Town of Moraga	Agenda Item
Ordinances, Resolutions, Requests for Action	10. B.

Meeting Date: May 11, 2022

TOWN OF MORAGA **STAFF REPORT**

To: **Honorable Mayor and Councilmembers**

From: **Shawn Knapp, Public Works Director / Town Engineer**
Bret Swain, Senior Civil Engineer

Subject: **Receive the Town Facilities Energy Generation Study Initial Presentation and Provide Staff with Feedback**

Background

In October 2014, the Town Council accepted the Town's Climate Action Plan (CAP) as an advisory document. The CAP calls for the Town to consider implementing a wide variety of environmentally sustainable strategies that aim to achieve the overall goal of reducing Town-generated greenhouse gas (GHG) emissions by 15% below 2005 levels by the year 2020.

A Town Council Goal for 2021 was to "Continue evaluation and implementation of viable strategies in Moraga's Climate Action Plan to lessen the Town's impact on the environment." On June 23, 2021, the Town Council adopted the FY 2021/22 Capital Improvement Program (CIP) Budget, which included $78,000 in funding for a Town Facilities Energy Generation Study (CIP 21–109). The Town Facilities Energy Generation Study was to identify appropriate redundant power needs and resources to maintain critical operations in case of power disruptions for the Town's four major building locations: Town Administrative offices (329 Rheem Boulevard); Town Council Chambers/Corporation Yard (335 Rheem Boulevard); Hacienda de las Flores (2100 Donald Drive); and Moraga Library (1500 St. Mary's Road).

On November 5, 2021, the Town issued an RFP seeking a qualified consultant to conduct the Town Facilities Energy Generation Study. On January 12, 2022, the Town Council awarded a Professional Services Agreement to Clean Coalition (Santa Barbara, CA) for $60,000 to conduct the Town Facilities Energy Generation Study (Study).

Clean Coalition's agreement stipulates that they will participate in three public meetings: 1) Community Outreach meeting; 2) Town Council presentation of the community outreach meeting and preliminary results; and 3) Town Council presentation on the final Study, including addressing feedback from previous Town Council presentation.

The Community Outreach webinar meeting was held on Thursday, April 21, 2022, via Zoom to receive community comments and feedback. For more information, visit the Town Facilities Energy Generation Study project web to view the webinar video. https://www.moraga.ca.us/energygenerationstudy.

Discussion

The Town of Moraga Facilities Energy Generation Study is being conducted to analyze the power needs for four Town of Moraga properties mentioned above, and proposing various alternatives for independent and emergency backup power generation for each site. The Clean Coalition conducted this study by obtaining and analyzing the energy usage at each of the four Town properties, forecasting the expected future energy usage, determining which critical loads would be required to be served by onsite energy generation during grid outages, and modeling various options to provide the required resilience at each site while considering both renewable energy and fossil fuel resources.

The resulting analysis provides recommendations for backup or independent power generation based on the Town of Moraga's program and project goals for climate change, current and future energy provider mix of resources, sustainability, grant funding, and rebates, financing, affordability, and duration for planning, design, and construction.

The Clean Coalition analyzed energy resources and resilience solutions for Moraga through a four-step study process:

Step 1: Resilience Scenarios: analyze existing electricity loads over a relevant 12-month period; include expected additional loads due to increases from EV charging, electrification of appliances, and planned building upgrades or new construction; determine the Total Critical Load Required (TCLR) to be served during grid outages;

Step 2: Resource Scenarios: analyze multiple onsite energy resource options that are viable for each site, and that will satisfy the TCLR;

Step 3: Economic Scenarios: analyze the total costs and economic benefits of each of the viable Resource Scenarios at each site; and,

Step 4: Results: Present the results and recommendations via project review meetings, presentations, and reports.

Resilience Scenarios

Resilience Scenarios were calculated for TCLR for each site. The Resilience Scenarios require that the proposed energy resources can provide uninterrupted backup power to the critical loads for five consecutive days, enabling each site to withstand any expected or unexpected grid outage with energy provided to all critical loads during an outage.

