

Desert Community Energy

2018 INTEGRATED RESOURCE PLAN

August 1, 2018



Approved by DCE Board of Directors on July 16, 2018

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1. Executive Summary

Desert Community Energy (DCE) is a Community Choice Aggregation program, otherwise known as a CCA, serving the cities of Palm Springs, Cathedral City, and Palm Desert. DCE has planned to begin serving customers in August 2018. As a result, while it had initiated procurement to be able to provide service to customers for the remainder of 2018, based on short-term resources, DCE has not completed long-term resource procurement and will not have procured resources to serve customers in future years at the time it submits this Integrated Resource Plan (IRP) to the California Public Utilities Commission (CPUC).

DCE's objectives in its IRP portfolio analysis are to provide a conforming portfolio to meet the CPUC's directives in D.18-02-018 and to analyze an alternative, preferred portfolio that reflects the DCE Board's approved procurement goals: that is to be 55% renewable and 100% carbon-free by 2030.¹ For each portfolio, we estimate greenhouse gas (GHG) emissions using the CPUC's approved clean net short method. Because so little procurement has been completed, these portfolios remain largely hypothetical and rely primarily on generic resource assumptions.

For the conforming portfolio, DCE simply allocated the capacity by resource type for the reference CAISO system portfolio to DCE based on DCE's fraction of total energy within the CAISO system ("load ratio share"). For the alternative, preferred portfolio, DCE adjusted the conforming portfolio to meet its Board's procurement goals. This, essentially, involves scaling down the fossil portion of the reference system portfolio, while scaling up the renewable and carbon-free portions. Based on the results of DCE's analysis, the preferred portfolio 2030 GHG emissions are 0.011 MMT, a decrease of 96% from levels in the conforming portfolio (0.294 MMT) and well below the assigned benchmark of 0.268 MMT.

The portfolio results provided here are targeted at providing enough energy to meet DCE's load and to calculate GHG emissions. DCE expects to procure RA separately. Given the conforming portfolio resource mix is designed to meet RA requirements for the CAISO system, DCE anticipates it will provide adequate RA for all LSEs. The increased reliance on renewable generation in the preferred resource mix could require additional grid integration costs, such as through increased energy storage. DCE will monitor RA requirements and renewable RA benefits as well as storage costs and benefits and is prepared to procure additional storage above the amount in the conforming portfolio if necessary to meet RA requirements.

This Integrated Resource Plan was prepared and approved by the DCE Board of Directors on July 16, 2018 to be ready for submittal by the deadline. On July 25, 2018 the DCE Board of Directors voted to delay the start date for serving customers. This delay was prompted by changes in energy market conditions and other factors that would limit DCE's ability to offer competitive rates and benefits to customers. DCE will be evaluating the best time to start serving customers; RA procurement for 2019 and 2019 energy procurement would be timed based on the launch date which is yet to be determined. This document reflects the intent of the DCE Board of Directors to increase the procurement of renewable

¹ These goals will be reviewed as procurement progresses and may change in the future.

energy and offer a 100% carbon-free option. Therefore, the analysis presented in the IRP has not been modified since the decision to delay was made, one week prior to the deadline. DCE will also comply with SB350 long-term procurement requirements. DCE anticipates that procurement may begin in early 2019.

In addition, expected Board agenda items in the near term, include the following:

- Consideration of alternative rate designs and NEM enhancements to encourage further distributed generation. Feed-in tariffs for local renewable generation will also be considered.
- Developing new energy efficiency programs that enhance, but do not duplicate, existing programs
- Adopting procurement guidelines for improving service to and providing economic development opportunities for local disadvantaged communities

Longer term, the Board also intends to consider new programs for demand response, electric vehicles, building electrification, and energy storage.

DCE will report on its progress with these activities in future IRPs and provide a more refined preferred portfolio, reflecting actual long-term contracts.

2. Introduction

a. Desert Community Energy

DCE is a Community Choice Aggregation program, otherwise known as a CCA, serving the cities of Palm Springs, Cathedral City, and Palm Desert. DCE is governed by a board of directors that includes an elected representative from each participating city. DCE is a public joint powers agency located within the geographic boundaries of Riverside County, formed in 2017 for the purpose of offering rate savings to electricity customers and developing and implementing sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient and renewable resources available in the region.

DCE has planned to begin serving customers in August 2018. However, as a result of unexpected market conditions and other factors, the DCE Board of Director voted on July 25 to delay launch of the CCA program to a later date. In anticipation of the summer 2018 launch, DCE had successfully reached agreement with SCE on meeting resource adequacy (RA) requirements and completed procurement of the necessary energy to serve customers at that time. While the future launch date is still being evaluated, DCE had completed this integrated resource plan (IRP) for submittal by the August 1 due date. Completion of the IRP prior to initiating DCE's service to customers presents several challenges.

First and foremost, DCE is just beginning its procurement activities. The delay in DCE's launch date, will result in a delay in procurement until the new start date is determined. As a result, DCE has not completed long-term resource procurement and will likely have procured very limited resources to serve customers in future years at the time it submits this IRP to the CPUC. Thus, while DCE

believes its planned procurement of resources for the future to be reasonable, its projected future resource mix remains indicative. In addition, while DCE has worked to develop policies regarding distributed generation within its service area, its efforts to develop local resources and facilitate economic development remain nascent.

DCE expects that it will be able to provide increasingly detailed and precise planned resource portfolios in future years, as it launches service and pursues resource procurement, particularly longer-term resource agreements consistent with SB 350.

DCE was established with founding principles, as described in our joint powers agreement, which guide the development of this IRP and related procurement activities:

- Reducing greenhouse gas emissions related to the use of power throughout DCE jurisdictions and neighboring regions;
- Providing electric power and other forms of energy to customers at a competitive cost;
- Carrying out programs to reduce energy consumption;
- Stimulating and sustaining the local economy by developing local jobs in renewable and conventional energy; and
- Promoting long-term electric rate stability, energy security and reliability for residents through local control of electric generation resources.

These broad policy objectives were used as the basis for the more specific energy procurement strategies included in this IRP.

b. Product Offerings

When DCE launches its electric service, it will offer two products. The first option is the “Desert Saver” rate, which will be DCE’s default rate and will offer 35% renewable and 50% carbon-free electricity at rates that are 3% below SCE’s generation charges. The second option is the “Carbon Free” rate, which will offer 100% carbon-free electricity at rates equal to SCE’s current rates using a mix of approximately 35% renewable and 65% other carbon-free resources. Notably, DCE has committed not to contract for nuclear generation for any of its service options.

In addition, DCE plans to offer its customers Net Energy Metering (NEM) service with grid exports compensated at a rate that matches the rate offered by SCE. This will allow customers to pair cleaner grid electricity with renewable energy generated on their premises and potentially support solar-related jobs in the region. The DCE Board plans to explore ways to incentivize rooftop solar and other renewable electric generation systems in the future.

Finally, customers will continue to have access to important electric rate discounts under programs such as Medical Baseline and CARE/FERA, as well as potential new programs specific to DCE customers.

c. Procurement Status

Table 1 summarizes the status of DCE’s short-term procurement activities. DCE also plans to do its first long-term procurement based on a revised launch schedule, but not before the CPUC reaches a decision in the ongoing Power Charge Indifference Adjustment (PCIA) proceeding. Specifically, DCE requires a resolution on the utility-proposed green allocation mechanism or GAM. Allocation to DCE through the GAM could delay the need for a long-term procurement of renewable and carbon-free power in order to meet its green power targets for its two product offerings.

DCE will also comply with SB 350 long-term procurement requirements. Among other GHG-reduction provisions, SB 350 has some requirements applicable to CCAs including a requirement that CCAs will submit IRPs to the CPUC for certification. SB 350 also requires that at least 65 percent of a CCA’s RPS compliance procurement must be under contracts of 10 years or longer beginning in 2021; DCE anticipates that procurement may begin in early 2019.

DCE must also procure energy storage to meet requirements under AB 2514; although no specific timeline for this procurement has been adopted. The CPUC decision established a target for community choice aggregators and electric service providers to procure energy storage equal to 1 percent of their forecasted 2020 peak load. Installation of energy storage is to be completed by 2024.

Table 1. Procurement schedule.

| Product Year | Product | |
|------------------|---------------------------------------|--|
| | Resource Adequacy | Energy/RPS/Carbon-Free |
| 2018 | Complete (through agreement with SCE) | To be determined based on launch date |
| 2019 | To be determined based on launch date | To be determined based on launch date |
| 2020 | Fulfill requirements in 2019 | Fulfill requirements in 2019 |
| 2021 | Fulfill requirements in 2019-2020 | Beginning prior to launch; Fulfill requirements in 2020 |
| Subsequent years | TBD | TBD |

3. Study Design

a. Objectives

DCE’s objectives in its IRP portfolio analysis are to provide a conforming portfolio to meet the CPUC’s directives in D.18-02-018 and to analyze an alternative, preferred portfolio that reflects the DCE Board’s approved procurement goals. The preferred portfolio focuses on DCE’s goal to reduce GHG emissions related to electricity use. For each portfolio, we estimate greenhouse gas (GHG) emissions using the CPUC’s approved clean net short method. Because so little procurement has been completed, these portfolios remain largely hypothetical and rely primarily on generic resource

assumptions. Future IRPs and resource plans will be more detailed and reflect actual resources and contracts.

b. Methodology

i. Modeling Tool(s)

DCE developed a spreadsheet model to create each portfolio and to estimate non-GHG emissions. To estimate GHG emissions for each portfolio, DCE relied on the CPUC's GHG Calculator spreadsheet tool. It did not conduct any production cost modeling or portfolio optimization studies. The independent spreadsheet model and GHG Calculator results are attached to this IRP.

ii. Modeling Approach

For the conforming portfolio, per the CPUC's directives DCE must demonstrate consistency with the reference system portfolio assumptions with "some updating to reflect the latest IEPR assumptions."² Thus, DCE did not rely on the exact portfolio shown in D.18-02-018, but instead used the RESOLVE output from the 2017 IEPR Update model run.³ DCE simply allocated the capacity by resource type for the CAISO system portfolio⁴ to DCE based on DCE's fraction of total energy within the CAISO system ("load ratio share"). The load ratio share was calculated for each year of the forecast period (namely 2018, 2022, 2026, and 2030). Energy production for each resource type in the portfolio was estimated using the actual capacity factors for each resource as output from RESOLVE.

