Final Draft

El Camino Homeowners Organization

(ECHO)

Solar Energy Report

August 2019

Introduction

This report constitutes the solar energy study pursuant to survey results from the **El Camino HOA Survey 2019** that was conducted by the board of directors for the El Camino Homeowners Organization (ECHO). Specifically, the report provides an analysis of interviews with a local solar energy company and Black Hills Energy (BHE). BHE is one of two investor-owned electric utilities that are regulated by the Colorado Public Utilities Commission (PUC). BHE owns two main power generating facilities — the natural gas-fired Pueblo Airport Generating Station and the Busch Ranch Wind Project in Huerfano County that is integrated into their airport generating station.

Under current PUC Net Metering rules, utility customers can have solar panel arrays containing photovoltaic cells that convert sunlight into electricity. Solar panels are installed mostly on homeowner rooftops or by way of a community solar project — sometimes referred to as a 'community solar garden' or shared renewable energy plant. Both renewable energy configurations are required by the PUC to remain connected to the BHE grid.

The primary purpose of a 'community solar garden' is to allow members of the community (often referred to as "subscribers") to share the benefits of solar power, even if they cannot or prefer not to install solar panels on their properties. Under current PUC regulations, utility customers with home-owned solar systems or members of a 'community solar garden' earn credit against the ratepayer's electricity bills based on what their solar panels produce.

The ECHO board came to the realization that BHE is concerned with potential *competition* from so-called 'distributed generation' by residential solar projects and is seeking to reduce Net Metering credits which are set by the PUC. BHE is ever-increasing initial investment costs for solar adopters connecting to their grid. BHE does this in order to diminish the incentive to participate in renewable energy projects by making it as unaffordable and risky as possible — especially for those who seek to create their own community solar gardens.

Contributors to this report include the following ECHO board members:

- Charlie Martinez, President
- Kurt Madic
- Carl Dazzio
- Joseph Griego

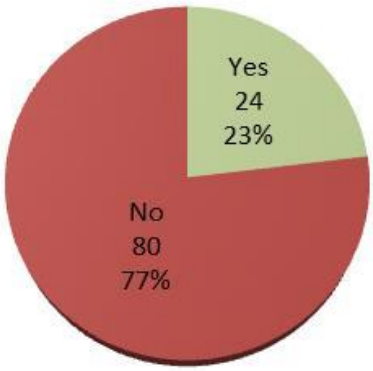
Executive Summary

Homeowner Survey

The **El Camino HOA Survey 2019** was conducted early this year. Results for two survey questions pertaining to solar energy were as follows:

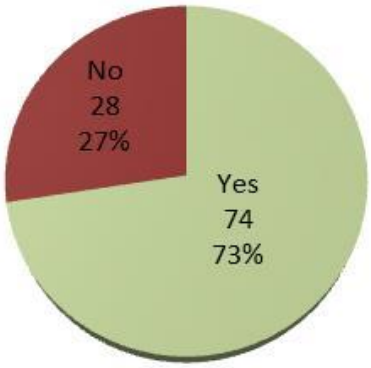
7. Are you considering purchasing rooftop solar energy in the next 2-3 years (high initial upfront cost to homeowner) ?

Number of Responses: 104



8. If solar energy would be available to your home through a community solar garden (initial upfront cost zero and modest monthly savings) would you be interested?

Number of Responses: 102



Rooftop Solar

AX CO Solar & Roofing is a local solar company. At the beginning this year, the AX CO company owner and his energy consultant made a formal presentation before the ECHO board to help the directors understand the advantages and associated costs homeowners encounter when considering a solar system. AX CO also gave an overview of community solar gardens that they also assemble.

AX CO produces professional **Performance & Analysis** proposals for interested homeowners that thoroughly spell out **Electric Utility Savings** potential. An image of a **Performance Summary** is shown below, the main segment of an AO CO offer prepared for a homeowner whose electricity costs on average exceed $400 a month:

Performance Summary

Solar Electric (PV) System: 11.1 kW DC (10.823 kW AC) producing 19,598 kWh/Year.

