
City of Hercules

Feasibility Assessment Findings *Partnership to Achieve Savings*

*City Council Presentation
September 24, 2019*



Beyond Energy - 3 Dimensions of Impact



3 DIMENSIONS
OF IMPACT

Environmental Impact

- Transition Hercules to more sustainable forms of energy to decrease its carbon footprint.

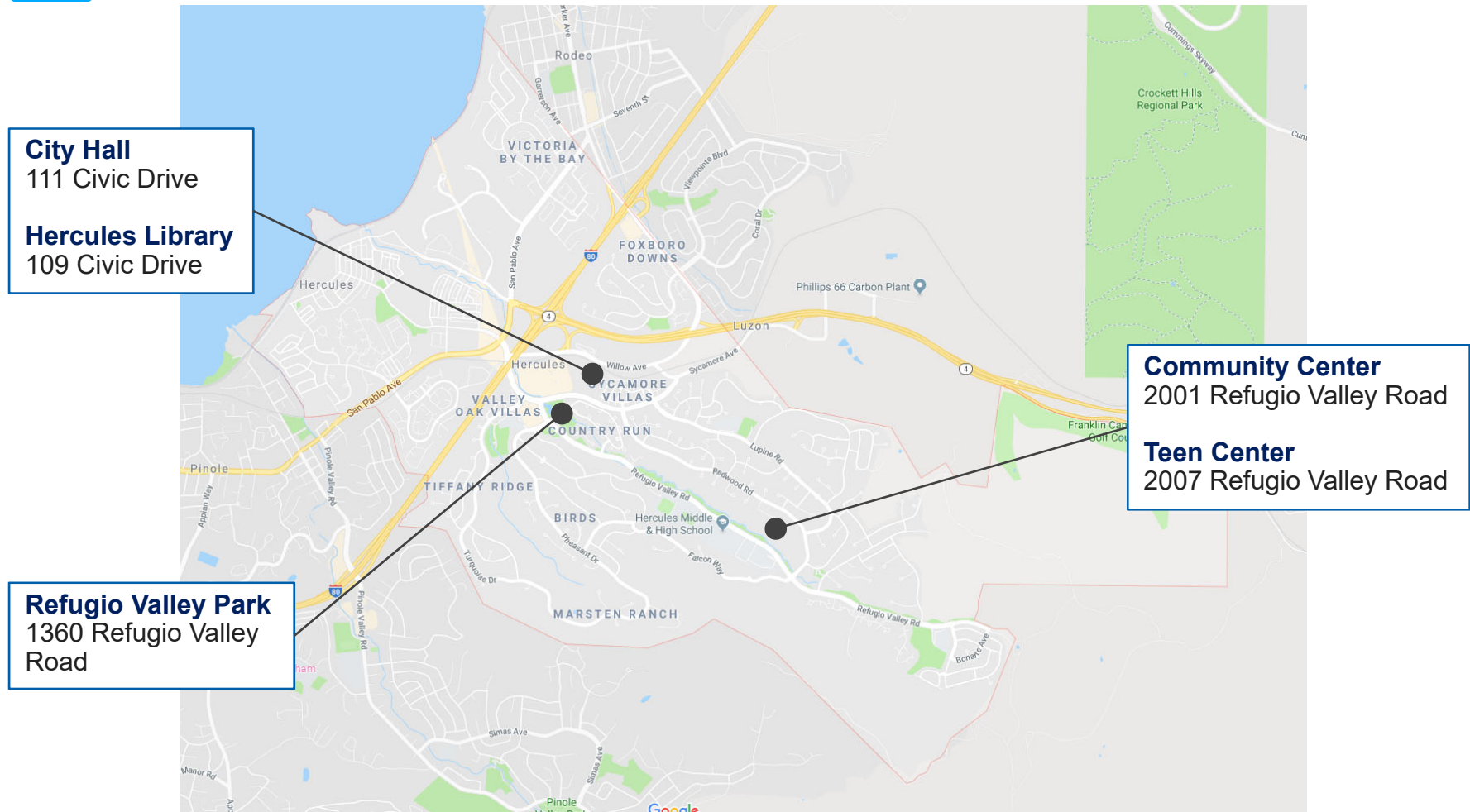
Economic Impact

- Save taxpayer money, improve cash flow and reduce City's exposure to risk.

