ATTACHMENT A

Alternative LSE Plan

Solana Energy Alliance

2018 INTEGRATED RESOURCE PLAN

Table of Contents

Executive Summary *[Attachment A to D.18-08-018, Page 3]*

Use this section to provide an overview of the process used by the LSE to develop its plan and summarize the LSE's findings, including a brief overview of the LSE's Preferred Portfolio and Action Plan.

Background

The City of Solana Beach, dba Solana Energy Alliance (SEA), launched its Community Choice Aggregation Program (CCA or Program) on June 1, 2018 for the purpose of implementing certain elements of its Climate Action Plan (CAP). The CAP provides a comprehensive roadmap to address the challenges of climate change in the City of Solana Beach. Acting on climate change means reducing greenhouse gas (GHG) emissions from activities within the City and helping the community adapt to climate change and improve its resilience over the long term.

Specific to implementing CCA, the following objectives were adopted in the City's CAP:

- Install 10.8 MW of residential rooftop solar PV systems
- Install 2 MW of commercial rooftop solar PV systems
- Install solar hot water heaters at:
  - 20 percent of the City's existing commercial spaces
  - 25 percent of new homes and home retrofits
- Increase energy efficiency retrofits to achieve:
  - 15 percent reduction in residential energy consumption
  - 15 percent reduction in commercial energy consumption

The City remains committed to implementing these objectives through SEA.

In operating a CCA, and assuming responsibility as a load serving entity (LSE) for the residential and business customers within the City of Solana Beach, SEA also has responsibility to contribute to the State of California's goals for addressing climate change and reducing GHG emissions, as required under SB 350. Specific to this Integrated Resource Plan, SEA is required to consider the state's Reference Plan, present a Conforming Portfolio, and then adopt an action plan for implementing the Conforming Portfolio.

Achieving the Program goals outlined in the CAP, and implementing a Conforming Portfolio consistent with state requirements, are not mutually exclusive. It will, however, take time and analysis to thoroughly consider how to accomplish both objectives. The approximately 60-day period between Program launch and the due date for submittal of its first IRP is not sufficient time to perform the required analysis. With adoption of this IRP, SEA is beginning a process that will culminate in a long-term resource strategy to guide SEA's procurement activities consistent with making a proportional contribution to the state's Reference Portfolio, as well as the requirements of the City's CAP.

The Conforming Portfolio identified in this IRP establishes the minimum baseline resource strategy that SEA will need to implement as it operates its Program. In the future, SEA will consider Alternative Portfolios that remain consistent with making, or exceeding, a proportional contribution to the State's Reference Portfolio but that also include implementation of CAP Program objectives.

Conforming Portfolio

This IRP process is used to evaluate the state's Reference Portfolio and then create a roadmap for SEA to procure the necessary components of a Conforming Portfolio.

SEA utilized the California Public Utilities Commission (CPUC) Reference Plan as the framework to create the SEA Conforming Portfolio and develop a strategy for SEA to meet those stated goals. With the exception of the load forecast, the IRP team relied on the tools made available by the CPUC.

SEA's share of the Reference Portfolio largely aligns with the broader CAP, although SEA's current portfolio does not meet the requirement that 65 percent of SEA's RPS needs must be met by renewable resources under long-term (at least 10 year) contracts by 2021 Figure 5ES-1.

Figure ES-1: Minimum Long-term Renewable Generation Contract Requirements

	2018	2022	2026	2030
Load (MWh)	37,061	64,009	63,694	61,674
Minimum RPS Compliance (%)	29%	36%	43%	50%
Minimum RPS Compliance (MWh)	10,748	23,299	27,516	30,837
Required Contracted Quantity (MWh)	6,986	15,145	17,885	20,044

SEA's guidelines at Program launch give preference to utilizing shorter-term agreements from existing generating resources to meet Program renewable and GHG resource targets. This strategy is prudent at Program startup to minimize cost and risks. SEA recognizes, however, that within the next two years it will need to procure long-term renewable energy from existing and/or from new generation capacity for at least 65 percent of its state mandated renewable purchases.

SEA has not issued an RFO for long-term contracts from existing generators so the cost of long-term renewable contracts is unknown. For this reason, the IRP team adopted the candidate resource costs from the RESOLVE model for this study. The IRP team decided on adding the lowest cost utility scale solar resources for SEA's Conforming Portfolio.

While SEA currently falls short of the minimum long-term contracting requirements, SEA is expected to continue its 75 percent carbon-free procurement for the foreseeable future. Doing so should place SEA on a trajectory to comply with SEA's share of the 2030 statewide GHG emissions quota. SEA's Conforming Portfolio is shown in Figure 6ES-2.

Figure ES-2: SEA Conforming Portfolio

	2018	2022	2026	2030
Load (MWh)	37,061	70,763	75,158	77,998
Minimum RPS Compliance (%)	29%	36%	43%	50%
Minimum RPS Compliance (MWh)	10,748	25,758	32,468	38,999
Required Long-Term Contracted Quantity (MWh)	0	16,743	21,104	25,349

Annual Generation (MWh)	**2018**	**2022**	**2026**	**2030**
Solar	0	16,743	21,104	25,349
Batteries			79	377
Short Term PCC1 REC/Energy Purchases	8,061	2,576	3,168	3,523
Short Term PCC2 REC/Energy Purchases	2,687	6,439	8,117	9,750
Additional Carbon Free (NW Hydro)	21,588	37,292	35,775	33,149
System Power	7,412	14,153	15,032	15,600
Total MWh	39,748	77,203	83,275	87,748
GHG Emissions (metric tons)	2,624	4,232	4,479	3,744

The expected 2030 emissions, assuming 75 percent carbon-free power with the remainder filled with system power is approximately 3,750 metric tons CO_2. It will also allow SEA to meet the 50 percent renewable energy mandate by 2030, with 65 percent of the renewable supply procured under long-term contracts and the residual procured under short term purchases. The SEA Conforming Portfolio is also the SEA Preferred Portfolio.