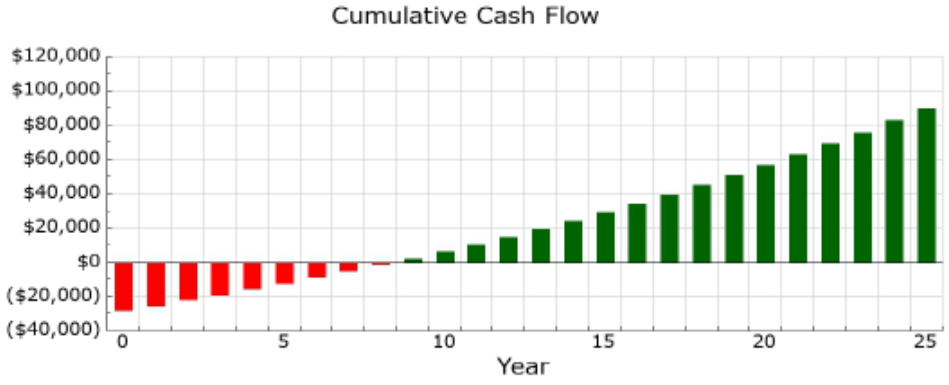
Purchase Price & Net Cost

Contract Price: **$40,989**
Incentives to Customer: ($12,297)
Net Purchase Cost: $28,692

Financial Ratios

Customer`s Profitability Index: 2.1
Cashflow Payback: 8.4 years
Internal Rate of Return (IRR): 12.8%
Net Present Value (NPV): $32,381
Cash Gained over Life: $90,160

- Property Value Appreciation: $61,020 (first-year utility savings x 20 years)
- CO2 Saved over System Life: 402 tons. Equivalent to driving 804,000 auto miles



Rooftop Solar (Performance Summary Continued)

The Cost of Doing Nothing

Your Hedge Against Utility Inflation: Your investment in this project will protect you from utility rate inflation.

Utility Cost by Month

December includes a Net-Metering "True-Up" payment to reconcile any net-meter credits accumulated over the prior year.

Rooftop Solar (Conclusion)

The AX CO proposal example goes on to explain how a homeowner's investment in a rooftop solar system can protect the homeowner from utility rate inflation, and how a homeowner's carbon footprint can be reduced.

AX CO also schooled the ECHO board about the concept of Net Metering, a utility billing mechanism that offers utility bill credits to resident customers who make excess electricity with their solar panel systems that basically allows them to store energy in the electric grid. That is to say, when solar panels produce more electricity than is needed, that energy is sent to the grid in exchange for utility bill credits, or allows homeowners with solar systems to sell surplus power back to the utility at retail prices.

According to AX CO, when homeowners with rooftop solar systems produce more electricity than is needed for a given billing period and opt for a payment rather than a credit, Black Hills Energy reimburses them approximately 2¢ per kWh[1].

[1] A **kilowatt hour** (kWh) is a unit of energy that is transmitted or used at a constant rate over a period of time. The total energy in kilowatt hours is equal to the power in kilowatts multiplied by the time in hours. The typical American home consumes 867 kWh per month, on average, according to the U.S. Energy Information Administration (EIA).

Electricity Rate Comparison

Electricity Local[2], a comprehensive online resource of electricity rates and usage information for thousands of cities and towns across the United States, catalogs residential electricity rates for Pueblo as compared with select Front Range cities illustrated below.

