -
Performance Bond	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000
Cost of Credit for Procurement	$ 808,784	$ 816,872	$ 825,041	$ 833,291	$ -	$ -	$ -	$ -	$ -
Total	$ 37,345,619	$ 39,064,880	$ 41,178,058	$ 43,436,528	$ 43,487,260	$ 45,504,269	$ 47,095,369	$ 48,642,522	$ 51,285,511
PG&E Non Bypassable Charges									
PCIA	$ 21,131,316	$ 22,636,523	$ 23,080,403	$ 22,323,925	$ 22,236,801	$ 21,638,713	$ 21,178,524	$ 20,671,906	$ 19,784,311
T&D	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Regulatory/Other	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Franchise Fee	$ 548,390	$ 553,874	$ 559,413	$ 565,007	$ 570,657	$ 576,364	$ 582,127	$ 587,949	$ 593,828
PG&E Billing Services	$ 383,723	$ 398,136	$ 413,090	$ 428,605	$ 444,701	$ 461,401	$ 478,727	$ 496,702	$ 515,351
Total	$ 22,063,429	$ 23,588,534	$ 24,052,906	$ 23,317,537	$ 23,252,160	$ 22,676,478	$ 22,239,378	$ 21,756,557	$ 20,893,491
Reserves									
Annual Contribution	$ 14,667,061	$ 15,551,509	$ 15,643,371	$ 16,845,326	$ 19,734,318	$ 21,233,819	$ 23,140,874	$ 25,252,844	$ 26,832,011
Cumulative Reserve Fund	$ 14,667,061	$ 30,218,570	$ 45,861,941	$ 62,707,267	$ 82,441,585	$ 103,675,404	$ 126,816,278	$ 152,069,122	$ 178,901,133
Average Energy Costs									
Generation	$ 49.55	$ 51.29	$ 53.49	$ 55.82	$ 55.36	$ 57.33	$ 58.73	$ 60.04	$ 62.64
PG&E Non Bypassable Charges	$ 27.36	$ 29.01	$ 29.29	$ 28.05	$ 27.66	$ 26.65	$ 25.83	$ 24.96	$ 23.65
Reserves Contribution	$ 18.99	$ 19.93	$ 19.85	$ 21.17	$ 24.55	$ 26.15	$ 28.22	$ 30.49	$ 32.08
Average Retail Rate	$ 95.89	$ 100.24	$ 102.63	$ 105.04	$ 107.58	$ 110.13	$ 112.78	$ 115.49	$ 118.37
CCA Rate Benefit vs. PG&E	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Renewable Attributes									
CO2 Emissions [lbs/MWh]	312	292	276	260	245	230	215	199	184
Renewable Percentage	50%	50%	50%	50%	50%	50%	50%	50%	50%
Reserves - D+Y	$ 7,609,244	$ 15,521,028	$ 23,445,205	$ 32,080,817	$ 42,742,907	$ 54,307,266	$ 67,036,232	$ 81,056,047	$ 96,021,467

Attachment: Presentation - Woodland-VCEA Impact Analysis

Woodland-VCEA Impact Analysis

Mar 20, 2017 Presentation

Revised Apr 7, 2017

Agenda

- Background
- Load Analysis
- Financial Analysis
- Costs by Rate Class
- Risks
- Cost/Benefit to Joining VCEA

Background

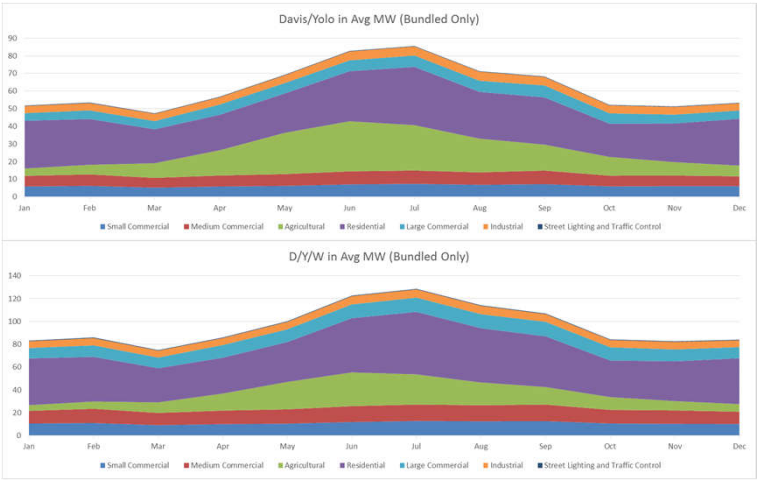
- 2015-2016 TEA prepared report for City of Davis and Yolo County on feasibility of CCE
  - Examined Stand-alone, Joining MCE & Outsourced
  - Supported recommendation by Davis Citizens Advisory Committee to do Stand-alone
- Current Analysis is Update of Davis-Yolo analysis and extended to include Woodland

