APPENDIX 2

Standard LSE Plan

SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E)

2020 INTEGRATED RESOURCE PLAN

SEPTEMBER 1, 2020

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ATTACHMENTS:

SAN DIEGO GAS & ELECTRIC COMPANY
2020 INDIVIDUAL INTEGRATED RESOURCE PLAN

I. EXECUTIVE SUMMARY

In accordance with the direction provided in Decision ("D.") 20-03-028 and related rulings issued in the Commission's Integrated Resource Planning ("IRP") proceedings, Rulemaking ("R.") 16-02-007 and R.20-05-003, San Diego Gas & Electric Company ("SDG&E") submits this Individual Integrated Resource Plan ("IIRP"). As required by the Commission, SDG&E provides two preferred conforming portfolios[1/] (each a "Preferred Conforming Portfolio"); one that achieves the 46 MMT greenhouse gas ("GHG") benchmark, and a second that achieves the 38 MMT GHG benchmark.[2/] SDG&E's analysis confirms that it is well-positioned to achieve its 2030 GHG benchmark and reliability needs. Of the two Preferred Conforming Portfolios presented, SDG&E prefers the Conforming Portfolio associated with the 46 MMT scenario. Thus, SDG&E requests Commission approval for the 46 MMT scenario Preferred Conforming Portfolio.

A. Overview of the Process Used to Develop SDG&E's Plan

SDG&E's analysis relies upon the assumptions utilized in the Reference System Plan ("RSP"), which was approved in D.20-03-028 (the "RSP Decision"). At a high level, SDG&E compared; (i) its load forecast; (ii) its existing portfolio; (iii) procurement resulting from

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[1/] In accordance with the direction provided in D.20-03-028, SDG&E provides two conforming portfolios, one for the 38 MMT scenario and one for the 46 MMT scenario. The Commission required each LSE to select a "preferred" conforming portfolio for each scenario (since some LSEs may elect to provide more than one conforming portfolio for each scenario). Because SDG&E elected to provide only one conforming portfolio for each scenario, SDG&E's conforming portfolios also serve as its preferred conforming portfolios.

[2/] GHG benchmarks for the 38 MMT and 48 MMT scenarios were assigned to individual LSEs in the ALJ's Ruling Correcting April 15, 2020 Ruling Finalizing Load Forecasts and GHG Benchmarks for Individual 2020 IRP Filings, dated May 20, 2020.

D.19-11-016 (the "2017-2018 IRP Procurement Track Decision"), and; (iv) its position relative to existing procurement obligations[3/] to determine the optimal approach for long-term procurement planning on behalf of SDG&E's bundled service customers.

It is important to note that the analysis presented does not reflect significant load departure that is expected to occur in the SDG&E distribution service territory over the IRP planning period. In particular, the assumptions related to additional load fluctuation and existing portfolio resources used to develop SDG&E's analysis do not align with anticipated market developments in the San Diego region. As the Commission is aware, a substantial increase in the number and size of Community Choice Aggregator ("CCA") programs is anticipated in the San Diego area over the next few years, at the same time that Direct Access ("DA") is expanding statewide. Indeed, it is anticipated that the majority of load in SDG&E's distribution service territory will be served by other load-serving entities ("LSEs") by 2022. This significant shift is consistent with the Commission's own prediction that up to 85 percent of retail load may be served by LSEs other than the Investor-Owned Utility ("IOUs") within the next decade.[4/] This transition away from the IOU as the primary commodity retail service provider creates challenges, as well as opportunities, and raises important questions including: (1) how to forecast the volume of load remaining with the IOUs over the IRP planning horizon; and (2) how IOUs should allocate their existing portfolios to departing load.

[3/] Renewable Portfolio Standard ("RPS") compliance requirements, Resource Adequacy ("RA") compliance requirements and GHG benchmarks.

[4/] CPUC Staff White Paper, *Consumer and Retail Choice, the Role of the Utility, and an Evolving Regulatory Framework*, May 2017, p. 3. Available at: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Retail%20Choice%20White%20Paper%205%208%2017.pdf.

SDG&E's analysis relies upon the required California Energy Commission ("CEC") Integrated Energy Policy Report ("IEPR")-adopted load forecast, which assumes a significant decline in SDG&E's bundled load in 2021 as customers increasingly transition to CCA commodity retail service. However, the IEPR forecast assumes no additional load departure in the forecast period.[5/] There currently exists substantial uncertainty regarding the volume of load that SDG&E will serve within the next decade in light of continued growth in CCA and the reopening of DA.[6/] Thus, there may be significantly more load departure in SDG&E's service area than what is included in this analysis. As was expressed in SDG&E's March 13, 2020 Comments Regarding Administrative Law Judge's Ruling Allowing Updated Load Forecast, SDG&E urges the Commission to support accuracy of load forecasts in future cycles of the IRP such that LSEs portfolios more accurately represent the load it will serve over the planning period.

As this reality comes to fruition and SDG&E experiences substantial load departure beginning in 2021, SDG&E's need for resources will be reduced. Accordingly, SDG&E will need to "right-size" its portfolio in response to this expected transition. SDG&E will undertake this right-sizing in a manner consistent with its portfolio optimization framework, which is discussed in SDG&E's Draft 2020 Renewable Portfolio Standard ("RPS") Plan and in comments submitted in the Commission's Power Charge Indifference Adjustment ("PCIA") proceeding regarding Working Group #3 ("WG#3") on Portfolio Optimization. In order to avoid prejudging the resolution of issues currently before the Commission in the PCIA proceeding, the

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[5/] For SDG&E, this includes load departure projections associated with initial implementations plans from SDCP and CEA. Note that these projections have already changed and may continue to be adjusted over time.

[6/] D.19-03-009 expands the DA cap for the State by 4,000 GWh, ~380 GWh of which is allocated to the SDG&E service territory.

Commission directed the IOUs in this IRP cycle to assume that they retain their entire resource portfolios.[7/] Given the significant load departure expected in SDG&E's region in 2021, as discussed above, this assumption has a large impact on SDG&E's IIRP results.

B. Overview of SDG&E's Preferred Portfolios and Action Plan

Based on the Commission's direction to assume retention of its existing portfolio, SDG&E's Preferred Conforming Portfolios do not identify a need for incremental procurement in either the 46 MMT or 38 MMT scenario. Between now and the next cycle of the IRP, SDG&E expects its primary focus to be on taking action to right-size its portfolio as customers depart bundled service in favor of CCA and DA service. While future cycles of the IRP could result in a need for SDG&E to procure resources, any such procurement would be based on the evolving procurement landscape and/or new GHG targets or other procurement requirements established by the Commission.

The recent system reliability event where the California Independent System Operator ("CAISO") declared a Stage 3 Electrical Emergency and ordered the first rolling blackouts in the State since 2001, highlights the need to assess the State's energy landscape. As SDG&E transitions to a low carbon grid in 2030 natural gas facilities and infrastructure will act as a critical strategic partner to enabling renewable integration. SDG&E believes that a multi-faceted approach is needed to determine what caused the rolling blackouts. Areas to assess in the root cause analysis include: Resource Adequacy, energy sufficiency, import, exports, supply, retirements, load forecast, and policy (including market policy). If the Commission determines

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[7/] D.20-03-028, OP 8. The Commission's direction reflects its desire to provide a consistent planning assumption that allows the Commission to study state-wide GHG reduction and reliability procurement needs without pre-judging the results of the PCIA proceeding, which is charged with determining how to implement portfolio optimization efforts.

that rules and requirements need to evolve and that additional procurement to mitigate the system reliability issues are needed, the Commission should direct LSEs that lean on the system to meet reliability requirements to undertake the procurement required to meet the identified reliability need. If deficient LSEs are not able to meet their share of the system reliability need the Commission should support legislation designating a statewide Central Procurement Entity ("CPE"), to provide backstop procurement and mitigate the procurement gaps created by LSEs' individual procurement decision-making, while ensuring that the system reliability needs are met in an affordable and reliable way. LSEs who are not deficient should not be burdened with the obligation to procure on behalf of customers of other LSEs who have failed to do their part to meet reliability requirements.

SDG&E's IIRP includes a discussion of principles that it believes should guide future procurement:

1. The Commission must balance GHG goals and affordability

Achieving the goals of the IRP will require the Commission to consider multiple objectives, including meeting the State's GHG emissions reductions goals as contemplated in Senate Bill ("SB") 350 and SB 100 and prioritizing affordability to ensure that customer rates are reasonable. To strike the right balance between GHG mitigation and affordability, the Commission must:

- Allow time for new technologies to become affordable;
- Recognize that the transportation sector is critical to overall GHG reduction and that the transportation sector must do more;
- Understand that increased electricity rates may hinder decarbonization progress in other sectors;
- Prioritize customers impact; and

- Allow carbon sink projects to be part of the decarbonization solution.

2. Reliability must be prioritized

Ensuring the reliability of the electric grid is one of the most critical and fundamental obligations of the Commission. Thus, considerations related to system reliability are a key component of the IRP planning process. Due to the importance of reliability, natural gas facilities and infrastructure will act as a strategic partner in enabling renewable integration. In this IRP cycle, protecting system reliability will require:

- Maintaining existing gas plants and gas infrastructure to enable a transition to a clean energy future without compromising grid reliability (*e.g.*, explore pipeline integrity measures, and gas power plant enhancements); and
- Exploring viable long duration storage options such as hydrogen and pumped hydroelectric.

3. Investment in enabling infrastructure is key to IRP success

The IRP process must consider the infrastructure needed to achieve the State's ambitious GHG reduction goals. To meet the objectives of the IRP process, the Commission must focus on developing infrastructure that will facilitate delivery of clean energy through technologies such as microgrids and other grid technologies, as well as the need to increase installation of electric vehicle ("EV") charging stations to facilitate decarbonization in the transportation sector. Enabling infrastructure will be critical for the electric sector as well as other sectors to contribute to the State's decarbonization efforts in an affordable and reliable way.

II. STUDY DESIGN

A. Objectives

SDG&E's main objective in preparing its IIRP was to develop a plan to meet the assigned GHG benchmark based on its assigned load, while also achieving RPS and Resource

Adequacy ("RA") requirements in a least-cost, best-fit manner. SDG&E's analysis, which shows that SDG&E has no deficiencies in any of these areas, will be critical for the Commission to consider when it determines how to allocate procurement needs across LSEs, if any, and highlights that procurement should be allocated to LSEs that have deficiencies or to a CPE if the deficient LSEs are unable to procure the allocated amount.

SDG&E also addresses its existing portfolio of resources and how it may change over time as a result of load departure and other factors. Of particular note in this IRP cycle, two new Joint Powers Authorities ("JPAs") have formed in SDG&E's service territory – San Diego Community Power ("SDCP") and the Clean Energy Alliance ("CEA") – which is expected to significantly reduce SDG&E's load. As noted above, the Commission instructed LSEs to assume retention of their existing portfolio, despite expected load departure; therefore, SDG&E's analysis and data templates reflect this assumption. For example, if 50 percent of SDG&E's load departs to JPA service, SDG&E does not assume that it will optimize to 50 percent of its supply portfolio.

SDG&E's IIRP notes that SDG&E's portfolio is in flux and proposes that the Commission refrain from requiring SDG&E to procure additional resource on behalf of its bundled customers at this time, while acknowledging that SDG&E might be responsible for additional procurement in future IRP cycles as the result of evolving GHG and/or reliability targets. Section 1.B above briefly describes SDG&E's guiding principles for future procurement needed to serve bundled service customers.

SDG&E's IIRP also seeks to comprehensively describe SDG&E's activities related to disadvantaged communities ("DACs"). It is important that the Commission have a full understanding of the DACs in SDG&E's service area, including the factors that cause these areas

to be considered DACs, and the characteristics of the generation resources that are located in these areas.

