

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
And Related Matters	Application 15-07-002 Application 15-07-003 Application 15-07-006
(NOT CONSOLIDATED)	
In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015)
And Related Matters	Application 15-07-007 Application 15-07-008

**2021 GRID NEEDS ASSESSMENT AND DISTRIBUTION DEFERRAL
OPPORTUNITY REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E)**

PUBLIC VERSION

Jonathan J. Newlander
8330 Century Park Court, CP32D
San Diego, CA 92123
Telephone: (858) 654-1652
Facsimile: (619) 699-5027
E-mail: jnewlander@sdge.com

Attorney for:
SAN DIEGO GAS & ELECTRIC COMPANY

August 16, 2021

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
And Related Matters	Application 15-07-002 Application 15-07-003 Application 15-07-006
(NOT CONSOLIDATED)	
In the Matter of the Application of PacifiCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015)
And Related Matters	Application 15-07-007 Application 15-07-008

**2021 GRID NEEDS ASSESSMENT AND DISTRIBUTION DEFERRAL
OPPORTUNITY REPORT OF SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E)**

Pursuant to the Commission’s Decision on Track 3 Policy Issues, Sub-Track 1 (Growth Scenarios) and Sub-Track 3 (Distribution Investment and Deferral Process), Decision 18-02-004, San Diego Gas & Electric Company (“SDG&E”) hereby submits its 2021 Grid Needs Assessment and Distribution Deferral Opportunity Report. As contemplated by the Administrative Law Judge’s Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company’s Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004, dated July 24, 2018, and Section 3.3 of General Order 66-D, SDG&E is concurrently filing a motion to submit

under seal unredacted versions of these materials, based on customer privacy and market sensitivity considerations, as set forth in the Declaration of Alan Dulgeroff attached to the motion.

Respectfully submitted,

/s/ Jonathan J. Newlander

Jonathan J. Newlander
8330 Century Park Court, CP32D
San Diego, CA 92123
Telephone: (858) 654-1652
E-mail: jnewlander@sdge.com

Attorney for:
SAN DIEGO GAS & ELECTRIC COMPANY

August 16, 2021

**2021 Grid Needs Assessment Report of
San Diego Gas & Electric Company**



2021 GRID NEEDS ASSESSMENT REPORT
OF SAN DIEGO GAS & ELECTRIC



Contents

- Purpose 3
- Background 3
- Executive Summary..... 3
- 1. Distribution Planning Process 4
- 2. SDG&E’s Distribution Planning Assumptions and GNA Scope 5
 - 2.1 SDG&E’s Distribution Resources Planning Horizon..... 5
 - 2.2 SDG&E’s Distribution System Load Forecast Assumptions..... 6
 - 2.3 SDG&E’s Distribution System DER Growth Forecast Assumptions..... 7
 - 2.4 SDG&E’s Load Transfers and Switching Assumptions..... 8
 - 2.5 Grid Needs Assessment Scope 9
 - 2.6 Customer Confidentiality 9
 - 2.7 GNA Modeling Refinements 10
 - 2.8 Near-term Needs 10
- 3. GNA Results..... 10
 - 3.1 Distribution Capacity Needs..... 11
 - 3.2 Voltage Support Needs 12
 - 3.3 Reliability (Back-Tie) Needs..... 12
 - 3.4 Resiliency (Microgrid) Needs 13
- 4. Updates to the GNA 13
 - 4.1 Changes from SDG&E’s 2020 GNA 13
 - 4.2 GNA and online maps 13
 - 4.3 Modify future GNA requirements..... 14
- Appendix 1 – Load Disaggregation..... 15
 - Load Disaggregation Process 15
- Appendix 2 - Substation Bank and Circuit Forecast Detail Summary 16
 - GNA – Distribution Circuits, Substations, Sub-transmission Capacity Service..... 16
 - GNA - All Other Grid Service Needs 16
- Appendix 3 - DER Disaggregation Process 12
 - General Process 12
 - Additional Achievable Energy Efficiency (AAEE) 13
 - Residential and Non-Residential Photovoltaics 13
 - Energy Storage 15

Electric Vehicles	17
Demand Response	19
Disaggregation Methods.....	19

Figures

Figure 1 – Distribution Resource Planning Cycle	4
Figure 2 – Overview of Load Disaggregation	15
Figure 3 – Overview of DER disaggregation.....	12
Figure 4 – Energy Efficiency disaggregation	13
Figure 5 – S-Curve Model.....	14
Figure 6 – Photovoltaic disaggregation.....	14
Figure 7 – Energy Storage disaggregation	16
Figure 8 – Electric Vehicle disaggregation	17
Figure 9 – LMDR disaggregation	19
Figure 10 – Generalized S-Curve Model.....	20

Tables

Table 1 – SDG&E GNA deficiencies solved via operational solutions	9
Table 2 - SDG&E Model Refinements	10
Table 3 - Summary of the Number of Grid Needs by Distribution Service Type	11
Table 4 - Summary of the Number of Grid Needs by Distribution Service Type and Equipment Type.....	11
Table 5 - Summary of the Number of Grid Needs by In-Service-Date	11
Table 6 - Summary of the Number of Peak Thermal Grid Needs by Project Type	11
Table 7 - Summary of the Number of Peak Thermal Grid Needs by In-Service-Date	12
Table 8 - Summary of the Number of Voltage Needs by Project Type	12
Table 9 - Summary of the Number of Voltage Grid Needs by In-Service-Date.....	12
Table 10 - Summary of the Number of Back-tie-Grid Need by Project Type.....	12
Table 11 - Summary of the Number of Back-tie Grid Needs by In-Service-Date	12
Table 12 - Summary of the Number of Microgrid Needs by Project Type.....	13
Table 13 - Summary of the Number of Microgrid Needs by In-Service Date	13
Table 14 - Key Data Sources for PV disaggregation	15
Table 15 - Key Data Sources for Energy Storage Disaggregation.....	16
Table 16 - Key Data sources for Electric Vehicles disaggregation.....	19

Purpose

San Diego Gas and Electric (SDG&E) hereby submits its 2021 Grids Needs Assessment (GNA) report in compliance with Ordering Paragraph (OP) 2.d of Decision (D.)18-02-004 (Decision), the Administrative Law Judge’s Ruling issued May 7, 2019 (May 2019 Ruling), the Administrative Law Judge’s Ruling issued May 11, 2020 (May 2020 Ruling), revised Attachment A provided by the ALJ on June 12, 2020 with further revisions on August 11, 2020, and the Administrative Law Judge’s Ruling issued June 21, 2021.

Background

On February 15, 2018, the California Public Utilities Commission (Commission or CPUC) issued D.18-02-004 on Track 3 Policy Issues, Sub-track 1 on Growth Scenarios and Sub-track 3 on Distribution Investment Deferral Framework. This Decision directed the Investor-Owned Utilities (IOUs or utilities) to file a Grid Needs Assessment (GNA) by June 1 of each year, and a Distribution Deferral Opportunity Report (DDOR) by September 1 of each year.¹ A subsequent May 2019 Ruling directed the IOUs to provide additional GNA/DDOR reporting requirements and moved the annual filing date for the GNA and DDOR to August 15th.^{2,3}

The GNA report is intended to provide stakeholders with an overview of grid needs that arise from the IOU’s distribution planning process, as those needs relate to the four distribution services the Commission approved as deferrable by a Distributed Energy Resource (DER). For the GNA, the May 2019 Ruling requires the GNA report to include forecast loading levels for all distribution circuits and substation transformer banks, regardless of whether there are projected grid deficiencies on that specific equipment. The May 2019 Ruling also requires that each IOU’s GNA report include a narrative describing that IOU’s process to disaggregate the system-level DER forecast values provided by the California Energy Commission down to the circuit level.