DCE acknowledges there are alternative ways to craft a conforming portfolio. For example, the only nuclear capacity left in CAISO in 2030 is SCE's share of Palo Verde Nuclear Generating Station. Therefore, one could assume that the only party with nuclear capacity in its resource mix in 2030 will be SCE. However, we did not wish to bias any particular resource type for purposes of the conforming portfolio for this IRP. Therefore, all resource types in the CAISO system are represented.

² D.18-02-018, pg. 80.

³ The key difference between the RESOLVE output summarized in D.18-02-018 and the updated run is that the updated load forecast is higher, thus increasing the amount of renewables added, especially geothermal.

⁴ We allocated resource capacity for resources contracted to serve CAISO. Therefore, some resources will not be physically located within the CAISO market footprint.

For the alternative, preferred portfolio, DCE adjusted the conforming portfolio to meet its Board’s procurement goals. This, essentially, involves scaling down the fossil portion of the reference system portfolio, while scaling up the renewable and carbon-free portions.

iii. Assumptions

Load Forecast

DCE filed an annual load forecast out to 2030 on April 20, 2018, per the Administrative Law Judge’s ruling seeking comment on greenhouse gas emissions accounting methods and addressing updated greenhouse gas benchmarks filed April 3, 2018. DCE used this load forecast to craft portfolios in the IRP. This forecast did not include any specific assumptions for energy efficiency, electric vehicle load growth and charging, or behind-the-meter (BTM) generation. Therefore, DCE used the default assumptions embedded in the GHG tool workbook for both portfolios. These assumptions are summarized in the table below. The forecast includes an assumed 10% opt out rate. Table 2 also shows the load ratio share used to allocate capacity (MW) for the CAISO system to DCE.

Table 2. Load assumptions.

| | | 2018 | 2022 | 2026 | 2030 |
|--|---------------------|-------------|-------------|-------------|-------------|
| Assigned Load Forecast for IRP (i.e., Managed Retail Sales Forecast) | <i>GWh</i> | 489 | 1,408 | 1,477 | 1,531 |
| Default Demand Inputs (based on sales-weighted share of total from IEPR, grossed up for T&D Losses) | <i>Units</i> | 2018 | 2022 | 2026 | 2030 |
| Baseline net energy for load (no BTM PV, EV, electrification, energy efficiency) | <i>GWh</i> | 560 | 1,706 | 1,891 | 2,058 |
| Electric Vehicle Load - Home Charging Only | <i>GWh</i> | 4 | 29 | 48 | 64 |
| Electric Vehicle Load - Home + Work Charging | <i>GWh</i> | 0 | 5 | 14 | 28 |
| Other Electrification | <i>GWh</i> | 0 | 2 | 4 | 5 |
| Building Electrification | <i>GWh</i> | - | - | - | - |
| Energy Efficiency | <i>GWh</i> | (5) | (76) | (153) | (230) |
| Behind The Meter Photovoltaic (PV) | <i>GWh</i> | (31) | (145) | (211) | (274) |
| Total Managed Net Energy for Load | <i>GWh</i> | 528 | 1,519 | 1,593 | 1,650 |
| CAISO Managed Net Energy for Load | <i>GWh</i> | 225,889 | 224,124 | 221,928 | 218,478 |
| Load Ratio Share | | 0.56% | 0.68% | 0.72% | 0.76% |

Resource Adequacy

For 2018, SCE will be responsible for meeting and reporting on the RA compliance to the CPUC and the CAISO for both SCE and DCE. This has been arranged through an agreement between SCE and DCE filed with SCE’s Advice Letter 3801-E.

The focus of the limited modeling performed for this IRP was to craft portfolios to meet DCE’s energy requirements and calculate portfolio GHG emissions. DCE will also comply with all RA

requirements, including any future requirements for multi-year RA obligations. Current projections of system, flex, and local RA requirements are summarized in the table below.

Table 3. DCE Projections of RA requirements (MW).⁵

| | 2018 | 2022 | 2026 | 2030 |
|-------------------|----------------|------|------|------|
| South System | SCE to Provide | 286 | 298 | 310 |
| LA Basin | | 65 | 68 | 71 |
| Big Creek/Ventura | | 19 | 20 | 21 |
| Flex | | 67 | 69 | 72 |

Because the modeling here uses RESOLVE output as a starting point and RESOLVE has ensured adequate resources to meet system and local RA requirements, DCE assumes there will be adequate RA available to meet system needs for each portfolio modeled. DCE has not attempted to construct a portfolio of future RA as procured from any specific resource or resource type.

In addition, DCE has not performed an analysis of RA acquired from resources through the CAM or designated any particular resource type as including CAM resources. DCE will pay for its allocated share of resources subject to the CAM as necessary in the future.

DCE Procurement Goals

DCE intends to provide electric service that is both less costly and cleaner than traditional utility service. Consistent with the policy direction of its board of directors, DCE will not contract for nuclear power as part of its procurement mix. DCE will procure 35% of its energy from resources that qualify as renewable under California’s RPS when it begins serving customers and will procure 50% of its energy from carbon-free resources. That is, 15% of total energy procurement will be from non-nuclear, non-RPS eligible carbon-free resources, which is likely to be existing large hydroelectric resources. DCE plans to escalate each of these percentages over time so as to continue providing cleaner energy for its customers than SCE’s bundled service. Although the Board may change its carbon-free and renewable energy targets over time in response to changing technology and cost, Table 4 lays out current expectations for green energy procurement. The targets presented are largely consistent with DCE’s Implementation Plan,⁶ with the RPS eligible target percentage extrapolated to be 55% by 2030, which is greater than the mandated 50% target.

⁵ Numbers reflect summer conditions and will vary by month through the calendar year. Local and flex requirements are not additive to system requirement listed but represent the part of system RA that must also satisfy local and flex needs.

⁶ Available on DCE's website at https://desertcommunityenergy.org/wp-content/uploads/2018/05/DCE_Implementation-Plan.pdf. See Table 2 on page 14.

Table 4. DCE current green energy targets.

| Green Energy Target | 2018 | 2022 | 2026 | 2030 |
|---------------------|------|------|------|------|
| % RPS Eligible | 35% | 46% | 49% | 55% |
| % Added Carbon Free | 15% | 24% | 44% | 45% |
| % System Power | 50% | 30% | 7% | 0% |

Customer selection of the Carbon Free rate option could require additional purchases of carbon-free energy in the near term beyond that shown in the targets above, but DCE has not modeled any specific scenarios at this time. DCE will provide more specific information about how adoption of Carbon Free energy impacts procurement in future planning studies when more is known about the adoption of this product.

Emissions

DCE estimated carbon emissions using the clean net short method, as embedded in the GHG Calculator for IRP v1.4.5 workbook. The capacity inputs by resource type allocated by load ratio share are not directly entered into this workbook. For purposes of this workbook, only RPS eligible resources that are portfolio content category (PCC 1) are considered GHG-free. As are hydro and nuclear resources that are not RPS-eligible but are owned and under a resource-specific (not system power) contract and deliverable into the CAISO system. The capacity values entered are those that will generate the same GWh as estimated from the load ratio share allocation. The capacity values will differ from those directly allocated if the capacity factors as output from RESOLVE are not the same as those input into the GHG Calculator tool.

Total energy generated by resource type does not perfectly match DCE’s load forecast values. DCE assumed the difference would be comprised of unspecified spot imports or exports. Based on the analysis, DCE would be a net importer for the conforming portfolio case. DCE did not enter any resource capacity values for imports into the tool, but instead assumed these resources will largely be fossil resources and large hydro from outside CAISO. GHG reductions from large hydro imports are separately accounted for in the GHG Calculator tool.

DCE’s approved 2030 GHG emissions benchmark is 0.268 MMT. For oxides of nitrogen (NOx) and fine particulate matter (PM2.5) emissions calculations, DCE used emission rate assumptions from the CPUC’s proposed reference system plan post-processing spreadsheet. These assumptions are summarized in Table 5.

Table 5. NOx and PM2.5 Emissions Rate Assumptions.

| | NOx Emissions Rate (lb/MWh) | PM2.5 Emissions Rate (lb/MMBtu) |
|----------------------------|--------------------------------|------------------------------------|
| Combined Cycle Gas Turbine | 0.07 | 0.0066 |
| Gas Turbine Peaker 1 | 0.099 | 0.0066 |
| Gas Turbine Peaker 2 | 0.279 | 0.0066 |
| Steam Turbine | 0.15 | 0.0075 |
| Reciprocating Engine | 0.5 | 0.01 |

4. Study Results

This section describes the results of our analysis for each portfolio we developed.

a. Portfolio Results

DCE developed two portfolios:

- **Conforming Portfolio:** This portfolio is based upon the Reference System Plan.
- **Preferred Portfolio:** This portfolio reflects DCE’s procurement goals as approved by its Board of Directors.

The contents of each portfolio are described in more detail below.