B. Methodology

1. Modeling Tools

SDG&E relied on the following modeling tools to prepare its IIRP:

- GHG Clean System Power Calculator ("CSP"):[8/] this tool, which was formerly known as the Clean Net Short calculator, was used to determine the GHG mass quantity from SDG&E's portfolio and determine what additional actions, if any, may be needed during the planning period to meet the 2030 GHG planning targets.

- Production costing software was used to determine total generation portfolio costs included in the rate analysis. SDG&E used ABB's Portfolio Optimization Model, version 19.4. This tool differs from RESOLVE in several ways. First, this tool is not a capacity expansion model, but instead allows for hourly cost-based dispatch. The ABB model was used to obtain SDG&E-specific cost data for the Preferred Conforming Portfolios. Second, the ABB model dispatched SDG&E's Preferred Conforming Portfolios for all years and all days of the planning period, as compared to RESOLVE which only modeled four years and used a limited number of typical days.

2. Modeling Approach

SDG&E's approach to developing its two scenarios is consistent with the requirements set forth in D.20-03-028, therefore SDG&E is including the 46 MMT and 38 MMT benchmark scenarios. SDG&E details below the assumptions used and its assessment of procurement need.

a. Assumptions

As required, SDG&E used the "mid Baseline mid AAEE" version of Form 1.1c of the CEC's 2019 IEPR demand forecast for planning purposes across the IRP planning horizon for SDG&E's service territory. This load forecast includes fixed assumptions regarding the level of

[8/] The CSP was originally developed by the Commission and adopted in the May 25, 2018 *Administrative Law Judge's Ruling Finalizing Greenhouse Gas Emissions Accounting Methods, Load Forecasts, and Greenhouse Gas Benchmarks for Individual Integrated Resource Plan Filings*. It was later updated and renamed prior to the 2019-2020 IRP cycle.

BTM solar photovoltaic ("BTM PV"), Energy Efficiency ("EE"), electric vehicles ("EV"), energy storage, Demand Response ("DR") and building electrification. SDG&E also includes its existing resource commitments as of July 2020.

SDG&E's treatment of contract expirations in its modeling differed from the approach taken by Energy Division ("ED"). While ED assumed that all existing resources net of planned[9/] or economic retirements[10/] continued to operate for the planning period regardless of contract terms, SDG&E removed any existing resources from its portfolio based on contract expirations. Table 2-1 below shows SDG&E's expiring contracts through the planning horizon.

Table 2-1
SDG&E's Expiring Contracts through 2030

Technology Type	Contract Name	Capacity (MW)	Contract End Year
Biogas	Miramar	4.5	2023
Biogas	Prima Deshecha	6.1	2022
Biogas	Sycamore Landfill 2	2.25	2024
Biogas	HL Power Company, LP[11/]	24	2027
Demand Response	OhmConnect	4.5	2023
Natural Gas	Calpeak Escondido	45	2021
Natural Gas	CP Kelco	26.8	2024
Natural Gas	Goal Line (CHP)	49.9	2025
Natural Gas	Grossmont Hospital (CHP)	4.6	2026
Natural Gas	Otay Mesa	603.6	2024

9/ *E.g.*, Once-Through Cooling ("OTC") plants.

10/ RESOLVE uses an economic retention functionality to examine what portion of the existing gas-fired generation fleet may need to be retained or allowed to retire over the planning horizon. See Appendix A, slide 33 of IRP Ruling on Proposed RSP dated November 6, 2019.

11/ D.18-12-003 requires that IOUs monetize RA from their BioRAM contracts, which contemplates an IOU using the RA for compliance, however the Decision prohibits IOUs from using renewable energy credits ("RECs") for compliance. IOUs must instead make them available for sale.

Natural Gas	Yuma Cogeneration Associates (CHP)	50	2024
Solar PV	Maricopa West	20	2030
Specified Imports	Morgan Stanley (NOB)	190	2022
Wind	Coram	7.5	2026
Wind	Glacier 1	106.5	2023
Wind	Glacier 2	103.5	2024
Wind	Kumeyaay Wind	50	2025
Wind	Oak Creek	3.5	2024
Wind	San Gorgonio	11.2	2025

Making this assumption allows SDG&E to assess whether re-contracting with existing resources may be the best option in the future. Additionally, it is more conservative to assume contracted resources will retire. However, SDG&E did not assume Desert Star Energy Center (a 485 MW combined cycle power plant) would retire when its land lease expires in 2027. SDG&E maintained the Commission assumption that the plant would continue to operate throughout the planning cycle.

b. Assessment of Need

SDG&E's Preferred Conforming Portfolios demonstrate that it is well positioned to achieve the State 's climate and reliability goals under both the 46 MMT and 38 MMT benchmark scenarios. This is due in part to: (i) SDG&E's early compliance with RPS requirements, with around 45 percent of its energy mix expected to come from renewable resources in Compliance Period 3 (2017-2020); (ii) SDG&E's aggressive adoption of energy storage; (iii) the absence of coal resources in its portfolio; and (iv) disproportionate amount of clean resources as compared to its declining customer base due to the Commission's requirement that SDG&E retain its full portfolio for IRP modeling.

In assessing its need, SDG&E first compared its existing portfolio to its GHG benchmark, and RPS and RA compliance requirements. Although the RSP modeling is intended

to optimize for all three of these constraints to produce an optimal resource mix, it does not provide insight into the portion of these resources that each LSE should procure. SDG&E's analysis of its portfolios as compared to its compliance requirements provides guidance on whether the additional resources identified by the RSP should be procured by SDG&E or by other LSEs who have less robust portfolios.

- For GHG, SDG&E determined the portfolio's GHG mass production in each of the modeled years using the CSP. The result was compared to an allocated share of the total GHG benchmarks (38 MMT and 46 MMT, respectively) used in the RESOLVE model for each of the modeled years as formalized in the Assigned ALJ's Ruling.[12/] Although D.20-03-028 only set 2030 targets, evaluation of all of the years modeled in the CSP shows SDG&E's current and future positions as compared to the modeled glide path to meet the 2030 targets and provides useful information regarding short- and mid-term needs. SDG&E has no such need.

- For RA, SDG&E examined SDG&E's share of the local physical capacity requirements, and, local and system contractual requirements as follows:

    - The local physical capacity requirement was evaluated by comparing the California Independent System Operator ("CAISO") Local Capacity Requirement ("LCR") for the San Diego-Imperial Valley area against all generating resources within the same electrical area.

    - SDG&E's local contractual requirement was evaluated by comparing SDG&E's bundled portion of the CAISO LCR net of SDG&E transmission access charge ("TAC") area demand response to SDG&E's contracted resources within the San Diego-Imperial Valley LCR area.

    - SDG&E's system contractual requirement was evaluated by comparing SDG&E's bundled portion of the SDG&E TAC area 1-in-2 Net Electricity Peak Demand from the 2019 IEPR Form 1.5b, including a 15 percent planning reserve margin and peak load coincidence adjustment, to all resources contracted with SDG&E, regardless of electrical location.

- For RPS, SDG&E calculated its RPS position as the percentage of total bundled retail sales that were supplied by RPS eligible generation.

[12/] Available at: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M338/K276/338276679.PDF.

Table 2-2 below shows SDG&E's GHG, RA, and RPS positions relative to the various requirements and indicates that SDG&E expects to meet each requirement without additional incremental procurement at this time.

Table 2-2
2030 SDG&E Compliance Positions Relative to Requirements

	SDG&E Position	**Requirement**[13/]	
		with CHP	*without CHP*
GHG for 46 MMT	0.430 MMT CO2	1.247 MMT CO2	1.093 MMT CO2
GHG for 38 MMT	0.461 MMT CO2	1.031 MMT CO2	0.876 MMT CO2
Resource Adequacy	Consistent with the RA methodology described above for local physical capacity requirements, and, local and system contractual requirements, SDG&E will meet its RA requirements		
RPS for 46 MMT	105%	60%	
RPS for 38 MMT			

In addition to the analytical results produced for each benchmark or requirement in Table 2-2, supplemental analysis was performed to compare the RSP resource mix with SDG&E's portfolio resource mix. This analysis indicates SDG&E should not be allocated incremental procurement requirements at this time because SDG&E's portfolio is well-positioned with regards to clean energy resources like solar and wind, despite having lower volumes of geothermal and hydro than the statewide mix. For example, because of its location, hydro makes up a small part of SDG&E's resource mix, requiring more gas-fired resources to provide the long duration, multi-day dispatchable energy that hydro can provide for other LSEs.

[13/] For GHG requirements, values represent emissions with and without combined heat and power.

Table 2-3
Resource Mix - RSP Compared to SDG&E's 2030 Portfolio

	46 MMT		38 MMT	
	RSP	**SDG&E**	**RSP**	**SDG&E**
Nuclear	0.7	0	0.6	0
CHP	2.4	0	2.3	0
Natural Gas	26.2	38.9	22.9	38.9
Coal	0	0	0	0
Hydro (Large)	7.4	0	7.0	0
Hydro (Scheduled Imports)	3.0	0	2.8	0
Biomass	0.9	0.3	0.9	0.3
Geothermal	1.9	0	1.8	0
Hydro (small)	1.0	0.1	1.0	0.1
Wind	10.8	22.6	12.6	22.6
OOS Wind on New Tx	0.6	0	3.0	0
Solar	27.1	31.9	26.7	31.9
Battery	12.7	5.1	12.9	5.1
Pumped Storage	2.7	0.9	3.2	0.9
Demand Response	2.5	0.2	2.4	0.2
Total Percent	100	100	100	100
Customer Solar (% of supply-side resources)	21.0	57.6	19.9	57.6
Gas Not Retained (% of remaining supply-side resources)	0.03	0.0	2.0	0.0

It is important to note that while SDG&E does not propose in its IIRP to undertake new incremental procurement, its IIRP does contemplate continued compliance with existing procurement mandates such as mandates implemented through the Procurement Track of the previous IRP cycle. As required by the 2017-2018 IRP Procurement Track Decision, OP 13, an update on the status of that procurement is discussed in Section 4 – Action Plan.

III. STUDY RESULTS

A. Conforming and Alternative Portfolios

SDG&E elected to provide the two required Conforming Portfolios, one portfolio based on the 46 MMT benchmark and one portfolio based on the 38 MMT benchmark. SDG&E's two

Conforming Portfolios are also SDG&E's Preferred Conforming Portfolios given SDG&E did not provide more than one Conforming Portfolio for each scenario. Due to the assumptions required for this cycle's IRP which requires SDG&E to retain its entire portfolio when modeling the two scenarios, SDG&E's existing portfolio is able to achieve both GHG benchmarks in 2030, making both portfolios provided in this IIRP identical. SDG&E did not elect to provide an Alternative Portfolio.

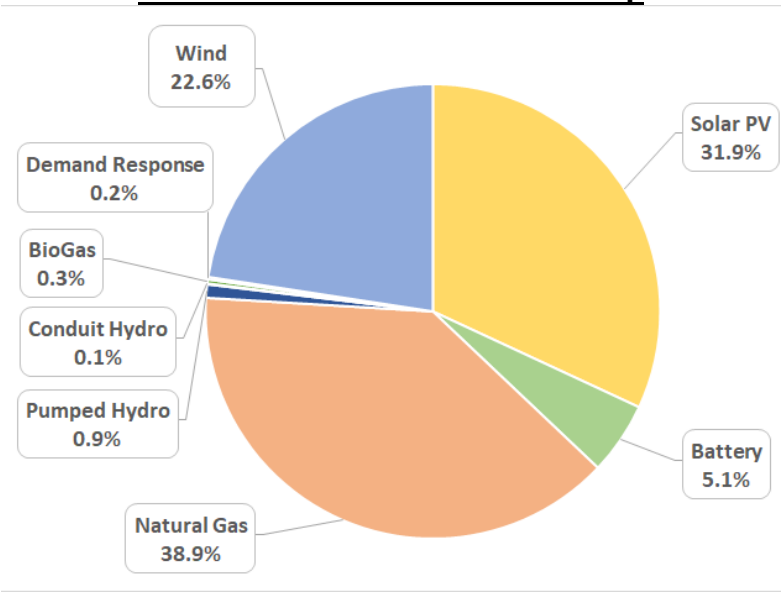
As noted elsewhere in this IIRP, while SDG&E expects its portfolio will change significantly in the coming years to accommodate load departure, the current Preferred Conforming Portfolios demonstrate that SDG&E's portfolio will meet the GHG reduction requirements of this cycle's IRP. Based on the planning requirements for this IRP, no new near-term incremental procurement is required at this time, however that may change due to recent system reliability events.