Community Impact

- Change lives with educational programs.
- Modernize Hercules' streets, neighborhoods, and civic facilities.

Feasibility Assessment Locations



Preliminary Energy Conservation Summary Matrix

Scope for upcoming Energy Program Development activities

Site	Total Annual Electric Bill	Solar PV	Interior LED Lighting Retrofits	Exterior LED Lighting Retrofits	Streetlight Conversion to LED	Boiler & HVAC Upgrades	BMS
City Hall	\$69,384	X ¹	X	X		X	
Public Library	\$32,269	X	X	X			X
Community Center & City Pool	\$44,012	X ¹	X	X			
Teen Center	\$4,868	X	X	X			
Refugio Valley Park	\$14,234			X			
City-wide streetlights (545)	TBD				X		
TOTAL	\$164,766						

Guide to Acronyms:

Solar PV = Solar Photovoltaic System

BMS = Building Management System (controls)

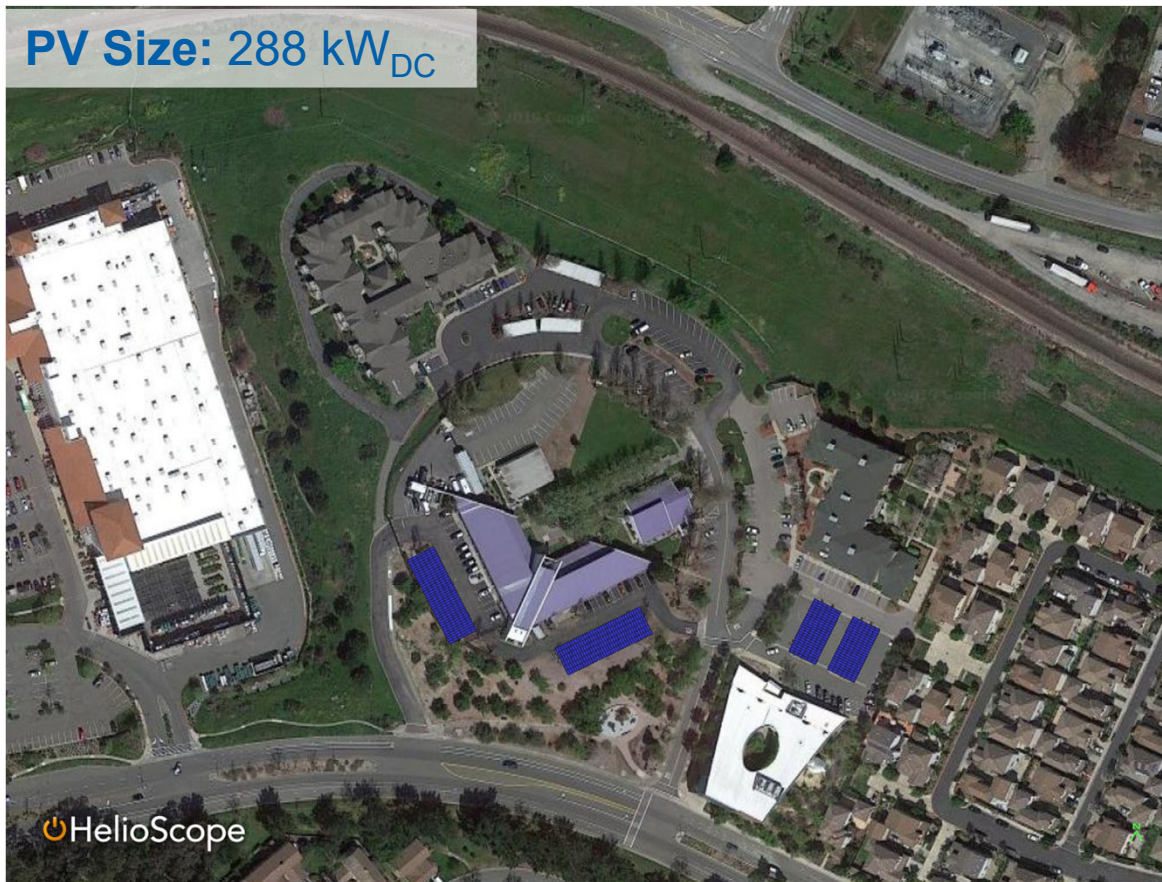
NEM-A = Net Metering Aggregate PG&E tariff

Measures included in
budgetary proforma (pg 7)

Additional
recommendations

¹Under a NEM-A (Net Metering Aggregate) arrangement with PG&E, one solar PV system can be used to offset the total electric load for all facilities on adjacent land parcels. For example, a PV system located at the City Hall parking lot could be used to offset the electric use of the Library facility across the street.

