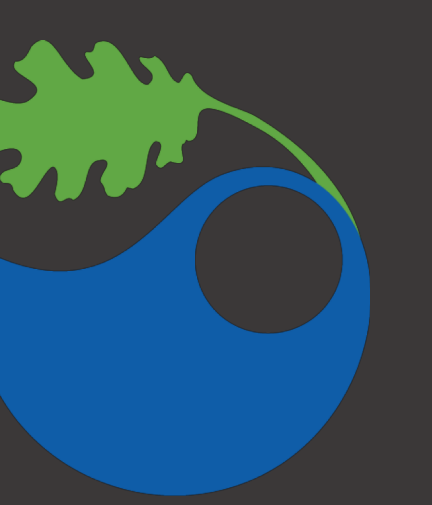


PATHWAY TO 100% A CORPORATE RENEWABLE ENERGY PROCUREMENT STRATEGY

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WHY RENEWABLE ENERGY?

Climate change is one of the most significant and defining issues faced by our planet today. Greenhouse gas emissions from the burning of fossil fuels are directly linked to climate change. Renewable energy, such as wind or solar, presents a key solution to climate change because it emits zero carbon emissions when producing electricity and there is an unlimited amount available for harnessing! Corporations are motivated to buy renewable energy to power their operations for the following three reasons.



DECLINING COSTS
Wind and solar technologies are becoming increasingly cost competitive with fossil fuels



STAKEHOLDER PRESSURE
Investors, consumers, and employees are demanding companies be more sustainable



INDUSTRY TRENDS
99% of all U.S. non-utility renewable energy purchases have been from corporations

THE PROBLEM

Corporations want to purchase renewable energy to reduce their environmental impact, create business value, and potentially save on electricity costs. **BUT PURCHASING RENEWABLE ENERGY IS A COMPLEX PROCESS**

Why? There are numerous renewable energy purchase options, and there is no "one-size-fits-all" solution for all businesses. Also, the availability and implementation of renewable energy purchases is determined by many factors, including:

- 1 electricity regulations that differ on a state-by-state basis,
- 2 feasibility based on physical infrastructure or geographic location,
- 3 financial mechanism for purchasing renewable energy.

Furthermore, there are standards for how companies should purchase renewable electricity to have positive environmental and societal impacts. This means there are "good" and "bad" ways for a company to purchase renewable energy. Companies are under pressure to adhere to these standards in order to avoid public criticism.

OUR GOALS

1. Develop a streamlined and standardized method for evaluating renewable energy purchase options for corporations.
2. Recommend the most cost-effective combination of renewable energy options that will increase the procurement of renewable energy for CBS facilities nationwide.

ENERGY OPTIONS

The following four renewable energy purchase options are the most popular options among corporate renewable energy buyers. Thus, we evaluated implementation of these four options to match 100% of a company's electricity load.

ON-SITE SOLAR PHOTOVOLTAIC SYSTEM

Renewable power generation systems consisting of PV panels and auxiliary systems that supply electricity directly to the facility. Solar PV panels can be installed on the building's rooftop, parking lot cover, or ground area.



GREEN POWER PRODUCTS

Optional service products for customers to purchase renewable energy offered by their local utility or a third-party supplier. Green power products allow customers to buy RECs and physical electricity from the default utility.



COMMUNITY SOLAR PROGRAMS

Large, shared solar PV systems that are located away from the customer's facility. Customers of a community solar project would subscribe to a portion of the generation from the project to match their electricity demand.



VIRTUAL POWER PURCHASE AGREEMENT

Financial contracts between a customer and third-party developer where a customer agrees to purchase a project's renewable energy output and RECs at a fixed price, while the developer sells the energy to the wholesale market.



OUR SOLUTION

In order to navigate the complex process of corporate renewable energy procurement, we developed a standardized three-step process for evaluating different energy options.