SDG&E's Preferred Conforming Portfolios include all contracted resources as well as shortlisted resources as a result of the 2017-2018 IRP Procurement Track Decision. SDG&E is not proposing new resources, beyond what was shortlisted, therefore a description in table form of how new planned resources compare to the mix of new resources identified in the RSP is not included.

As mentioned above, SDG&E's Preferred Conforming Portfolios are identical, therefore, the resources within SDG&E's Resource Data Template ("RDT") are the same for both the 46 MMT and 38 MMT cases. Figure 3-1 below, illustrates the makeup of SDG&E's portfolio which is reflected in both RDTs. As a starting point, SDG&E is a leader in renewable energy and is expected to achieve around 45 percent RPS in in Compliance Period 3 (2017-2020). Consistent with SDG&E's Draft 2020 RPS Plan, SDG&E will continue to meet and exceed state

RPS mandates.[14/] As shown below, SDG&E's portfolio is primarily made up of solar, wind, natural gas, and energy storage with small amounts of biomass and hydro. The total capacity of resources in 2030, excluding customer solar, is 4,232 MWs.

Figure 3-1
SDG&E's Portfolio Content Makeup



B. Preferred Conforming Portfolios

SDG&E's Preferred Conforming Portfolios are those required by the Commission, described above. These portfolios result in lower GHG emissions than SDG&E's assigned benchmark for the 46 MMT and 38 MMT Preferred Conforming Portfolios. Of the two Preferred Conforming Portfolios included, SDG&E supports approval of the 46 MMT Preferred Conforming Portfolio which strikes the right balance between the goal of advancing the State's climate goals, and the need to avoid placing a disproportionately high cost burden on electric sector customers. Affordable electricity rates are key to incentivizing other sectors to implement

[14/] See SDG&E's Draft 2020 RPS Plan filed July 6, 2020 available at: https://www.sdge.com/sites/default/files/regulatory/R.18-07-003%20SDGE%202020%20Draft%20RPS%20Plan%20Public%20Version.pdf

GHG reduction initiatives; for example, lower electricity rates for charging will result in greater adoption of EVs, which will reduce GHG emissions within the transportation sector. The 46 MMT Preferred Conforming Portfolio also: (i) allows more time for new technologies to become affordable; (ii) enables other sectors to achieve greater GHG reductions (*e.g.*, transportation sector); (iii) maintains natural gas plants and gas infrastructure which will be important for other GHG free solutions in the future; and (iv) is within the California Air Resources Board ("CARB") range of acceptable emissions. Table 3-1 below, describes how SDG&E's selections are consistent with each relevant statutory and administrative requirement.

Table 3-1

Evidence of Compliance for 46 MMT and 38 MMT Benchmark Scenarios

Requirement	Evidence of Compliance
§ 454.51 Identifying a diverse and balanced portfolio	The supply diversity of SDG&E's Preferred Conforming Portfolio is shown in Figure 3-1, which shows SDG&E's resource mix is made up of multiple generating resource types such as solar, wind, biomass, natural gas and storage.
§ 454.52(a)(1)(A) Elec sector / LSE GHG targets	Emissions associated with SDG&E's Preferred Conforming Portfolios, based on the CSP methodology, are below the benchmarks for each Preferred Conforming Portfolio; 46 MMT and 38 MMT respectively. These benchmarks reflect the CPUC's efforts to develop individual targets that will result in meeting the electric sector's contribution to reducing GHG emissions below 40 percent from 1990 levels by 2030.[15/]
§ 454.52(a)(1)(B) RPS targets	SDG&E is fully compliant with RPS and long-term contracting requirements. SDG&E continues to procure to meet resource-specific renewable procurement mandates, as required, but does not expect to procure additional resources for RPS compliance purposes until after 2030.

[15/] Both SDG&E portfolios assume no incremental procurement so GHG cost assumptions are the same in both scenarios. To the extent future IRP cycles signal that SDG&E would have to procure additional resources to meet a future GHG target SDG&E would focus on ensuring that the GHG technologies adopted preserve our guiding principle to balance GHG and affordability.

§ 454.52(a)(1)(C) Just and Reasonable Rates 454.52(a)(1)(D) Minimizing impacts on ratepayer bills	A forecast of the resulting system average rate based on the required cost assumptions is discussed in Section 3.E. SDG&E notes it proposes no procurement. Going beyond than the 38 MMT target would result in higher costs.
§ 454.52(a)(1)(E) Ensuring system and local reliability	SDG&E's portfolio was developed in compliance with the CPUC's current Resource Adequacy framework to address both system and local needs.
§ 454.52(a)(1)(F) Strengthening the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities	This requirement is met through reliance on the RSP and coordination among agencies and proceedings. For example, at the transmission level, the CAISO's planning assumptions are expected to consider the results of the Commission's IRP proceeding and long-term forecasts of energy demand produced by the CEC in its IEPR. At the distribution level, coordination between the IRP, Distribution Resources Plan (DRP) and Integrated Distributed Energy Resource (IDER) proceedings allows the IRP to include the most up-to-date information regarding any potential value of deferring distribution upgrades with preferred resources. This coordinated effort to share information improves the diversity, sustainability and resilience of the grid, which benefits local communities.
§ 454.52(a)(1)(G) Enhance distribution systems and demand-side energy management	SDG&E's Preferred Conforming Portfolio incorporates the demand-side assumptions built into the CPUC's RSP including assumptions made within the IEPR. These assumptions reflect the adopted forecasts of demand-side resources.
§ 454.52(a)(1)(H) Minimizing air pollutants with early priority on disadvantaged communities ("DACs")	SDG&E's Preferred Conforming Portfolio relies on the adopted RSP and thus incorporates its impacts on disadvantaged communities. SDG&E's portfolio assumes a continued focus on programs that minimize air pollutants in DACs, as described in Section D, below.
D.19-11-016, OP 13. Status of mandated procurement resulting from the 2017-2018 IRP cycle's Procurement Track	As required by the 2017-2018 IRP Procurement Track Decision, SDG&E is providing the Commission staff information within its IIRP detailing contract and resource information, to allow the Commission and stakeholders to monitor progress about system reliability and renewable integration. Please see Section 4 for more detail on this topic.

C. GHG Emissions Results

The GHG mass emissions associated with SDG&E's Preferred Conforming Portfolios from the CSP, as compared to its share of the GHG mass planning benchmarks, 46 MMT and 38 MMT respectively, in RESOLVE are shown in Table 3-2 below. This shows that the GHG emissions associated with SDG&E's Preferred Conforming Portfolios are below both 2030 GHG emissions benchmarks. No custom hourly load shapes for GHG-free generation were used in the CSP.

Table 3-2
SDG&E's Preferred Conforming Portfolio 2030 Emissions Relative to Benchmark for 38/46 MMT

	SDG&E Position	Requirement	
GHG for 46 MMT	0.430 MMT CO2	1.247 MMT CO2 (with CHP)	1.093 MMT CO2 (without CHP)
GHG for 38 MMT	0.461 MMT CO2	1.031 MMT CO2 (with CHP)	0.876 MMT CO2 (without CHP)

Given SDG&E's current RPS position, with around 39 percent of its energy mix coming from delivering renewables in 2019 and no coal resources, SDG&E's portfolio has reduced GHG emissions such that the reduction benchmarks are achieved for both scenarios. This fact, in combination with SDG&E's energy storage progress, leads to the conclusion that no incremental procurement beyond SDG&E's current obligations is needed. The emissions under the 38 MMT case are slightly higher even though both portfolios are the same. This is due to the assumptions inherent in the CSP calculator under the 38 MMT case, which are slightly different due to production cost modeling differences from running the lower emission state-wide portfolio.

D. Local Air Pollutant Minimization and Disadvantaged Communities

1. Local Air Pollutants

As required, SDG&E provides local air pollutants associated with its Preferred Conforming Portfolios using the CSP. Table 3-3 below, shows the results of SDG&E's analysis for NOx, PM2.5, and SO2.

Table 3-3
SDG&E's Preferred Conforming Portfolio NOx, SO_2 and PM 2.5 Emissions

SDG&E 46 MMT Preferred Conforming Portfolio				
Emission	**2020**	**2022**	**2026**	**2030**
NOx (tonnes/yr)	485	272	245	84
PM 2.5 (tonnes/yr)	218	82	81	29
SO_2 (tonnes/yr)	69	55	41	15
SDG&E 38 MMT Preferred Conforming Portfolio				
Emission	**2020**	**2022**	**2026**	**2030**
NOx (tonnes/yr)	487	272	244	76
PM 2.5 (tonnes/yr)	219	83	81	31
SO_2 (tonnes/yr)	69	55	41	15

2. Focus on Disadvantaged Communities

This section describes SDG&E's efforts to minimize local air pollutants with early priority on DACs. As instructed in D.20-03-028, SDG&E includes information as required by D.18-02-018. Specifically, D.18-02-018 requires: DAC demographics, a description of which DACs the LSE serves, current and planned activities or programs impacting DACs, discussion on estimates of emission of annual greenhouse gases, information for planned resources if proposed to be located in a DAC (emitting and non-emitting), outreach efforts within DACs, criteria for evaluating procurement in DACs, and information on fossil-fueled plants within DACs. SDG&E responds to each of these topics below:

- **DAC demographics -** DACs are defined as "any community statewide scoring in the top 25 percent statewide or in one of the 22 census tracts within the top five percent of communities with the highest pollution burden that do not have an overall score, using the most recent version (CalEnviroScreen 3.0) of the California Environmental Protection Agency's CalEnviroScreen tool."[16/] Application of these criteria to SDG&E's service territory yields 38 DAC census tracts. SDG&E serves approximately 64,000 customers in these census tracts which are largely located in South San Diego (Chula Vista, National City and San Ysidro) along with El Cajon in the East. This makes up about five percent of SDG&E's total customers. Table 3-4 below presents additional demographic details for SDG&E's DACs compared with SDG&E's overall distribution service territory. [17/]

Table 3-4
DAC Demographics[18/]

	DACs	SDG&E Territory
General Demographics		
Male	53%	50%
Female	47%	50%
Median Age	29	37
CARE Customer Breakdown Total		
Total Customers	64,222	1,366,878
Total CARE Customers	27,458	241,822
CARE participation rate	43%	18%
Customer Type %		
Industrial	0.13%	0%
Commercial	16%	11%
Residential	83%	89%
Rate Type Breakdown %		
TOU Rate	17%	16%
Res TOU	39%	43%

16/ Narrative Template pp. 8-9.

17/ Demographics reflect census tract level data. Note that some customers in each census tract may be served by DA providers.