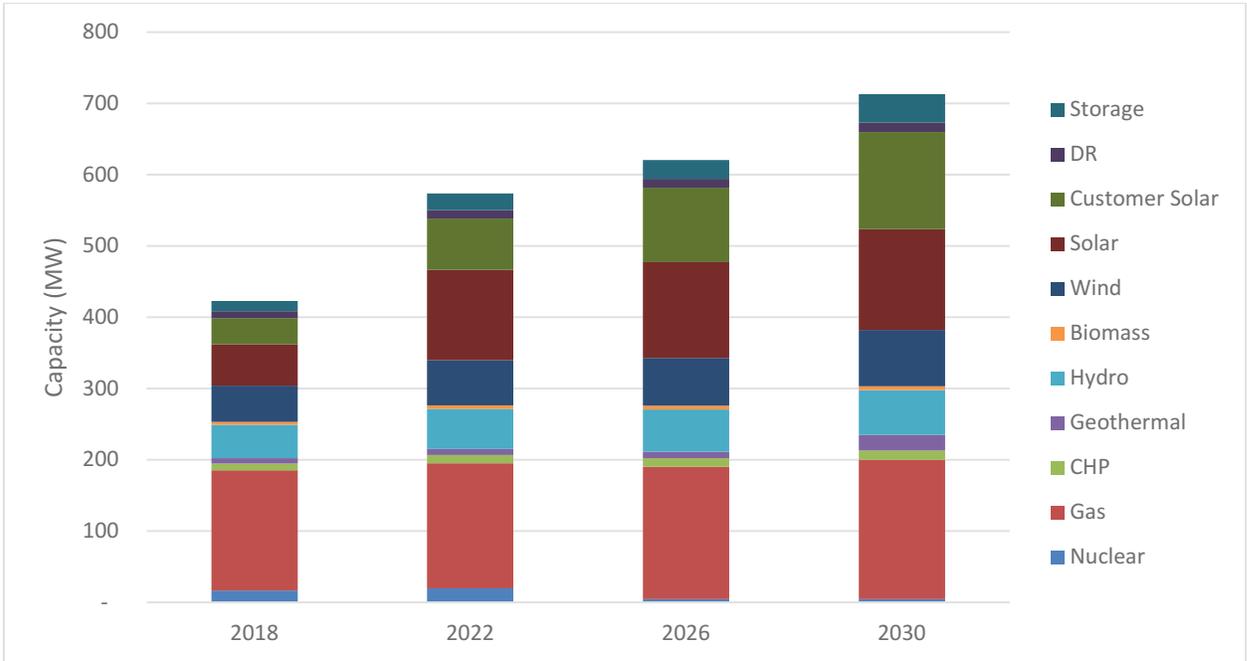
b. Preferred and Conforming Portfolios

Conforming Portfolio

The chart below shows the allocated capacity (MW) of each resource type to DCE, including BTM solar generation and demand response. DCE did not estimate equivalent capacity of energy efficiency investment, but the assumed energy reductions embedded in the load forecast are shown in Table 2. Because resources in the conforming portfolio reflect the Reference System Plan, they include resources that DCE would not necessarily have access to or sign contract for delivery. For example, the nuclear resources shown in the figure reflect DCE's load ratio share of Diablo Canyon in 2018 and 2022, and of SCE's share of Palo Verde in all four years shown. As indicated earlier, the analysis completed for this plan did not exclude any resource type within CAISO's system for allocation to DCE when creating its conforming portfolio, even though in practice they would not contract for power from nuclear resources. It also includes additional storage resources to reflect the AB 2514 procurement mandate of 1% of 2020 peak load. Since 2020 peak demand is forecasted to be 345 MW,

the conforming portfolio includes 3.45 MW of total new lithium ion battery storage⁷ for years 2022 and 2026. In 2030, the conforming portfolio reflects DCE’s load ratio share of new lithium ion battery storage equal to 15.9 MW.

Figure 1. Conforming Portfolio Capacity by Resource Type.⁸



The chart below shows the conforming portfolio broken down by resource type on an energy (GWh) basis, including net imports. This chart assumes service would begin August 1, 2018, meaning 2018 is a partial year. To better show the change in portfolio composition for that year, we also present a chart on a percentage basis (see Figure 3).

⁷ New lithium ion battery storage is in addition to DCE’s load ratio share of the 1325 MW storage mandate for the investor-owned utilities, which is also included in the conforming portfolio.

⁸ Nuclear resources reflect DCE's load ratio share of Diablo Canyon in 2018 and 2022, and of SCE's share of Palo Verde in all four years shown. As indicated earlier, DCE did not exclude any resource type within CAISO's system for allocation to DCE when creating its conforming portfolio.

Figure 2. Conforming Portfolio Energy by Resource Type.

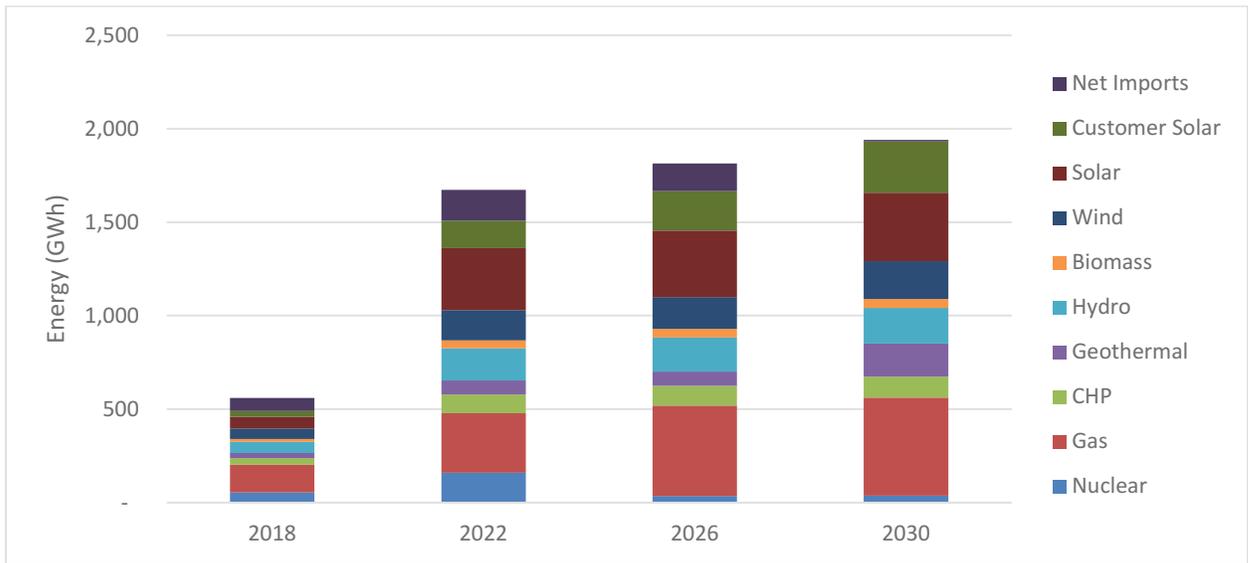
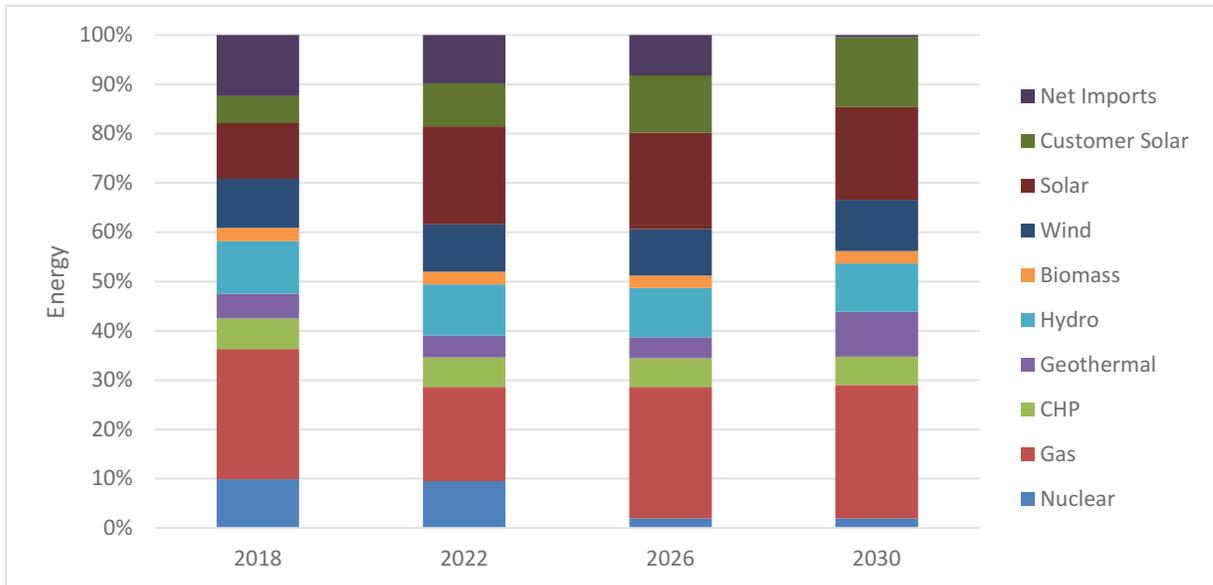


Figure 3. Conforming Portfolio Energy by Resource Type, %.



The conforming portfolio reflects the composition output by RESOLVE for the CAISO system. It predicts growth in storage resources, geothermal, and especially solar generation.

Figure 4 shows the capacity that is new⁹ based on DCE’s load ratio share of new capacity per RESOLVE’s classification. This also includes customer solar generation capacity incremental to 2018 levels. As indicated earlier, customer solar generation reflects default assumptions in the GHG calculator tool. Currently, there are approximately 9,400 Net Energy Metering customers within DCE

⁹ RESOLVE classifies resources as baseline (existing or planned) or new.

territory. NEM customer exports to the grid were 3.2 GWh in 2017. DCE does not have an estimate of total BTM generation capacity or energy production in DCE’s service territory. Future IRPs will reflect actual BTM capacity to the extent data becomes available.