Action Plan

SEA's action plan addresses resource acquisitions and other concerns that appeared over the course of this IRP analysis.

- ✓ SEA's program goals largely align with a proportional share of the Conforming Portfolio.
    - SEA will begin to solicit offers for contracts to meet the requirement that 65 percent of RPS requirements be met through long-term contracts with a duration of at least 10 years by 2021
    - SEA will continue to contribute to the development of new renewable energy resources as it explores opportunities to acquire solar resources
- ✓ Continuing with the current 75 percent GHG-free procurement goals are forecasted to keep SEA under its quota of 11,000 metric tons of GHG emissions in the 2030 42 million metric ton scenario. It will also put SEA on a straight line path to meeting statewide 2050 goals.
- ✓ Resource adequacy conditions are fluid, as are RA requirements and CAM, reliability must-run (RMR), and demand response (DR) allocations. SEA will continue to monitor the RA environment and act accordingly to comply with the RA program.
- ✓ SEA will continue to monitor energy economic fundamentals to ensure that its resource strategy provides rate payers with a maximum amount of renewable energy at a competitive cost.

Study Design

[Attachment A to D.18-08-018, Page 3]

Use this section to describe how the LSE approached the process of developing its LSE Plan.

The City of Solana Beach, dba Solana Energy Alliance (SEA), launched its Community Choice Aggregation (CCA or Program) program on June 1, 2018. Solana Energy Alliance's (SEA or the Program) 2018 Integrated Resource Plan (IRP) lays out a strategy for meeting SEA's energy and resource adequacy needs, as well as meeting California's renewable portfolio standard and greenhouse gas emission obligations over a planning horizon stretching from 2018 through 2030. The goal of this IRP is to provide a framework for measuring the effectiveness of an array of resources towards meeting these goals. The Conforming Portfolio identified in this IRP establishes the minimum baseline resource strategy that SEA will need to implement as it operates its Program. In the future, SEA will consider Alternative Portfolios that remain consistent with making, or exceeding, a proportional contribution to the State's Reference Portfolio but that also include implementation of CAP Program.

The description for each section, as established by the California Public Utilities Commission, are included to provide context for each portion of the study.

Objectives

[Attachment A to D.18-08-018, Page 7]

Provide a description of the LSE's objectives for the analytical work it is documenting in the IRP.

The IRP process was used to determine whether the SEA's stated goals and objectives for its Program are able to meet the requirements as described in the Conforming Portfolio. In the event the Program's existing procurement plans fell short, the IRP could be used to create a roadmap to procure the necessary components to meet the functions of the Conforming Portfolio.

Methodology

SEA utilized the California Public Utilities Commission (CPUC) Reference Plan as the framework to create the SEA Conforming Portfolio, developing a strategy for SEA to meet those stated goals while still achieving SEA's primary target of maximizing the use of local renewable energy while providing competitive rates to customers. Program goals include:

- A renewable energy mix (as defined by state law) of at least 50 percent
- A power supply consisting of at least 75 percent greenhouse gas (GHG) free power
- A 100 percent renewable energy mix by 2035

To meet its Program objectives, SEA is open to the procurement of both existing and new resources, as well as providing incentives to customers to achieve the following objectives adopted as part of the City's Climate Action Plan:

- Install 10.8 MW of residential rooftop solar PV systems
- Install 2 MW of commercial rooftop solar PV systems
- Install solar hot water heaters at:
  - 20 percent of the City's existing commercial spaces
  - 25 percent of new homes and home retrofits
- Increase energy efficiency retrofits to achieve:
  - 15 percent reduction in residential energy consumption
  - 15 percent reduction in commercial energy consumption

The IRP team established a Conforming Portfolio through an iterative process of adding increasing quantities of carbon-free generation until the targets were met.

Modeling Tools

[Attachment A to D.18-08-018, Page 7]

Name all modeling software used by LSE to develop its IRP, if any, and include the vendor and version number. Provide an explanation of differences between the LSE's modeling tool and RESOLVE, and an explanation of how those differences should be considered during evaluation of the LSE's portfolio(s).

As the IEPR did not produce a load forecast for SEA, this IRP utilized the forecast submitted to the CPUC pursuant to the Administrative Law Judge's ruling, dated April 20, 2018[1].

[1] http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M214/K907/214907554.PDF

Net annual consumption by end users is forecasted to increase at an average rate of 1.29 percent per year through the end of the study period.

GHG emission forecasts were determined though plugging in SEA loads and resources into the CPUC's Clean Net Short calculator.

Production cost modeling of electricity prices entails several fundamental models working in concert. The progression can be broken down into three principal phases. In the first phase, fundamental and legislative factors would be modeled and integrated. Examples include CO_2 costs, GHG emissions targets, and regional RPS goals. The second part of the study would use the inputs from the first step to run a capacity expansion analysis. In this phase, market prices would be simulated for all of the Western Interconnect utilizing a production cost methodology. The capacity expansion model optimally adds hypothetical resources to the existing supply stack over the duration of the study period. In the final phase, the modified supply stack would be integrated back into a simulation of power prices using the aforementioned variable inputs.

However, because two of the most significant input variables, natural gas and GHG prices, were set by the CPUC, the IRP team judged that independent production cost modeling would not have provided materially different results than that of the RESOLVE model. For that reason, the IRP team used the power price forecast derived in the RESOLVE 42 million metric ton statewide annual electric sector emissions, mid AAEE scenario for 2030.