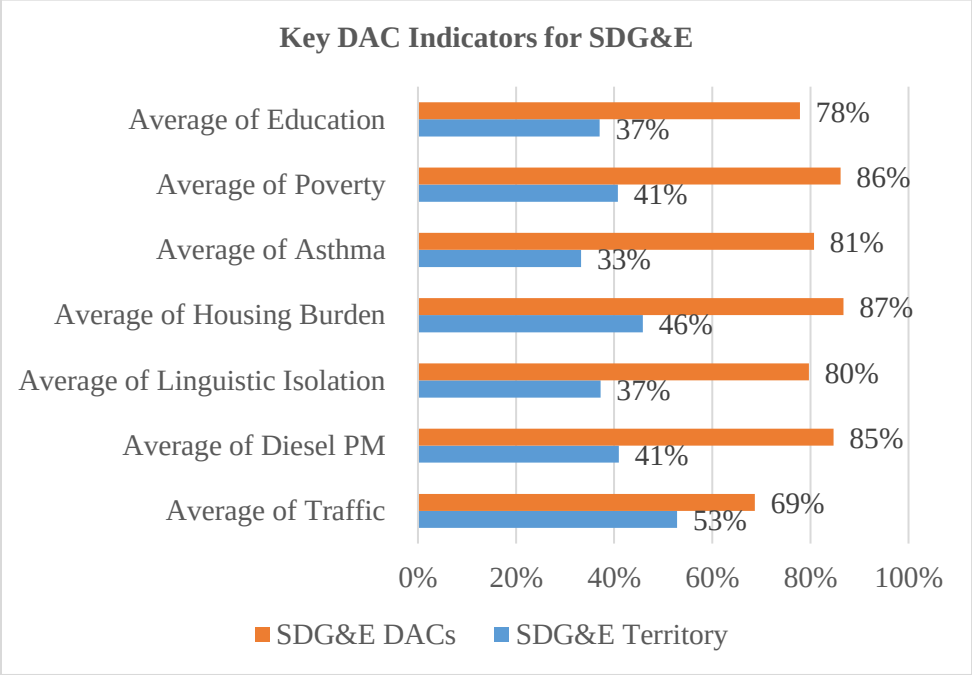
18/ SDG&E Territory data does not include DAC census tract data.

Net Energy Metering Customer	5%	13%
DA Customers	0.50%	0.40%

Understanding what factors contribute to each of SDG&E's DACs is critical to designing the best approach to serving these communities. CalEnviroScreen's designating factors are divided into two categories: pollution factors[19/] and population factors.[20/]

The key indicators for SDG&E's DACs are shown in Figure 3-2 below. These indicators show that SDG&E DACs are burdened to a larger degree than the rest of its service territory with issues involving education, poverty, asthma, housing, linguistic isolation, diesel Particulate Matter ("PM") and vehicle traffic.

Figure 3-2[21/]



- **DACs served by SDG&E –** Figure 3-3 below provides a view of SDG&E's DACs along with CalEnviroScreen rankings. The highest scoring DACs are located near major transportation corridors. This highlights the need to continue

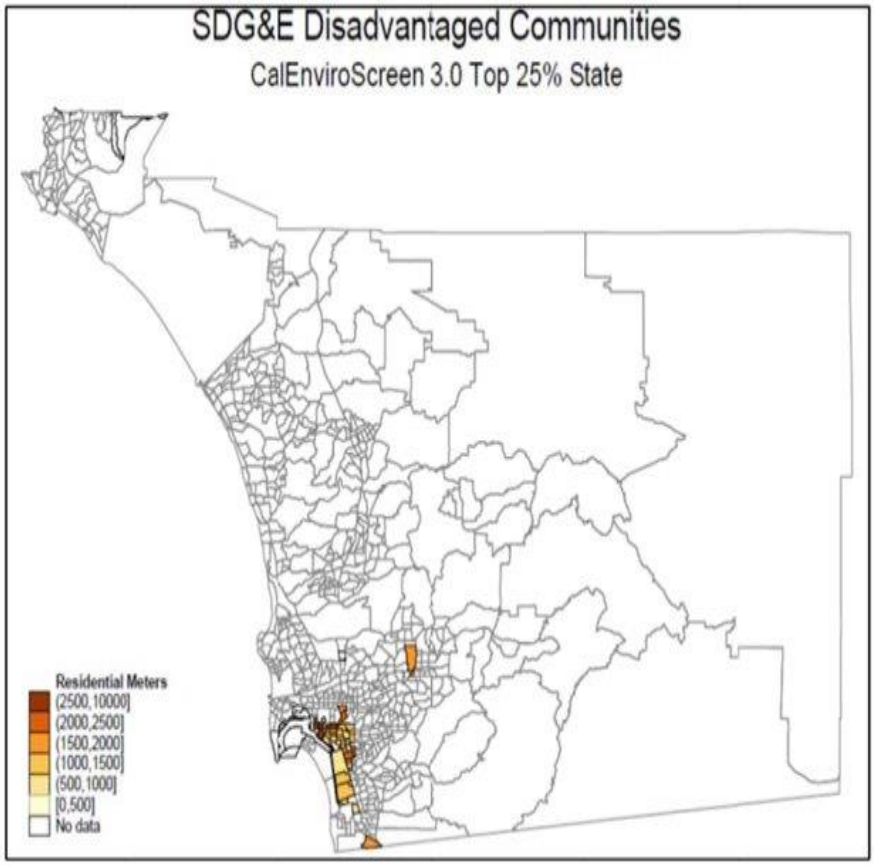
[19/] Pollution factors include; ozone, PM 2.5, diesel PM, pesticide, toxic release, cleanup sites, groundwater threats, hazardous waste, imp. Water bodies, solid waste.

[20/] Population factors include; asthma, low birth weight, cardiovascular disease, education, linguistic isolation, poverty, unemployment and housing burden.

[21/] Source: CalEnviroScreen 3.0. aggregate average percentile score by census tract.

efforts to maintain a clean power production fleet, but also to focus on the transportation sector as a major contributor to pollution in DACs. Effectively serving DACs requires an understanding of the characteristics of the relevant communities and analysis of the factors that quality them as DACs. Factors that are particularly relevant to SDG&E's DACs include diesel particulates, traffic, housing burden, linguistic isolation, poverty, asthma and education level. Since SDG&E has very few conventional generation resources located in DACs, it will be critical for SDG&E to focus not only on reducing power plant emissions and pollution, but also on understanding the pollution impacts from other sectors as it considers how best to serve DAC customers.

Figure 3-3



- **Current programs serving DACs -** SDG&E has a number of current and planned DAC-related initiatives, which are summarized in Table 3-5 below. Many of these measures address some of the top DAC indicators for these communities, for example by providing economic assistance with energy bills or low-cost opportunities to participate in green programs like energy efficiency and solar.

SDG&E is committed to serving the needs of its DAC customers. More than forty percent of SDG&E's DAC customers receive bill assistance through the California Alternate Rates for Energy ("CARE") program. In addition, SDG&E CARE customers are automatically referred to the Energy Savings Assistance ("ESA") Program that offers no-cost energy efficiency measures to income eligible customers that have not already been treated through the ESA Program.

All of SDG&E's existing or proposed electric vehicle programs target DACs in some way, and SDG&E proposed significant clean energy improvements for the Port of San Diego. The Commission approved SDG&E's request and SDG&E will pursue specialized energy efficiency measures through a pilot program as requested in A.17-09-005.[22/] The Port is located near SDG&E's most concentrated DAC area and the pilot program will help provide emission reduction in that area.

SDG&E's extensive set of EV programs provide a significant and meaningful opportunity to reduce air pollution. Transportation electrification programs provide substantial GHG benefits for San Diego DAC customers since transportation makes up 40 percent of the GHG emissions in California,[23/] approximately 50 percent of the GHG emissions in San Diego County,[24/] and 55 percent of the GHG emissions in the City of San Diego.[25/] The CARB's recently-released GHG Emission Inventory highlights the importance of focusing on transportation-related initiatives. While electric sector emissions have continued to decline and now represents 15 percent of statewide GHG emissions, the transportation sector continues to see challenges, for example, the transportation sector saw a 6 percent increase in emissions between 2013-2017.[26/] SDG&E intends to continue its focus on these programs, while exploring ways to further serve its DAC customers.

[22/] D.19-12-022 p. 48.

[23/] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf.

[24/] http://www.sdforward.com/pdfs/EIR_final/Appendix%20G%20Greenhouse%20Gas%20Emissions.pdf.

[25/] https://www.sandiego.gov/sites/default/files/final_july_2016_cap.pdf.

[26/] https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf.

Table 3-5
SDG&E Existing/Pending Programs Serving DACs

Initiatives	Description
Rates	
California Alternate Rates for Energy (CARE)	Bill discount for income eligible customers
Family Electric Rate Assistance (FERA)	Bill discount for income eligible customers
Energy Efficiency	
Energy Savings Assistance (ESA)	No-cost energy efficiency measures for eligible homes
Procurement Programs	
Green Tariff Shared Renewables (GTSR) Environmental Justice (EJ) Carve-out	SDG&E's GTSR (community solar) program includes a carve-out of 10 megawatts (MW) to be procured from projects sized between 0.5 and 1 MW located within the 20 percent most impacted areas identified by CalEnviroScreen 2.0.
Solar on Multifamily Affordable Housing (SOMAH)	To encourage the development and installation of solar systems on multi-family low income complexes in California's DACs. Launched in summer of 2019. To date, the statewide program administrator has shared with us that no installations have occurred, but they are actively recruiting in SDG&E's territory.
DAC Single Family Solar Homes (DAC-SASH)	The DAC-SASH program is newly available in mid-2020 to low-income customers who are resident-owners of single-family homes in DACs. Unlike traditional SASH, eligibility for DAC-SASH is not limited to designated affordable housing units, and so will be available to a broader group of homeowners than the current SASH program.[27] This program is administrated by a statewide administrator and SDG&E has no insight at this time into enrollments.
DAC-Green Tariff	While this program has been approved by the CPUC, the CPUC has not approved SDG&E's budgets, and the program will not launch until funds are available. Modeled after the Green Tariff portion of the Green Tariff/Shared Renewables Programs, the DAC-Green Tariff program (DAC-GT) was approved by the CPUC on June 21, 2018. DAC-GT will be available to customers who live in DACs and meet the income eligibility requirements for CARE and FERA. DAC-GT will provide a 20 percent rate discount compared to their otherwise applicable tariff. This will allow customers who are not in a position to take advantage of SOMAH or DAC-SASH (described below) to choose clean energy options without the need to own their home and without

[27/] The Singe-Family Affordable Solar Homes (SASH) program is administered by the Center for Sustainable Energy for SDG&E's service territory.

	the cost of installing their own distributed renewable energy generation systems.
Community Solar Green Tariff	While this program has been approved by the CPUC, the CPUC has not approved SDG&E's budgets, and the program will not launch until funds are available. The Community Solar Green Tariff (CSGT) program is another variation on the Green Tariff/Shared Renewables Program and is structured similarly to DAC-GT. The Community Solar Green Tariff program will allow primarily low-income customers in disadvantaged communities to benefit from the development of solar generation projects located in their own or nearby disadvantaged communities. The program provides these customers opportunities to gain a sense of ownership of locally-generated solar power, via the required efforts of a local sponsor.
Pilot Programs	
CARE Programmable Communicating Thermostat (PCT)	Targeted at high usage CARE customers to test if PCTs assist them on a time-of-use (TOU) rate.
Expanded CARE Energy Storage (ES) Program	Provides a $1.20/watt incentive (up to $75,000) to cover the full cost of ES for Expanded CARE Non-Profits
Demand Response Pilot	The pilot program targeting DACs from the Demand Response proceeding has been approved by the CPUC. The Pilot is on hold due to the COVID-19 orders from the state. The Pilot's purpose is to install a battery in a nonprofit community services location, and via outreach to small and medium DAC business show them the advantage of using a small battery to help manage their energy usage. Outreach about the project will also go to residential customers.
Electric Vehicles[28/]	
Power Your Drive Pilot	• EV grid-integrated charging infrastructure program that has installed 3,040 Level 2 chargers at 254 apartments, condos, and businesses. • DAC target: 10 percent[29] (Current program has 32 percent DAC implementation).
Port Electrification	• Installed 30-40 pieces of equipment, including 13 charging ports, to support medium/heavy-duty EVs and electric forklifts at the Port of San Diego. • DAC target: Majority in DACs. (Current program has 100 percent DAC implementation).
Electrify Local Highways	• Installed 88 Level 2 ports and 8 Direct Current Fast Charger charging stations at four Caltrans Park-and-Ride lots located

[28/] Current program unless otherwise noted.