The May 2020 Ruling and the revised Attachment A direct the IOUs to include additional distribution information in the GNA. Some of this information may be developed outside the standard distribution planning process.

Executive Summary

SDG&E’s 2021 GNA and DDOR for the 2021-2025 five-year distribution planning period provide an overview of nineteen (19) projected grid needs. These projects have the following in-service years: 2021: 0 projects, 2022: 17 projects, 2023: 0 projects, 2024: 0 projects, 2025: 2 projects.

¹ Decision, at OP 2.d.

² R.14-08-013 *Order Instituting Rulemaking to Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769*, at 9.

³ Some of the additional reporting requirements are specific to the 2019 or 2020 GNA and DDOR.

1. Distribution Planning Process

The distribution planning process follows the activities originally described in the Decision, which outlines the existing utility distribution planning process with new additional DER disaggregation requirements. Although the milestone dates and cycle times vary by utility, the general process is sufficient to describe the typical sequence of events and scope. Figure 1 illustrates the revised steps comprising the Distribution Resources Planning cycle, as discussed in the Decision and the May 2019 Ruling.

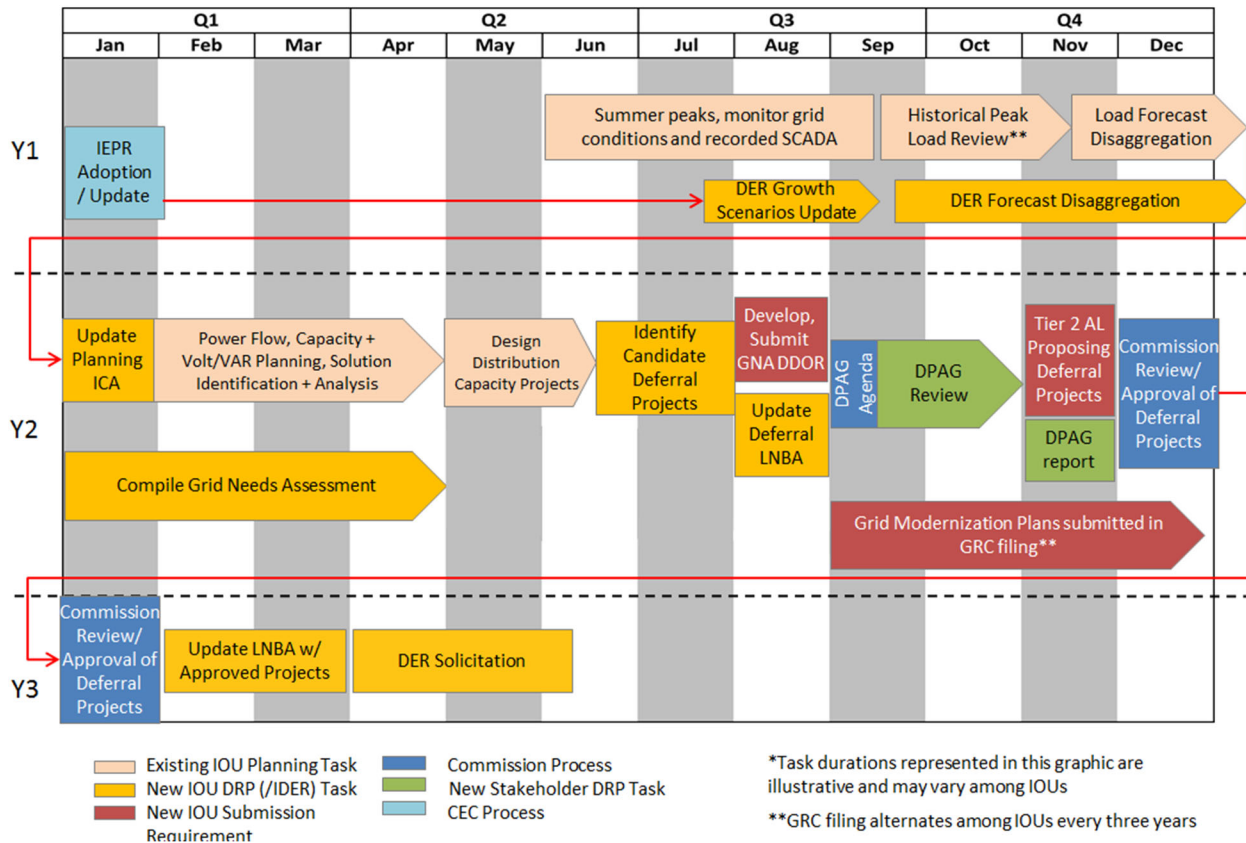


Figure 1 – Distribution Resource Planning Cycle

As shown above, the distribution planning process typically begins with assessing the Historical Peak Load Review for circuits and banks, to establish a reference point for future forecast projections. Concurrently, various system information is captured that is necessary to disaggregate the California Energy Commission (CEC’s) system-level projections of load and DER additions to the individual circuit level. Once the actual peak loads and timestamps have been determined for circuits and substation transformer banks, the historical peak is evaluated considering factors such as anticipated new load additions, load transfers, loss of a generator, weather conditions at the time of the historical peak, etc. These factors may result in adjustments to the forecast circuit and bank loading.

A third-party proprietary software forecast toolset, LoadSEER, from Integral Analytics, Inc., is used to incorporate the disaggregated CEC forecast load and DER additions to the circuit level and to include adjustments based on the factors listed above. The initial model outputs are reviewed by distribution

planning engineers to identify and correct errors, to address technical issues, and to validate the circuit-level forecasts for overall reasonableness. Once validated, the forecast is exported to be used for the GNA capacity report and for detailed distribution power flow modeling as needed. Power flow models are generated by extracting circuit models from Geographic Information System (GIS), incorporating data refinements and populating the model with forecast loads from LoadSEER.

Once the power flow models are finalized, distribution planning engineers identify conventional distribution projects that mitigate forecast circuit performance issues revealed by the power flow results (*i.e.*, distribution needs). Such mitigation is designed to resolve needs at the substation transformer bank, circuit, and line segment levels.

Distribution needs that would result in new distribution capital infrastructure if built, are included in the DDOR as Planned Investments and, if passing defined screens, are listed in the DDOR as Candidate Deferral Opportunities. Forecast grid deficiencies identified in the GNA that do not have a corresponding project in the DDOR either have operational-based solutions (which have little to no associated capital investment), are the result of modelling refinements, and/or have committed planned investments identified in a previous DIDF cycle. Therefore, the mitigation projects included in the DDOR address a subset of those GNA grid deficiencies that are anticipated to require new capital investment.