Modeling Approach

[Attachment A to D.18-08-018, Page 7]

Describe the LSE's overall approach to developing the scenarios it evaluated, and explain why each scenario was considered. Also describe any calculations, including post-processing calculations, used to generate metrics for portfolio analysis.

A long term integrated financial and energy position model was created to forecast SEA's annual wholesale power costs of a compliant portfolio for selected years of the study period. The financial model used the results from previous sections, including forecasted loads, power prices, forecasted generation resources, and the output from generation resources. The model also includes additional wholesale requirements and costs such as GHG-free energy, RPS, and resource adequacy. The output from the model measured the impact of these different scenarios in a single metric: net present value of wholesale power costs. The model simulates the annual wholesale costs of 2018, 2022, 2026, and 2030 reflecting the data provided by RESOLVE.

Required Portfolio

[Attachment A to D.18-08-018, Page 3-4]

Each LSE must produce at least one portfolio, deemed the "Conforming Portfolio," that uses the assigned load forecast and is demonstrated to be consistent with the Reference System Portfolio according to the following criteria:

- *Use of either the GHG Planning Prices in Table A or the LSE-Specific 2030 GHG Emissions Benchmark assigned to the LSE in an ALJ ruling.*
- *Use of inputs and assumptions (e.g., baseline generating fleet, candidate resource cost assumptions, financial assumptions, etc.) matching those used in developing the Reference System Portfolio*

The portfolio analysis applies results from the CPUC staff recommended statewide annual electric sector GHG Planning Target emissions of 42 MMT in 2030 ("Reference Portfolio"), which is consistent with meeting the statewide 2030 emissions reduction target and also provides a straight-line trajectory towards meeting the 2050 target.

The Reference Portfolio suggests the in-state construction requirement of 8.8 GW of solar, 1.1 GW of wind, 0.2 GW of geothermal, and 2 GW of battery storage of incremental generation capacity by 2030. Data in the 2017 Integrated Energy Policy Report (IEPR) Form 1.1c suggests that SEA represents approximately 0.025 percent of statewide electricity consumption. The IRP team applied SEA's percentage of total load for each respective study year in the RESOLVE model to determine the Program's proportional share of the Recommended Portfolio. Figure 1 displays both the statewide resource needs and SEA's proportional share of generation capacity.

Figure 1: 42 Million Metric Ton Annual GHG Emission Reference Portfolio Generation Capacity Additions by Year and SEA Proportional Share (MW)

42MMT Reference Portfolio (MW)	2018	2022	2026	2030
Wind	1,145			
Solar		8,828		
Battery			161	1,830
Geothermal				202
Total	1,145	8,828	161	2,032

SEA Share (MW)	2018	2022	2026	2030
Wind	0.29			
Solar		2.21		
Battery			0.04	0.46
Geothermal				0.51
Total	0	2	0.0	1

Using the assumptions for capacity factor listed in the RESOLVE model, Figure 2 is the cumulative energy output of new resources for each year of the study period.

Figure 2: Cumulative Annual Energy Output of New Resources (MWh)

Cumulative New Resource Generation (MWh)	2018	2022	2026	2030
42 MMT Reference Portfolio	3,259,815	28,006,465	29,205,271	44,301,922
SEA Share	677	7,444	7,743	14,689

SEA's proportional share of the 42 million metric ton GHG total emissions goal is 16,000 metric tons[2]. SEA intends to procure additional carbon-free resources under long-term contracts in accordance with its program objectives. Among the program objectives in 2017 and 2018 was a goal to serve 75 percent of its load with carbon-free energy. This was accomplished through a resource mix of contracting with Portfolio Content Category 1 (PCC1), and PCC2 generators, as well as purchasing carbon-free power from Northwest large hydro facilities. Under the current RPS rules, PCC2 Renewable Energy Certificates (RECs) are considered carbon-free, though that will not be the case under the adopted CNS rules. SEA is not considering the addition of any GHG-emitting resources, therefore the GHG planning price is not used in the portfolio analysis.

The final SEA Conforming Portfolio analyzed is illustrated in Figure 3.

[2] As recorded in Rulemaking 16-02-007 ALJ/JF2/jt2, 5/28/2018

Figure 3: Conforming Portfolio Scenario

SEA Conforming Portfolio	2018	2022	2026	2030
Load Forecast (MWh)	2018 Load Forecast	Load forecast submitted to CPUC dated April 20,2018		
Renewable Resources	Proportional share of RESOLVE 42MMT mid Scenario + long term contract with lowest cost resource to meet 65% of RPS needs			
RPS		50%		
GHG-Free		75%		

Assumptions

[Attachment A to D.18-08-018, Page 7]

Describe any inputs or assumptions used by the LSE that differ from the corresponding assumption used by the Commission to prepare the Reference System Plan. Each differing assumption must include a rationale for use of this assumption and any intermediate calculations used to develop the assumption and source data with citations. Include a side-by-side comparison of the original assumption data from the Reference System Plan and the LSE's differing assumption data. Report data according to the requirements in the Data section below.

SEA did not apply any different assumptions than the ones described in the 42 MMT Reference Plan.

Load Forecast

[Attachment A to D.18-08-018, Page 3]

For projecting load across the IRP Planning Horizon (i.e., until 2030, for the purposes of IRP 2017-18), LSEs shall use the "mid Baseline mid AAEE mid AAPV" version of Form 1.1c of the CEC's adopted 2017 IEPR forecast, unless a new load projection is assigned to the LSE in an Administrative Law Judge (ALJ) ruling.