Current Analysis

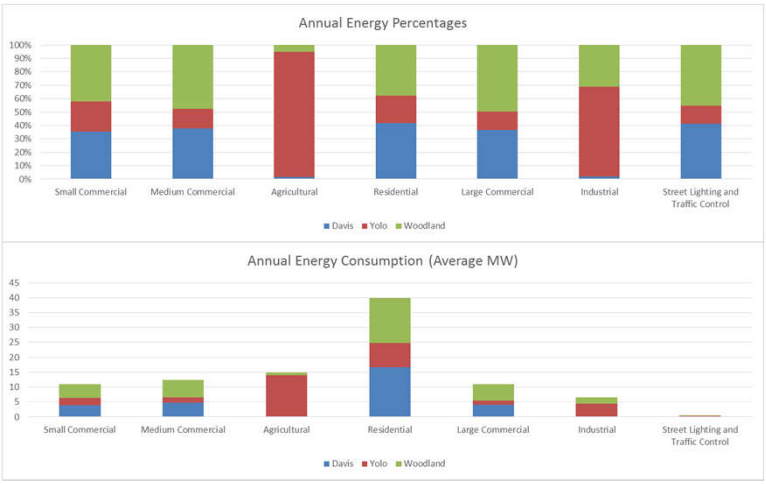
- Updated key inputs
  - New energy, capacity and renewables prices (as of March for energy, and Jan/Feb for Capacity & Renewables)
  - New PG&E generation and PCIA rates and rate forecasts (hired new rates consultant)
- Incorporated Woodland load
- Focus on key issues for Woodland
  - Impact of larger load & load diversification
  - Potential economic contribution

Load Overview

Historical Load by Class



Historical Load – D/Y/W by Class

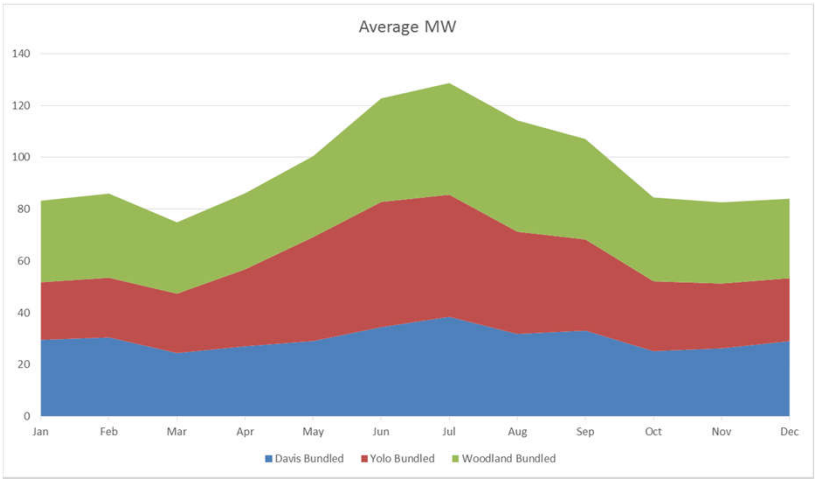


Small Commercial: load < 17.1 avg kW & demand not > 75 kW for 3 consecutive months