[29/] DACs associated with EV programs are defined consistent with D.16-01-045 and SDG&E Advice Letter 2876-E.

	along highways for public use. • DAC target: Current program has 50% DAC implementation.
Dealership Incentives	• Offer educational materials, training and financial incentives for dealerships that sell EVs in exchange for customers agreeing to participate in one of SDG&E's EV rates. • Emphasize sales in DACs and focus on dealerships in DACs.
Fleet Delivery	• Installed charging ports for about 79 fleet delivery vehicles at four locations. • DAC target: Current program has 75% DAC implementation.
Green Shuttle	• Installed charging stations at 3 locations frequented by shuttles on a fixed route, including 4 Direct Current Fast Chargers and six high powered Level 2 chargers. • DAC target: Current program has 67% DAC implementation.
Airport Ground Support Equipment	• Phase 1: Retrofit 16 existing chargers, collect data, and develop a load management plan; • Optional phase 2: Install up to 45 charging ports to support about 90 new pieces of electric ground support equipment at San Diego International Airport.
Power Your Drive for Fleets (MD/HD) and V2G Electric School Bus Pilot	• Install EV charging infrastructure to support approximately 3,000 Class 2-8 medium/heavy-duty EVs including forklifts and transport refrigeration units at 300 sites. • V2G Electric School Bus Pilot will utilize 6 electric school buses capable of V2G as a distributed energy resources to bid into the CAISO markets. • DAC target: 30 percent of infrastructure budget.
Power Your Drive for Schools (AB1082)	• Future pilot proposal to pilot EV charging infrastructure in schools and educational institutions. • DAC target: 40 percent.
Power Your Drive for Parks (AB1083)	• Future pilot proposals to pilot EV charging infrastructure in State/City/County parks and beaches. • Expansion of AB 1083 to City and County parks will enable larger opportunity for DAC incorporation. • DAC target 50 percent.
Power Your Drive for Work and Homes Extension	• Application for an extension of the Power Your Drive Pilot Program to add 2,000 Level 2 charging ports at workplaces and multi-unit dwellings over two years. • DAC target: 10 percent.

In addition to the existing and proposed programs listed above that serve DACs, SDG&E has also successfully contracted with or built multiple renewable energy facilities located in DACs. For example, although SDG&E does not have any retail customers in Imperial County, renewable facilities made more economic by SDG&E's Sunrise Powerlink provide a helpful economic boost to the region, which has historically suffered from significant unemployment and high poverty

levels. In addition, one of SDG&E's first energy storage facilities was built in El Cajon, a DAC within SDG&E's service area.

- **Estimates of emission of annual greenhouse gases** - The Commission has directed LSEs to include in their IRPs "detailed estimates of annual greenhouse gases and local air pollutants (including at least, nitrogen oxides and particulate matter), as well as annual starts of natural gas plants" in DACs.[30/] Providing DAC-specific emissions related to SDG&E's portfolio is not meaningful, because emissions from these plants cannot be specifically tied to SDG&E's Preferred Conforming Portfolios, or to the energy needs of the DACs in which they are located. These units are dispatched by the CAISO and thus are operated to meet all loads and not just the load served by SDG&E, or the load in the DAC. However, to help inform the Commission as to the operation of plants located in DACs in SDG&E's service area, SDG&E provided a list of the plants in Table 3-6.

  It is also important to note that for SDG&E's service area, the number of natural gas plants located in DACs is relatively small. These plants fall into two categories: Combined heat and power ("CHP") facilities and natural gas peaker plants that provide both system and local reliability. SDG&E's contract for the 26.8 MW CHP facility will expire in 2024. Of the two peaker plants located in DACs, one is under a long-term contract with SDG&E. The other is owned by SDG&E. Both of these plants are used to meet local resource adequacy obligations. These plants are bid at their variable operating cost to the CAISO markets. The market solution determines their operation based on CAISO needs, not SDG&E's bundled need.

  SDG&E also has an energy storage facility located in a DAC. SDG&E installed a new energy storage facility in El Cajon in 2017, in response to the Commission's request to add energy storage to reduce reliance on natural gas plants due to the reduction in Aliso Canyon's operational gas storage.

  Information regarding natural gas plants located in DACs in SDG&E service area is provided in Table 3-6 below:

Table 3-6
SDG&E Owned or Contracted Natural Gas Plants in DACs

Facility	Size (MW)	Description
CP- Kelco	26.8	CHP Facility, under contract to SDG&E through 2024, per CHP settlement
El Cajon Energy Center	48.1	Peaking facility under contract through 2035, needed to meet local resource adequacy
Cuyamaca Facility	47	Peaking facility owned by SDG&E, needed to meet local resource adequacy

30/ D.18-02-018, OP 7.

- **Locational information for all planned resources if proposed to be located in a DAC including emitting and non-emitting resources:** Procurement mandated by the 2017-2018 IRP cycle is underway. It is expected that two shortlisted battery storage projects will be located in a DAC; one in El Cajon and one in Santa Ana, California.

- **Evaluation criteria for potential procurement in DACs:** SDG&E is developing methods to ensure that new procurement will prioritize the reduction of air emissions and pollution in DACs. First, SDG&E will focus on use of bid evaluation criteria to ensure "early priority" for reducing air emissions in DACs. Specifically, SDG&E will actively seek bids for non-emitting resources located in DACs by using bid evaluation criteria that favor such projects. SDG&E is incorporating DAC considerations into its least-cost, best-fit ("LCBF") valuation methodology. A similar approach to the approach utilized under the RPS program will be applied to procurement made under the IRP (*i.e.*, it will be applicable to the evaluation of all technologies as well as new or operating facilities). This ensures that impacts to DACs are evaluated at the earliest possible opportunity and that the results are incorporated into the decision-making process. Qualitative criteria are used to compare projects of similar cost, meaning that a project that provides benefits to DACs may be ranked higher than a similar project that does not provide such benefits.

E. Cost & Rate Analysis

The RSP Decision requires LSEs to provide data showing forecasted revenue requirements and system average rate information to reflect how the LSE anticipates its Preferred Portfolio will affect costs for its customers. Due to expected departing load and the assumption that SDG&E's existing portfolio is retained, SDG&E does not require incremental procurement. In Attachment A hereto (Revenue Requirements and System Average Bundled Rates for Preferred Conforming Portfolio) includes a table that reflects SDG&E's existing portfolio costs through 2030. The revenue requirements in Attachment A do not include anticipated portfolio optimization activities that might include, but are not limited, to REC and/or RA sales due to load departure. Consistent with the direction provided regarding filing requirements, SDG&E's analysis is based on revenue requirements reflective of SDG&E's general rate case ("GRC") and other Commission approved revenues and balancing accounts,

and modeling assumptions provided in the category descriptions below. Note that the illustrative system average rates provided in Attachment A are for purposes of this IRP only, are not representative of SDG&E's actual rates, and should only be used for the limited purpose of assessing the impact of the Preferred Portfolios.

- **Line 1 Transmission**: Transmission revenue requirements reflect SDG&E's Federal Energy Regulatory Commission ("FERC") Approved 2020 rates and escalated per SDG&E's Form 8.1 a/b submittal to the CEC in its 2019 IEPR.

- **Line 2 Distribution**: Distribution revenue requirements reflect SDG&E's GRC and Commission approved revenues in 2020 rates and escalated per SDG&E's Form 8.1 a/b submittal to the CEC in its 2019 IEPR.

- **Line 3 Generation**: Generation costs are based on a production cost model run of SDG&E's portfolio to meet bundled load requirements per the CEC's approved load forecast Form 1.1c grossed up for losses. The generation costs include CAISO load charges, PCIA up to market costs, and the bundled customer share of generation revenue requirement, net of market revenues, for generation resources paid for by all customers. This includes PCIA above market costs and resources that are subject to Cost Allocation Mechanism ("CAM")[31/] and the Competition Transition Charge ("CTC").

- **Line 4 Demand-Side Programs**: Demand-side management ("DSM") program costs include Energy Efficiency and Demand Response Programs in SDG&E's Commission approved revenues in 2020 rates and escalated per SDG&E's Form 8.1 a/b submittal to the CEC in its 2019 IEPR.

- **Line 5 Other**: Costs include Department of Water Resources ("DWR") bond charges, public purpose programs, GHG Allowance revenue returns and other miscellaneous expenses in SDG&E's Commission approved revenues in 2020 rates and escalated per SDG&E's Form 8.1 a/b submittal to the CEC in its 2019 IEPR.

All costs have been converted to 2019 dollars using the required deflator. Based on these assumptions, the resulting system average rate is shown in Attachment A.

[31/] This is represented as the Local Generation Charge ("LGC") rate component for SDG&E.

F. System Reliability Analysis

SDG&E supports the Loss of Load Expectation ("LOLE") methodology for verifying the reliability of the aggregated portfolio, that it meets a minimum reliability criterion of less than or equal to 0.1, or 1 day in 10 years LOLE. This assessment is performed in development of the RSP and it is performed again to test the reliability of the aggregated LSE's conforming portfolios.

While there is not currently an effective method for determining which LSEs are deficient in their share of meeting the system reliability criteria, requiring a load and resource comparison table from each LSE is an important first step. SDG&E's table can be found in Attachment B. Attachment B compares the expected peak load of each LSE + planning reserve margin ("PRM") with the net qualifying capacity ("NQC") of the LSE's generation resources. A 15 percent PRM is currently used in this comparison.

For the next IRP cycle, analysis should be conducted to calibrate the PRM so that the portfolio which meets the new PRM also produces a LOLE that does not exceed 0.1. Intuitively, the increased penetration of intermittent and use-limited resources should push the PRM that produces a 0.1 LOLE to a higher level. If this analysis is performed and a new PRM is determined that is equivalent to a 0.1 LOLE, then this PRM can be used with LSE peak load in the next cycle IRP filings to determine each LSE's contribution to system reliability. The Commission adopted SDG&E's proposal in the RA proceeding to perform a new PRM analysis. SDG&E believes the Commission could incorporate such results into the next IRP cycle.

This process will encourage a robust analysis of reliability needs by each LSE as they develop their planning assumptions. It also allows the Commission to determine which LSEs should be responsible for system reliability procurement needs by assessing which portfolios are deficient relative to their individual system requirements. If an interim reliability assessment is

needed before the Commission can complete this full process, it will be critical to understand how to allocate that need appropriately to the LSEs with portfolios that fall short of system RA requirements. Additionally, the Commission may wish to consider how much in energy-limited resources each LSE may procure to meet their system RA requirements. Relying solely on energy-limited resources will risk reliability even if an LSE were to meet its system RA requirements. The Commission needs to ensure reliability can be met in the long-run because when significant reliability issues surface in the RA time frame, it will be too late to avoid load shedding (*i.e.*, blackouts) to maintain reliability if no additional resources exist at that time.

Attachment B is intended to provide SDG&E's assessment of the effective capacity in its portfolio relative to its peak demand allocation for September of each year, similar to RA program requirements. The RDT uses each LSE's 2021 RA allocation and estimates its RA requirement for 2022-2030 based on the 2021 value. This approach does not make sense for SDG&E considering that between 2020 and 2023, SDG&E's bundled load requirement is expected to decrease by approximately 60 percent due to load departure. SDG&E will go from serving 78 percent of the region's electrical demand to 30 percent within this timeframe. Taking into account anticipated load departure, SDG&E's RA requirement in 2022-2030 will be significantly lower than in 2021, which is what is used in the RDT analysis.

Since the RDT instructions prohibit modification, the table in Attachment B depicts an inaccurate SDG&E RA position. Therefore, SDG&E performed a separate internal analysis of its contractual System RA positions as described in Section 2B. Importantly, SDG&E's analysis is more accurate because it accounts for departing load and includes accurate calculations that reflect RA requirements after load departure. For the reliability analysis performed, SDG&E assumed that expiring contracts were allowed to terminate and were not renewed. Additionally,

the Desert Star Energy Center is assumed to remain available beyond 2027, the year its land lease expires. The table in Attachment B shows a surplus capacity in all years after load departure.