SEA does not have an independent forecast of behind the meter solar or EV penetration, thus it cannot effectively project how the adoption of those technologies will affect total consumption or hourly shapes. The IRP team used the SEA board approved 2018 load forecast adopted for the 2018 study year. Since the IEPR did not include a load forecast for SEA, this IRP utilized the forecast submitted to the CPUC pursuant to the Administrative Law Judge's ruling, dated April 20, 2018[3]. GHG emissions were also calculated using the CNS calculator default settings as SEA did not independently create its own assumptions. Resource adequacy needs are assumed to grow at a rate consistent with loads.

Energy Prices

The IRP team assumed forward prices as marked on the InterContinental Exchange (ICE) for the 2018 price forecast, as the year is well underway. For the remainder of the study period, input prices came from the RESOLVE model outputs. Because RESOLVE modeled only 37 representative days of the year, the IRP team assumed that the simulation captures the seasonal fluctuations and its effect on market prices. GHG prices are assumed to be included in the modeling. It is also assumed that liquidity is sufficient such that SEA will be able to transact at market prices without substantial transaction costs.

Resource Adequacy, GHG, and REC Pricing

[Attachment A to D.18-08-018, Page 5]

LSEs electing to use the GHG Planning Price—rather than the LSE-specific GHG Emissions Benchmark—in developing their portfolio(s) must use the values presented in Table A below. The GHG Planning Price is equivalent to the marginal cost of GHG abatement associated with the 42 MMT Scenario for the years 2018 to 2026 (i.e., a curve that slopes upward from ~$15/ton to

[3] http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M214/K907/214907554.PDF

~$23/ton), followed by a straight-line increase from ~$23/ton in 2026 to $150/ton in 2030. The straight-line increase is intended to fill the gap for the years for which RESOLVE does not produce GHG abatement cost values (i.e., 2027, 2028, and 2029).

RESOLVE did not explicitly model resource adequacy or GHG-free energy; thus the IRP team relied on internal experience and expertise to estimate future costs of these attributes. The intrinsic value of a PCC1 REC is residual of the levelized cost of a new resource less the value of the brown power, with a floor price of $0. Because renewable resources continue to decline in costs, the cost of RECs should through time as well. With solar expected to be the dominant renewable resource in California, REC forward prices in this IRP were derived by utilizing levelized cost data input into RESOLVE and the corresponding energy prices outputs. PCC2 REC prices are assumed to be pegged to PCC1 prices multiplied by a ratio, plus the GHG cost of the resource required to firm and shape the REC. The ratio of 0.35 was calculated by dividing current PCC2 REC prices by PCC1 REC prices; the ratio is expected to remain constant for the study period. The GHG emissions rate of the firming and shaping resource was assumed to be equal to the average annual system power emissions rate for each respective year. Assumptions for market prices of wholesale energy and its associated attributes are displayed in Figure 4.

Figure 4: Price Assumptions for Wholesale Products

	2018	2022	2026	2030
Energy ($/MWh)	$ 41.78	$ 40.53	$ 46.32	$ 87.40
GHG-Free ($/MWh)	$ 2.50	$ 3.04	$ 3.69	$ 4.49
Resource Adequacy ($/kW-mo)	$ 3.25	$ 3.95	$ 4.80	$ 5.84
PCC1 REC ($/REC)	$ 17.00	$ 11.47	$ 22.68	$ -
PCC2 REC ($/REC)	$ 6.00	$ 9.69	$ 14.99	$ 36.00

REC price results for 2030 do not make sense at first glance: a PCC2 REC is more valuable than a PCC1 REC, which has no value. However, power prices are forecasted to be nearly $90/MWh in 2030, while the levelized cost of building a new solar plant is $66/MWh. An entity would be better off economically by contracting with or developing a new facility than paying anything for a PCC1 REC. PCC2 RECs are priced as such because of the carbon cost required to firm and shape the resource. The underlying assumption, of course, is that the resource potential of solar power is nearly unlimited.

Study Results

[Attachment A to D.18-08-018, Page 7]

Use this section to present the results of the analytical work described in Section 2: Study Design.

The results of the portfolio analysis are discussed in this section.

Portfolio Results

[Attachment A to D.18-08-018, Page 6/8]

Provide a list of all portfolios developed. Each portfolio's content must be itemized in the Data Template Excel workbooks referenced below. A portfolio clearly identifies:

- *New resources that the LSE plans to invest in. This does not include future contracts with existing resources.*

- *Existing resources that the LSE owns or contracts with. This includes future contracts with existing resources. Existing resources are those on the 3/15/2018 NQC List,4 or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018.*

Each LSE must produce a Conforming Portfolio. Alternative Portfolios are also permitted, provided that any deviations from the Conforming Portfolio are explained and justified. The LSE will identify one portfolio as its Preferred Portfolio.

GHG Accounting in IRP Planning

LSEs should use the Clean Net Short Methodology and calculator tool for GHG accounting.

SEA's share of the Reference Portfolio largely aligns with the CAP, however, its current portfolio does not meet the SB 350 requirement that 65 percent of SEA's RPS needs must be met by renewable resources under long-term (at least 10 year) contracts by 2021 Figure 5.

Figure 5: Minimum Long-term Renewable Generation Contract Requirements

	2018	2022	2026	2030
Load (MWh)	37,061	64,009	63,694	61,674
Minimum RPS Compliance (%)	29%	36%	43%	50%
Minimum RPS Compliance (MWh)	10,748	23,299	27,516	30,837
Required Contracted Quantity (MWh)	6,986	15,145	17,885	20,044

SEA's guidelines give preference to utilizing existing building stock to support additional solar generation capacity. SEA is also evaluating the option of entering into long-term contracts with existing renewable generators within Southern California, as well as the contracting or development of new generation capacity through competitive solicitations in the next two years.