1 REGULATORY ASSESSMENT

There are many renewable energy regulations across states. Regulations govern how companies can sell on-site solar energy back to the grid, how much energy can be purchased from a community solar project, and types of utility green power programs available.

Example: States have either regulated or deregulated electricity markets. In a regulated market, the local utility is the only entity allowed to sell electricity to retail customers. In a deregulated market, third-party suppliers other than the local utility are allowed to sell electricity to retail customers.

Example: Regulated vs. Deregulated



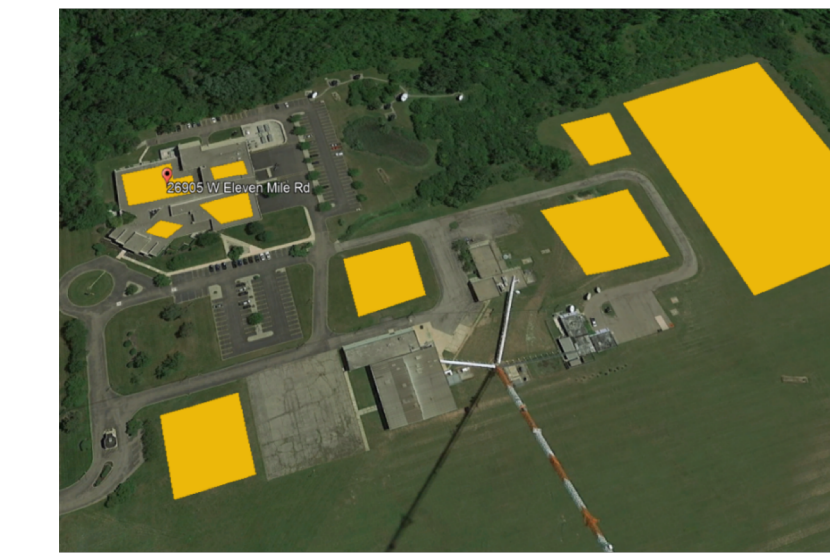
Regulated Energy Market (White)
Deregulated Energy Market (Blue)

2 FEASIBILITY ASSESSMENT

The feasibility of energy options vary across the U.S. because of regional availability of solar and wind, varying policies that enable or prohibit renewable energy development, and numerous third-party project developers who offer competitive contract prices.

Example: After filtering out states without enabling state policies, each facility was assessed for their physical feasibility to host an array on their roof, ground space, or parking lot. Suitable host facilities were further assessed for their usable area, solar system size, and generation potential.

Example: On-Site Solar PV System



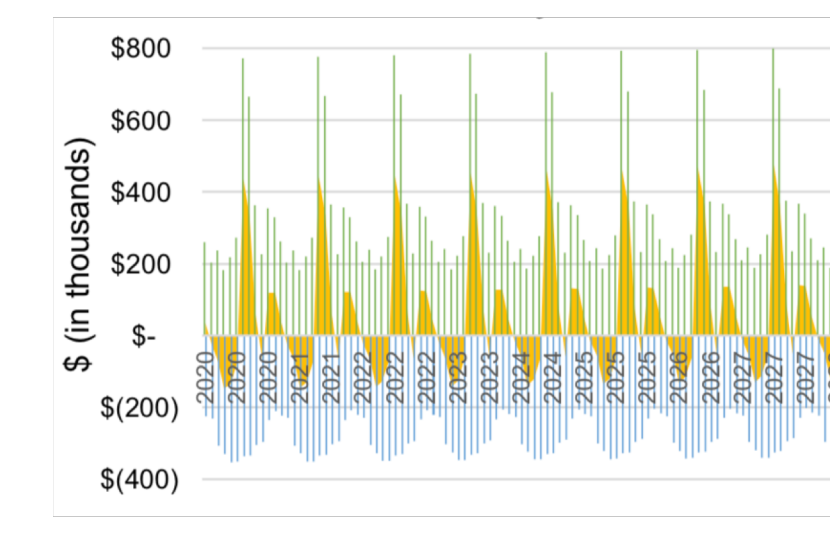
Usable Area
Solar System Size
Energy Generation Potential

3 FINANCIAL ASSESSMENT

We evaluated each energy option's profitability using net present value and used first-year financial return as the metric to compare energy options. We recommended the energy option(s) that had the greatest financial return for a facility.