Facility energy usage from the 2019 electricity load data was used in calculating the loads for each site, given that COVID impacted 2020 and 2021, and the sites used a lower than the accurate amount of energy during those years. Using the 2019 load data as the baseline, the Master Load Profile was then prepared in order to calculate the TCLRs. The Master Load Profile is the anticipated annual load profile using the baseline load plus adjustments for anticipated EV Charging Infrastructure (EVCI), electrification, energy efficiency, and new facilities. The TCLR calculations are also based on the most conservative numbers to ensure that the resource scenarios will provide electricity for the 5-day TCLR under the most conservative timeframes using the expected highest electricity use combined with the lowest solar generation.

Moraga Facilities	**TCLR Calculation**
Town Hall / Police Offices	Electrical loads from the highest five consecutive days using the Master Load Profile
Council Chambers / Corporation Yard / Emergency Operations Center	Electrical loads from the highest day and repeat for five days using three options: 1. Baseline Load Profile; 2. Baseline + Two Level 2 EV Chargers 3. Master Load Profile – Baseline + Two Level 2 Chargers + Two Level 3 Chargers;
Town Library	Electrical loads from the highest day and repeat for five days using the Baseline Load Profile
Hacienda de las Flores Park	Electrical loads from the highest five consecutive days using the Baseline Load Profile of the Hacienda main building and the Pavilion

As a note, future EV charging stations are included in the TCLR for Town Hall and Police Offices and considered for the Corporation Yard and Council Chambers, but not for the Library or Hacienda sites. Nonetheless, EV charging can be available for all sites when solar generation is abundant. Also, where available, peak load testing details previously conducted by Moraga were used to help evaluate the TCLRs.

Based on the required Resilience Scenarios, various Resource Scenarios were analyzed to assess specific options and sizes of energy resources to be located at each site. The Clean Coalition conducted in-person visits to each site with the Town of Moraga staff to determine the existing electrical configuration and the viable opportunity and locations for new energy resources, including solar generation, energy storage, and diesel generators.

Detailed site layouts were created showing the proposed locations and sizing for viable energy resources, including solar panels and/or solar carports, proposed locations for added EV charging, and locations of existing generators and potential new generators. These site layouts are provided in the following section of this study. The solar potential for each site was designed to accept realistic sizing for solar panels while achieving a key goal of delivering a Net Zero Energy (NZE) outcome for each site where applicable, with the solar generation equaling the amount of electricity used at each site on an annual basis, thus resulting in significant electricity bill cost savings.

Based on the resulting Resilience Scenarios as determined by the TCLRs and the practical potential for energy generation at each site, the following table lists the three Resource Scenarios deemed viable, and that proceeded to the detailed study.

Resource Scenarios	Feasible or Not Feasible Determination
Solar + Battery Storage	Feasible for detailed study
Solar + Battery Storage + Diesel Generator	Feasible for detailed study
Solar + Diesel Generator	Feasible for detailed study

Six additional scenarios (Solar only, Battery only, Hydroelectric, Geothermal, Biofuel, Pipeline Fueled Generators and Propane) were evaluated and found not feasible due to higher capital costs or no resiliency during power outages.

Economic Analysis

Based on the resulting Resource Scenarios, the Economic Analysis was conducted to determine the total cost and cost benefits for each viable Resource Scenario. Note that since each Resource Scenario satisfies the TCLR for each site during an outage, the comparison of the scenarios can focus largely on the economic results. Additional key points regarding the Economic Analysis:

1. The Economic Analysis evaluates financing for each scenario via a "cash" option – paying the capital expenditure (Capex) and operating expenditure (Opex) costs for each system
2. The Analysis also evaluates the economic value of a Power Purchase Agreement (PPA). A PPA is an established, industry-standard financial solution enabling site owners to pay for solar and solar+storage systems using a multi-year energy services contract based on the amount of solar energy (kWh) the system delivers, whether via solar in real-time or solar time-shifted via a battery, and with no upfront cash or maintenance expenditures.
3. The Town of Moraga will likely not choose the cash option and will select the PPA.

The following economic assumptions apply to all scenarios:

- All sites have been modeled using rates (see table below) to achieve the best economic savings. PG&E rate B-10S is used due to adding EV charging stations. For solar+diesel scenarios, either B-19S Option R or B-10S is used, whichever yielded greater economic savings. For solar+storage+diesel scenarios, B-19S Option S is used for greater economic savings. All use the MCE Light Green energy generation service.
- Electricity Bill Cost Escalation: 3% - very conservative as it could reach 10% or more due to additional infrastructure costs planned by utilities.
- Battery replacement occurs at Year 16 and is included in the economic results.
- The state subsidy for batteries, known as SGIP, is included in the scenarios with storage.