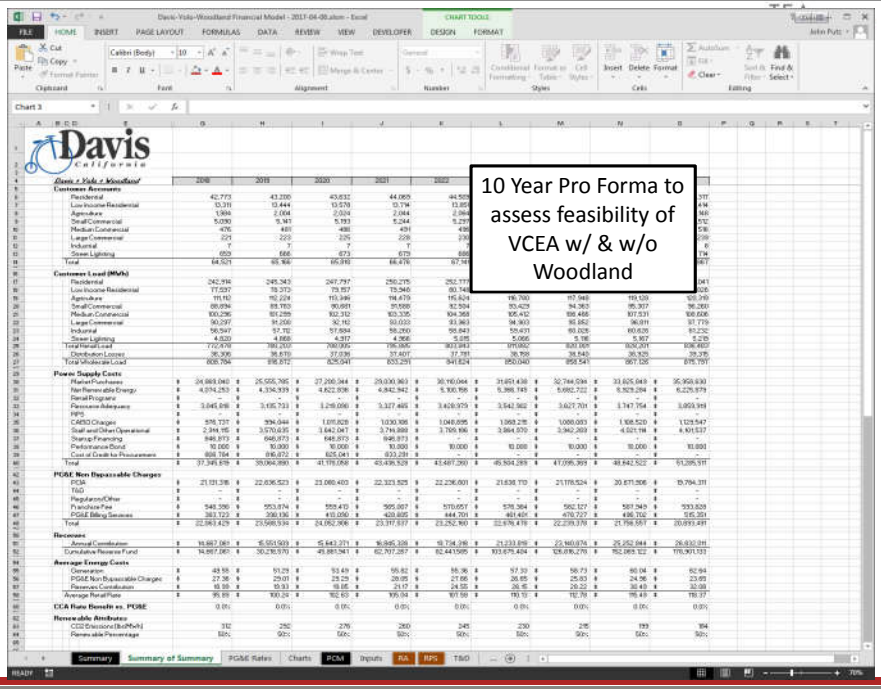
Med Commercial: demand < 499 kW for 3 consecutive months

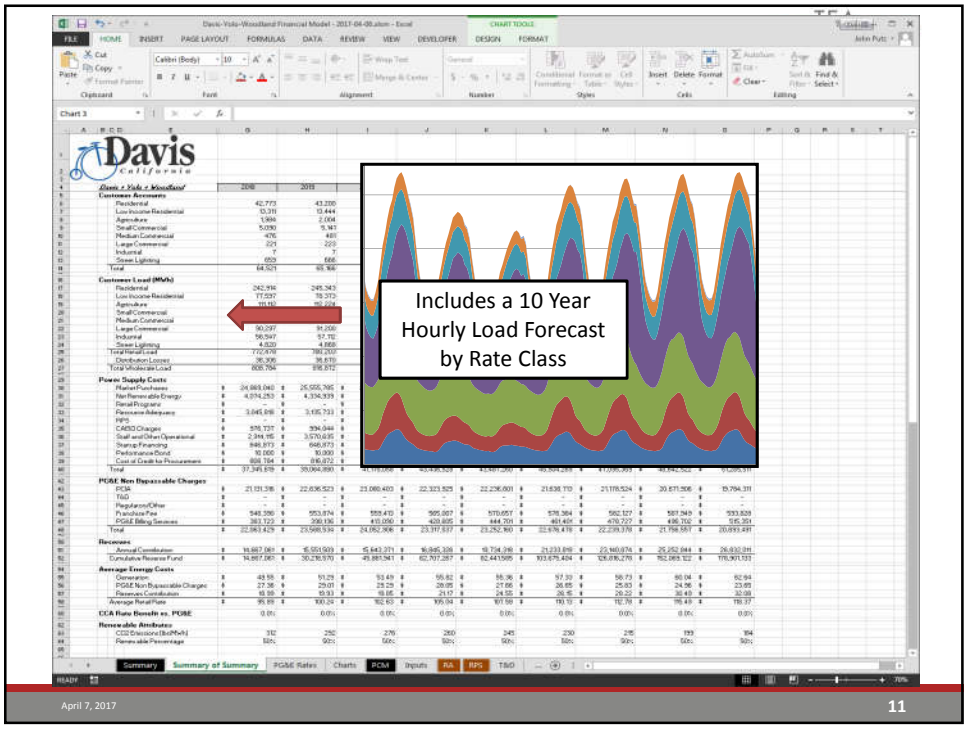
Large Commercial: demand > 499 kW for 3 consecutive months