2. SDG&E's Distribution Planning Assumptions and GNA Scope

The following sections describe the study methodology and assumptions used to forecast and identify distribution needs that are reflected in SDG&E's 2021 GNA. These assumptions pertain to load forecasts, DER growth forecasts, and distribution operational switching/load transfer criteria over the distribution planning period or planning horizon. Additionally, the technical criteria for determining distribution needs identified in the GNA is described.

2.1 SDG&E's Distribution Resources Planning Horizon

As directed by the Commission, SDG&E's distribution planning process uses a five-year forecast period (which includes the current year's summer peak) as the study horizon over which to identify grid needs at the circuit and substation transformer bank level.⁴ SDG&E's 2021 GNA covers the 2021-2025 five-year planning horizon. SDG&E uses only the first three years of the five-year forecast (*i.e.*, a three-year horizon) when identifying needs associated with downstream line segments of a circuit.^{5,6}

Line segment needs reflect the granular allocation of load and DER impacts based on a system-level forecast. Compared to needs identified for distribution circuits or substation transformer banks, where forecast DER impacts are cumulative, line segment needs are inherently uncertain and highly sensitive to locational allocations and individual customer load and DER adoption. Because individual customer decisions significantly influence line segment needs, infrastructure solutions tend to be smaller and

⁴ Decision at Section 3.4.1.1.

⁵ May 2019 Ruling, at 5-6.

⁶ SDG&E differentiates between a circuit need and a line segment need. A circuit need generally occurs on the portion of a circuit that has larger wire size and is close to the supplying substation (*e.g.*, within one "electric" circuit-mile of the supplying substation). A line segment need generally occurs on the portion of the circuit that has a smaller wire size and is at a greater distance from the supplying substation (*e.g.*, more than one mile away from the supplying substation). A typical circuit is 4-6 miles in length.

short-term in nature. Due to the high degree of forecast and modeling uncertainty associated with line segment needs that may arise beyond the third year of SDG&E's distribution planning horizon SDG&E does not assess whether there may be line segment needs during years four and five of SDG&E's five-year planning horizon.

2.2 SDG&E's Distribution System Load Forecast Assumptions

SDG&E's load growth forecast begins with the most recent CEC-approved SDG&E Integrated Energy Policy Report (IEPR) Load Modifier Mid Baseline-Low Additional Achievable Energy Efficiency (AAEE) California Energy Demand (CED) 2019 forecast. SDG&E's forecast of known new loads (*e.g.*, specific requests for new electrical service) are deducted from the CEC system load growth forecast.⁷ The resultant system-level growth is allocated by customer class (residential, industrial, and commercial) proportional to the customer class' forecast annual energy consumption. The system-level customer class distribution is then allocated to SDG&E's distribution circuits using geospatial analysis. Expected impacts from known new loads are then added at the applicable circuits.

SDG&E uses the LoadSEER GIS geospatial forecasting program. This program uses satellite imagery and proprietary data analytics to score each acre in SDG&E's territory for the likelihood of increased load by customer class. This GIS model also uses historical land aerial imagery to help determine expansion trends that have occurred within specific areas and takes this information into account for the acre scoring analysis. After area scores are determined, the geospatial program allocates the customer class load growth projections to each parcel and maps the load growth to circuits based on closest proximity. The output of the geospatial program is an annual SDG&E peak megawatt (MW) growth by circuit and customer class for the forecast period. This growth is then uploaded into the LoadSEER forecasting program, which uses customer-class load shapes to turn the allocated customer class growth amount into a 576-hour load shape⁸ that can then be applied to the circuit or bank load shape.

SDG&E uses a normalized and adverse 1-in-10-year (90th percentile of high loading) weather event forecast as the basis for making decisions regarding planned capital upgrades and permanent load transfers. Weather normalization is performed for each circuit by comparing the historical air temperature of a nearby weather station to historical substation peaks. A regression curve is created between substation loading and temperature values. Based on the most recent summer weather data and historical substation loading in response to weather, an adjustment is generated to calibrate the recent substation peak to a 1-in-2 weather year. LoadSEER then applies an adverse weather factor to each circuit to create the 1-in-10 weather year forecast, which is the basis for identifying distribution grid needs.

The geospatial load forecast is derived from the CEC load forecast and reviewed by for SDG&E distribution planning engineers. This activity includes identifying circuits where the geospatial forecast is not supported by historic loads and local knowledge. In these instances, distribution planning engineers must reallocate load growth among nearby circuits served from the same substation and/or tightly coupled adjacent substations. Typically, a circuit with an unreasonably high load growth is reduced and

⁷ Known new distribution loads are deducted from the system-wide forecast so that they can be added back in as local new load adjustments while maintaining consistency with the CEC forecast in aggregate.

⁸ This represents hourly loads for both a typical weekday and weekend day for each month.

the reduced load is added to nearby circuits. This effort preserves consistency with the CEC forecast and provides continuity with the geospatial methodology.

An important step to the forecast process is SDG&E distribution planning engineers' validation and adjustment of historical peak loads for distribution substation transformer banks and circuits. This process establishes a starting point for distribution loading projections that are consistent with the existing circuit configuration on a going-forward basis. The following guidelines for verifying and modifying historical loads are typically followed:

- Bank and circuit peak loads are obtained through either historical SCADA data, monthly recorded substation metering data, or cumulative advanced metering infrastructure (AMI) data. Peak demand (in MW) for banks as well as maximum current loading (in amps) for circuits are recorded along with peak date and time.
- Recorded peak load information is compared with adjacent days' peak load information to assess whether an unusually high or low load occurred during a planned or unplanned switching condition. Distribution Operations switching log information is reviewed to confirm the timing of the switching operations that create unusual or temporary configurations and the circuits impacted.
- Peak loads on circuits coincident with temporary switched loads are adjusted because loading under temporary switching conditions is not relevant for forecasting normal peak loads and may lead to double-counting or under-counting of loads. If a peak load is recorded after a newly executed permanent load transfer, then the previous historical loads will be automatically adjusted to maintain the present circuit configuration when analyzing historic load growth on the circuit.

Historical circuit peak loads are adjusted, if necessary, to account for the largest distributed generation facility served by a circuit being offline during that circuit's peak – also known as G-1 planning scenario. Multiple distributed generators on the same circuit may be grouped into the equivalent of a G-1 scenario if they have a reasonable risk of all being offline at the same time.

The inputs, process, and outputs for disaggregating the CEC forecast to circuits can be found in Appendix 1, which reflects work done in the Distribution Forecast Working Group (DFWG).

A detailed summary of SDG&E's substation bank and circuit peak demand forecasts that were utilized for this GNA are included in Appendix 2.

2.3 SDG&E's Distribution System DER Growth Forecast Assumptions

Separate from load growth, SDG&E has incorporated DER adoption into its distribution bank and circuit forecast assumptions. The starting point for developing these circuit-level DER growth forecasts is the CEC's systemwide CED forecast. The CED forecast accounts for all behind-the-load meter resources: residential PV, retail non-residential PV, self-generation resources and energy efficiency for different customer classes, electric vehicles, energy storage, and Load Modifying Demand Response (LMDR).⁹

⁹ Load Modifying Demand Response reshapes or reduces the net load curve as opposed to Supply Resource Demand Response which is integrated into the California Independent System Operator energy markets.

This year, SDG&E completed all DER forecast disaggregation using methodologies discussed during the DFWG.