City Hall & Library Solar PV System



■ = Potential locations of solar PV parking shade canopies

Community Center Solar PV System



■ = Potential locations of solar PV parking shade canopies

Budgetary Pro Forma

Year	Solar Electricity Produced (kWh)	Solar Avoided Electric Rate (\$/kWh)	Solar Electricity Savings	Solar O&M and M&V Costs	Net Solar Project Savings	Energy Conservation Savings	O&M Savings	Total Program Savings	CEC Loan	Project Net Benefit	Cumulative Program Savings
	A	B	C = A * B	D	E = C - D	F	G	H = E + F + G	I	J = H - I	K
1	616,698	\$0.164	\$101,138	\$7,669	\$93,469	\$22,049	\$5,000	\$120,518	\$111,266	\$9,253	\$9,253
2	613,615	\$0.171	\$105,161	\$7,899	\$97,262	\$23,041	\$5,150	\$125,453	\$111,266	\$14,188	\$23,440
3	610,546	\$0.179	\$109,344	\$8,136	\$101,208	\$24,078	\$5,305	\$130,591	\$111,266	\$19,325	\$42,765
4	607,494	\$0.187	\$113,693	\$8,380	\$105,313	\$25,162	\$5,464	\$135,938	\$111,266	\$24,673	\$67,438
5	604,456	\$0.196	\$118,215	\$8,632	\$109,584	\$26,294	\$5,628	\$141,505	\$111,266	\$30,240	\$97,677
6	601,434	\$0.204	\$122,917	\$17,995	\$104,922	\$27,477	\$5,796	\$138,196	\$111,266	\$26,930	\$124,608
7	598,427	\$0.214	\$127,806	\$18,535	\$109,272	\$28,714	\$5,970	\$143,955	\$111,266	\$32,690	\$157,297
8	595,435	\$0.223	\$132,890	\$19,091	\$113,799	\$30,006	\$6,149	\$149,954	\$111,266	\$38,688	\$195,986
9	592,457	\$0.233	\$138,176	\$19,664	\$118,512	\$31,356	\$6,334	\$156,202	\$111,266	\$44,936	\$240,922
10	589,495	\$0.244	\$143,672	\$20,254	\$123,418	\$32,767	\$6,524	\$162,709	\$111,266	\$51,443	\$292,365
11	586,548	\$0.255	\$149,386	\$20,861	\$128,525	\$34,241	\$6,720	\$169,486	\$111,266	\$58,220	\$350,585
12	583,615	\$0.266	\$155,328	\$21,487	\$133,841	\$35,782	\$6,921	\$176,544	\$111,266	\$65,279	\$415,864
13	580,697	\$0.278	\$161,506	\$22,132	\$139,374	\$37,392	\$7,129	\$183,896	\$111,266	\$72,630	\$488,494
14	577,793	\$0.291	\$167,930	\$22,796	\$145,134	\$39,075	\$7,343	\$191,552	\$111,266	\$80,287	\$568,780
15	574,904	\$0.304	\$174,609	\$23,479	\$151,130	\$40,834	\$7,563	\$199,526	\$111,266	\$88,261	\$657,041
16	572,030	\$0.317	\$181,554	\$24,184	\$157,371	\$42,671	\$7,790	\$207,832	\$111,266	\$96,566	\$753,607
17	569,170	\$0.332	\$188,776	\$24,909	\$163,867	\$44,591	\$8,024	\$216,481	\$111,266	\$105,216	\$858,823
18	566,324	\$0.347	\$196,284	\$25,657	\$170,628	\$46,598	\$8,264	\$225,490	\$111,266	\$114,224	\$973,047
19	563,492	\$0.362	\$204,092	\$26,426	\$177,665	\$48,695	\$8,512	\$234,872	\$111,266	\$123,607	\$1,096,653
20	560,675	\$0.378	\$212,209	\$27,219	\$184,990	\$50,886	\$8,768	\$244,644	\$111,266	\$133,378	\$1,230,031
21	557,871	\$0.396	\$220,650	\$28,036	\$192,614	\$53,176		\$245,790		\$245,790	\$1,475,822
22	555,082	\$0.413	\$229,426	\$28,877	\$200,550	\$55,569		\$256,118		\$256,118	\$1,731,940
23	552,307	\$0.432	\$238,552	\$29,743	\$208,809	\$58,069		\$266,878		\$266,878	\$1,998,818
24	549,545	\$0.451	\$248,040	\$30,635	\$217,405	\$60,683		\$278,087		\$278,087	\$2,276,906
25	546,797	\$0.472	\$257,906	\$31,554	\$226,352	\$63,413		\$289,765		\$289,765	\$2,566,670
Total	17,220,158		\$4,199,262	\$524,248	\$3,675,014	\$982,618	\$134,352	\$4,791,984	\$2,225,314	\$2,566,670	