Historical Load – Total Bundled Load

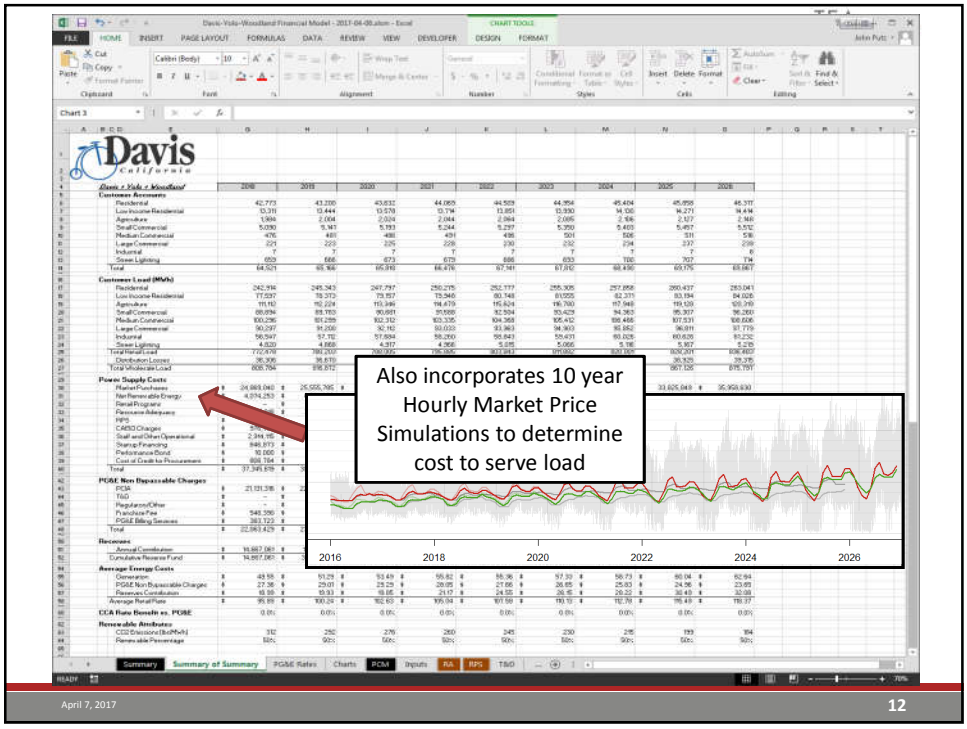


Financial Analysis

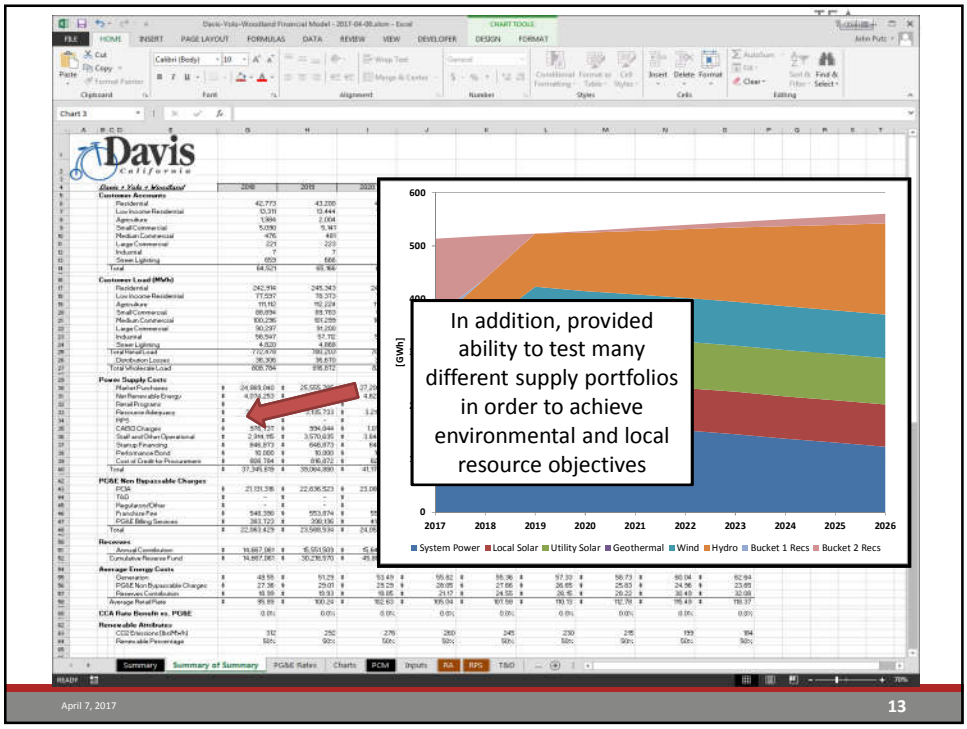


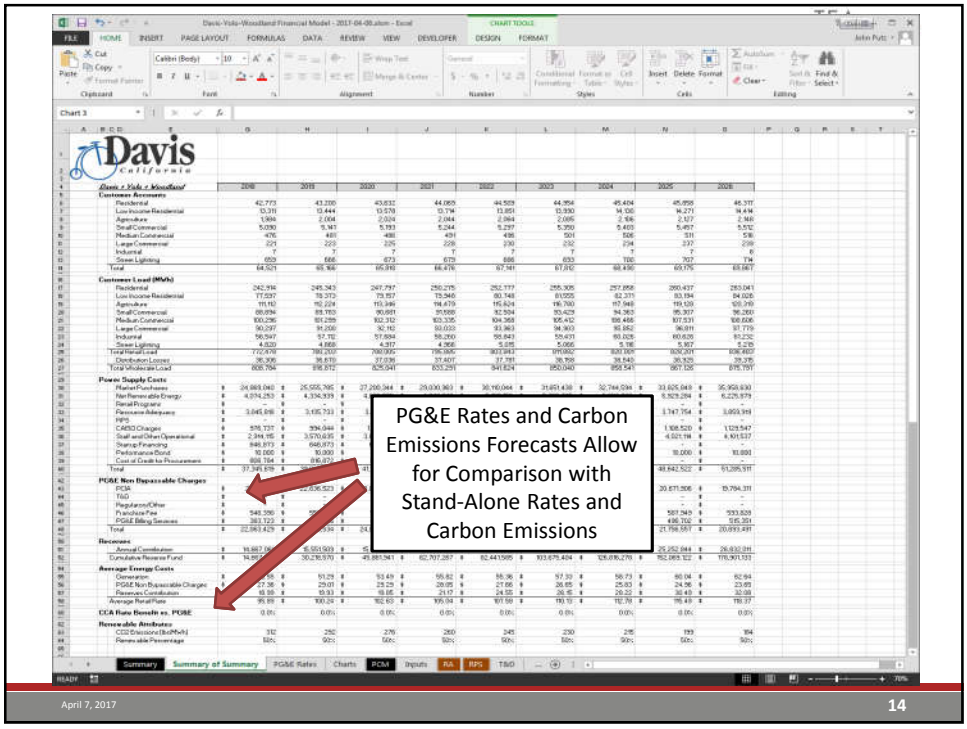


April 7, 2017 11



April 7, 2017 12


In addition, provided ability to test many different supply portfolios in order to achieve environmental and local resource objectives
[GWh]
600
500
0
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
System Power
Local Solar
Utility Solar
Geothermal
Wind
Hydro
Bucket 1 Recs
Bucket 2 Recs


PG&E Rates and Carbon Emissions Forecasts Allow for Comparison with Stand-Alone Rates and Carbon Emissions

Financial Viability – Headroom

- Headroom = Difference between PG&E's Gen Rates for Bundled Customers and Cost Paid by a CCE Customer
  - Costs Paid by CCE Customer:
    - CCE's Costs (overhead, supply)
    - PG&E PCIA – Exit fee charged to CCE customers but not PG&E Bundled Customers
- Headroom with respect to a base-case costs
- Reflects "Surplus" which can be applied to:
  - Building Reserves
  - Rate savings