The system-level incremental MW capacity by DER technology type is allocated to the circuits based on methodologies specific to each DER type. Variables used to allocate incremental DER capacity geospatially include consumption by customer class, historical PV adoption by zip code, the s-curve trending model, weather zones, and many other factors specific to each type of DER.¹⁰ SDG&E’s Distribution System DER Growth Assumptions utilize the following documents to disaggregate the 2019 IEPR Mid Baseline-Low AAEE:¹¹

- CED 2019 Load Modifiers - Mid Baseline Mid AAEE – Corrected MDHD
- CED 2019 Managed Forecast - LSE and BA Tables Mid Demand - Mid AAEE Case CORRECTED Feb 2020
- CED 2019 Managed Forecast - LSE and BA Tables Mid Demand - Low AAEE Case CORRECTED Feb 2020
- CED 2019 Hourly Results - SDGE - MID-LOW
- FINAL CEDU 2019 Baseline SDGE Mid Demand Case
- CED 2019 - AAEE Savings by Planning Area and End Use

The inputs, process, and outputs for disaggregating each DER type can be found in the Appendix 3, which reflects work done in the DFWG.

A detailed summary of SDG&E’s substation bank and circuit DER forecasts that were utilized for this GNA are included in Appendix 2.

2.4 SDG&E’s Load Transfers and Switching Assumptions

SDG&E’s 2021 GNA includes the results of SDG&E’s electric distribution grid as a snapshot in time that includes planned load transfers that will be performed as well as committed planned investments from previous distribution cycles. Needs that can be addressed via operational or switching-based load transfers that require minimal costs to implement are included in the GNA but do not appear in the DDOR. Planned load transfers and switching operations are typically the lowest cost options to address an identified need as they utilize existing capacity on distribution circuits.

Table 1 summarizes the 2021 GNA deficiencies addressed through load transfers or phase balancing.

2021 GNA	Facility ID
Load Transfers	<ul style="list-style-type: none"> • 2021_0405 • 2021_0635 • 2021_0902 • 2021_0992 • 2021_0993
Phase Balancing	<ul style="list-style-type: none"> • 2021_0475

¹⁰ SDG&E’s DER Growth Forecast Assumptions are subject to updating and revision in accordance with distribution planning criteria and guidance provided by the Commission.

¹¹ Consistent with the Assigned Commissioner’s Ruling on the adoption of Distributed Energy Resources Growth Scenarios issued August 9, 2017.

2.5 Grid Needs Assessment Scope

As directed in the Decision, SDG&E’s 2021 GNA identifies distribution grid needs associated with the four distribution services that DERs can provide: distribution capacity, voltage support, reliability (back-tie) and resiliency (microgrid).¹² For simplicity in SDG&E’s 2021 GNA, the word “peak thermal” represents “distribution capacity”, “back-tie” represents “reliability (back-tie)” and “microgrid” represents “resiliency (microgrid).” SDG&E’s 2021 GNA identifies peak thermal, voltage, back-tie, and microgrid needs at the substation transformer bank, circuit, and line segment levels.

As clarified in the May 2019 Ruling, the IOUs’ respective GNAs are to include, as applicable, identified transmission planning projects that are not separately undergoing an analysis as part of the California Independent System Operator (CAISO) Transmission Planning Process (TPP) (*i.e.*, that include transmission planning needs for any of the four DER deferral services that would result in a transmission project under the jurisdiction of the CPUC). SDG&E does not have any such identified needs, as none of SDG&E’s transmission facilities are under the jurisdiction of the CPUC.

Also, as clarified in the May 2020 Ruling, the IOUs’ respective GNAs will include, as applicable, identified Pre-Application and Post-Application Projects that are (i) subject to the requirements of General Order (GO) 131-D, or which are expected to be subject to GO 131-D, and (ii) include CPUC jurisdictional distribution component(s) addressing a need associated with the four DER deferrable services. None of SDG&E’s Pre-Application and Post-Application projects include distribution components that address a distribution need identified through the distribution planning process, and none can be deferred by DERs since all are associated with transmission projects that are not subject to deferral by DERs. The needs addressed by these distribution components are often associated with fire-hardening of certain transmission facilities where the co-located distribution components are relocated and may be hardened in the process. While some of the distribution components are being replaced in-kind, e.g., simply moving existing distribution under-build, others are new (e.g., new span or pole for distance). Accordingly, incidental changes in material are the result of hardening and building to SDG&E’s standard distribution design, material, and sizing practices (e.g., stronger wire meeting current standard).

2.6 Customer Confidentiality

In order to respect and protect customer privacy, SDG&E follows aggregation and anonymization rules, the primary of which is referred to as the “15/15 rule.” When publicly releasing aggregated customer usage data, the sample population must be more than 15 customers and no single customer should account for more than 15% of usage at any given time. Areas that do not meet these requirements will be redacted, as shown in Appendix 2. The public version of SDG&E’s 2021 GNA reflects the redaction of data conforming with the Ruling on Data Confidentiality.¹³

¹² As adopted in D.16-12-036.

¹³ R.14-08-013, *Administrative Law Judge’s Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company’s Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004* (July 24, 2018).

2.7 GNA Modeling Refinements

SDG&E’s distribution planning process begins with the development of a distribution load forecast. This load forecast is disseminated internally for a variety of business purposes. SDG&E makes an initial determination of distribution needs using this forecast. Subsequent to the internal release of the forecast, SDG&E undertakes an additional review of the initially-identified needs. During the course of this review, some planning, forecasting, and modeling refinements were identified that resulted in the removal of the initially-identified need. Examples of these refinements include: removing redundant load additions from the forecast and incorporating recent updates to distribution facility ratings. Affected circuits will continue to be monitored for future needs.

Table 2 summarizes the refinements implemented subsequent to the internal dissemination of the distribution load forecast and prior to the publication of the GNA/DDOR on August 16, 2021. For the 2021-2022 DIDF cycle, no modelling refinements were identified for the 2021 GNA report.

2021 GNA	Facility ID
Modelling refinements	None

Table 2 - SDG&E Model Refinements

2.8 Near-term Needs

When needs arise for the current year, SDG&E creates immediate mitigation and initiates near-term projects to implement the necessary mitigation. Near-term needs require urgent action and the mitigation therefore does not qualify as a candidate deferral project. Accordingly, the DDOR does not address mitigation for near-term needs.

3. GNA Results

Forecast distribution needs are the combined result of the inputs described in Appendix 1 and 2. Because it is the combined inputs (*e.g.*, forecast load amounts and types of DER additions on a circuit) that determine the need for mitigation solutions, it is generally not possible to directly attribute an identified need to any one causal variable.¹⁴ Accordingly, SDG&E is unable to provide a listing of strictly “DER-driven needs” within the planning cycle. However, if a need arises, it will be appropriately included in the DIDF reports and process.

Additionally, per the Commission-adopted Grid Modernization framework,¹⁵ SDG&E will incorporate programmatic and systemwide needs into its future GRC. For example, plans SDG&E has to upgrade monitoring and control systems were provided in SDG&E’s 2019 GRC testimony (Ted Reguly) and will be addressed in the future GRC.