Figure 4. Conforming Portfolio New Capacity by Resource Type.

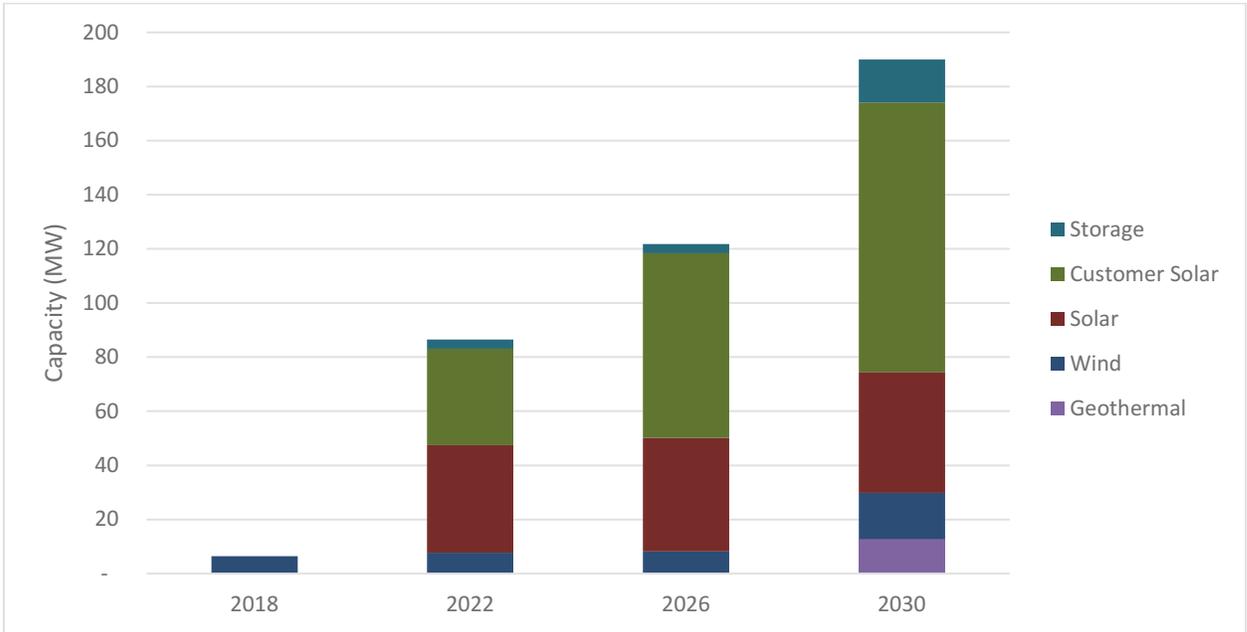
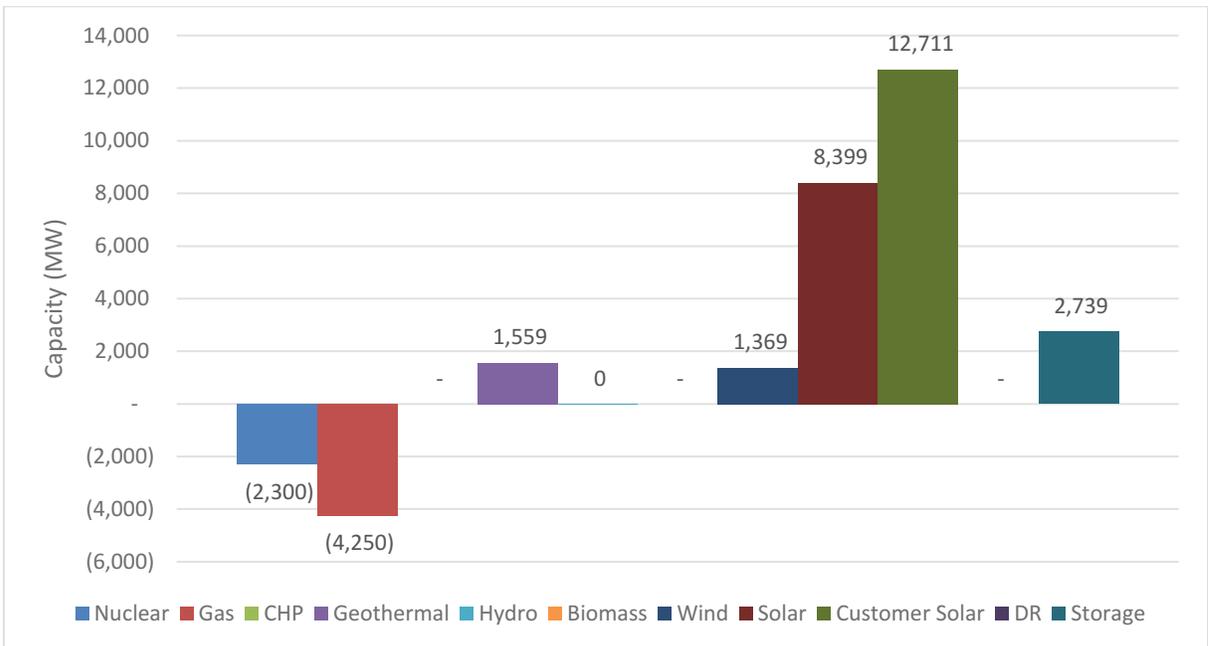


Figure 5 shows the net change in capacity by resource type between 2030 and 2018 for CAISO as output by RESOLVE.

Figure 5. CAISO Change in Capacity From 2018-2030 as Output from RESOLVE.



On net, there is a significant reduction in gas and nuclear generation and a significant rise in renewable generation, especially new solar resources. For the remaining gas and nuclear generation, DCE assumes these resources remain in the portfolio because they are the optimal resources to meet CAISO’s needs under the constraints input into RESOLVE. There is also significant addition of storage; all new storage modeled is lithium (Li) ion battery technology.

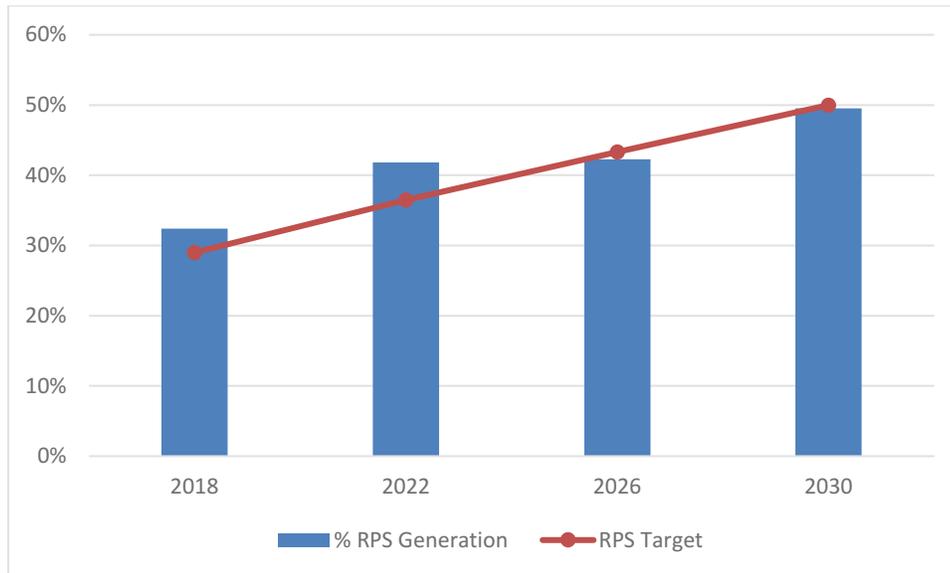
Table 6 is an excerpt from the GHG Calculator tool dashboard, showing that emissions attributed to DCE’s conforming portfolio under the clean net short method. All RPS-eligible resource types and BTM solar were input into the “Capacity Inputs” section of the tool. No reduction was made to reflect any assumption of PCC1 resources versus other types. The 3.45 MW of new lithium ion battery storage needed to meet state mandates was also included, as was DCE’s load ratio share of all new lithium ion battery storage in 2030 (15.9 MW). All other resource types are assumed to be part of system power. The result is that the conforming portfolio will produce 0.294 MMT of GHG emissions in 2030, which is above the 2030 benchmark of 0.268 MMT. Why it is above the benchmark is not entirely clear, but the preferred portfolio described in the next section is designed to provide additional carbon-free power, which will address this.

Table 6. Conforming Portfolio GHG Emissions Results.

| Emissions | Unit | 2018 | 2022 | 2026 | 2030 |
|---|--------------------------|--------------|--------------|--------------|--------------|
| Clean Net Short | <i>MMtCO2/yr.</i> | 0.135 | 0.334 | 0.351 | 0.315 |
| Owned or contracted non-dispatchable GHG-emitting resources | <i>MMtCO2/yr.</i> | - | - | - | - |
| Emissions offset for NW hydroelectric imports | <i>MMtCO2/yr.</i> | (0.007) | (0.019) | (0.020) | (0.021) |
| Total | <i>MMtCO2/yr.</i> | 0.128 | 0.315 | 0.331 | 0.294 |

Although DCE has not done a detailed analysis of RPS compliance—which would involve more consideration of eligible loads, REC banking, eligible resources not modeled in RESOLVE, and REC procurement standards—it has performed a simple calculation of the percent of supply-side resources in the portfolio that are RPS-compliant according to RESOLVE. This provides an indicator of whether the RPS goals will be met using this portfolio. As shown in Figure 6, the percent of RPS-compliant generation exceeds the target in 2018 and 2022 and is within one percentage point of the target in 2026 and 2030. DCE remains committed to meeting or exceeding all RPS goals set by the state.