Using typical residential monthly usage of 867 kWh footnoted on Page 6 and residential rates at cents per kWh shown above, this is how monthly bills total up for the following Colorado cities:

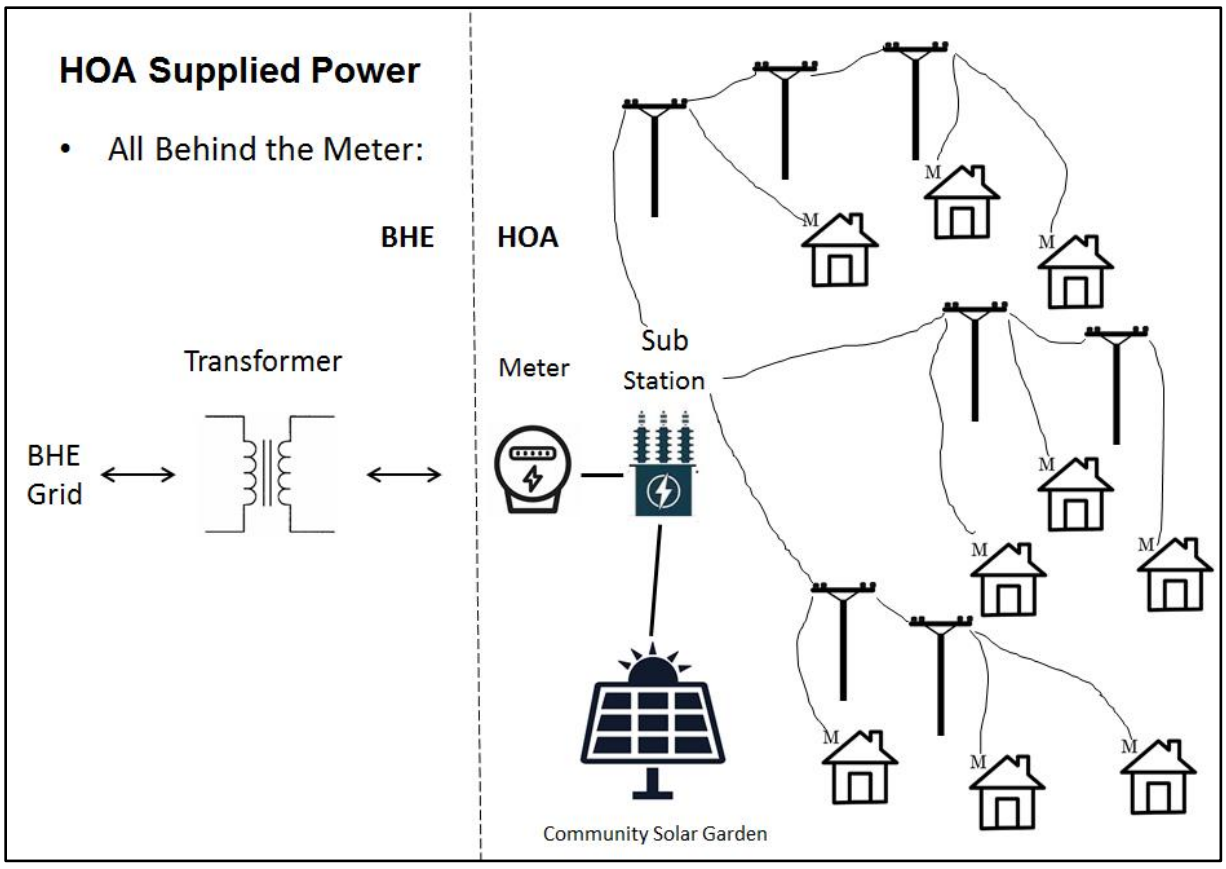
Pueblo	$141.06
Colorado Springs	$98.66
Aurora/Denver	$95.80
Fort Collins	$80.28

[2] www.electricitylocal.com/states/colorado/

Black Hills Energy

At the monthly ECHO board of directors meeting held on February 27, a Black Hills Energy engineer who works on the utility's **Renewable Energy Program** gave a presentation to help the directors understand the terms and conditions that would apply if ECHO were to take on a 'community solar garden' project.