The GNA results are summarized below by the four distribution service types: peak thermal, voltage support, back-tie and microgrid. For each of the four service types, the GNA results are further

¹⁴ For example, a peak thermal overload could be a net result of “low” forecast loads and “high” projections of DER growth or “high” forecast load and “low” projections of DER growth – both contribute to the peak thermal overload.

¹⁵ D.18-03-023 *Decision on Track 3 Policy Issues, Sub-Track 2 (Grid Modernization)* (March 22, 2018).

categorized by whether the need is at the substation (bank), circuit, or line segment level. GNA results are included in Appendix 2.

Table 3 summarizes the grid needs within SDG&E’s Distribution Planning Region and by service type.

	Distribution Service				Total
	Peak Thermal	Voltage	Back-Tie	Microgrid	
SDG&E	18	1	5	0	24

Table 3 - Summary of the Number of Grid Needs by Distribution Service Type

Table 4 summarizes the grid needs by service type and by equipment type (e.g., substation/bank, circuit, or line segment). Multiple grid needs may be related and can be solved by a single planned investment.

Equipment Type	Distribution Service				Total
	Peak Thermal	Voltage	Back-Tie	Microgrid	
Substation Bank	1	0	0	0	1
Circuit	6	0	2	0	8
Line Segment	11	1	3	0	15
Totals	18	1	5	0	24

Table 4 - Summary of the Number of Grid Needs by Distribution Service Type and Equipment Type

Table 5 summarizes the grid needs by need date.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	17	0	0	2	19

Table 5 - Summary of the Number of Grid Needs by In-Service-Date

3.1 Distribution Capacity Needs

Distribution peak thermal services provided by DERs are either load-modifying or supply-modifying. In order for DERs to defer planned distribution infrastructure, the magnitude and timing of load changes and electrical output must correspond to the magnitude and timing of the distribution need – right place, time, amount, and certainty. This can be effectuated by dispatch of controllable DERs or, for non-controllable DERs (e.g., energy efficiency), by deploying enough capacity in advance to ensure the distribution need is met when it is needed.

Table 6 summarizes the peak thermal needs.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	1	6	11	18

Table 6 - Summary of the Number of Peak Thermal Grid Needs by Project Type

Table 7 summarizes the peak thermal needs by need date.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	16	0	0	2	18

Table 7 - Summary of the Number of Peak Thermal Grid Needs by In-Service-Date

3.2 Voltage Support Needs

Voltage Support services are circuit level dynamic voltage management services provided by an individual resource and/or aggregated resources capable of dynamically correcting excursions outside voltage limits.

Table 8 summarizes the voltage support needs.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	0	0	1	1

Table 8 - Summary of the Number of Voltage Needs by Project Type

Table 9 summarizes the voltage needs by need date. All of the voltage support needs have a need date within the next three years, for the reasons specified in Section 2.1.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	1	0	0	0	1

Table 9 - Summary of the Number of Voltage Grid Needs by In-Service-Date

3.3 Reliability (Back-Tie) Needs

Back-tie services are load-modifying or supply-modifying services that provide the utility operational capacity (e.g., on an adjacent circuit) to restore service to an interrupted portion of the distribution system. Specifically, this service provides peak thermal capacity to provide service to customers during abnormal conditions and configurations. Back-tie service minimizes customer impacts during planned and unplanned outages.¹⁶

The 2021 GNA includes back-tie grid needs for substation banks, circuits, and line segments. Table 10 summarizes the back-tie grid needs.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	0	2	3	5

Table 10 - Summary of the Number of Back-tie-Grid Need by Project Type

Table 11 summarizes the back-tie grid needs by need date.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	4	0	0	1	5

Table 11 - Summary of the Number of Back-tie Grid Needs by In-Service-Date

¹⁶ 2019 Distribution Deferral Opportunity Report San Diego Gas and Electric, Appendix B.

3.4 Resiliency (Microgrid) Needs

As part of the Wildfire Mitigation Program (WMP), SDG&E is implementing mitigation measures to help reduce the risk of wildfires. As part of its Public Safety Power Shutoff (PSPS) Program, SDG&E may de-energize certain facilities that are within or cross Tier 2 and Tier 3 High Fire Threat District (HFTD) areas when forecasts predict extreme fire-threat conditions. To reduce the impacts of PSPS events on customers, SDG&E proposed several IOU-owned and IOU-controlled microgrids within its 2020 Wildfire Mitigation Plan (WMP).¹⁷ These resiliency needs were reported in SDG&E’s 2020 GNA. As of August 16, 2021, SDG&E has not proposed any additional IOU-owned and IOU-controlled microgrids; this is reflected in the tables below.

The 2021 GNA includes resiliency (microgrid) needs identified through SDG&E’s WMP efforts. Table 12 summarizes the resiliency (microgrid) needs.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	0	0	0	0

Table 12 - Summary of the Number of Microgrid Needs by Project Type

Table 13 summarizes the microgrid needs by need date.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	0	0	0	0	0

Table 13 - Summary of the Number of Microgrid Needs by In-Service Date

4. Updates to the GNA

SDG&E’s 2021 GNA conforms with data requirements identified in the Decision, the May 2019 Ruling, the May 2020 Ruling, and the Revised Attachment A. The following sections describe additional narrative requirements and SDG&E’s suggested modifications for future GNAs.

4.1 Changes from SDG&E’s 2020 GNA

There are no changes in data formats between SDG&E’s 2021 GNA and SDG&E’s 2020 GNA.

4.2 GNA and online maps

In compliance with Commission directives, SDG&E is filing this 2021 GNA on August 16, 2021.¹⁸ Applicable data from SDG&E’s 2021 GNA report data will be made available within an on-line map layer, which “pops-up” atop the circuit models in the DRP data access portal, to be viewed and downloaded via link or via API capabilities upon the next planned monthly data portal update.¹⁹

¹⁷ San Diego Gas & Electric Company Wildfire Mitigation Plan (“WMP”) (February 7, 2020), at 76-80.

¹⁸ D.18-02-004 and Administrative Law Judge’s Ruling Modifying the Distribution Investment Deferral Framework Process (filed 5/07/19).

¹⁹ As mentioned in SDG&E’s Advice Letter 3420-E, SDG&E’s modified plan to implement a DRP data access portal includes the objective of implementing updates to the data access portal by the first week of each month.

4.3 Modify future GNA requirements

SDG&E does not propose any modification to the Commission's adopted GNA process and/or reporting requirements.

Appendix 1 – Load Disaggregation

Load Disaggregation Process

Load disaggregation, Figure 2,²⁰ is the process of allocating the CEC load growth to circuits. SDG&E uses LoadSEER geospatial modelling to perform this disaggregation. The method consists of six major steps:

1. **Baseline Growth.** Adjust the CEC’s Mid Baseline Scenario load projections (i.e. MW) to avoid double counting specific DERs.
2. **Calculate Growth.** Calculate load growth (i.e. annual growth) from the adjusted baseline projections and apply the growth to the latest observed normalized distribution system coincident peak.
3. **Allocate Block Loads.** Allocate known block load growth based on expectations or new expanded service.
4. **Allocate Geo-spatial Loads.** Allocate remaining load growth based on the geo-spatial model. The geo-spatial model is a predictive model that captures location and environmental factors influencing growth on the distribution system. The geo-spatial models are calibrated to each utility’s distribution system.
5. **Local Planning Engineer Review.** Results are reviewed by local planning engineers with specialized knowledge of local areas.
6. **Circuit Level Review.** Planning engineers review and approve adjustments to the circuit level.