Example: To financially assess our simulated Virtual Power Purchase agreements, we developed a forecasted financial model displaying 15-year cash flows. To do this, we had to compare the hourly difference between projected wholesale market prices and the fixed contract price over the forecasted time period.

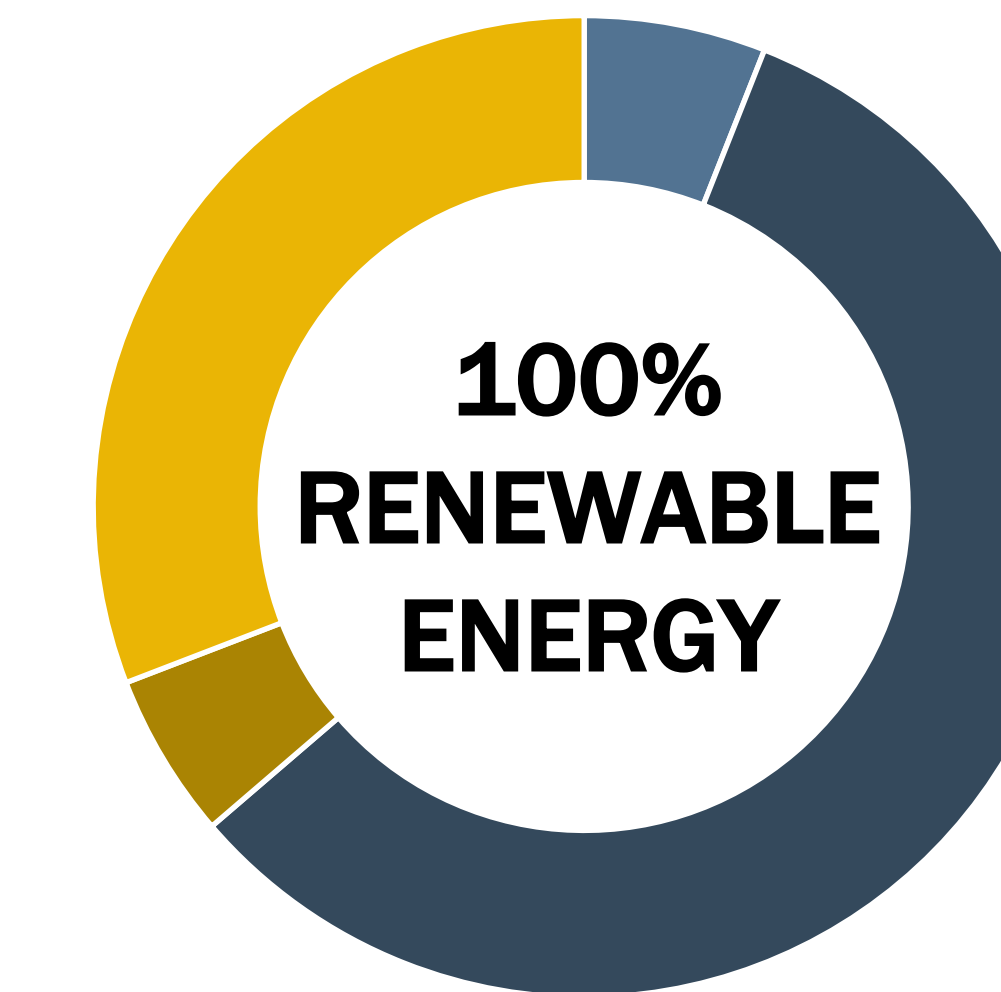
Example: Virtual Power Purchase



Wholesale Revenue
Fixed Energy Cost
Net Cashflow Settlement

OUR RECOMMENDATION

Our recommendations for all CBS facilities comprise of the following combination of renewable energy purchase options.