From the very start of his presentation, the engineer emphasized that Black Hills is a regulated "natural monopoly"[3] and that the PUC can quite literally tell the utility what it can and cannot do. To drive his point home, the engineer said this includes not only what Black Hills rates are but what is allowed and what is not allowed. Insofar as solar energy is concerned, Black Hills has two offerings authorized by the PUC — onsite rooftop or ground-mount solar panel systems, and community solar gardens. This segment of the report will focus only on the offering Black Hills has for the formation of a solar community garden as well as for its O&M (Operations & Maintenance).



Black Hills confirmed that El Camino is the first Pueblo neighborhood to request how to start a community solar project, so the engineer created a demarcation diagram as illustrated above to

[3] A **natural monopoly** is a monopoly in an industry in which high infrastructural costs and other barriers to entry relative to the size of the market give the largest supplier in an industry, often the first supplier in a market, an overwhelming advantage over potential competitors. *From Wikipedia, the free encyclopedia*

Black Hills Energy (Continued)

explain how it all works in accordance with guidelines approved by the PUC.

Moreover, the **Colorado Community Solar Gardens Act** grounded on House Bill 10-1342 specifies in part:

- A regulated utility provides power to members of a 'community solar garden' during off-peak periods such as nighttime and on a cloudy day when solar panels typically produce about 10-25% of their usual output.
- Excess energy generated must be sold directly to the regulated utility.
- A regulated utility provides Virtual Net Metering (VNM) credit on the subscribing customer bills. VNM is a bill crediting system for community solar gardens where members receive credits on electric bills for excess energy produced by a member's share of a solar garden.

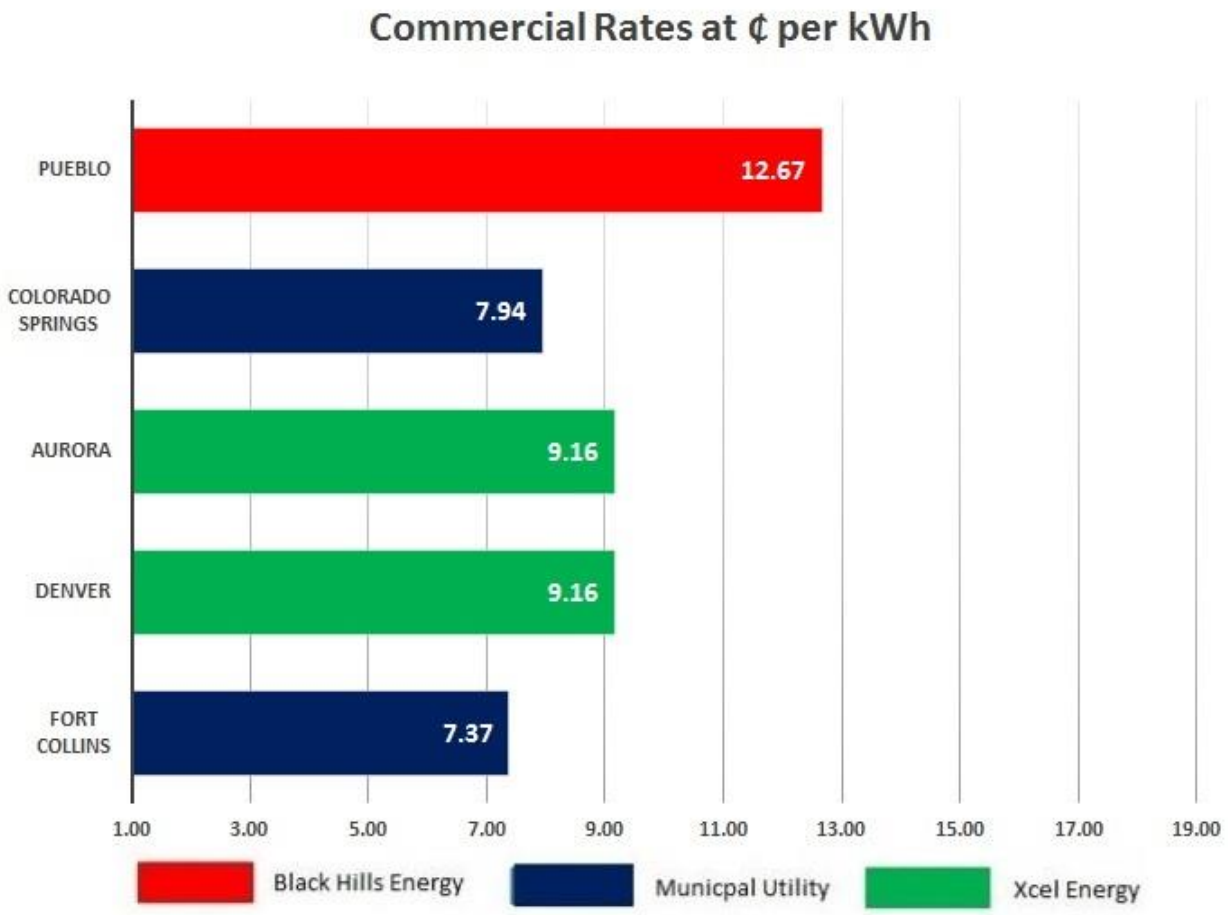
Under the present 'community solar garden' offering (authored by Black Hills and approved by the PUC), the Black Hills engineer stated that all of the utility's assets used to service El Camino would be sold and transferred to the community. Black Hills assets include transmission lines, substations, transformers, meters, various monitoring systems, and other infrastructure.