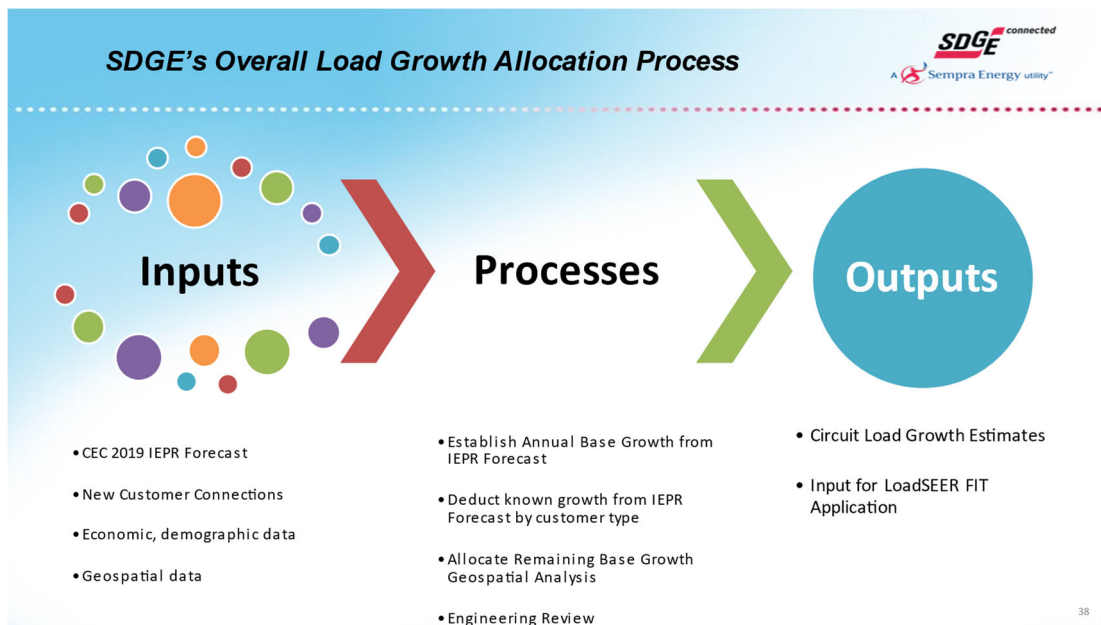


Figure 2 – Overview of Load Disaggregation

²⁰ From DFWG meeting on May 13th, 2021.

Appendix 2 - Substation Bank and Circuit Forecast Detail Summary

GNA – Distribution Circuits, Substations, Sub-transmission Capacity Service

Refer to “SDG&E GNA TABLES 2021 – PUBLIC.xls” tab “Cir-Bank Capacity”

GNA - All Other Grid Service Needs

Refer to “SDG&E GNA TABLES 2021 – PUBLIC.xls” tab “Ruling – All Other”

Appendix 3 - DER Disaggregation Process

General Process

Most of the information within Appendix 3 originates from the DFWG including the Progress Report R.14-08-013 filed on July 2nd, 2018. The working group was tasked to develop the appropriate assumptions and methods used to disaggregate various DER types. Upon completion, a final progress report was written summarizing the various methodology each utility would implement. Figure 3²¹ is an overview of activities using various disaggregation methods and variables depending on each DER type. For the subsequent flowcharts, the software tool LoadSEER is considered proprietary software and is briefly described in section 2.2. Nexant’s SPIDER™ (Spatial Penetration & Integration of Distributed Energy Resources) model is also considered to be proprietary and is used in the forecasts of Photovoltaics (PV), Electric Vehicles (EV) and for calculating the load shape for Energy Storage (ES).

DER disaggregation begins with the CEC’s IEPR forecast for each DER and then distributes the DER forecast to the circuit level. This section discusses the SDG&E’s disaggregation methods for the following five DERs: Additional Achievable Energy efficiency (AAEE), Photovoltaics (PV), Energy Storage (ES), Electric Vehicles (EV), and Load Modifying Demand Response (LMDR).

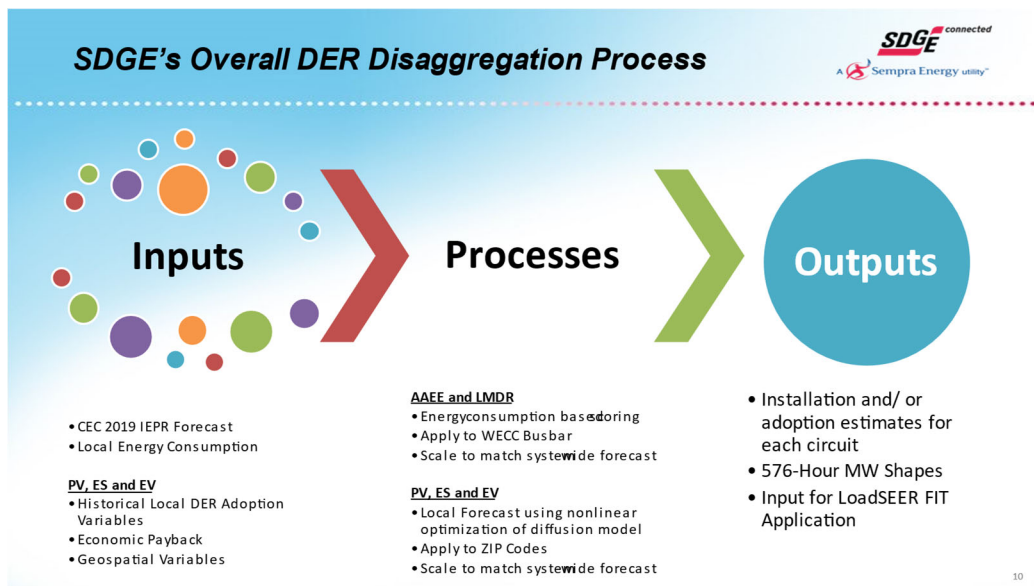


Figure 3 – Overview of DER disaggregation

²¹ From DFWG meeting on May 13th, 2021.

Additional Achievable Energy Efficiency (AAEE)

SDG&E bases their AAEE allocations on a Proportional Allocation Method. This method consists of (1) using the CEC service territory or busbar forecasts, and (2) allocating to circuits based on energy sector after calibrating data errors. Figure 4²² describes Energy Efficiency disaggregation.