  - Investment in lower GHG content, local renewables, programs, etc.

Headroom Calculation – Portfolio Assumptions

- Only Bundled Load (no DA customers) w/ 10% Opt-outs
- 50% Renewable, 5% Lower GHG Emissions than PG&E
- No local or owned supply
- No specific reserves set-aside
- No funding for local programs
- Using overhead assumptions from Davis/Yolo Study
- Base case for PG&E rates & current market prices

Headroom

	Davis + Yolo	Davis + Yolo + Woodland	Notes on Differences
		2018	
Load (MWh)	495k	772k	
Supply Cost ($/MWh)	$42.58	$42.68	Larger % of Peaking (Res/Com) load
Overhead ($/MWh)	$9.49	$6.88	Costs Spread over more customers
Headroom ($/MWh)	***$15.39***	***$18.97***	Difference between PG&E Gen Rates & CCE Customer Costs (= Supply + O/h + PCIA)
Headroom ($)	***$7.6mm***	***$14.7mm***	Greater Headroom / customer * more customers
		2020	
Load (MWh)	505k	788k	
Supply Cost ($/MWh)	$45.66	$45.75	
Overhead ($/MWh)	$10.82	$7.74	
Headroom ($/MWh)	***$15.71***	***$19.84***	
Headroom ($)	***$7.9mm***	***$15.6mm***	