- The diesel generator costs (see table below) are based on industrial-quality models, appropriate for providing municipal backup power function. The operations and maintenance costs are based on market-based annually required costs for diesel generators.
- The most conservative estimates are used for solar generation during outages

Included in the PPA cost:

- No PPA rate escalation
- All solar canopies and structures needed for parking areas
- EV chargers
- Required upgrades in electrical equipment
- All ongoing operations and maintenance costs

Not included in the PPA cost:

- Additional required site preparation such as re-grading parking lots for full ADA compliance and siting of solar canopies.

The following assumptions apply ONLY to a cash purchase option:

- Discount rate: 5%
- Federal Income Tax Rate: 30%
- State Income Tax Rate: 8%
- O&M Escalation Rate: 2%

The preliminary economic analysis for each site demonstrates that utilizing solar + diesel or the Hybrid Solar Microgrid (solar + storage + diesel) provides the Town of Moraga with significant cost savings for each site, resulting in a 25-year cumulative net savings over the life of each of these scenarios.

Resource Scenario and Economic Analysis – <u>Town Hall Offices and Police Station</u>:

As stated above, the Town Hall and Police Station resilience scenario uses the Master Load Profile, which includes all loads plus EV charging. This means that during an outage, all loads plus EV charging are covered by the resource scenario listed.

Town Hall Offices and Police Station - Economics									
Scenarios			Capex & Opex		25 Year Detailed Economic Analysis Results				
#	Resilience Scenario	Resource Scenario	Total Capex $	Total Annual Opex $	PPA rate $	Electrical Bill Savings $	25 Year Cumulative Savings: PPA $	25 Year Cumulative Savings: Cash Purchase $	Savings year 1: PPA $
1	Master load profile	Solar Microgrid (solar+storage)	$3,583,608	-	-	-	-	-	-
2	Master load profile	Solar + diesel	$742,104	$3,000	$0.16	$1,829,731	$828,367	$941,293	$11,214
3	Master load profile	Solar Microgrid + diesel	$911,250	$8,775	$0.21	$1,936,359	$622,069	$787,385	$2,026
4	Master load profile	Diesel only	$214,864	$2,600	-	-	-	-	-

Resource Scenario and Economic Analysis – <u>Library</u>:

As stated above, the Library resilience scenario assumes the Baseline Load Profile, which includes all loads but does not include EV charging. This means that during an outage, all loads except for EV charging are covered by the resource scenario as listed.

Library - Sizing										
Scenarios			PV Sizing	BESS Sizing		Generator Sizing			Indefinite Resilience	
#	Resilience Scenario	Resource Scenario	PV System Size kWp	Power Capacity kW	Energy Capacity kWh	Genset Capacity Rating kW	Minimum fuel tank size gal	Gallons needed to meet TCLR	Percentage of Baseline Load	Percentage of Master Load
1	Baseline load profile	Solar Microgrid (solar+storage)	113	80	2,652	-	-	-	65%	44%
2	Baseline load profile	Solar + diesel	113	-	-	100	350	233	0%	0%
3	Baseline load profile	Solar Microgrid + diesel	113	80	211	100	350	211	31%	22%
4	Baseline load profile	Diesel only		-	-	100	350	233	0%	0%

Library - Economics									
Scenarios			Capex & Opex		25 Year Detailed Economic Analysis Results				
#	Resilience Scenario	Resource Scenario	Total Capex	Total Annual Opex	PPA rate	Electrical Bill Savings	25 Year Cumulative Savings		Savings year 1
							PPA	Cash Purchase	PPA
			$	$	$	$	$	$	$
1	Baseline load profile	Solar Microgrid (solar+storage)	$2,752,812	-	-	-	-	-	-
2	Baseline load profile	Solar + diesel	$582,336	$3,000	$0.16	$1,298,558	$630,154	$586,646	$9,757
3	Baseline load profile	Solar Microgrid + diesel	$788,977	$8,920	$0.21	$1,449,439	$572,158	$418,406	$6,210
4	Baseline load profile	Diesel only	$231,912	$2,600	-	-	-	-	-