Black Hills will not disclose the cost for their assets in whole or in part unless it is compelled to do so by court order. But it would be a safe bet to assume that the acquisition costs for Black Hills' El Camino related assets could run into the millions of dollars.

The Black Hills engineer said El Camino would also be responsible for maintaining its own 'microgrid' that depends largely on its solar garden for energy. In addition, El Camino would be responsible for hiring or outsourcing its own technical staff to maintain and troubleshoot a private grid on a 24/7/365 basis. This includes making sure all required technical training and certifications are met. If El Camino homeowners were to commit to a 'community solar garden' project, El Camino would fundamentally own a 'private power company' having all the legal liabilities commonly associated with a business entity.

Black Hills would also consider El Camino a commercial customer having their applicable commercial rate apply instead of their residential rate. Currently, the average commercial rate that Black Hills charges is 12.67¢ per kWh (see comparison bar chart on the next page).

Black Hills Energy (Conclusion)



The Black Hills engineer said the utility would send El Camino's private power company one statement every billing cycle based on their Virtual Net Metering (VNM) crediting system. That means El Camino would also have to set up its own billing system to collect taxes and allocate charges to its members for electricity.

A community solar garden would ideally have a 100 percent subscriber-based model for it to operate successfully. El Camino homeowners who already have their own solar systems, or plan to have one, would create a technical and operational complication that the El Camino Homeowners Organization would have to resolve.

Conclusion

The ECHO **'**community solar garden' initiative will not be explored any further at this time for the following reasons:

1. Cost prohibitive
2. Liability
3. Maintainability

The ECHO board of directors encourages homeowners to continue to consider and research the many benefits from residential solar. Benefits include lowering your monthly utility bill, increasing the value of your home, and reducing CO_2 emissions in the environment.

The trend toward solar energy and storage will continue to grow by leaps and bounds. The emerging and game-changing battery storage technologies hold the promise of giving homeowners the ability to turn their homes into 'personal utilities' that do not need an operator like Black Hills Energy.

Sunshine rich Pueblo opens up possibilities for the El Camino community that are open-ended and variable. With each new development, new options are created and some are eliminated. The day will soon come when generating electricity can be like owning a kitchen appliance or a water heater.

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