Figure 6. Percent of conforming portfolio supply-side generation that is RPS eligible compared to RPS eligible generation target.



The portfolio results provided here are targeted at providing enough energy to meet DCE’s load. As noted above, we expect to procure RA separately. Given the resource mix is also adequate for meeting RA requirements for CAISO according to RESOLVE, we anticipate it will provide adequate RA for all LSEs.

Preferred Portfolio

Table 7 summarizes the 2018 preferred portfolio, which was based on contracts procured assuming DCE would begin service in 2018. Thus, this is subject to change.

Table 7. Summary of 2018 preferred portfolio.

| Product | Resource Type | Total Quantity (MWh) |
|-------------------------------|----------------------|----------------------|
| PCC1 RPS Eligible Generation | Geothermal | 90,000 |
| PCC1 RPS Eligible Generation | Utility Solar | 25,000 |
| PCC2 RPS Eligible Generation | Wind | 70,000 |
| Carbon-Free Energy | Large Hydroelectric | 92,000 |
| System Peak Energy Hedges | Unknown system power | 336,400 |
| System Off-Peak Energy Hedges | Unknown system power | 203,725 |

All contracts for RPS-eligible and large hydroelectric generation were tied to specific resources, the names of which are provided in the preferred portfolio baseline resource data template.¹⁰

For subsequent years, DCE made assumptions regarding resource types for its preferred portfolio, as follows:

- All added procurement of carbon-free energy comes from existing large hydro resources
- The amount of existing wind, geothermal, and solar energy in the portfolio was kept at 2018 levels.¹¹ Solar was modeled as CAISO solar and wind was modeled as NW wind in 2018. Solar and wind were modeled as CAISO solar and wind in future years.
- New solar generation was added in an amount equal to the new solar generation in the conforming portfolio. New solar was modeled as the Riverside East Palm Springs type generic resource from RESOLVE.
- All remaining RPS generation needed to meet annual targets was assumed to be met with new geothermal resources in the Greater Imperial Valley area.
- All system power reflects a conventional (that is, non RPS-eligible) generation mix in the CAISO system as output from RESOLVE. This is scaled to meet non-RPS eligible and non-carbon free portions of the portfolio.
- Since we do not have an alternative load forecast, the level of energy efficiency and customer solar generation is the same as the conforming portfolio
- The demand response and total storage capacity (both pumped hydro and lithium ion battery) included is the same as the conforming portfolio
- Reliance on PCC2 RECs decreases linearly from 2018 levels to zero by 2030; thus by 2030 all RPS-eligible resources can be counted as GHG-free in the GHG calculator tool

This portfolio is preferred over the conforming portfolio because it reduces GHG emissions and increases renewable generation in accord with local values in DCE's service territory and as approved by DCE's Board. Future IRPs will include more refined assumptions as actual contracts are signed and DCE sets more specific customer generation targets.

Figure 7 shows the capacity (MW) of each resource type in DCE's preferred portfolio. This is analogous to Figure 1 for the conforming portfolio. Again, because of the reliance on CAISO system generation for energy beyond RPS and GHG-free, the figure shows small amounts of resources that DCE is not specifically contracting with but are sold into the wholesale market from which DCE would purchase its system power (e.g., CHP and nuclear).

¹⁰ See Section 6 for more information regarding the resource templates.

¹¹ The 2018 contracted energy amounts were annualized for each full year modeled.

Figure 7. Preferred Portfolio Capacity by Resource Type.¹²

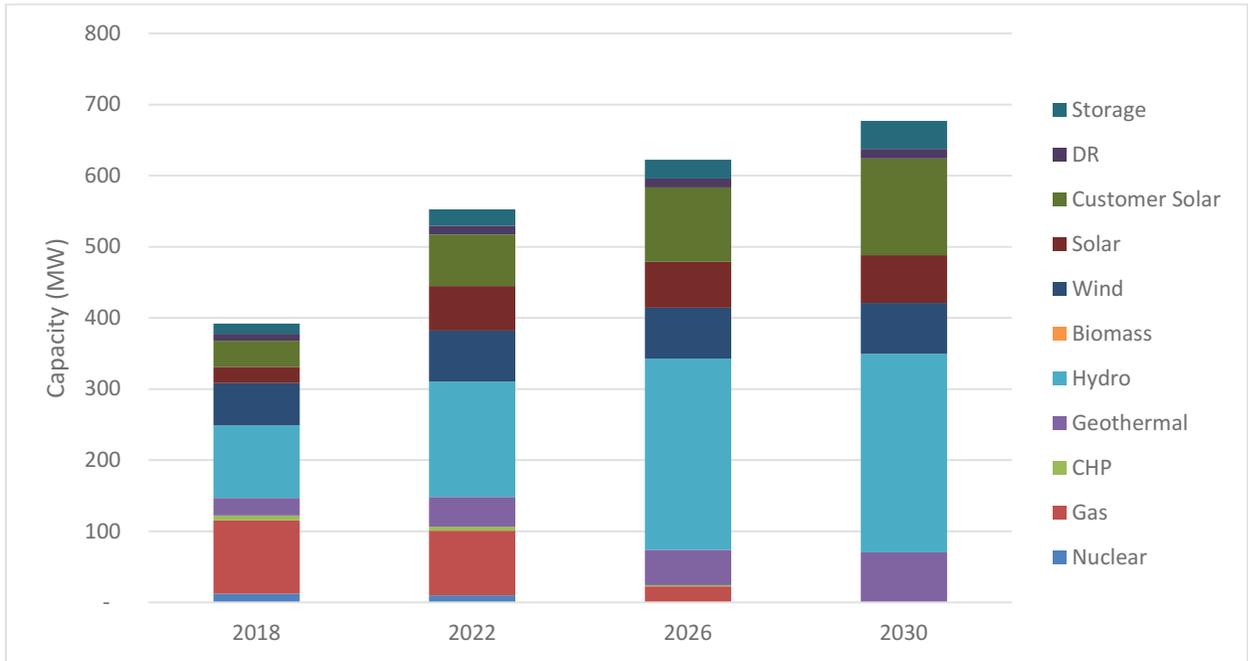
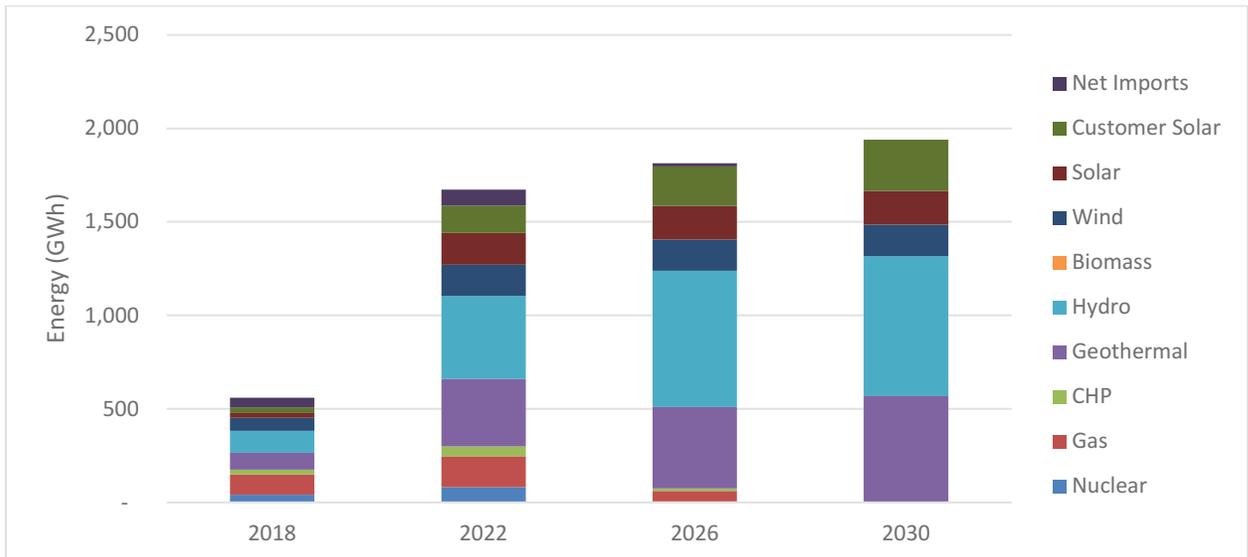


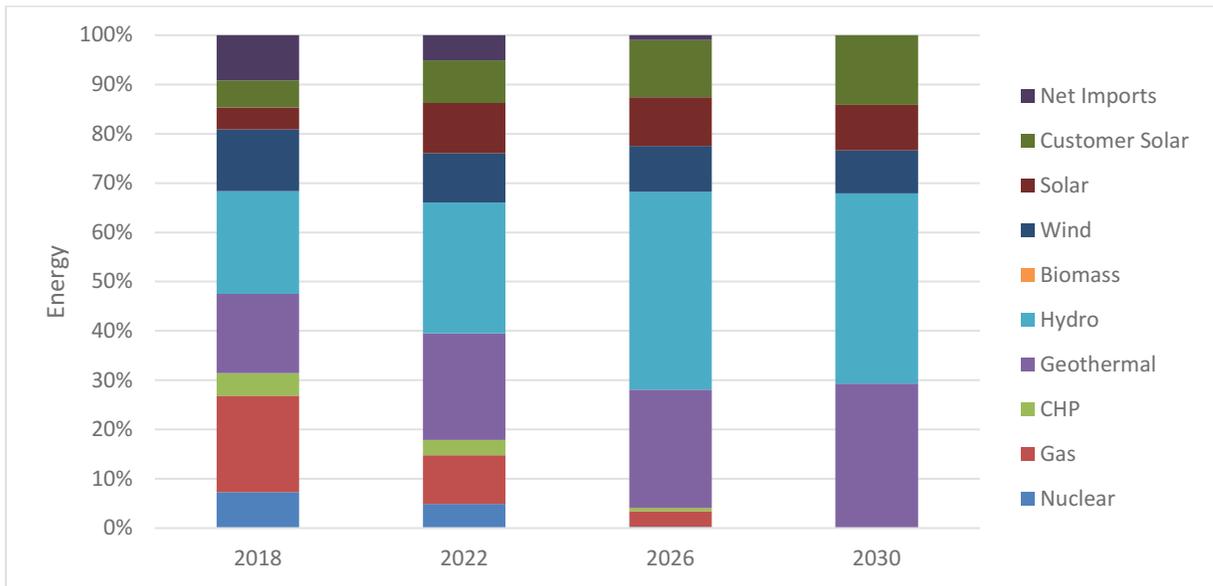
Figure 8 shows the preferred portfolio broken down by resource type on an energy (GWh) basis, including net imports. Figure 9 shows the energy by percentage of resource type to better show how the mix changes from 2018, which is a partial year.