Resource Scenario and Economic Analysis – <u>Hacienda Main Building and Pavilion</u>:

As stated above, the Hacienda site resilience scenario assumes the Baseline Load Profile, which includes all loads but does not include EV charging. This means that during an outage, all loads except for EV charging are covered by the resource scenario as listed. Also note that the analysis provides the sizing and related costs and savings for three options: the Hacienda main building and Pavilion together, the Hacienda main building, and just the Pavilion. The goal is to provide the resilience solution for both the Hacienda main building and the Pavilion together; the other two scenarios are provided as references in case the Town of Moraga wants to consider those options.

Hacienda & Pavilion - Sizing										
Scenarios			PV Sizing	BESS Sizing		Generator Sizing			Indefinite Resilience	
#	Resilience Scenario	Resource Scenario	PV System Size kWp	Power Capacity kW	Energy Capacity kWh	Genset Capacity Rating kW	Minimum fuel tank size gal	Gallons needed to meet TCLR	Percentage of Baseline Load	Percentage of Master Load
1	Hacienda & Pavilion Baseline	Solar Microgrid (solar+storage)	53	36	731	-	-	-	74%	45%
2	Hacienda & Pavilion Baseline	Solar + diesel	53	-	-	50	95	60	0%	0%
3	Hacienda & Pavilion Baseline	Solar Microgrid + diesel	53	40	106	50	95	40	44%	26%
4	Hacienda & Pavilion Baseline	Diesel only	-	-	-	50	95	60	0%	0%
1	Hacienda Baseline	Solar Microgrid (solar+storage)	53	28	649	-	-	-	79%	43%
2	Hacienda Baseline	Solar + diesel	53	-	-	50	95	53	0%	0%
3	Hacienda Baseline	Solar Microgrid + diesel	53	30	79	50	95	34	42%	24%
4	Hacienda Baseline	Diesel only	-	-	-	50	95	53	0%	0%
1	Pavilion Baseline	Generator only - diesel	-	-	-	20	32	23	0%	0%

Hacienda & Pavilion - Economics									
Scenarios			Capex & Opex		25 year Detailed Economic Analysis Results				
#	Resilience Scenario	Resource Scenario	Total Capex $	Total Annual Opex $	PPA rate $	Electrical Bill Savings $	25 Year Cumulative Savings PPA $	25 Year Cumulative Savings Cash Purchase $	Savings year 1 PPA $
1	Hacienda & Pavilion Baseline	Solar Microgrid (solar+storage)	$839,135	-	-	-	-	-	-
2	Hacienda & Pavilion Baseline	Solar + diesel	$352,303	$3,000	$0.19	$489,526	$158,779	$24,444	$326
3	Hacienda & Pavilion Baseline	Solar Microgrid + diesel	$458,957	$6,486	$0.25	$560,384	$125,192	($67,591)	($1,636)
4	Hacienda & Pavilion Baseline	Diesel only	$180,367	$2,600	-	-	-	-	
1	Hacienda Baseline	Solar Microgrid (solar+storage)	$764,849	-	-	-	-	-	-
2	Hacienda Baseline	Solar + diesel	$303,791	$3,000	$0.19	$476,838	$146,092	$60,269	($47)
3	Hacienda Baseline	Solar Microgrid + diesel	$385,448	$6,017	$0.25	$544,153	$108,960	$3,746	($2,143)
4	Hacienda Baseline	Diesel only	$131,855	$2,600	-	-	-	-	-
1	Pavilion Baseline	Diesel only	$149,135	$2,600	-	-	-	-	-

Resource Scenario and Economic Analysis – <u>Corporation Yard and Council Chambers</u>:

As stated above, the Corporation Yard and Council Chambers resilience scenario considers three options: 1) Baseline Load Profile; 2) Baseline + two L2 EV charging ports; 3) Master Load Profile that includes Baseline + two L2 EV charging ports + two L3 charging ports that are managed to provide charging simultaneously but at the rate of one L3 port. This means that during an outage, all loads except for EV charging are covered by the Baseline scenario, all loads plus the two L2 charging ports are covered by the Baseline + L2 scenario, and all loads including both the two L2 charging ports and the two managed L3 charging ports are covered by the Baseline + L2 + L3 (Master) scenario.