Because SEA has not issued an RFO for long-term contracts from existing generators, the cost of those contracts is unknown. The levelized cost of energy from new resources, however, was modeled by RESOLVE and is publicly available. For this reason, the IRP team adopted the candidate resource costs from the RESOLVE model in this study. Due to the abundant solar resource available to SEA both locally and within Southern California, the IRP team decided on adding the lowest utility scale solar resources in the SEA Conforming Portfolio.

Utilizing the Clean Net Short (CNS) methodology and SEA's proportional share of the Reference Portfolio resources, SEA forecasts annual emissions of 3,937 metric tons for 2018, but rising to 23,131 metric tons for 2022. A portfolio that consists solely of SEA's pro-rata share of the Reference Portfolio will result in annual emissions that exceeds SEA's emissions quota of 16,000 MMT. Continuing with current program goals of 75 percent GHG free energy, however, will be sufficient to meet SB 350 GHG targets. The final SEA Conforming Portfolio is described in Figure 6.

[4] http://cpuc.ca.gov/irp/filingtemplates/

Figure 6: SEA Conforming Portfolio

	2018	2022	2026	2030
Load (MWh)	37,061	70,763	75,158	77,998
Minimum RPS Compliance (%)	29%	36%	43%	50%
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Total MWh	39,748	77,203	83,275	87,748
GHG Emissions (metric tons)	2,624	4,232	4,479	3,744

The expected 2030 emissions with 75 percent GHG free power, with the remainder filled with system power is approximately 3,750 metric tons CO2. It will also allow SEA to meet the 50 percent renewable energy mandate by 2030, with 65 percent of the renewable supply procured under long-term contracts, and the residual procured under short term purchases. The SEA Conforming Portfolio is also the SEA Preferred Portfolio.

Local Air Pollutant Minimization

[Attachment A to D.18-08-018, Page 9]

Describe and provide quantitative evidence to support how the LSE's Preferred Portfolio minimizes localized air pollutants and other GHG emissions with early priority on disadvantaged communities.

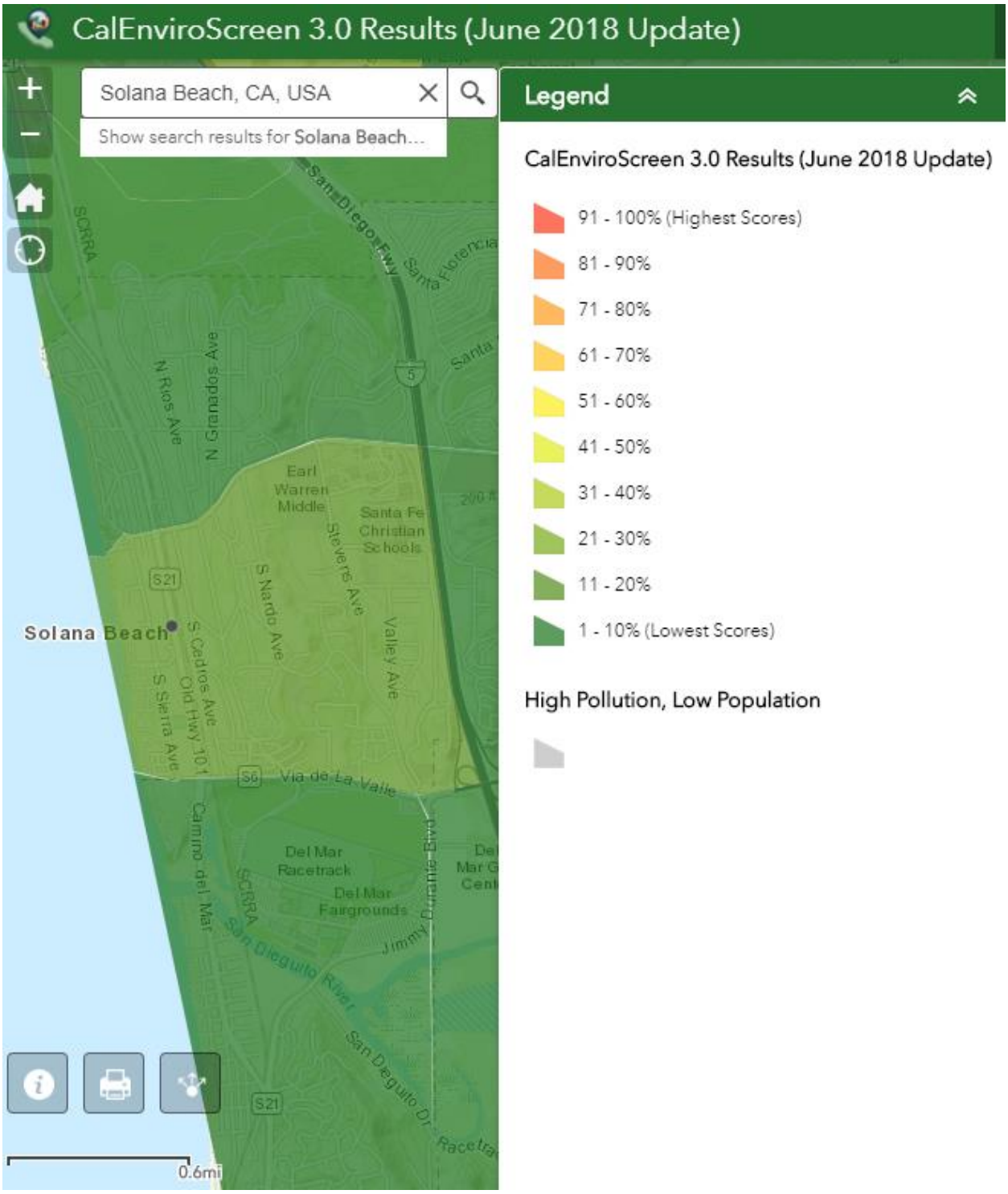
In order to identify "disadvantaged communities" that are located within its service territory, each LSE must use CalEnviroScreen 3.0 to identify the top 25% of impacted census tracts on a statewide basis and the top 5% of census tracts without an overall score but with highest pollution burden. LSEs must specify:

- *Customers served in disadvantaged communities along with total disadvantaged population number served as a percentage of total number of customers served*
- *What current and planned LSE activities/programs, if any, impact disadvantaged communities or contribute to economic development within disadvantaged communities (e.g. list all individual programs carried out in/for disadvantaged communities, along with description of program)*
- *Estimates of annual emissions of nitrogen oxides and particulate matter5 (NOx and PM2.5, at a minimum), including emissions from normal plant operations and from plant cycling. As stated above, the Commission delegates to staff and the assigned ALJ to define a GHG accounting methodology apportioning responsibility to individual LSEs. The method may also be used to estimate localized pollutants such as nitrogen oxides and particulate matter.*

[5] LSEs are encouraged to use factors from the CEC Cost of Generation (2015) and the USEPA AP-42, the EPA's compilation of air emission factors.

The entirety of SEA's service territory is the City of Solana Beach. SEA's service territory does not include any disadvantaged communities, which are defined by SB535 as areas that are in either the top 25 percent of impacted census tracts or census tracts with the highest overall pollution burden, are not located within SEA's service territory as suggested by the CalEnviroScreen 3.0 results (Figure 7).

Figure 7: CalEnviroScreen 3.0 Results



If any part of Solana Beach become re-categorized as a disadvantaged community in the future, SEA's long-term program objectives aim to construct a clean generation portfolio through the extensive use of renewable and GHG-free energy. With the notable exception of resource adequacy, SEA intends to construct or contract exclusively with renewable or GHG-free generation resources. The Program, however, will continue to rely on unspecified system power for short-term energy needs. In the first year of operations, SEA's default generation portfolio is expected to achieve a 75 percent GHG-free and a 50 percent renewable energy mix, resulting in an energy supply that possessed both a greater renewable content and a lower GHG emission rate than that of the incumbent utility. SEA's long-term energy procurement strategy is not expected to negatively impact local air quality.

Cost and Rate Analysis

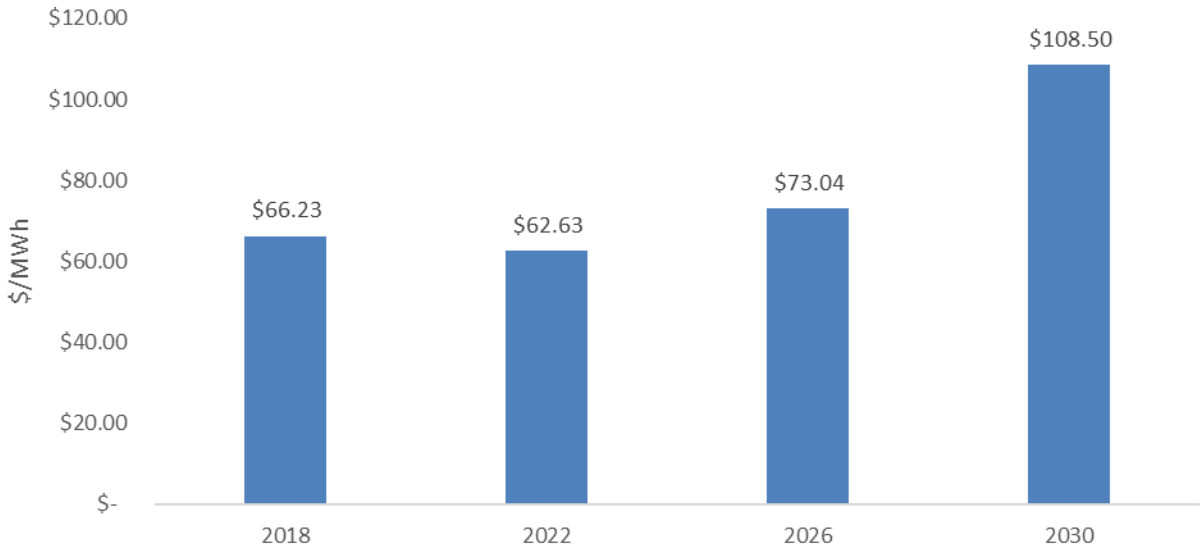
[Attachment A to D.18-08-018, Page 9]

Describe and provide quantitative information to reflect how the LSE anticipates that its Preferred Portfolio will affect the costs for its customers. For this analysis, assume other LSEs procure resources in a manner consistent with the Reference System Plan.

All LSEs should consider cost and rate impacts on their customers when planning and submitting their individual IRPs, and, at a minimum, include a narrative description of their approach in support of this requirement.

The various inputs discussed in prior sections including power prices, RA capacity prices, new resource costs, GHG-free energy costs, and REC prices were input into the long-term model to estimate total wholesale procurement costs Figure 8.

Figure 8: Modeled Wholesale Procurement Costs to Serve Retail Load ($/MWh)



The statistic that immediately jumps out is that 2018 procurement costs are expected to be higher than 2022 costs. The primary reason for this is two-fold. First, SEA started up operations in June 2018, meaning that the bulk of its load came during the higher priced summer period. Second, unique physical constraints in the natural gas system caused 2018 prices in Southern California to rise steeply. These short-term dynamics are unlikely to be modeled by RESOLVE. The cost analysis studies only the wholesale supply components of serving retail load; as a CCA, the incumbent IOU is still responsible for transmission and distribution of the energy to the retail level, and those issues are presumably discussed in SDG&E's IRP.