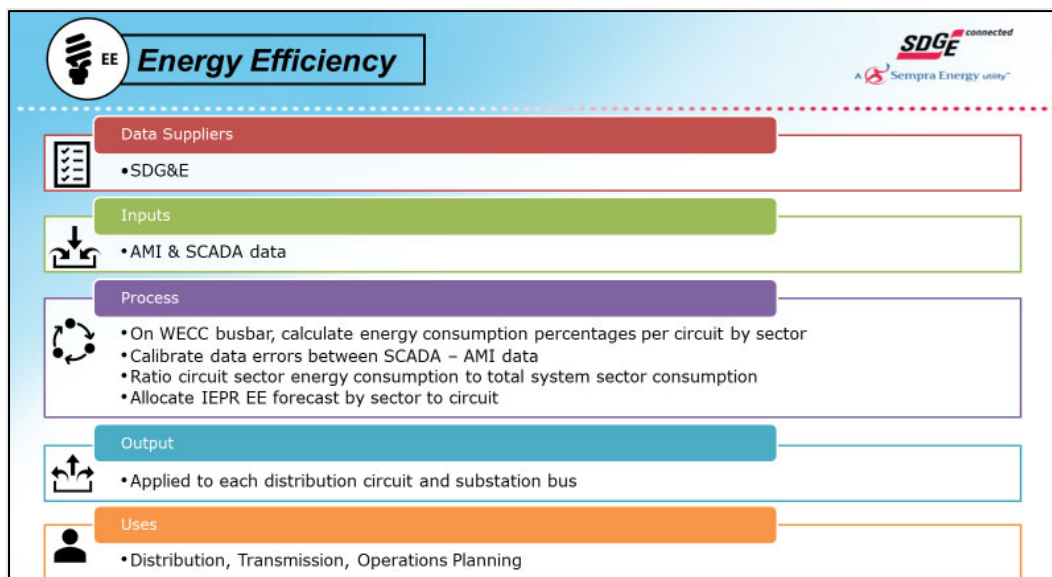


Figure 4 – Energy Efficiency disaggregation

Residential and Non-Residential Photovoltaics

SDG&E is refining adoption models for locational disaggregation of PV. Adoption models are S-curve models that capture how customers adopt a technology through time. The classic S-curve model is the Bass Diffusion model. Within a Bass Diffusion model, three parameters (P, Q, and M) are optimized to explain monthly adoption patterns. In dynamic models the values of these parameters may change through time in response to economic conditions, customer behavior, and market activities. These parameters are listed below and represent the key uncertainties in the model.

P: This parameter is for innovation and represents the behavior of early adopters for a technology as well as advertising effects. The value of this parameter may be modelled in a variety of ways.

Q: This parameter is for imitation and represents word-of-mouth adoption and the influence of previous adopters. As with the P parameter, this value may be modelled in a variety of ways.

M: This parameter is the market potential for the technology. Market potential captures the impacts of policy, policy changes, economics, tax laws, customer attitudes, and technology evolution. As with the P and Q parameters, there are a variety of ways to model this parameter.

Figure 5 shows how an S-curve models captures cumulative adoption (left) based on incremental adoption (right). Actual adoption data are shown in red and the model results are shown in blue.

²² From DFWG meeting on May 13th, 2021

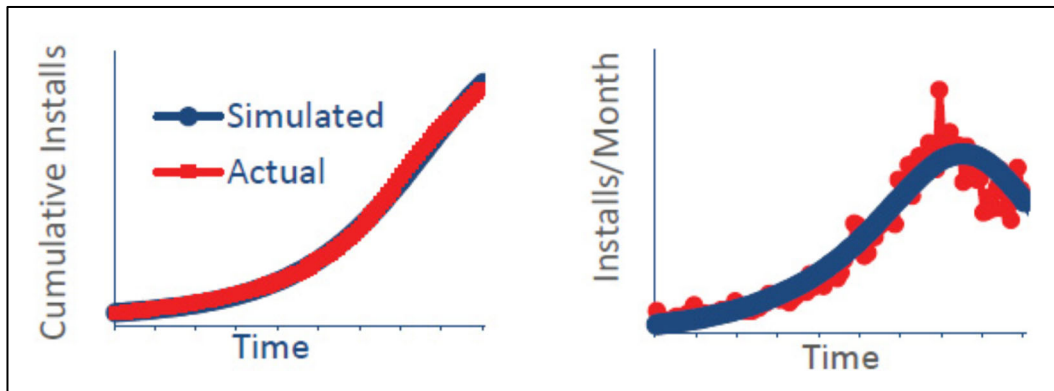


Figure 5 – S-Curve Model

By using S-curve models, SDG&E can generate bottom-up forecasts of PV adoption with parameters estimated at the ZIP code level. The bottom-up forecast is used for disaggregation. Figure 6²³ describes the PV disaggregation.

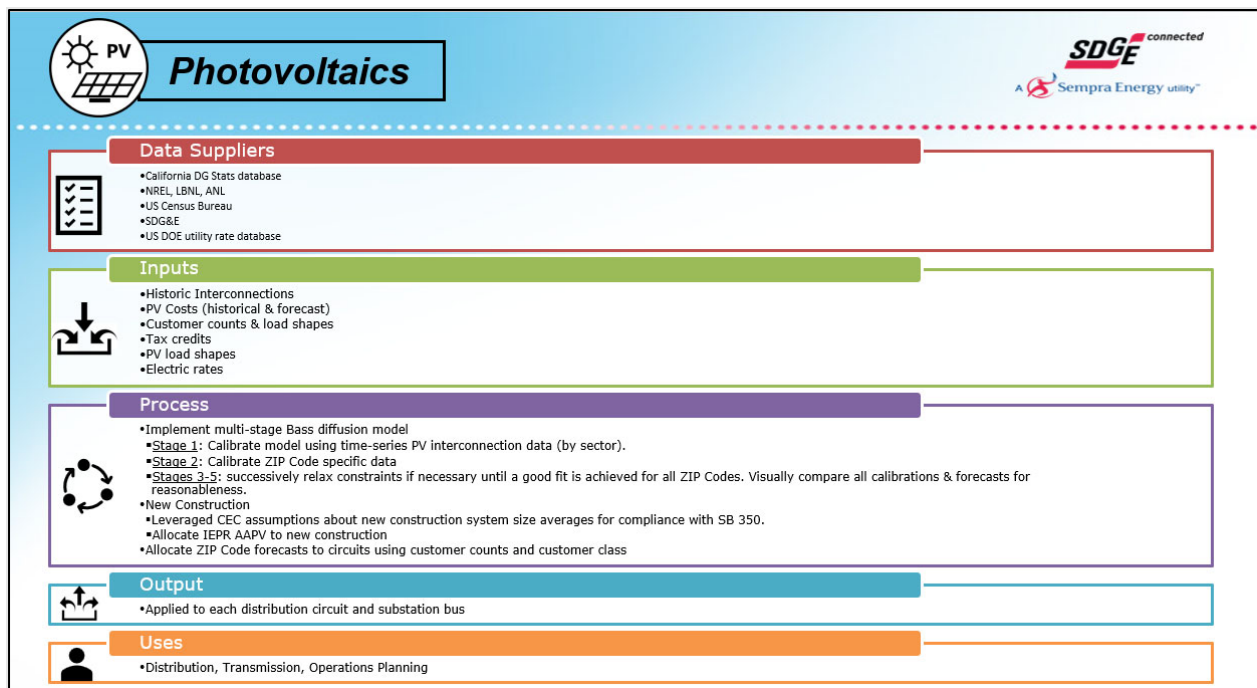


Figure 6 – Photovoltaic disaggregation

PV Data Sources

A variety of publicly available data sources combined with select SDG&E-specific data were leveraged in the PV forecasting and allocation process. Table 1 summarizes the key data sources used in the PV allocation process.