Economic Impact

- CCE Redirects Funds which would otherwise flow out of Davis/Yolo/Woodland Area
- Headroom
  - will primarily flow to local economy through rate discounts, local programs, reserves
  - ~$14mm/year
- Admin
  - ~$2mm/year
- Local Supply
  - Fraction of local supply expenditures will go to local economy (solar installers, etc.)
  - Total Supply Cost ~$40mm/year

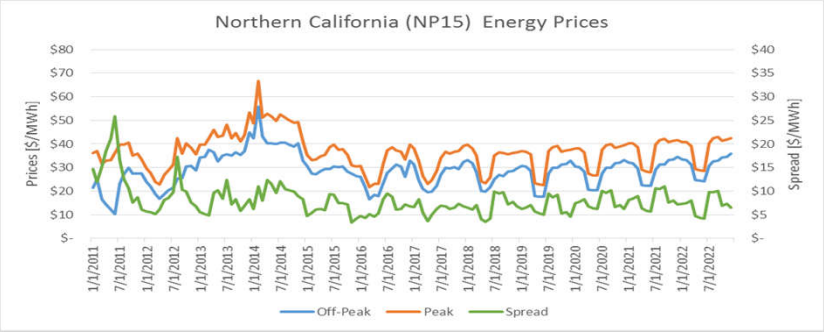
Rate Class Costs/Revenues

Cost to Serve vs Revenue from Rate Classes

- CCE's Rate Structures
  - Generally copy PG&E's but offer discount
  - Relying on PG&E's Cost-of-Service being accurate
  - CCE can structure rates however it likes
- Cost of Rate Class
  - Depends on pattern of energy use
    - summer, peak hours more expensive
  - Depends on when and how large peak use is
    - Coincidence with system peak
    - Cost for capacity higher in peak months (summer)

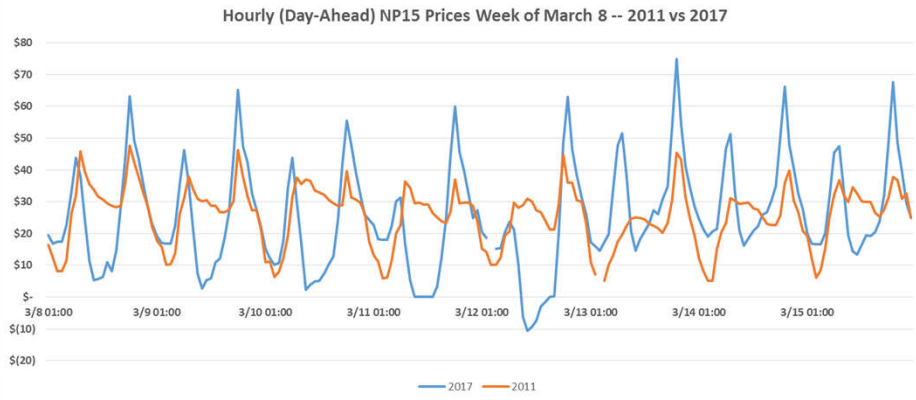
Energy Costs

- Peak – Off-Peak Spreads
  - With ↑ in solar, Peak – Off-Peak Spreads have ↓
- Energy Costs Function of Peak/Off-Peak Ratios



Energy Costs

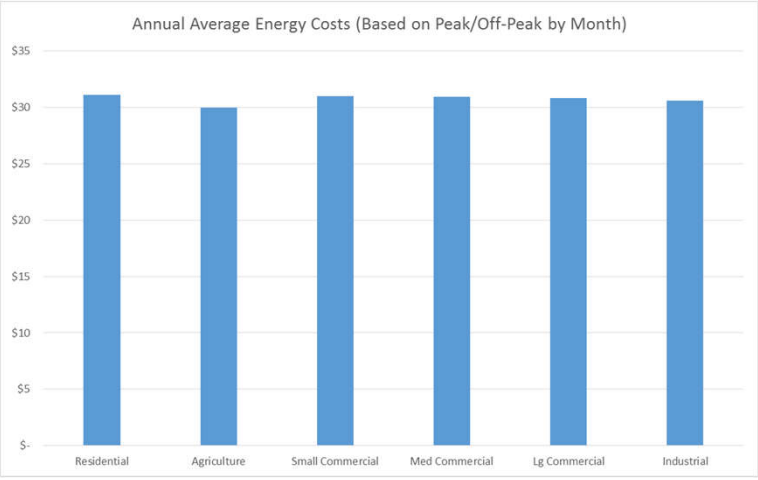
- Hourly Shapes
  - Solar-based Duck Curve leading to higher afternoon peak, lower midday prices