- ON-SITE SOLAR: 6%
- GREEN POWER PROGRAM: 56%
- COMMUNITY SOLAR: 5%
- VIRTUAL PPA: 33%

These renewable energy options were recommended across the diverse profile of CBS facilities across the nation, which comprise of the following:



27 LOCATIONS



10 TRANSMITTERS



13 STATES

VALUE PROPOSITION

With the application of our standardized method for assessing renewable energy options and implementation of our recommendations above, CBS Corporation could expect to capture significant financial and environmental value in the range of:

AVOIDED COST FROM BUYING UNBUNDLED RECs

If CBS were to purchase unbundled RECs to match 100% of their load, it could expect to pay over \$100,000 in additional costs for going renewable.

\$100 THOUSAND+

ESTIMATED COST SAVINGS FROM RECOMMENDATIONS

However, if CBS implemented our renewable energy purchase recommendations above, it could expect approximately over \$3 million in financial savings from its electricity costs.

\$3 MILLION+

GREENHOUSE GAS EMISSIONS OFFSET

Finally, if CBS implemented our renewable energy recommendations above, it could expect to offset over 60,000 metric tons of carbon emissions, equivalent to taking over 13,000 cars off the road in one year.

60,000+ TONS CO₂e

PRINCIPLES

We considered the following four principles when evaluating the implementation of each renewable energy option because of the financial, environmental, reputational benefits they provide to a company.



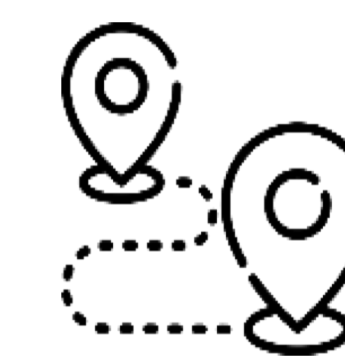
ATTRIBUTION

Ability to claim the attributes of using renewable energy through renewable energy credits (RECs)



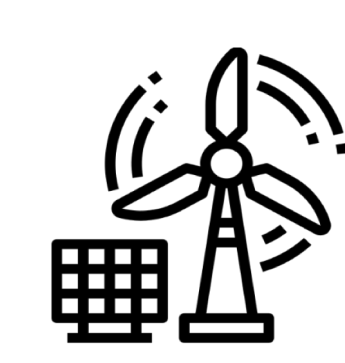
COST

Capital and operational costs of the project, measured in net present value (NPV)



PROXIMITY

Projects that will operate and deliver renewable energy on the same grid as the facility