G. Hydro Generation Risk Management

SDG&E's portfolio consists of one small pumped hydro generation facility, whose unique characteristics, ensure minimal in-state drought risk for SDG&E. SDG&E ran a scenario without its 40 MW pumped hydro facility to quantify any potential procurement need due to droughts and the results of that quantitative analysis indicated that SDG&E still met its GHG, RA, and RPS requirements. Furthermore, a portion of SDG&E energy needs are supplied by the market, some of which could include hydro from other areas of California. To the extent there is a drought limiting hydro energy in the market, there are other resources available to mitigate those risks.

SDG&E has much less hydro than the RSP which greatly reduces risk incurred by droughts. SDG&E compensates for less hydro by having more gas-fired generation, which provides dispatchable energy regardless of the precipitation levels. The increased GHG resulting from having more gas-fired generation than the RSP is offset by having more renewables, particularly solar, than the RSP.

H. Long-Duration Storage Development

SDG&E's current portfolio consists of a diverse set of resources, including natural gas-fired generation, while remaining below the GHG benchmarks. From a statewide perspective, long-duration storage could provide important benefits to the grid that mirror benefits provided by natural gas-fired generation and the underlying gas infrastructure. As California transitions toward a GHG-free statewide portfolio, emerging technologies such as long-duration storage must be further developed to meet the reliability needs of the future grid in an affordable way.

Seasonal variability of renewable generation, intra-day ramping needs and the potential for multiple-day renewable energy droughts, highlight the need for flexible, dispatchable resources that are available year-round.

Natural gas combustion and its underlying natural gas infrastructure can support a high-renewable portfolio by responding to: (i) intra-day ramping needs; (ii) multi-day renewable droughts; and (iii) seasonality. Four-hour battery storage can assist with intra-day ramping, but not multi-day solar droughts, nor seasonality. Further analysis must be conducted to confirm that batteries are optimized in a way that maximizes their intra-day ramping capability during significant events.

With clean energy technologies constantly evolving, it is possible that in the future, a new or modified solution for long-term storage will emerge. Retaining natural gas combustion and infrastructure through much of the IRP planning cycle through 2030 is prudent as it can act as a bridge to allow for potential new technologies and for carbon-free or even negative carbon combustion via combustion of hydrogen, combustion of renewable natural gas ("RNG"), or combustion of natural gas with Carbon Capture Sequestration ("CCS").

Benefits of combusting hydrogen include that it releases zero emissions. Further, if that hydrogen is green hydrogen (*i.e.*, generated from 100 percent renewable electricity), then combusting green hydrogen would meet the goals of zero carbon electricity. RNG combusted at power plants uses existing power plants and pipeline infrastructure. RNG combustion also has the potential to provide negative emissions and depending on where the RNG is sourced, it could have the added benefit of reducing methane from the Agriculture sector and potentially from DACs. Combustion of RNG provides all three reliability benefits of natural gas combustion. Similarly, combustion with CCS is another option that could provide all three reliability needs

listed above and be a zero-carbon resource. CCS utilizes generators and pipelines that have already been built and paid for rather than burdening ratepayers with unnecessary new build costs. However, while CCS and RNG technologies are promising, they must be further developed to become an affordable solutions.

A key guiding principles for SDG&E's future procurement is the need to explore technologies that can replace long-duration dispatchable attributes currently provided by gas-fired generation across the state in a responsible way. Although SDG&E's portfolio does not support development of such resources at this point, SDG&E is continually monitoring opportunities that support the transition to clean long-duration resources in the future without jeopardizing the reliability needs of the grid and SDG&E's ability to deliver clean energy to all of its customers.

While there is not an immediate need for long-duration storage in the RSP, as iterations of the IRP occur, it will be important to reassess the needs for the grid that account for current and future system reliability constraints to determine when, and how to incorporate long-duration storage in a cost-effective manner.

I. Out-of-State Wind Development

Modeling indicates that there is minimal need for out-of-state wind development through 2030. Further, SDG&E has no need for resources up to 2030, therefore, it does not plan on undertaking out of state wind procurement.

J. Transmission Development

SDG&E does not propose procurement in its IIRP, thus is not including information regarding resource location information in the RDT as there is none to report. SDG&E recognizes that transmission development may be necessary to help the procurement efforts of other LSEs in the region. SDG&E agrees that transmission upgrades may be a cost-effective

way for an LSE to access new resources and that LSEs should demonstrate that they are actively coordinating with the CAISO and transmission owners to plan for upgrades along with cost justifications, timelines, and risks associated with those upgrades.

SDG&E believes that given the energy transition from baseload generation to intermittent resources and changes in load patterns, further evaluation of the transmission system should be performed. This evaluation should assess, for example, whether there is enough readily-available and spare transmission deliverability capacity in the Southern California Desert Area. Without readily-available transmission deliverability capacity in the Southern Desert Area, LSEs will not be able to procure Local and System RA in a timely manner. This might interfere with the ability of the CAISO to preserve grid reliability during stressed system conditions. The current IRP and CAISO Transmission Planning Process ("TPP") calls for the IRP to first identify procurement needs before transmission area deliverability upgrades are proposed. This construct should be revisited to ensure, through closer coordination with CAISO studies, that the transmission system always has reasonable spare deliverability capacity available to accommodate emergency or non-emergency procurement needs that results from the IRP.

IV. ACTION PLAN

A. Proposed Activities

SDG&E's IIRP does not show a procurement need, therefore, SDG&E proposes to undertake no procurement activities in this IRP cycle, consistent with its Preferred Conforming Portfolios. SDG&E is compliant with regard to GHG, RPS and RA in both the 46 MMT and 38 MMT scenarios, therefore, any procurement efforts should be assigned to LSEs that are not able to meet their share of the procurement targets. Since SDG&E is currently not deficient, assigning any future procurement to SDG&E would only add incremental volume to SDG&E's portfolio that would subsequently need to be optimized to account for load departure.

Future cycles of the IRP will be more informative as SDG&E endeavors to right-size its portfolio to reflect adoption of customer choice while continuing to meet the needs of SDG&E's remaining bundled customers. Load departure requires SDG&E to focus on reducing the volume of its portfolio – requiring SDG&E to procure additional resources is plainly at odds with this effort.

To the extent the Procurement Track identifies resources that are needed as a result of the Commission's analysis and compilation of the Preferred System Portfolio ("PSP"), the resources procurement obligation should be allocated to LSEs who show a need for either GHG emissions reduction, reliability or RPS procurement, and not to LSEs, like SDG&E, who have met all their requirements.

While SDG&E does not propose to undertake new incremental procurement to meet GHG reduction or RPS needs, its IIRP does contemplate continued compliance with existing procurement mandates.

1. Existing Obligations

SDG&E is subject to various mandated resource procurement programs, including those listed in Table 4-1 below. The targets set forth below represent SDG&E's share of the respective program targets, unless otherwise noted.

Table 4-1
Existing Obligations

PROGRAM	SDG&E TARGET (MW)
Conventional	
Combined Heat & Power Feed-in Tariff (Assembly Bill (AB) 1613)	N/A – must-take program for facilities up to 20 MW in size[32/]
Combined Heat & Power Settlement (D.10-12-035)	211[33/]

[32/] D.09-12-042, pp. 2, 81.

[33/] D.10-12-035, Attachment A, Settlement Agreement Term Sheet, p. 8.

Energy Efficiency	
Program Target/Authorization	46[34/] (2020 goal)
Reliability	
Resource Adequacy (AB 380)	Local, System and Flexible RA requirements vary by month as determined by the Commission and by the CAISO for the San Diego LCR sub-area[35/]
Demand Response Auction Mechanism (R.13-09-011)	$1.92M for 2020 and $2.0M in 2021[36/]
Demand Response Programs	14[37/] (2020)
Dynamic Rates	27[38/] (2020)
IRP Procurement Track Reliability Procurement	292.9 MW (SDG&E target), 8.4 MW (opt out)
Renewable	
Bioenergy Renewable Auction Mechanism	19 MW (target) / 24 MW procured
Bioenergy Market Adjusting Tariff (Senate Bill (SB) 1122)	24.5[39/]
Green Tariff Shared Renewables Program (SB 43)	59[40/]
Qualifying Facility/Public Utility Regulatory Policies Act (Pub.L. 95–617, 92 Stat. 3117)	Must-take program for facilities up to 20 MW in size[41/]

2. Outreach for Planned or Re-Contracted Resources in DAC

Since SDG&E's Conforming Portfolio does not call for near-term procurement or re-contracting, SDG&E has not initiated extensive DAC outreach. However, should SDG&E have a need for new resources located in DACs in the future, the general process to engage SDG&E's

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[34/] *See* D.19-08-034.

[35/] *See* http://www.cpuc.ca.gov/RA/.

[36/] *See* D.17-07-009, p. 31.

[37/] SDG&E April 1 Annual Load Impact Reports, Executive Summary Appendix B: SDG&E 1 in 2 Weather Scenario - Portfolio. (Year: 2020 – Month: August).

[38/] *Id*.

[39/] D.14-12-081, p. 36.

[40/] D.15-01-051, p. 6.

[41/] D.10-12-035, Attachment A, Exhibit 6. Note that conventional facilities are also eligible.

DAC customers on this topic would likely involve the following two-pronged approach designed to provide information and gather input on potential areas of concern: (1) outreach to local government decision-makers (*e.g.*, elected officials); and (2) outreach to leaders and members of community-based organizations (*e.g.*, local K-12 school districts, clinics, and environmental, affordable housing, youth development, local business chamber, and other civic community-based organizations).

To accomplish this outreach, SDG&E would build upon its existing network of outreach partners. SDG&E's well-established outreach platforms keep customers informed about a variety of topics, among them fire safety, clean energy goals, rate changes, customer assistance programs, and electric transportation. SDG&E depends on an extensive network of community leaders and community-based non-profit organizations to maintain open lines of communication regarding energy-related issues impacting SDG&E's service territory. For example:

- The SDG&E Community Relations network of community-based organizations consists of approximately 500 non-profit organizations in the areas of environmental education, after-school education and youth development, safety and emergency preparedness, and economic development. SDG&E supports these organizations through its shareholder-funded philanthropic giving. Since 2011, 70 percent or more of SDG&E's annual charitable giving has been to diverse and underserved communities. Year-to-date in 2020, 89 percent of SDG&E's charitable funding has been to diverse and underserved communities.
- The SDG&E Community Advisory Council: SDG&E hosts quarterly meetings with this group of 20 key community leaders who represent academic, business, labor, non-profit, environmental, law enforcement, local government, and other

civic interests in the San Diego region. The Community Advisory Council provides a direct and candid exchange of ideas and perspectives between community leaders and SDG&E's senior leadership to help improve SDG&E programs, such as clean energy, clean transportation, rate changes, customer assistance programs, infrastructure projects, fire safety, and energy efficiency, in the diverse communities that SDG&E serves.

- The SDG&E Regional Public Affairs department is SDG&E's direct liaison to elected officials and their staffs at 27 cities, two counties, and several special district governments (*e.g.*, water districts, special districts, and the San Diego Association of Governments).
- The SDG&E Energy Solutions Partners are in large part a subset of SDG&E non-profit partner organizations who are specifically focused on outreach to hard-to-reach customers on SDG&E customer assistance programs, such as CARE, Energy Savings Assistance, Medical Baseline, and FERA programs. The goal of the Energy Solutions Partners is to work one-on-one with specific, grassroots community organizations to develop customized outreach programs that benefit customers by driving enrollments in SDG&E's assistance programs.

SDG&E's existing outreach structure and partners provide the foundation for its communication strategy and will enable a comprehensive and effective outreach effort related to any future need for DAC-sited energy projects.