Energy Costs

- Peak/Off-Peak Usage → Determines relative cost to serve for energy
- Presumably PG&E COSA based on average shapes over service area
- Likely Davis/Yolo/Woodland has higher Peak/Off-Peak than average
- However, on daily basis, for non-TOU rates billed based on PG&E load profiles
- As change to TOU rates, usage patterns should correspond more closely to charges

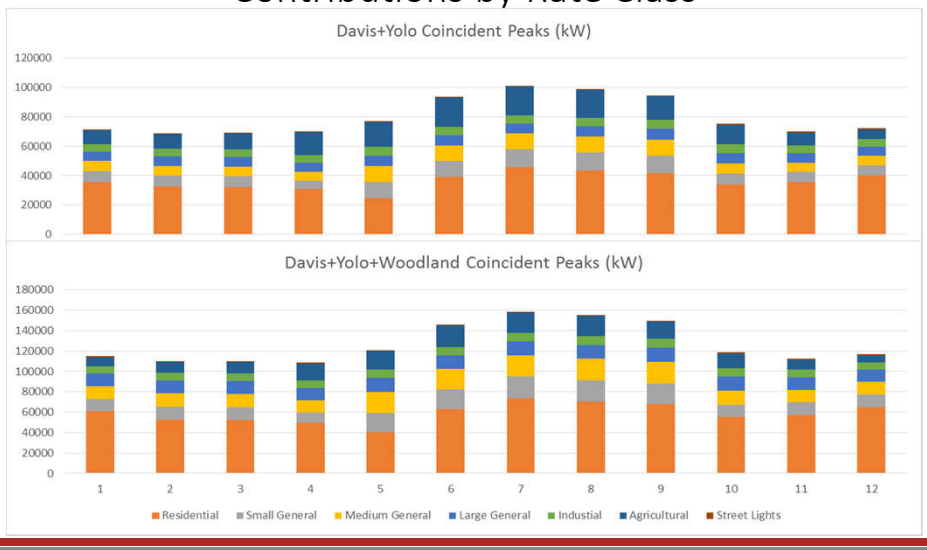
Energy Costs by Rate Class



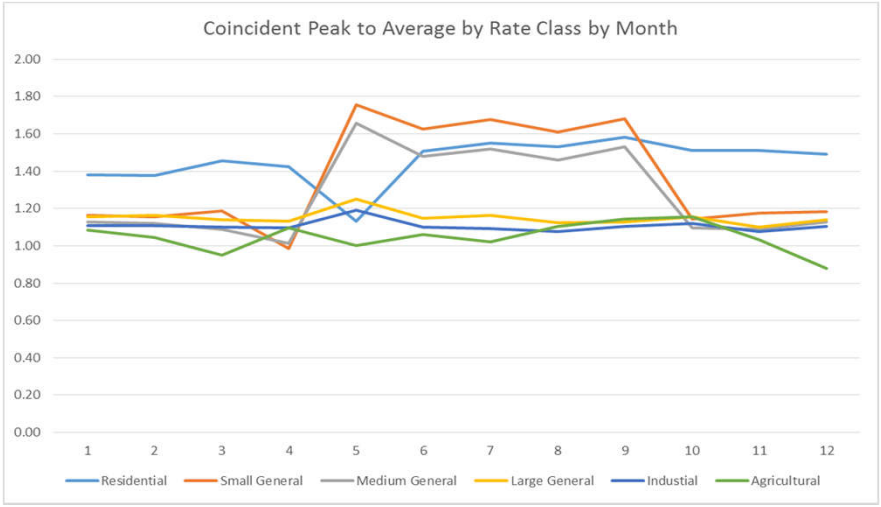
Demand (capacity) Costs

- Relative cost depends on (forecasted) coincidence of peak demand with system peak
- Some rate classes (large commercial, industrial, agriculture) include demand charges
- System peaks likely pretty correlated with D/Y/W peaks