RESOLVE expects market prices to increase modestly between 2018 and 2026, at which point GHG planning prices rise exponentially, with power prices following closely behind. There is a breakthrough in wholesale costs in 2030 with high power prices, but while high prices translate to higher costs for load serving entities, there is a similar benefit for generators that sell into high priced environments. Outside of resources already under contract, incremental RPS compliance costs should decline to near zero.

Resource Adequacy

[Attachment A to D.18-08-018, Page 10]

Additionally, LSE Plans should account for any resources subject to the cost allocation mechanism (CAM) in their portfolios. In estimating the resource adequacy benefits of resources subject to the CAM in its Conforming Portfolio, each LSE should refer to the most recent year-ahead CAM resource list available on the Commission's Resource Adequacy Compliance Materials webpage.[6] *The year-ahead CAM list itemizes the resource adequacy value benefiting all LSEs within a given IOU service territory, by month and year. In developing its IRP portfolios, LSEs should assume its future resource adequacy obligations are reduced by its proportional share of the resource adequacy value itemized in the year-ahead CAM list. An LSE's proportional share is determined by its year-ahead share of peak load out of total coincident peak load for the IOU service territory the LSE is located in, as assigned in the Commission's annual resource adequacy process. The LSE's proportional share is assumed static through the IRP planning horizon for the purpose of projecting its share of CAM resource adequacy value, but will be updated each IRP cycle based on the current proportional share assignment from the Commission's annual resource adequacy process. LSEs should not make assumptions or predictions on what resources may be procured on behalf of all load and subject to the CAM in the future.*

LSEs that serve load within a CAISO-defined local capacity area must report the LSE's own assessment of how it will meet the local capacity needs projected in the most recent CAISO Transmission Plan.[7] *In doing so, LSEs should use the Local Capacity Technical Analysis (LCT) reports for years 2018 and 2022 associated with the CAISO board-approved 2017-18 Transmission Plan when developing the local needs analysis of their Conforming Portfolios. LSEs may use the 2017 IEPR-based final LCT reports for 2019 and 2023 (expected to be available by the end of May2018 at the latest) to develop a local needs analysis in their AIternative Portfolios.*[8] *LSEs should use the Commission's resource adequacy program's definition of local capacity areas for the purposes of the local needs analysis. These areas are: Greater Bay Area, Big Creek Ventura, CAISO System, LA Basin, San Diego IV, and Other PG&E.*

Resource adequacy (RA) costs are inclusive of the estimated 10 MW resulting from the cost allocation mechanism (CAM).

The SEA footprint is located within the San Diego local capacity area. The 2019 and 2023 Local Capacity Technical Reports both conclude that there will be sufficient capacity available to serve the local capacity area.

SEA's focus on the procurement of local resources likely means that the long-term renewable resource procurement will also be located in these local capacity areas. SEA has and will continue to comply with the CPUC RA program.

Action Plan

[Attachment A to D.18-08-018, Page 11]

This section will present all the actions that the LSE proposes to take in the next 1-3 years to implement its LSE Plan.

[6] Refer to the Commission's Resource Adequacy Compliance Materials, available at: http://cpuc.ca.gov/General.aspx?id=6311.

[7] CAISO has ten primary local capacity areas (i.e. transmission-constrained load pockets): Humboldt, North Coast North Bay, Sierra, Stockton, Greater Bay, Greater Fresno, Kern, LA Basin, Big Creek Ventura, San Diego Imperial Valley.

[8] LCT reports are available at: www.caiso.com/informed/Pages/StakeholderProcesses/LocalCapacityRequirementsProcess.aspx.

The IRP defines SEA's need for new resources and investigates different generic resource types with an objective of presenting both quantitative and qualitative analysis of the benefits of pursuing different resource technologies to fulfill the District's load, RPS, and GHG requirements. SEA's action plan addresses resource acquisitions and other concerns that appeared over the course of this IRP analysis.

- ✓ SEA's program goals largely align with a proportional share of the Conforming Portfolio.
    - SEA will begin to solicit offers for contracts to meet the requirement that 65 percent of RPS requirements be met through long-term contracts with a duration of at least 10 years by 2021
    - SEA will continue to contribute to the development of new renewable energy resources as it explores opportunities to acquire solar resources
- ✓ Continuing with the current 75 percent GHG-free procurement goals are forecasted to keep SEA under its quota of 11,000 metric tons of GHG emissions in the 2030 42 million metric ton scenario. It will also put SEA on a straight line path to meeting statewide 2050 goals.
- ✓ Resource adequacy conditions are fluid, as are RA requirements and CAM, reliability must-run (RMR), and demand response (DR) allocations. SEA will continue to monitor the RA environment and act accordingly to comply with the RA program.
- ✓ SEA will continue to monitor energy economic fundamentals to ensure that its resource strategy provides rate payers with a maximum amount of renewable energy at a competitive cost.
    - Wholesale market prices 2026 and beyond are a point of concern, as the rapidly rising GHG planning prices drive power prices towards $100/MWh. If it is both more economically and environmentally effective to reduce dependence on the wholesale market and rely more upon SEA owned or contracted resources, SEA will explore resource acquisitions incremental to the Preferred Portfolio beyond 2026 to remain cost competitive

Barrier and Risk Analysis

[Attachment A to D.18-08-018, Page 12]

Identify any market, regulatory, financial, or other barriers or risks associated with the LSE acquiring the resources identified in the Preferred Portfolio. Include an analysis of any risks associated with potential retirement of existing resources on which the LSE intends to rely in the future.