Corporation Yard and Council Chambers: Baseline + L2 + L3 (Master) scenario:

Corp Yard & Council Chambers - Sizing											
Scenarios			PV Sizing	BESS Sizing		Generator Sizing			Indefinite Resilience		
#	Resilience Scenario	Resource Scenario	PV System Size kW	Power Capacity kW	Energy Capacity kWh	Genset Capacity Rating kW	Minimum Fuel Tank Size gal	Gallons Needed to Meet TCLR	Percentage of Baseline Load	Percentage of Baseline+L2 Load	Percentage of Master Load
1	Baseline+L2+L3 (Master)	Solar Microgrid (solar+storage)	61	79	2,421	-	-	-	100%	54%	27%
2	Baseline+L2+L3 (Master)	Solar + diesel	61	-	-	100	350	238	0%	0%	0%
3	Baseline+L2+L3 (Master)	Solar Microgrid + diesel	61	80	211	100	350	213	100%	31%	13%
4	Baseline+L2+L3 (Master)	Diesel only	-	-	-	100	350	238	0%	0%	0%

Corp Yard & Council Chambers - Economics									
Scenarios			Capex & Opex		25 Year Detailed Economic Analysis Results				
#	Resilience Scenario	Resource Scenario	Total Capex $	Total Annual Opex $	PPA rate $	Electrical Bill Savings $	25 Year Cumulative Savings PPA $	25 Year Cumulative Savings Cash Purchase $	Savings year 1 PPA
1	Baseline+L2+L3 (Master)	Solar Microgrid (solar+storage)	$2,358,461	-	-	-	-	-	-
2	Baseline+L2+L3 (Master)	Solar + diesel	$414,262	$3,000	$0.19	$626,184	$210,396	$90,724	$727
3	Baseline+L2+L3 (Master)	Solar Microgrid + diesel	$620,903	$8,641	$0.24	$1,064,780	$539,575	$210,199	$9,537
4	Baseline+L2+L3 (Master)	Diesel only	$200,680	$2,600	-	-	-	-	-

Corporation Yard and Council Chambers: Baseline + L2 scenario:

Corp Yard & Council Chambers - Sizing (Based on Baseline+L2 Profile's Lower Peak)										
Scenarios			PV Sizing	BESS Sizing		Generator Sizing			Indefinite Resilience	
#	Resilience Scenario	Resource Scenario	PV System Size (kW)	Power Capacity (kW)	Energy Capacity (kWh)	Genset Capacity Rating (kW)	Minimum fuel tank size (gal)	Gallons needed to meet TCLR	Percentage of Baseline Load	Percentage of Baseline+L2 Load
1	Baseline+L2	Solar Microgrid (solar+storage)	61	29	1,290	-	-	-	100%	54%
2	Baseline+L2	Solar + diesel	61	-	-	50	132	127	0%	0%
3	Baseline+L2	Solar Microgrid + diesel	61	30	79	50	132	104	93%	24%
4	Baseline+L2	Diesel only	-	-	-	50	132	127	0%	0%

Corp Yard & Council Chambers - Economics (Based on Baseline+L2 Profile's Lower Peak)									
Scenarios			Capex & Opex		25 Year Detailed Economic Analysis Results				
#	Resilience Scenario	Resource Scenario	Total Capex	Total Annual Opex	PPA rate	Electrical Bill Savings	25 Year Cumulative Savings		Savings year 1
							PPA	Cash Purchase	PPA
			$	$	$	$	$	$	$
1	Baseline load profile + L2	Solar Microgrid (solar+storage)	$1,379,798	-	-	-	-	-	-
2	Baseline load profile + L2	Solar + diesel	$355,520	$3,000	$0.19	$531,811	$116,023	$55,094	($2,049)
3	Baseline load profile + L2	Solar Microgrid + diesel	$437,177	$6,298	$0.25	$601,327	$54,238	$773	($5,324)
4	Baseline load profile + L2	Diesel only	$141,938	$2,600	-	-	-	-	-

The key preliminary findings which will be reviewed in detail by the Clean Coalition consultants at the meeting are as follows:

- Based on the detailed economic analysis, solar + storage and diesel-only are considered not preferable due to the cost and lack of savings each of these options would impose on Moraga. Solar + storage would cost over $8 million; diesel-only would cost over $800,000; most importantly, both options provide zero savings.