Figure 8. Preferred Portfolio Energy by Resource Type.



¹² Nuclear resource shown is part of procurement of system power, which includes nuclear, gas, and hydro generation. Under the Board's approved procurement practices, DCE will not sign contracts specifically for nuclear power.

Figure 9. Preferred Portfolio Energy by Resource Type, %.



Comparing Figures 1-3 with Figures 7-9 shows that the preferred portfolio in 2030 differs from the conforming portfolio in the following ways:

- Reduces energy produced from gas and nuclear to zero
- Expands hydro generation from 10% to almost 40% of DCE’s energy portfolio
- Increases capacity additions of geothermal generation
- Eliminates reliance on biomass and small hydro to meet RPS requirements

Figure 10 shows the capacity that is planned or new based on the preferred portfolio. As discussed above, additional reliance on RPS eligible resources was assumed to be procured from new geothermal resources. Thus by 2030, the preferred portfolio contains 33MW of additional new geothermal capacity as compared to the conforming portfolio.

Figure 10. Preferred Portfolio New Capacity by Resource Type.

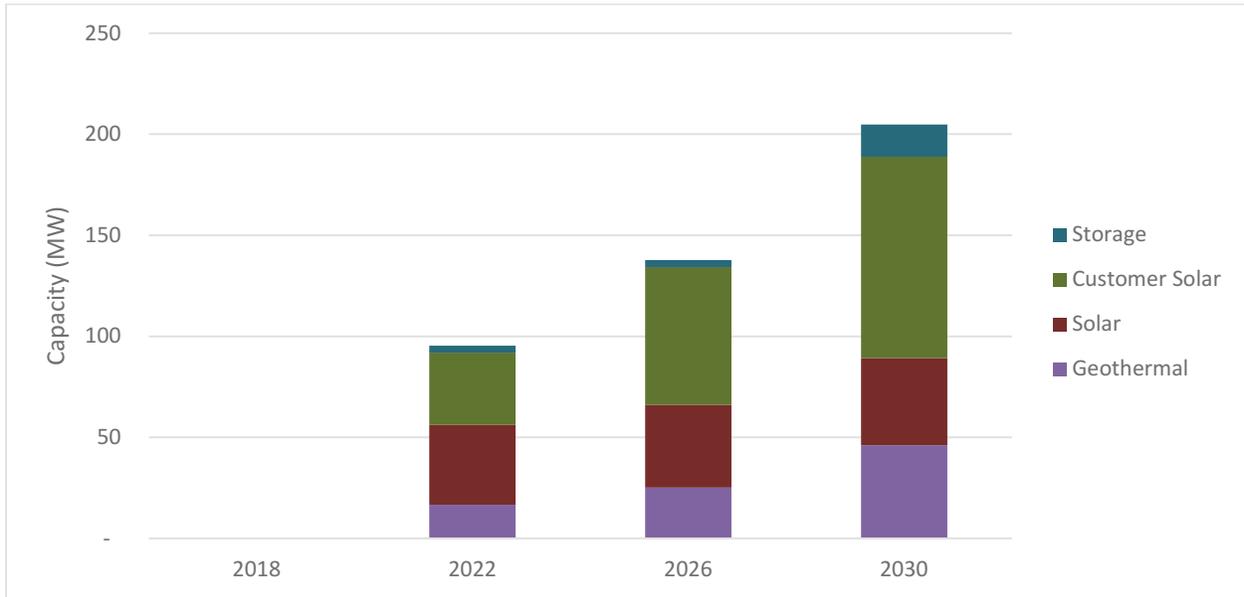


Figure 10 also shows the same addition of solar and storage resources as the conforming portfolio.

Table 8 is an excerpt from the GHG Calculator tool dashboard, showing that emissions attributed to DCE under the clean net short method. Only the PCC1 RPS-eligible resources, purchases of large hydro tied to specific resources to meet carbon-free procurement goals, and BTM solar were input into the “Capacity Inputs” section of the tool. As indicated earlier, all PCC2 purchases are not considered GHG-free under the approved methodology, and all other resource types are assumed to be part of system power. The result is that the preferred portfolio will produce 0.011 MMT in 2030, a reduction of 96% from the conforming portfolio, and well below the 2030 benchmark of 0.268 MMT. The result is not zero, however. This is a consequence of the clean net short methodology which may attribute a greater amount of GHG emissions during hours when load exceeds the amount of GHG-free generation than GHG emissions reductions during times when GHG-free generation exceeds load.

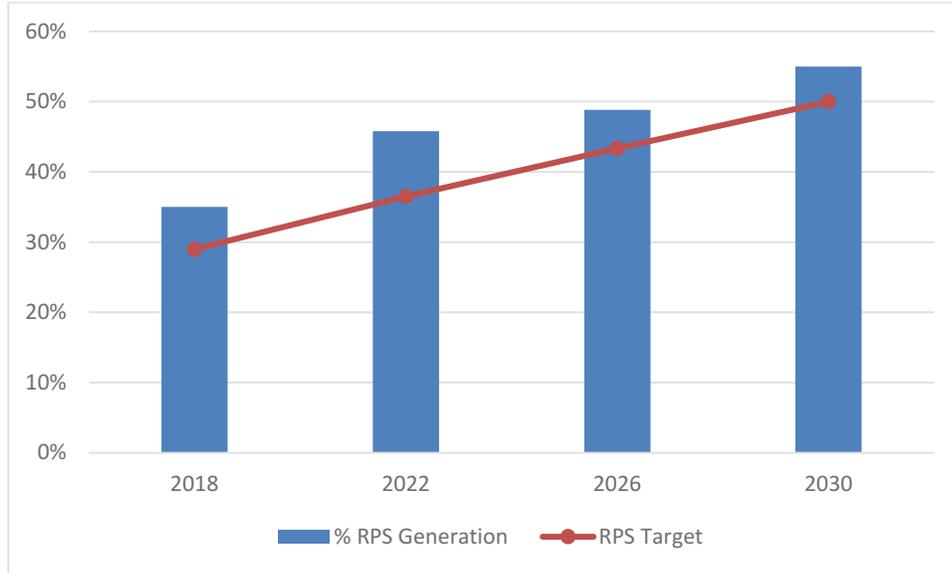
Table 8. Preferred Portfolio GHG Emissions Results.

| Emissions | Unit | 2018 | 2022 | 2026 | 2030 |
|---|------------------------------|--------------|--------------|--------------|--------------|
| Clean Net Short | MMtCO ₂ /yr. | 0.126 | 0.226 | 0.087 | 0.032 |
| Owned or contracted non-dispatchable GHG-emitting resources | MMtCO ₂ /yr. | - | - | - | - |
| Emissions offset for NW hydroelectric imports | MMtCO ₂ /yr. | (0.007) | (0.019) | (0.020) | (0.021) |
| Total | MMtCO₂/yr. | 0.119 | 0.207 | 0.066 | 0.011 |

Since the preferred portfolio includes a large amount of existing large hydro generation, at least some of which will be sourced from the Pacific Northwest, the emissions offset for northwest hydroelectric imports shown in Table 8 may include some double counting. However, even setting this to zero, the preferred portfolio will significantly reduce greenhouse gas emissions compared to the conforming portfolio and stay well below the benchmark.

Figure 11—analogue to Figure 6 above—shows that the amount of RPS-eligible generation in the preferred portfolio as a fraction of total generation exceeds the RPS target in all years modeled.

Figure 11. Percent of preferred portfolio supply-side generation that is RPS eligible compared to RPS eligible generation target.