SEA foresees a number of risks to successfully implementing its Preferred Portfolio. Risks associated with market volatility can be managed with a risk management program. These risks include power prices, natural gas prices, and loads. All of these variables are interconnected, and any number of events, such as a major transmission/gas pipeline outage or severe weather can cause a spike in power prices. These events are uncontrollable, but not necessarily unforeseeable. Weather, which is strongly correlated to loads, can be forecasted. In developing its CCA program, the Solana Beach City Council adopted a risk management policy and established a risk management team. SEA's risk management program continually monitors conditions, keeping SEA in a position to take action when necessary.

SEA is expected to be exposed to the wholesale market even after its resource acquisitions. A hedging program allows SEA to lock in energy prices at a level that provides price and supply certainty and reduces exposure to market volatility.

California set aggressive targets with respect to renewable energy and GHG emissions. Meeting these targets is predicated on technology continuing to evolve and costs continuing to decline. While renewable energy penetration and cost reductions have exceeded nearly all forecasts, it is possible that the opposite will also occur. If renewable energy and battery price projects do not decline as they are anticipated to, the cost of RPS and GHG compliance will put upward pressure on rates.

Regulatory risk is perhaps the most uncertain. The adoption or repeal of a piece of legislation can entirely overhaul the current RPS and GHG compliance targets. Remaining cost competitive is in part dependent on where the power chare indifference adjustment (PCIA) or PCIA replacement charges are set. Too high of a PCIA charge will make it difficult to stay competitive.

Glossary of Terms

Alternative Portfolio *– LSEs are permitted to submit "Alternative Portfolios" developed from scenarios using different assumptions from those used in the Reference System Plan. Any deviations from the Conforming Portfolio must be explained and justified.*

Conforming Portfolio *– Each LSE must produce a "Conforming Portfolio" that is demonstrated to be consistent with the Reference System Portfolio according to the following criteria: (1) use of either the GHG Planning Prices or the LSE-Specific 2030 GHG Emissions Benchmark, (2) use of input assumptions matching those used in developing the Reference System Portfolio, and (3) consistent with the 2017 IEPR "mid Baseline mid AAEE mid AAPV" forecast, unless superseded by Administrative Law Judge ruling.*

Data Template *– Data provided by the LSE should be reported in the "Baseline Resource Data Template" and the "New Resource Data Template" provided by the Commission. "Baseline" means existing resources and costs. "Existing" includes resources on the 3/15/2018 NQC List, or projects not yet online but that have secured a contract and may therefore be identified in the Commission's RPS Contracts Database or an Application filed at the Commission, as of January 1, 2018. "New" means any new (incremental to the baseline) resources and costs associated with a particular LSE portfolio.*

Disadvantaged Communities *– For the purposes of IRP, and consistent with the results of the California Communities Environmental Health Screening Tool Version 3 (CalEnviroScreen 3.0), "disadvantaged communities" refer to the 25% highest scoring census tracts in the state along with the 22 census tracts that score in the highest 5% of CalEnviroScreen's pollution burden, but which do not have an overall CalEnviroScreen score because of unreliable socioeconomic or health data.*

GHG Emissions Benchmark *– Each LSE filing a Standard LSE Plan must use either the GHG Emissions Benchmark or GHG Planning Price in developing its Conforming Portfolio. The LSE-specific benchmarks have been provided in an ALJ ruling. If the total emissions attributable to the LSE's preferred portfolio exceed its GHG Emissions Benchmark for 2030, the LSE must explain the difference and describe additional measures it would take over the following 1 - 3 years to close the gap, along with the cost of those measures.*

GHG Planning Price *–The GHG Planning Price is equivalent to the marginal cost of GHG abatement associated with the 42 MMT Scenario for the years 2018 to 2026 (i.e., a curve that slopes upward from ~$15/ton to ~$23/ton), followed by a straight-line increase from ~$23/ton in 2026 to $150/ton in 2030, as shown in Table A. Each LSE must use either the GHG Planning Price or GHG Emissions Benchmark in developing its Conforming Portfolio.*

IRP Planning Horizon *– The IRP Planning Horizon will typically cover 20 years. However, for the purposes of this IRP 2017-18 cycle, the IRP Planning Horizon will cover only up to the year 2030.*

Long term *– 10 or more years (unless otherwise specified)*

Portfolio *– A portfolio is a set of supply and/or demand resources with certain attributes that together serve a particular level of load.*

Preferred Portfolio *– Among all the portfolios developed by the LSE, the LSE will identify one as the most suitable to its own needs, deemed its "Preferred Portfolio." Any deviations from the Conforming Portfolio must be justified and explained.*

Reference System Plan *– The Reference System Plan refers to the Commission-approved integrated resource plan that includes an optimal portfolio (Reference System Portfolio) of future resources for serving load in the CAISO balancing authority area and meeting multiple state goals, including meeting GHG reduction and reliability targets at least cost.*

Reference System Portfolio *– The Reference System Plan refers to the Commission-approved portfolio that is responsive to statutory requirements per Pub. Util. Code 454.51; it is part of the Reference System Plan.*

Scenario *– A scenario is a portfolio together with a set of assumptions about future conditions.*

Short term *– 1 to 3 years (unless otherwise specified)*

Standard LSE Plan *– A Standard LSE Plan is the type of integrated resource plan that an LSE is required to file if its assigned load forecast is ≥ 700 GWh in any of the first five years of the IRP planning horizon.*

Standard LSE Plan Template *– Each LSE required to file a Standard LSE Plan must use the Standard LSE Plan Template according to the instructions provided herein.*

(End of Attachment A)