- By contrast, solar + diesel and solar + storage + diesel would each save Moraga over $1.8 million over the 25-year duration of these scenarios, utilizing the PPA option with no upfront cash and all maintenance and operations costs included.

- In addition, due to the addition of storage, the solar + storage + diesel option provides ongoing, indefinite support for a percentage of loads during outages, while also providing additional Value-of-Resilience (VOR) of over $250,000, thus bringing the total savings to Moraga for this scenario at over $2.1 million.

Project Delivery Approaches

The study is at a critical point where a decision needs to be made regarding the project delivery approach in order to complete the study work.

There are a number of Project Delivery approaches to construction contracting for solar projects by public agency including the following typical methods: 1) Design-Bid-Build; 2) Design Build; and 3) Power Purchasing Agreement. An attached Appendix A. Project Delivery Approaches provides pros and cons descriptions of the typical project delivery methods used to delivery solar energy generation and storage projects.

Recommendation

Staff recommends that the Town Council receive Clean Coalition's presentation on the preliminary results of the Facilities Energy Generation Study and provide staff with feedback.

Report reviewed by: **Cynthia Battenberg, Town Manager**

Attachments **Appendix A. Project Delivery Approaches**

ATTACHMENT A

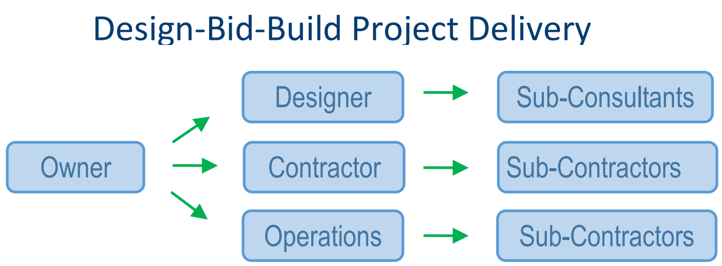
Appendix A. Project Delivery Approaches

Appendix A - Project Delivery Approaches

There are a number of Project Delivery approaches to construction contracting for solar projects by public agencies. A description of the three main methods follows:

1) Design-Bid-Build;
2) Design Build; and
3) Power Purchasing Agreement.

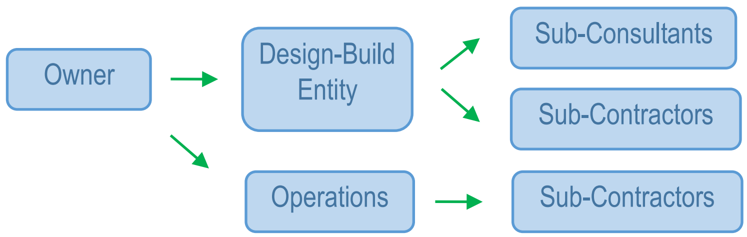
1. Design-Bid-Build (DBB) - DBB is the approach most familiar to public agencies who use the competitive low bid method for construction awards. This is a standard engineering approach of Plan, Design, Bid, and Construct. Contractors bid the project exactly as it is designed and the lowest responsible, responsive bidder is awarded the work. There are many decades of established laws, standards, specifications and contract templates developed to cost-effectively implement typical public works projects that municipalities undertake, such as road work.



A DBB contract is most suited for less complicated projects that are budget-sensitive, but not necessarily schedule-sensitive or subject to change. The agency can define and control the design through the architectural/engineering consultant. DBB projects have clearly defined requirements, firmly set tasks and deadlines, and need sufficient time for planning. Construction Quality Assurance follows a well-developed and defined set of contract documents. Atypical projects, where templates are not readily available may result in higher costs for planning, administration, design and quality assurance. Using the DBB process for atypical projects can promote more conflict between the designer and the builder.

2. Design Build (DB) - DB is an alternative approach, which is more commonly utilized in unique, specialized projects. DB is allowed under California Public Contracts Code (PCC §22160, et seq.). Under the DB process, the agency retains a contractor and designer as a team (within a single entity or through subcontracts) under a single contract to develop the design and construct the projects. The DB approach is more typically utilized in specialized unique projects or smaller projects where there are efficiencies in contractors utilizing in-house design services to provide a one-stop shopping opportunity, such as custom architectural projects, solar industry projects, small custom homes, and large unique complexed project with limited criticality.