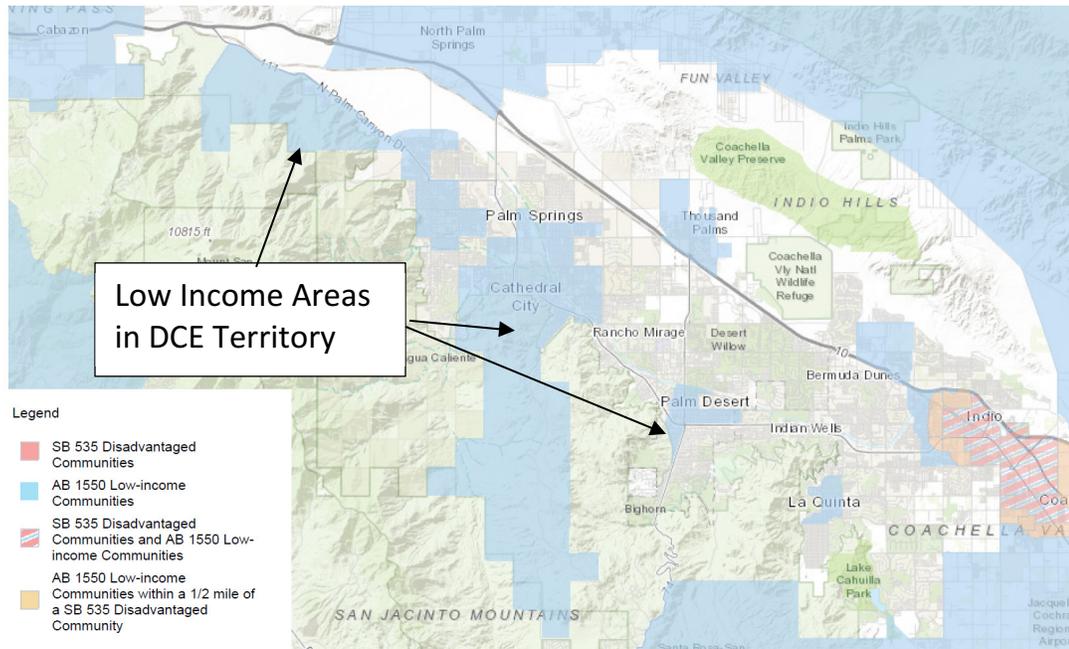
As with the conforming portfolio, the preferred portfolio is targeted at providing enough energy to meet DCE’s load, and DCE expects to procure RA separately. An alternative, preferred portfolio of RA resources may not be required or may be different than shown here for energy needs in future years. This will be reported on in future IRPs.

i. Local Air Pollutant Minimization

DCE’s service territory lies within Riverside County’s Coachella Valley. The valley has long been and continues to be a popular winter tourist destination and is home to a diverse population year-round. It is also known as a retirement haven and has a large population of people over 65.

We identified 81 census tracts that at least partially overlap with DCE’s three-city service territory. Based on the CPUC’s definition in D.18-02-018, none of the identified census tracts qualify as disadvantaged communities. However, there are 28 census tracts that at least partially overlap with areas considered low income under AB 1550. The map below shows these areas graphically. The greenhouse gas emissions reduction and air quality improvements associated with the preferred portfolio are expected to benefit the low income and disadvantaged communities in the region, even though these communities may be outside the DCE territory.

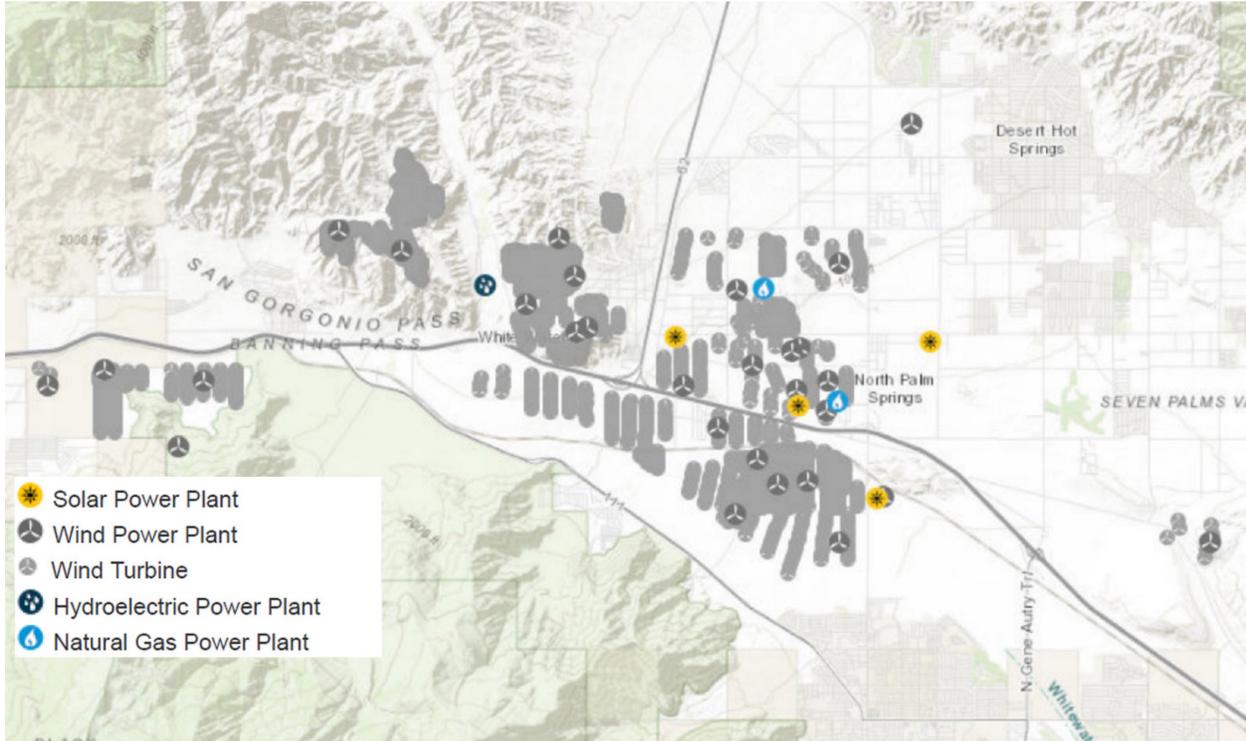
Figure 12. Map of low Income communities.



The DCE service territory also includes Tribal lands of the Agua Caliente Band of Cahuilla Indians. The Tribe itself is a direct access customer for their facilities (offices, casino etc.), and will not be enrolled automatically in DCE. Due to the checkerboard pattern of the Reservation lands, many DCE customers in Palm Springs and Cathedral City reside on Tribal leased land. DCE has kept the Tribe informed of our progress.

The Coachella Valley desert climate creates excellent conditions for renewable energy development. There is a significant amount of generation already in the Coachella Valley, especially near North Palm Springs. This includes several wind farms, multiple solar farms and natural gas-fired plants, as well as one small hydro plant. The map below from the Energy Information Administration (EIA) shows the location of these facilities.

Figure 13. Map of local generation resources.



The largest natural gas-fired station in the local area is the Sentinel Energy Center, an 800 MW facility in North Palm Springs.

Conforming Portfolio

Since DCE did not perform production cost modeling that could provide emissions for each generating resource, it only performed a limited analysis of NOx and PM2.5 emissions for the conforming portfolio. DCE used estimates of gas generation from Figure 2 and emissions rates in Table 4 to estimate total emissions. The table below reports our findings.

Table 9. Estimates of NOx and PM2.5 from gas generation in conforming portfolio.

| | NOx | | | | PM2.5 | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2018 | 2022 | 2026 | 2030 | 2018 | 2022 | 2026 | 2030 |
| Total Emissions (tons) | 5.2 | 11.5 | 17.1 | 18.4 | 3.5 | 7.5 | 11.2 | 12.0 |
| Total Generation* (GWh) | 459 | 1,362 | 1,455 | 1,657 | 459 | 1,362 | 1,455 | 1,657 |
| Effective Emissions Rate (t/GWh) | 0.011 | 0.008 | 0.012 | 0.011 | 0.008 | 0.006 | 0.008 | 0.007 |

*Excludes net imports and customer solar

The table shows a decrease in emissions intensity from 2018 to 2022 and then an increase in 2026, largely due to additional gas generation subsequent to the retirement of Diablo Canyon nuclear power plant in 2025. Emissions intensity then declines again in 2030.

Preferred Portfolio

DCE performed a similar analysis for the preferred portfolio. As the table below shows, the reduced reliance on gas generation in the preferred portfolio decreases the amount of NOx and PM2.5 emissions.

Table 10. Estimates of NOx and PM2.5 from gas generation in preferred portfolio.

| | NOx | | | | PM2.5 | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 2018 | 2022 | 2026 | 2030 | 2018 | 2022 | 2026 | 2030 |
| Total Emissions (tons) | 3.9 | 6.0 | 2.0 | 0.0 | 2.6 | 3.9 | 1.3 | 0.0 |
| Total Generation* (GWh) | 477 | 1,442 | 1,586 | 1,665 | 477 | 1,442 | 1,586 | 1,665 |
| Effective Emissions Rate (t/GWh) | 0.008 | 0.004 | 0.001 | 0.000 | 0.005 | 0.003 | 0.001 | 0.000 |

*Excludes net imports and customer solar

Either portfolio may include contracts with local existing resources. DCE plans to pursue development of new renewable resources in the Coachella Valley area. Such development is expected to reduce emissions and provide local economic development. DCE does not plan to contract with any new local fossil fuel resources. Thus, when customers elect to take service from DCE, it should not increase local emissions, and it may decrease local emissions, depending on how new renewable development impacts the dispatch of local natural gas-fired generation.

ii. Cost and Rate Analysis

DCE's rate setting has the following objectives:

- Rate competitiveness
- Rate stability
- Equity among customers
- Customer understanding
- Revenue sufficiency

Each objective is described in more detail in DCE's Implementation Plan.¹³ DCE intends to modify its procurement goals if necessary to achieve these objectives. DCE's ability to maintain rate competitiveness is also dependent on its customers' liability from SCE's PCIA charge. As of the time of this writing, DCE still anticipates the CPUC decision in the current PCIA proceeding, which is expected in July 2018.

As described earlier, at the start of service, DCE intends to adopt rate designs and rates based on SCE's current rates. The "Desert Saver" product will be priced 3% below SCE's rates and the "Carbon Free" product will be priced the same as SCE's rates. Over time, DCE will consider adopting unique rate designs. Rate setting will typically be done once per year in an

¹³ See descriptions beginning on page 27.

open and transparent process culminating in a Board decision each January. The Board retains the right to change rates at any time if circumstances warrant.