3. Method for Ensuring "Early Priority" for Reducing Air Emissions in DACs

As discussed in Section 3.D, SDG&E is incorporating DAC considerations into its LCBF valuation methodology. This can help ensure that impacts to DACs are evaluated at the earliest

possible opportunity and that the results are incorporated into the decision-making process. Qualitative criteria may be used to compare projects of similar cost, meaning that a project that provides benefits to DACs may be ranked higher than a similar project that does not provide such benefits. Additionally, many of SDG&E's existing programs already prioritize reducing air emissions and pollution in DACs, as described in Table 3-5. If, in the future, if SDG&E proposes new or re-contracted emitting resources located in DACs, SDG&E will include an explanation as to why the need cannot be met by non-emitting resources.

4. Reduced Reliance on Natural Gas

As mentioned throughout this IIRP, natural gas and its underlying infrastructure will provide important resource characteristics that ensure local and system reliability in a cost-effective way. Until and unless those characteristics are replicated on the grid by other resources, natural gas and its underlying infrastructure will continue to be needed in order to maintain balance between GHG reduction goals and affordability. However, as LSEs work to achieve the State's carbon neutrality goals through 2030 and beyond, reduced reliance on natural gas will be complementary to investing in clean energy resources. SDG&E cautions that reduced reliance on natural gas as an end-use or for stand-alone gas-fired generation does not necessarily mean a reduction of the gas infrastructure as the possibility of combusting RNG, hydrogen or natural gas paired with CCS would still likely rely on the existing gas infrastructure. As mentioned earlier, these three options would both utilize existing infrastructure and support long-duration storage.

SDG&E agrees with the Commission that, "there could be potential for hydrogen as a replacement for natural gas power plant fuel, similar to how fuel oil was replaced with natural gas in previous generations of conventional power plants."[42/]

a. Procurement Activities

The Commission's RSP provides helpful directional guidance on the types of resources that CAISO LSEs should procure to achieve the State's climate goals while maintaining reliability and affordability. The RSP states, "the continued use of the 46 MMT target also balances GHG reductions with reliability and affordability."[43/] Additional analysis is needed at the LSE level to determine the specific types of resources needed. SDG&E's discussion is framed in terms of near-term, mid-term and long-term resource needs and distinguishes between the different drivers of those needs (GHG reduction, RPS/SB 100 goals or reliability) in order to prioritize its procurement efforts.

5. Near-Term Procurement

The Commission recently mandated 3,300 MWs of reliability procurement to fill a need for short term reliability resources.[44/] This need is currently being filled by LSEs, including 292.9 MW mandated for SDG&E's bundled customers.[45/] SDG&E is also responsible for 8.4 MWs of backstop procurement from LSEs who opted out of procurement.[46/] Given recent reliability events that caused rolling blackouts, if after a multi-faceted root cause analysis is

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[42/] D.20-03-029, p. 93.

[43/] *Id.*, p. 27.

[44/] D.19-11-016, p. 3.

[45/] *Id.* at 41.

[46/] ALJ's April 15, 2020 Ruling finalizes individual LSE load forecasts for 2030 and associated GHG benchmarks for use in the 2020 IRP filings due September 1, 2020, as required by D.20-03-028.

completed the CPUC determines that additional procurement is needed, it should be assigned to LSEs that are found to lean on system reliability. Therefore, reliability obligations should not drive additional near-term procurement, unless SDG&E is found to be deficient its share of the system reliability need.

While the Commission's modeling provides directional guidance on short-term procurement, and indicates that there could be a benefit to procuring solar in the short term to take advantage of the Investment Tax Credit ("ITC"), SDG&E cautions against ordering additional near-term procurement. Procurement mandated under the 2017-2018 IRP cycle is currently underway and SDG&E's portfolio is already well-positioned with regard to solar and wind when compared to the overall 2030 RSP resource mix. Put simply, the fact that the ITC may expire is not reason enough to mandate near-term procurement. This is especially true since historical data suggest that developers do not pass ITC savings on to customers.

In addition, before ordering near-term procurement, the Commission should consider: (i) the need to revisit the import constraint since it is too restrictive, as many parties contend; and (ii) costs for new technologies that may be a better portfolio fit and could provide resource diversity are likely to continue to decline.

6. Progress on 2017-2018 IRP Procurement Track Reliability Procurement

SDG&E issued an RFO on December 13, 2019 as a result of D.19-11-016 which mandated 292.9 MW of capacity, plus an additional 8.4 MW to be procured for opt-out LSEs. Per the Decision 50% shall be online by August 1, 2021, 75% shall be online August 1, 2022 and 100% shall be online by August 1, 2023. SDG&E has identified a short list of resources and is in contract negotiations with bidders to procure this capacity by the dates required in the decision.

7. Mid Term Procurement

Given SDG&E's analysis of its compliance positions described in Table 2-2 and the IRP procurement track solicitation that is currently underway, SDG&E does not have a mid-term procurement need. The next iteration of the IRP will be more informative for LSEs in the SDG&E region given that it will better reflect the significant anticipated load departure. In the meantime, SDG&E intends on pursuing portfolio optimization efforts, while continuing to maintain its compliance obligations.

8. Long Term Procurement

SDG&E's analysis of its compliance positions described in Table 2-2 establishes that it does not have a long-term procurement need. The IRP is an iterative and directional process; thus, the prospect of considering procurement past 2026 should be met with caution. There are several components to long-term planning that impact procurement, including: (i) impacts of increased electrification; (ii) impacts of SB 100 modeling which will be available in later cycles of the IRP; (iii) potential for adjustments to the import limits after further analysis is performed; and (iv) potential for technology improvements and cost declines.

LSEs will benefit most from using information on long-term procurement needs to inform mid-term resource procurement. For example, the RSP indicates a long-term need for long-duration storage. As LSEs consider midterm procurement, they should also consider, in tandem, long-term needs identified in the RSP.

B. Potential Barriers

SDG&E's Preferred Conforming Portfolios indicate that no procurement is needed under the 38 MMT and 46 MMT scenarios, thus, potential barriers or risk associated with specific resources coming online are not included in this discussion. However, SDG&E does have concerns with general barriers faced in the IRP along with barriers related to planning

assumptions used to develop the RSP. These potential barriers include: (i) uncertainty resulting from market changes; (ii) the need for a central buyer; (iii) incorporation of PCIA Working Group 3 requirements; (iv) technology mandates that undermine the IRP; (v) barriers to resource diversity; (vi) import constraints used for modeling during peak demand scenarios ; (vii) demand side assumption issues; and (viii) risk associated with expiring contracts. Although SDG&E does not expect these issues to impact its near-term procurement needs, they add risk to the planning process.

1. Uncertainty Resulting from Market Changes

Major changes in California's energy landscape, in particular the transition to a decentralized procurement model, creates uncertainty that adds additional risk to any procurement resulting from this IRP cycle. Continued exponential growth in CCA adoption, as well as potential expansion of DA, is expected to result in a significant reduction in the customer load served by SDG&E. The IEPR forecast used for the IRP illustrates the upcoming significant decline in SDG&E's bundled customer load beginning in 2021. This reduction in bundled customer load materially reduces SDG&E's need for resources and necessitates portfolio reduction. A procurement mandate imposed in this IRP cycle would interfere with SDG&E's ability to right-size its portfolio and would unnecessarily increase procurement costs for SDG&E's bundled service customers.

2. Need for Central Buyer

SDG&E's analysis highlights the fact that the transition away from IOU bundled service necessitates creation of a central buyer construct to address the gaps created by LSEs' independent procurement decisions and to undertake backstop procurement where needed. It no longer makes sense for IOUs, who may only serve a small number of customers within their distribution service territory, to be required to undertake backstop procurement and essentially

act as a central buyer. Absent a CPE designated through legislation, or in an instance where no LSE voluntarily agrees to act as CPE, SDG&E submits that the largest LSE (*i.e.*, the LSE serving the greatest percentage of peak load) for each of the three TAC areas rather than the IOUs should be tasked with the role of providing backstop procurement for their respective regions. A CPE that only procures for the residual need will provide a balanced solution that supports LSEs procurement autonomy, while performing a critical backstop function in the event an LSE fails to procure.

3. PCIA Working Group 3 Issues

PCIA WG3 is dedicated to developing tools for optimization of the IOUs' respective portfolios and for reducing above-market costs.[47/] This effort creates several uncertainties related to long-term planning. Depending on the processes resulting from Working Group 3, SDG&E's portfolio could be significantly impacted. SDG&E's Working Group 3 proposal focuses on meeting the needs of its bundled service customers while preserving the flexibility to right-size its portfolio in the best interest of customers. If the co-leads' proposal is adopted instead, the result could be a significant reduction in SDG&E's supply portfolio, which could deposition SDG&E's bundled service customers by creating a procurement need that otherwise would not exist. Uncertainty regarding WG3 and what portfolio optimization activities (and possibly allocations) will be allowed and/or mandated will impact the future IRP planning process.

4. Technology-specific mandates undermine the IRP process

Technology-specific procurement mandates and are counter to the technology-neutral approach contemplated in the IRP and directly undermine the resource optimization function of the IRP. Technology-specific procurement mandates are also counter to the IRP's cost-

[47/] D.18-10-019.

optimization objective since existence of a procurement prevents consider other lower-cost resources available. Thus, technology-specific mandates pose a major barrier to the IRP process.

5. Resource diversity is a key consideration

The IRP and its supporting modeling should more closely consider energy diversity as California prepares to decarbonize the electric grid. Fossil fuels contribute to climate change and are a finite natural resource. As California and the world replace fossil fuels with cleaner energy sources, choosing a single or a limited number of technology solutions could create a new risk if raw materials for these solutions are not themselves renewable. For example, studies by the US geological society have raised concerns regarding the worldwide limited supply of cobalt and lithium available for lithium-ion batteries. A diverse set of solutions will be necessary to make the fight against climate change a sustainable one. IRP modeling should include a diversity discount to help the economic model incorporate resource diversity as a valued characteristic of the preferred portfolio. Decisions today should be able to sustain the energy needs of tomorrow; thus diversity of resources must be considered now.

6. Import limits are artificially constrained in the RSP

In its IRP modeling, Energy Division limited the physical import capability below the Maximum Import Capability ("MIC") which is not an accurate representation of the CAISO system. In future iterations of the IRP, an import study should be performed to determine what amount is appropriate for imports. The import study should examine physical infrastructure and available supply considering weather events and other market/policy dynamics such as retirement of conventional resources or higher renewable/GHG standards.

7. Baseline demand-side resource assumptions

SDG&E's Conforming Portfolio relies on demand-side resource assumptions that need improvement. SDG&E's discussion of barriers below identifies issues with EE, EV and BTM

solar assumptions with the goal of additional focus and improvement on forecasts for the next IRP.

- **EE assumptions are uncertain -** As calculated by the CSP, SDG&E's Conforming Portfolios include 298 MW of EE in 2030, which is based on the CEC's 2019 Mid Case of Additional Achievable Energy Efficiency ("AAEE").Although SDG&E believes that EE is a critical component of the State's emissions reduction plan, SDG&E is concerned about this level of dependence on EE because it will push the boundaries of feasibility and cost-effectiveness.[48/] SDG&E submits that the IRP should better optimize EE such that the model selects the appropriate volume of EE.