Design-Build Project Delivery

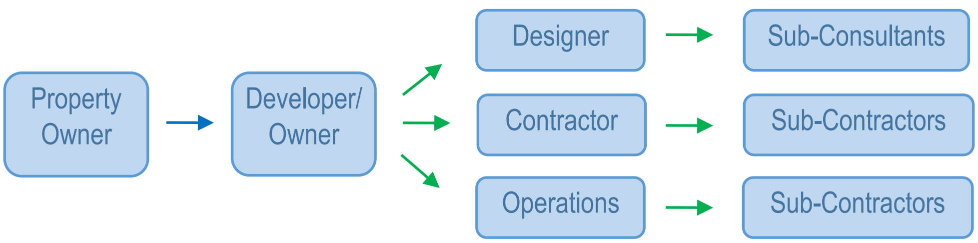


A subset of the DB approach is the Master Builder approach where an Architect or Engineer holds the prime contract and the construction contractor subcontract to the engineer or architect. DB represents a more agile project development process during design and construction. Because of required permitting and other approval processes, the DB approach at times aligns with developed DBB processes. The DB process can reduce project development time and afford greater flexibility during construction to make changes cost-effectively. Value engineering is readily integrated into the DB process affording a better opportunity for collaborative improvements between designer and builder to utilize innovative or proprietary solutions. The DB process can allow some design processes to overlap construction and allows for some recursive design during construction within the limits of permits and approvals. The DBB approach is generally well-suited where the primary project goals are design-driven or visionary rather than prescribed by budgetary constraint or functional requirements, where the project incorporates important artistic/creative elements, or where the efficiencies of DB approach and a designer's interpretive skill are of equal importance.

However, the DB approach is generally not as well-templated or standardized as the DBB approach and involves the retention of both the designer and the builder as one entity, contracts more detailed in front end of project to establish requirements and parameters for completion of the project. DB affords better opportunity for integration across designer and builder to utilize innovative, proprietary solutions. The pre-design phases of project planning, developing the requirements, retaining a designer-contractor can be more rigorous, costly and take more time than a DBB project. Additionally, the DB approach can afford less control during project development to owner over the design and final construction. As an example, Los Angeles Unified School District's Belmont project had numerous issues arise which became apparent upon completion. The final investigative report from the Los Angeles District Attorney's office identified a number of issues with the DB approach used in the project, which could have been better resolved early on through use of the DBB approach.

3. <u>Power Purchase Agreement (PPA)</u> - PPA is an agreement between a property owner (customer) and a solar project developer, where a developer arranges for the design, permitting, financing, installation, and construction of a solar energy system on a customer's property for minimal capital cost. The developer sells the power generated to the host customer at a fixed rate to pay off their capital investments, ongoing operating costs, and some profits. The energy rates are typically lower than the local utility's retail rate and future energy costs will be less than the anticipated energy cost to the customer had it not entered into the PPA. The purchase of energy from the developer by the customer of energy offsets the need to purchase power from the local energy service provider, such as PG&E or MCE, saving the customer some money. The developer receives the income from the sale of energy as well as possible tax credits and other incentives from the government. The developer is responsible for the installation, operation and maintenance, and decommissioning of the system through the duration of the agreement. At the end of a PPA contract term, a customer may have the option to extend the PPA, have the developer decommission the system, or buy the system from the developer. PPAs typically range up to 25 years.

Power Purchase Agreement



Advantages to the customer of a PPA are generally lower capital costs, lower energy costs, reduced operational risk, reduced greenhouse gas emissions "footprint" and a potential increase in property value. Disadvantages could be a loss of flexibility in the operation of facilities where these projects are installed, control over the appearance limited by contract, obligation to provide supporting facilities or services, and obligations for priority access.

Regarding PPA, the California Government Code Section 4217 allows public agencies to enter into energy services contracts without a formal bid process providing the governing body: 1) determines at a public hearing that the terms of the service contract(s) are in the best interest of the public agency; and 2) finds that the anticipated cost to the public agency for electrical energy provided by the energy conservation facility will be less than the anticipated marginal cost to the public agency of electrical energy that would have been consumed by the public agency in the absence of those purchases.