Budgetary Pro Forma Assumptions

NPV: \$1,978,818

- \$2.0 million project cost for turnkey design-build-guarantee equipment and services
- 4.5% annual utility escalation rate
- 3.0% annual escalation for O&M and M&V services
- 1.0% California Energy Commission (CEC) loan (20 year)
- 0.5% annual solar panel degradation rate
- Typical solar electric avoided rate for small city
- Cost for County plan check and inspection services

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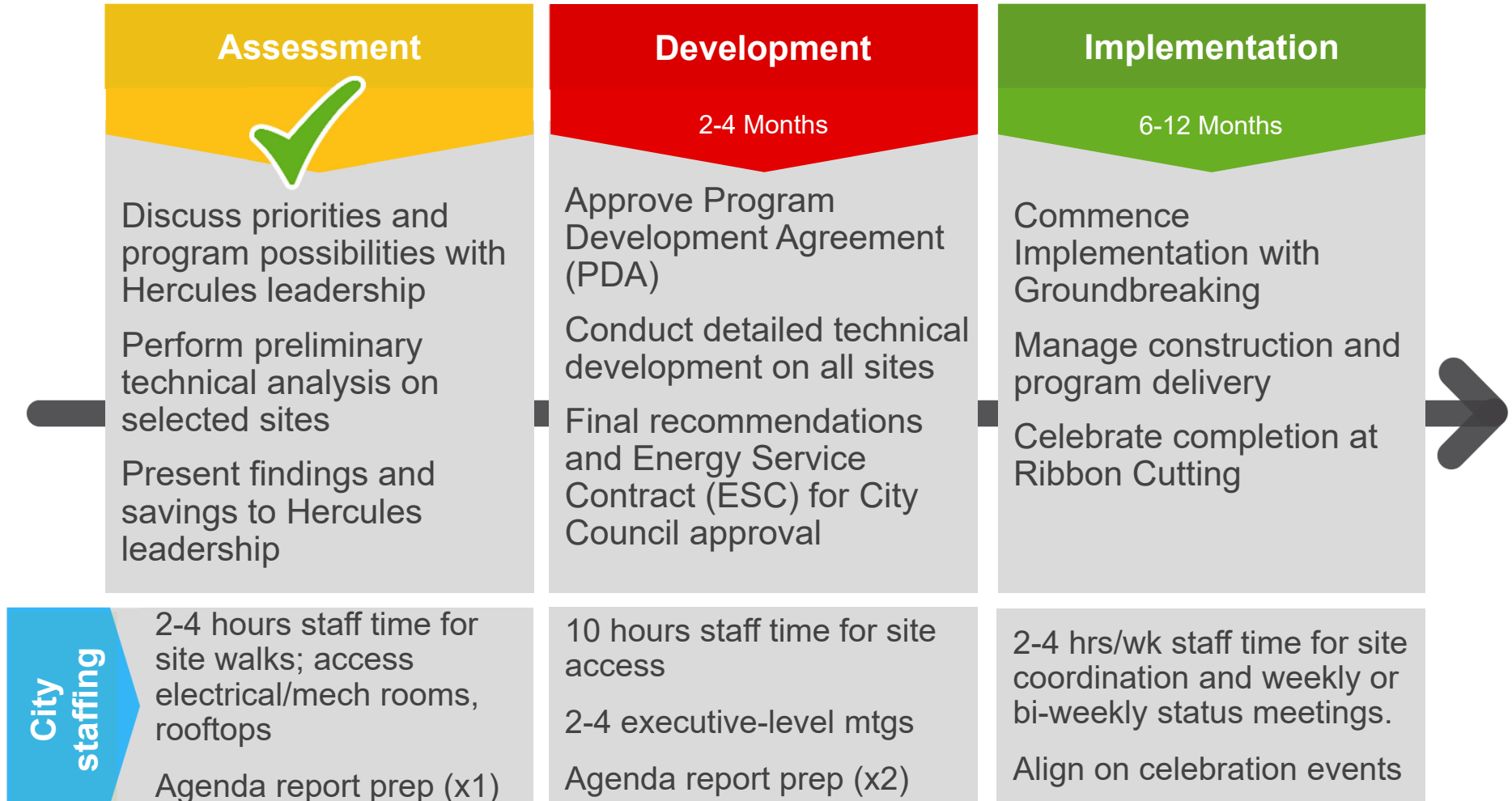
Budgetary Pro Forma Definitions