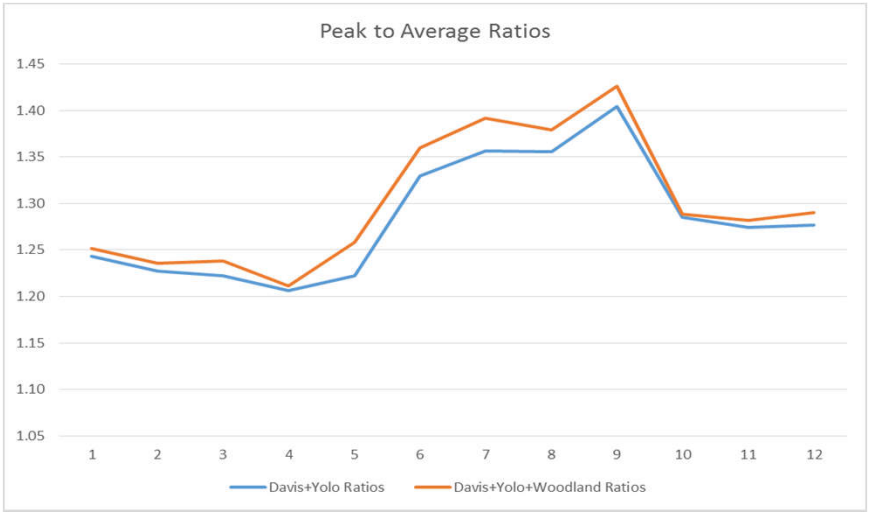
D/Y Peaks vs D/Y/W Peaks Contributions by Rate Class



Rate Class Peaks by Month



Peak/Average Ratios



Overall Rate Impacts of joining VCEA

- Overall Woodland joining VCEA Reduces Costs through spreading overhead cost over larger customer base
- Little impact on Supply Cost and Revenue
  - Supply cost on $/MWh basis ~ same
  - Revenue on $/MWh basis ~ same

Specific Rate Classes

- Industrial
  - Expect PG&E COSA, which provides basis for CCE rates is fair
- Direct Access
  - CCE's have not auto-enrolled DA accounts
  - DA accounts can join – function of rates offered & environmental/other objectives
- Net Energy Metering
  - NEM is subsidized by other ratepayers in CCE
  - CCE's pay a premium for surplus power produced in low-priced periods
  - Don't have data to know how big an impact in D/Y/W

Risks

Risks to CCE's Generally – Regulatory

- PCIA has been rising rapidly
  - Still undercompensating IOUs (according to IOUs)
  - If PCIA continues to increase significantly or is reworked, potential for CCE's to have more difficulty competing
- Wild Cards
  - Energy business is highly regulated
  - Many opportunities for Leg/Reg to impact CCE's
- Mitigations
  - Keep cost structure flexible
  - Build reserves
  - Engage in reg/leg efforts w/ other CCE's

Market Risk

- Key Metric is CCE rate competitiveness w/ PG&E
- CCE supply costs can become expensive relative to PG&E
  - Through PCIA, CCE essentially still owns PG&E supply portfolio
  - If CCE locks in its own high-price supply and market prices decline can get upside-down to PG&E
- Mitigations
  - Build reserves
  - Only moderate amount of long-term supply contracts

Opt-Out Risk

- Primarily a Function of Rate Competitiveness
- MCE customers have shown willingness to pay modestly higher premiums for short periods of time
- Mitigations
  - Maintain rate competitiveness
  - Build brand loyalty through local, service and environmental focus

Sensitivities

- PCIA
  - Any increase is $-per-$ decrease in headroom
  - Over last 2 years, rose ~$20/MWh
  - Expect it to rise more slowly, but may be wrong
- PG&E Generation Rates
  - Any decrease is $-per-$ decrease in headroom
  - Large hydro gen, low market prices ↓ PG&E gen cost
- Opt-outs
  - Not too sensitive to increased opt-outs within normal range of CCE opt-outs (0%-15%)
  - Larger opt-outs can lead to death spiral as fixed costs are spread over smaller revenue base
- Supply portfolios
  - Higher cost, longer obligation lead to higher risk of rate uncompetitiveness given continued decline in renewable prices
- Customer type / DA participation – low risk / conservative assumptions

Costs / Benefits of Woodland joining VCEA

Entity	Costs	Benefits
Woodland	Reputational risk should VCEA fail (no financial risk); Loss of share of initial startup costs should VCEA fail to launch	Economic benefit; Lower costs to customers & city; Climate action goals
Customers	None (can choose to opt-out at any time)	Lower rates; greener supply; local programs; better service
VCEA	Potential dilution of control	Better economies of scale; greater reach; more stable