DCE's Board has approved the following rates for domestic (residential) customers in 2018: \$0.06376/kWh for Desert Saver customers and \$0.06634/kWh for customers electing Carbon Free power. As noted, these rates are based on SCE rates and may need to be revised prior to launch. All other rates, including time-of-use rates and commercial rates are available on DCE's website.¹⁴

At the start of providing service, DCE is offering a NEM program that will match SCE's rates for surplus production exported to the grid. Existing SCE NEM customers will be automatically enrolled. DCE will also continue SCE's FERA, CARE, and Medical Baseline programs for low income customers and those with medical limitations.

As described in more detail in the Implementation Plan,¹⁵ DCE expects positive cash flows in the near term and will use these revenues to build a rate-stabilization or reserve fund, as well as build DCE's credit profile.

Conforming Portfolio vs. Preferred Portfolio

With current prices of renewable and carbon-free energy, DCE fully expects it can meet its current procurement objectives as embedded in the preferred portfolio as well as its rate objectives. Should market conditions change, the conforming portfolio serves as a guidepost for an alternative portfolio that may allow DCE to meet its rate objectives, while achieving California's aggressive green power mandates.

c. Deviations from Current Resource Plans

DCE has not filed any other resource plans other than that described in its Implementation Plan. DCE's preferred portfolio is consistent with the filed Implementation Plan

d. Local Needs Analysis

DCE is in the LA Basin local capacity area at the eastern edge. Expected local RA requirements are summarized in Table 3. As stated earlier, because our modeling uses RESOLVE output as a starting point and RESOLVE has ensured adequate resources to meet system and local RA requirements, we assume there will be adequate local RA available to meet DCE's needs for each portfolio modeled. We have not attempted to construct a portfolio of future RA as procured from any specific resource or resource type. To the extent additional reliance on intermittent renewable generation in the preferred portfolio requires increased grid integration costs, DCE will respond, either by shifting its portfolio to non-intermittent renewable resources or procuring storage capacity or some other method in accord

¹⁴ See <https://desertcommunityenergy.org/billing-rates/>.

¹⁵ See Chapter 7: Financial Analysis.

with local goals and values. DCE also anticipates development of new renewable resources will be at least in part within or adjacent to its service territory, which should provide additional supply into the constrained LA Basin area.

5. Action Plan

This section presents DCE's planned activities for the next 1-3 years.

a. Proposed Activities

Preferred Portfolio

Anticipated plans for DCE's procurement schedule are summarized in Table 1 in the Introduction of this IRP. DCE still awaits the CPUC decision on the PCIA. After this, and after it establishes a new launch date, DCE will plan its first long-term solicitation for local, renewable energy. DCE intends this procurement will place a priority on benefitting disadvantaged communities but has not finalized any planned outreach or procurement scoring bonuses. In addition, DCE will also comply with SB350 long-term procurement requirements. We anticipate that procurement may begin in early 2019. DCE must also procure energy storage to meet requirements under AB 2514, but no specific timeline for this procurement has yet been adopted.

DCE's communities have been and will continue to be active participants in local environmental planning, including electric service improvements. Notably, during the past several years, the municipalities within DCE's service area have conducted detailed greenhouse gas inventory analyses and adopted municipal energy action plans designed to reduce energy usage, promote energy efficiency, and support the deployment of electric vehicles through 2020. All three cities have adopted Climate Action Plans, with a goal to reduce greenhouse gas emissions to 1990 levels. In addition, Cathedral City, Palm Desert, and Palm Springs are members of the Desert Cities Energy Partnership, which is a local government partnership comprised of Blythe, Cathedral City, Desert Hot Springs, Indian Wells, Palm Springs, Rancho Mirage, Agua Caliente Band of Cahuilla Indians, La Quinta, Coachella, Indio, Southern California Gas Company (SoCalGas), Imperial Irrigation District (IID), and Southern California Edison (SCE).

The Desert Cities Energy Partnership is designed to assist local governments to effectively lead their communities to increase energy efficiency, reduce greenhouse gas emissions, increase renewable energy usage, protect air quality and ensure that their communities are more livable and sustainable. This Partnership focuses on installing measurable and effective energy efficiency and conservation devices for the benefit of the cities, their constituencies, the State of California, and California IOU ratepayers. Partnership activities focus on implementing energy efficiency measures in municipal facilities but also promote energy efficiency community-wide. The partnership establishes energy savings goals through city-identified projects, funded by partnership incentives and technical assistance. The partnership supports city and community energy efficiency efforts through marketing and outreach funds.

A Plug-in Electric Vehicle (PEV) Readiness Plan was adopted by Coachella Valley Association of Governments in 2014; DCE member agencies were participants in the PEV plan. These activities leave DCE well-positioned to achieve continued energy efficiency improvements and gains in electric vehicle use in the future consistent with the default demand assumptions in Table 2.

Expected Board agenda items in the near term, include the following:

- Consideration of alternative rate designs and NEM enhancements to encourage further distributed generation. Feed-in tariffs for local renewable generation will also be considered.
- Developing new energy efficiency programs that enhance, but do not duplicate, existing programs
- Adopting procurement guidelines for improving service to and providing economic development opportunities for local disadvantaged communities
- Long-term procurement of new renewable and storage resources

Longer term, the Board also intends to consider new programs for demand response, electric vehicles, building electrification, and energy storage.

Conforming Portfolio

DCE expects similar programs and actions under either portfolio. The only significant difference would be the lower amount of renewable and carbon-free power procurement necessary with the conforming portfolio.

b. Barrier Analysis

Preferred & Conforming Portfolio

Since so little procurement has been completed, DCE is unable to provide a specific analysis of risks to its preferred portfolio. DCE views the increased reliance on renewable power and large hydro should reduce risk from resource retirements, as compared to the conforming portfolio, as fossil and nuclear assets are at highest risk. To reduce risk, DCE intends to invest in a diverse portfolio of clean generation, including wind, hydro, distributed solar, utility solar, and geothermal. One potential risk to a portfolio heavy in intermittent resources is rising grid integration costs, such as through the need for battery or other grid storage. DCE will monitor developments in storage technology and procure necessary resources to ensure integration of renewable and carbon-free power.

c. Proposed CPUC Direction

DCE is not seeking any specific CPUC direction at this time.

6. Data

DCE has completed the required data templates. Most of the entries are for generic resources and contracts, except for specific resources under contract for 2018 in advance of the August 2018 start date expected when this IRP was prepared. The data provided are consistent with the portfolio results described in Section 4.

a. Baseline Resource Data Template

The completed Baseline Resource Data templates are attached to this IRP as Data_DCE_BaseRsrc_Conforming_20180801 and Data_DCE_BaseRsrc_PREFERRED_20180801. The preferred portfolio template includes information on signed contracts for 2018. All additional lines are best estimates. (Note: these templates are not included here but will be attached to the CPUC submittal)

b. New Resource Data Template

The completed New Resource Data templates are attached to this IRP as Data_DCE_NewRsrc_Conforming_20180801 and Data_DCE_NewRsrc_PREFERRED_20180801. All entries are best estimates and reflect generic new resources. (Note: these templates are not included here but will be attached to the CPUC submittal)

c. Other Data Reporting Guidelines

We are providing copies of all Excel models developed for this IRP as well as the GHG Calculator tool with inputs for both portfolios. (Note: these models are not included here but will be attached to the CPUC submittal)

7. Lessons Learned

Preparing this IRP report for submittal prior to DCE's launch has been challenging. However, DCE anticipates that under the requirements that will synch timelines for CCA start up and resource adequacy procurement,¹⁶ future CCAs will not face the same challenges as DCE has. Nonetheless, we make the following recommendations for consideration for future IRPs:

- Approve a reference system plan using the load forecast that LSEs will use in their IRPs.
- Limit data template requirements for LSEs electing to rely on RESOLVE modeling instead of doing independent system modeling, as this took significant time to do. For instance, the

¹⁶ As required under Resolution E-4907.

baseline template could be limited to actual contracts and the new resource template could be limited to additional new resources not selected in RESOLVE for any Alternative Portfolios.

RESOLUTION NO. 2018-03

**A RESOLUTION OF THE BOARD OF DIRECTORS OF
DESERT COMMUNITY ENERGY
APPROVING DESERT COMMUNITY ENERGY'S
2018 INTEGRATED RESOURCE PLAN**

WHEREAS, Desert Community Energy ("DCE") is a joint powers authority established on October 30, 2017 for the purpose of implementing a community choice aggregation program under Public Utilities Code Section 366.2.0

WHEREAS, the Board has established a set of strategic goals to guide DCE energy procurement to promote renewable energy, carbon-free energy, and greenhouse gas emissions reduction; and

WHEREAS, has ongoing commitments to fulfill regulatory requirements related to energy procurement, including submittal of an Integrated Resource Plan to the California Public Utilities Commission; and

WHEREAS, the 2018 Integrated Resource Plan has been prepared to address how DCE will meet these strategic goals and regulatory requirements by managing a portfolio of energy and capacity resources; and

WHEREAS, the Integrated Resource Plan documents DCE's current procurement status and outlines resource planning objectives and future procurement plans; and

WHEREAS, the 2018 Integrated Resource Plan was presented to the Board of Directors at a duly noticed public hearing for its consideration and approval.

NOW THEREFORE BE IT RESOLVED as follows:

1. The Board of Directors hereby approves the Desert Community Energy 2018 Integrated Resource Plan.

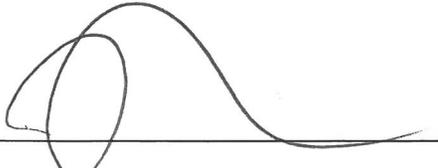
ADOPTED AND APPROVED by the Board of Directors of Desert Community Energy on this 16th day of July 2018.

AYES: 3
NOES: 0
ABSTAIN: 0
ABSENT: 0



Shelley Kaplan
Chair, Desert Community Energy

Attest:



Tom Kirk
Secretary, Desert Community Energy