- A. **Solar Electricity Produced:** actual generation expected by installed system and guaranteed by ENGIE
- B. **Solar Avoided Electric Rate:** weighted average of each building site's expected solar generation electric rate, based on the ratio of that building sites' electrical usage of site to the total combined electrical usage at the four building sites. Each building site's expected rate is based on current rate tariff.
- C. **Solar Electricity Savings:** savings accrued based on offsetting ongoing behind-the-meter PG&E charges; based on multiplying electricity produced and the Solar Avoided Electric Rate.
- D. **Solar O&M Costs:** annual cost of providing O&M services (preventative maintenance, reports, and panel washing)
Solar M&V Costs: annual cost of providing M&V services for performance guarantee, monthly and annual reports, and managing UtilityVision for guarantees and 24/7 monitoring
- E. **Net Solar Project Savings:** Solar savings minus solar service costs
- F. **Energy Conservation Savings:** energy savings due to installing LED lights (and other conservation measures).
- G. **O&M Savings:** savings due to installing lighting that requires less maintenance
- H. **Total Program Savings:** net solar project savings plus savings due to LED lighting and reduced O&M
- I. **Loan:** annual repayment of the loan that financed the project
- J. **Net Program Savings:** total program savings minus the loan payment
- K. **Cumulative Savings:** current year savings plus accumulated savings from prior years.

Program Benefits

- Expedited delivery of scopes saves staff time and resources
 - Allows completion of projects that staff otherwise has limited bandwidth to complete (for example boiler, HVAC, streetlights)
- Modernize Hercules civic facilities and infrastructure
- Hedge against rising PG&E rates
- Phase-in reliability & resiliency to address grid de-energization risk at city facilities
 - Solar PV installations are building blocks for future fully-islanding microgrids
- Achieve Operation & Maintenance savings from HVAC upgrades and LED lighting retrofits
- Low risk: development effort is no-cost to Hercules if a satisfactory scope and financial profile cannot be achieved
- Be a community leader and example for renewable energy and sustainability

Program Development Process / Next Steps



Roadmap to Savings

Task	Date	Complete
City Manager / PW Director First Meeting	August 2018	X
Access to PG&E data	February 2019	X
Site Walks	April 11 2019	X
Review of Preliminary Findings	June 28 / July 11 / July 17	X
City Council Presentation of Preliminary Findings	July 23	X
Approval of Program Development Agreement	today	
Detailed Program Development	Q4 2019	
Board Presentation / Approval of Implementation Contract	Late Q4 2019	
Groundbreaking and Construction	Q1-Q2 2020	

Project Contacts

Kelly Fergusson, PE

Senior Business Development Manager

415-405-6673

kelly.fergusson@engie.com

Amar Tiwari

Energy Performance Guarantee Oversight

(205) 447-2627

Amar.Tiwari@engie.com

Steve Ramirez

Senior Project Director

(415) 994-6942

Steven.Ramirez@engie.com