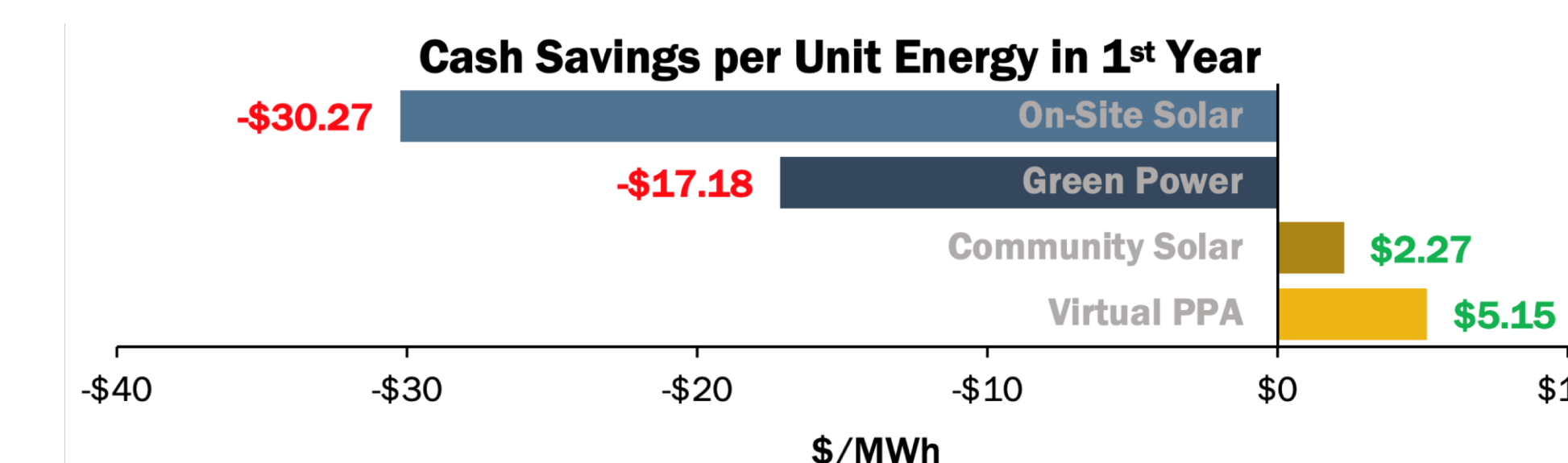


ADDITIONALITY

Projects that have not yet been constructed and will add new renewable energy to the grid

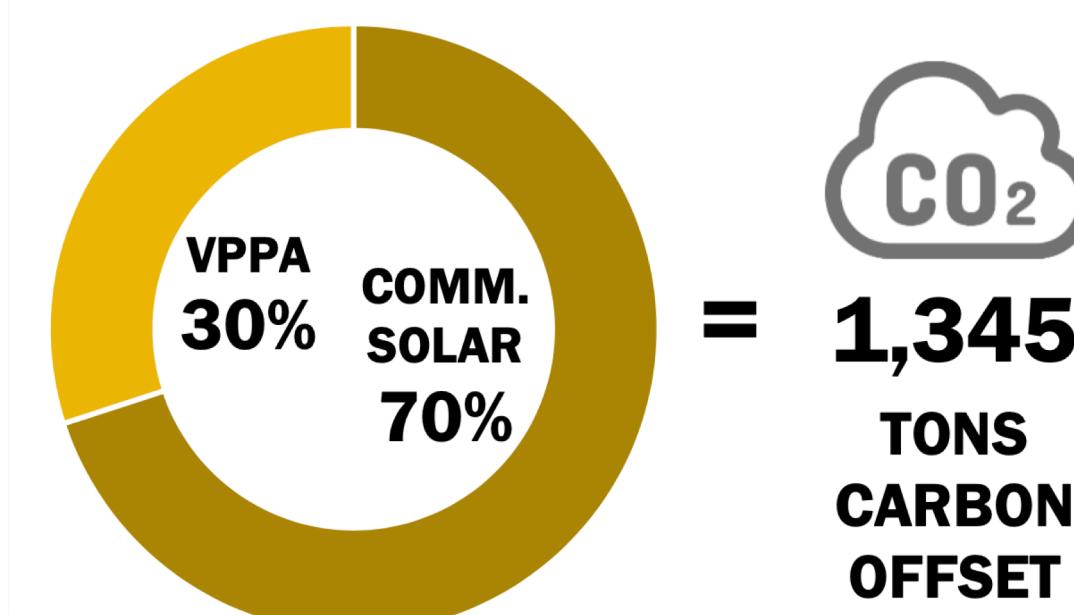
FACILITY RESULT

We applied our three-step evaluation approach for assessing each procurement option for every facility and calculated the cash savings per unit energy in the first year to determine the most cost effective renewable energy option.



Based on our analysis, we recommended the renewable energy options with the greatest financial return and quantified the carbon emissions and total financial savings from implementation of that option.

TOTAL SAVINGS: \$6,350



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