  First, although EE offers a very intuitive way to reduce GHGs, it involves two major obstacles: customer adoption and cost-effectiveness. SB 350 pushes the state to double EE, but *only* if it is feasible and cost-effective to do so.[49/] The feasibility of increasing EE adoption is questionable because it is unclear whether customers will continue to adopt ever-increasing amounts of EE measures, and because EE programming, traditionally administered and implemented by the IOUs, may be under-served in a more fragmented, decentralized market.[50/] In addition, cost-effectiveness is a key challenge to increasing EE. Forecasts for 2018's EE program portfolios generally showed that program administrators did not expect to meet the CPUC's cost-effectiveness standards.[51/] Even program portfolios that are cost-effective today may not be so in the future due to reliance on the dwindling volume of measures that are "low hanging fruit" for energy savings claims. The Commission is looking to third-party innovation and statewide program administration to provide efficiencies that will increase cost-effectiveness, but acknowledges that this outcome is not guaranteed.[52/]

  The IRP should also better optimize EE by having the IRP modeling start with a load forecast that does not already include a certain volume of demand reduction from EE, and instead allow the model to select the appropriate volume of EE based on how EE's cost and attributes match up against other Distributed Energy Resources ("DERs") and supply side resources. EE should be one of the various resource types that the model can select to meet load, along with other DERs and supply-side resources like utility scale wind, solar and storage ("candidate

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[48/] § 454.55 (a)(1).

[49/] Cal. Public Resources Code § 25310 (c)(1).

[50/] *2017 Integrated Energy Policy Report*, pp. 31-32.

[51/] D.18-05-041, p. 71.

[52/] *Id*.

resources"). EE should not be used to reduce load before the model even begins to select which resources are optimal.

- **Electric transportation load may be underestimated** - The RSP relies on assumptions that do not reflect the Governor's EV goals. The RSP assumptions come from the 2019 IEPR forecast, which do not reflect the Governor's January 2018 announcement of sweeping environmental initiatives that include a goal of 5 million zero-emission vehicles on the road by 2030.[53/] The impact of this goal will need to be factored into the EV forecast for future rounds of the IRP.

  Additionally, the IRP process should develop a comprehensive strategy to address cross sectoral issues, including how to address assignment of GHG emissions to the electric sector resulting from load growth due to decarbonization of other sectors (*e.g.*, transportation electrification). Developing a solution to this issue will likely involve consideration of rate structures and price signals that discourage the need for additional capacity as energy demand increases.

- **BTM solar assumptions are problematic** - SDG&E's Conforming Portfolio relies on the BTM solar volumes included in the 2019 IEPR forecast. The forecast shows continual growth (approximately doubling) of BTM PV between 2019 and 2030. The forecast is problematic inasmuch as it assumes the continuation of the current net energy metering ("NEM") subsidies.

  It is beyond dispute that BTM Solar will be an integral element of California's clean energy future. In order to ensure that the state achieves its GHG reduction targets with the most cost-effective mix of resources, however, reform of the existing NEM subsidy program is essential. This theme is echoed by academics, including Severin Borenstein, Director Emeritus of the University of California Energy Institute and the Energy Institute at Haas School of Business.[54/] Dr. Borenstein points out that reducing GHG emissions is the paramount goal of energy policy today. He explains that an important component of the strategy for achieving this goal is a careful examination of how technologies are subsidized. He notes that unreasonably high subsidies that result in inaccurate price signals, such as those provided through the NEM program, are counter-productive and should be avoided, suggesting that "…we should craft incentives that accurately reflect the net benefits each alternative technology offers. I'm not sure exactly how those incentives should be structured. But I can tell you that they don't involve paying households retail rates for power injected into the system, as net

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[53/] Executive Order B-48-18, https://www.gov.ca.gov/2018/01/26/governor-brown-takes-action-to-increase-zero-emission-vehicles-fund-new-climate-investments/.

[54/] Severin Borenstein is E.T. Grether Professor of Business Administration and Public Policy at the Haas School of Business and Faculty Director of the Energy Institute at Haas. *See* http://faculty.haas.berkeley.edu/borenste/BorensteinBio.html.

metering policies currently do."[55/] Until NEM is reformed so that costs and benefits are accurately addressed, it is unclear what assumption should be used regarding the appropriate level of BTM solar.

8. Potential retirement of existing resources

SDG&E's analysis shows that expiring contracts do not impact SDG&E's compliance positions with regard to GHG, RA, or RPS. One exception is related to SDG&E's assumption that the Desert Star Energy Center continues beyond its 2027 land lease expiration. SDG&E might not need to consider replacing or re-contracting with expired facilities given its compliance positions. However, due to departing load it is reasonable to assume that other LSEs may need to contract with those resources, once the SDG&E contract expires, in order to meet their customers' needs. While unlikely, if load does not depart, SDG&E's expiring contracts could be needed to serve that load.

Additionally, a large portion of SDG&E's portfolio is comprised of long-term contracts, which reduces risks associated with retirement of existing resources faced by SDG&E's bundled service customers. This includes relatively new renewable resources contracted long-term in order to provide developers the revenue stream required to obtain financing for their projects.

Furthermore, most of the resources that SDG&E relies on for local RA (which also typically provide system and flexible capacity) are also new and subject to long-term contracts. With regard to system resources, SDG&E anticipates that its system needs will be met through its existing portfolio. Local needs will be met by additional procurement. In other words, once SDG&E has procured the required local capacity (which, as noted above, typically includes the system capacity attribute), that procurement, plus the system capacity under contract through

[55/] Severin Borenstein, *Is Residential Solar the Future of Electric Generation*, 2015. Available at: http://blogs.berkeley.edu/2015/05/08/is-residential-solar-the-future-of-electricity-generation/.

SDG&E's other long-term contracts and existing resources owned by SDG&E, will meet the system capacity needs of SDG&E's bundled customers. However, the Commission should support extending resource retirements on a statewide basis if doing so could help to alleviate future system constraints.

C. Commission Direction or Actions

SDG&E is not seeking any new spending authorizations, changes to existing authorizations, or changes to existing programmatic goals or budgets in this IIRP. However, it is important that the issues and concerns identified in SDG&E's IIRP are resolved expeditiously by the Commission.

To the extent the Procurement Track identifies resources that are needed as a result of the Commission's analysis and compilation of the Preferred System Portfolio ("PSP"), the obligation to procure those resources should be allocated to LSEs who show a need for either GHG emissions reduction, reliability or RPS, rather than to IOUs like SDG&E who have met all applicable requirements.

D. Diablo Canyon Power Plant Replacement

SDG&E's preferred conforming portfolios provide that SDG&E has no procurement need, even considering the absence of Diablo Canyon. SDG&E's analysis shows that in the years Diablo Canyon retires, SDG&E continues to meet its reliability requirements without adding incremental procurement to its portfolio. Thus, SDG&E does not plan to procure additional resources in response to retirement of the Diablo Canyon resource.

V. LESSONS LEARNED

SDG&E offers below its observations regarding the overall IRP process and potential areas of improvement. SDG&E does not attempt to catalogue here every necessary modification to the IRP outline or process, or required data submittals – it anticipates that these issues will

continue to be refined over time – instead, it seeks to identify major issues that warrant immediate attention. Major areas requiring resolution prior to the next IRP cycle include:

- Proceeding and Policy Coordination:

  For the IRP process to be useful, the Commission must establish a clear link between the resource planning process and resource procurement targets. Separate Commission proceedings that impose siloed resource procurement requirements without regard for integrated resource planning targets must be linked to the IRP process so that the IRP can inform the determinations made in those proceedings regarding individual resource procurement mandates. For example, the IRP process should be more closely coordinated with the RPS proceeding, including policy initiatives that are RPS-related such as BioRAM and BioMAT. Consolidation of initiatives that involve mandated procurement should occur in the IRP proceeding, where procurement is examined at on a more holistic level.

  Other opportunities for coordination include collaboration with the affordability OIR to determine if an affordability threshold should be included and considered as the Commission considers procurement mandates.

- Local Capacity Requirements:

  Under the IRP, the need for new resources can be tied to attainment of GHG reduction goals, or to the need for resources to ensure that system and/or local reliability needs are met. The assessment of each LSE's position as to each of these targets is imperative to determining fair allocation of costs relative to need. Local reliability is not currently assessed as part of the IRP process. The IRP process should include an assessment similar to the CAISO's LCR process so that at least a regional assessment can be performed for each local area and reliability needs can be better identified as being driven by either system or local need.

  It is also important that the IRP and CAISO's transmission studies are closely coordinated so any necessary transmission upgrades are available to support resources that are identified in the IRP process. Additionally, in the development of a least cost portfolio, consideration of whether and when it is economic to reduce local capacity requirements through the addition of new transmission should be included. This determination requires a comparison between (i) the estimated cost of adding new transmission, and (ii) the projected cost of meeting local capacity requirements with existing and/or new local generation. This is a non-trivial undertaking since it requires extensive interaction with, and input from the CAISO. Current modeling approaches do not have the capability to perform this comparison and arrive at a solution that is optimized across all feasible transmission and resource options. The bus-bar mapping process is a good example of a successful iterative process with the CAISO during the course of the

IRP process. The CAISO's TPP process informs the IRP with an assessment of the previous cycle's preferred portfolio but it is not frequent enough to assess trade-offs between new resources and new transmission lines. If a more frequent iterative modeling exercise with the CAISO could be incorporated it would facilitate this type of analysis.

- Improved IRP Process:

  The Commission acknowledges that "the IRP planning process established in D.18-02-018 has proven to be a challenge to maintain, both for the Commission and for interested parties, because of the large amount of work associated with the development and adoption of both the RSP and the PSP."[56/] Since the RSP is advisory only, it would appear to be the least important of the two types of plans. SDG&E recommends transitioning to a three-year process or, alternatively, continuing the IRP as a two-year process while eliminating the RSP.
  If the Commission maintains the two-year process and eliminates the RSP, LSEs could use the prior IRP cycle's PSP to guide the development of their IIRPs. The PSP could be submitted for purposes of the CAISO's TPP and would be used to determine the need and assign procurement responsibility for the procurement track. For example, the PSP in the current cycle would be completed by the end of 2021. LSEs would then use the adopted PSP to conduct resource planning to inform their IIRPs, a process that would take up most of 2022. Staff would then aggregate the IRPs to create a draft PSP in 2023. The draft PSP would be tested for reliability in SERVM using an LOLE study followed by capacity adjustments required to bring the PSP to a 0.1 LOLE. The PSP could then be run through RESOLVE to determine the resource types represented by the additional perfect capacity that was added in SERVM to meet the reliability requirements. The final PSP would be used to determine the need and assign procurement responsibility in the procurement track, which should come out at the end of 2023. The final PSP would also be submitted for the CAISO's TPP.

- Deficiencies in the Resource Data Template:

  SDG&E appreciates the Commission's intention to conduct a reliability analysis of each LSE's load and resources. It appears that the RDT "Dashboard" tab is where this analysis will be conducted. The RDT was redundant in its data entry requirement in that it requires LSEs to enter identical rows of data except for the month and year values changing to have the dashboard properly update monthly and yearly capacity positions. In the future, a simple adjustment to the formulas in the dashboard cells could account for provided contract dates and would correct this issue, reducing the required amount of data entered to one entry per contract and reducing the size of the files being submitted. To handle resources that have changing NQC or energy values each year, such as CAM resources, the existing

[56/] R.20-05-003; IRP OIR Scoping Memo, p. 8.

CAM resource designation could be used with an additionally provided annual percentage share of the contract.

Second, no beta testing or review period was conducted. Such a process would have given LSEs the chance to use and evaluate the tool and to suggest changes before a final version was produced. This process could have identified the issue noted above, which would have resulted in a more user-friendly tool that produced more concise filed for the Commission's review. Additionally, it would be invaluable to submit an example file to the Commission to: (i) ensure LSEs understand what the document is asking for in regards to input and to confirm that LSEs are inputting the correct data; (ii) uncover small mistakes that would need to be addressed after the IIRP filing deadline; and (iii) make the Commission's task of evaluating all IIRPs for accuracy and correctness before aggregating them quicker and easier.

Attachment A

Revenue Requirements and System Average Bundled Rates for Preferred Conforming Portfolio (2019 $000)

Attachment B

System Reliability Progress Tracking Table

Attachment C

Clean System Power Calculator (38 MMT)

Attachment D

Resource Data Template (38 MMT)

Attachment E

Clean System Power Calculator (46 MMT)

Attachment F

Resource Data Template (46 MMT)