²³ From DFWG meeting on May 13th, 2021

Model Input	Source(s)
Historical Solar PV Adoption	California DG Stats Database ²⁴
Hourly Customer Load Shapes	SDG&E
Hourly PV Generation	Solar Irradiance, by climate zone, from SDG&E; PV output from NREL’s System Advisor Model ²⁵
Historical PV Costs	CA DG Stats ²⁶ and LBNL Tracking the Sun report ²⁷
Forecast PV Cost Reduction Percentage	NREL’s Cost-Reduction Roadmap for Residential Solar Photovoltaics (PV), 2017–2030 ²⁸
Average PV System Sizes	California DG Stats Database
Electric Rates (TOU)	SDG&E (TOU-DR1 for residential, AL-TOU Secondary <500kW for non-residential), NREL US Utility Rate Database (historical) ²⁹
Premise Counts	SDG&E (current), US Census (2010) and American Community Survey (2016) (forecast growth by ZIP, California Energy Commission (forecast growth by utility) ³⁰
Suitable Rooftop Area (Commercial)	NREL LIDAR Study and Database Viewer ^{31,32}
Tax Credits	DSIRE Database ³³

Table 14 - Key Data Sources for PV disaggregation

Energy Storage

SDG&E generated energy storage adoption forecasts using a ZIP-code-level Bass Diffusion method calibrated to historical energy storage interconnection data. To capture correlations between PV adoption and solar-paired energy storage adoption, the energy storage forecasts made use of the PV adoption forecasts. This approach considered the different customer economics and suitable building stocks for solar-paired versus stand-alone energy storage.

SDG&E then applied load shapes calculated using an energy storage dispatch optimization module. This module contains a mixed-integer program capable of simulating the optimal dispatch of a stand-alone or solar pair battery storage system for any input customer load profile, system size (PV and/or storage), electric rate structure and PV generation shape.

The model’s energy storage forecasts provided a basis for allocating the energy storage forecasts among ZIP codes, permitting further allocation to circuits. Figure 7³⁴ describes the ES disaggregation.

²⁴ <https://www.californiadgstats.ca.gov/downloads/>

²⁵ <https://sam.nrel.gov/>

²⁶ <https://www.californiadgstats.ca.gov/downloads/>

²⁷ <https://emp.lbl.gov/tracking-the-sun>

²⁸ <https://www.nrel.gov/docs/fy18osti/70748.pdf> (midpoint between “low” and “very aggressive” rate of cost decline)

²⁹ <https://openei.org/apps/USURDB/>

³⁰ CED 2019 Load Modifiers - Mid Baseline Mid AEE - corrected MDHD

³¹ <https://maps.nrel.gov/nsrdb-viewer>

³² <https://www.nrel.gov/docs/fy16osti/65298.pdf>

³³ <https://programs.dsireusa.org/system/program/detail/1235>

³⁴ From DFWG meeting on May 13th, 2021

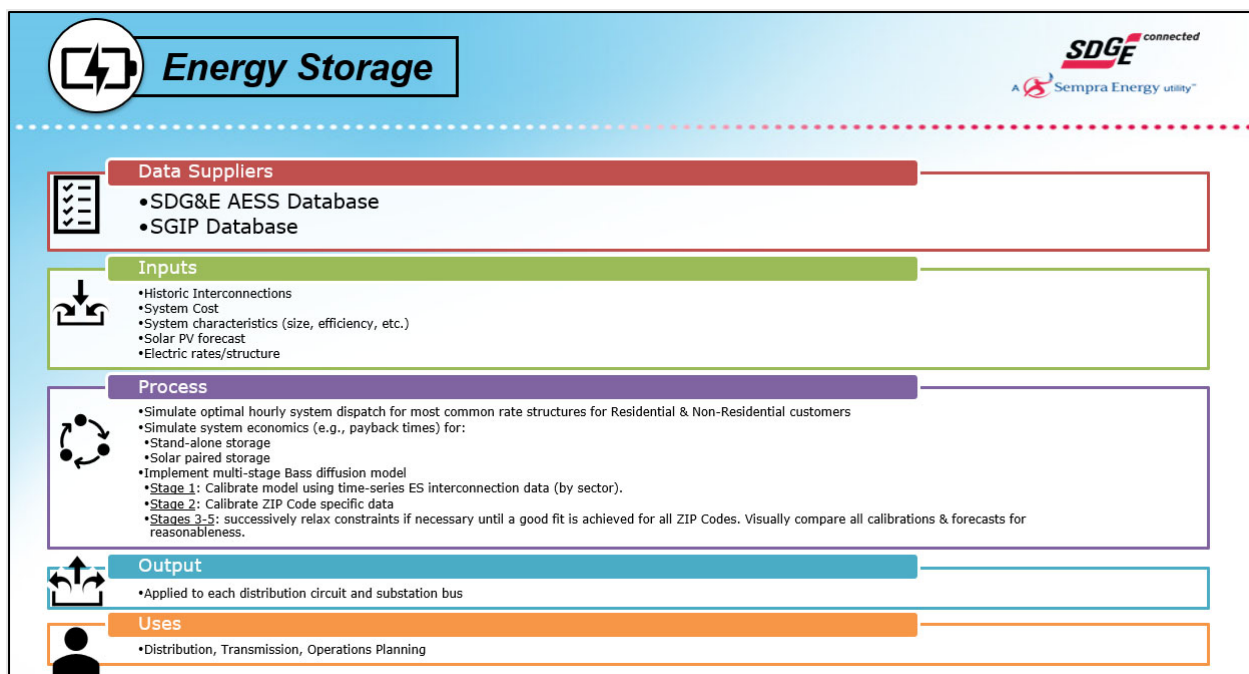


Figure 7 – Energy Storage disaggregation

ES Data Sources

Key data sources used in the Energy Storage allocation process are illustrated in Table 2.

Model Input	Source(s)
Historical Battery Storage Adoption	SDG&E Advanced Energy Storage Systems database
Hourly Customer Load Shapes	SDG&E
Historical Battery Costs	Self-Generation Incentive Program database ³⁵
Forecast Battery Cost Reduction Percentage	Greentech Media ³⁶
Historical State Incentive Rates	Self-Generation Incentive Program database
Average Battery System Sizes	SDG&E Advanced Energy Storage Systems database
Electric Rates	SDG&E (current TOU-DR1 for residential, AL-TOU Secondary <500kW for non-residential), NREL US Utility Rate Database (historical) ³⁷

Table 15 - Key Data Sources for Energy Storage Disaggregation

³⁵ https://www.selfgenca.com/documents/reports/statewide_projects.

³⁶ <https://www.utilitydive.com/news/not-so-fast-battery-prices-will-continue-to-decrease-but-at-a-slower-pace/518776/>

³⁷ <https://openei.org/apps/USURDB/>

Electric Vehicles

SDG&E based their light duty EV allocations on a Bass diffusion model at the ZIP code level while calibrating to available time-series DMV and statewide sales data. The model included a consumer choice model, where different vehicle types (e.g., conventional, electric, plug-in electric hybrid) competed for market share based on their relative consumer appeal. Vehicle capital costs, incentives, fuel and maintenance costs, and vehicle range impacted consumer appeal. The model is used to disaggregate the EV forecast based on customer information to the ZIP code level, which is then allocated to circuits. Figure 8³⁸ describes the EV disaggregation.

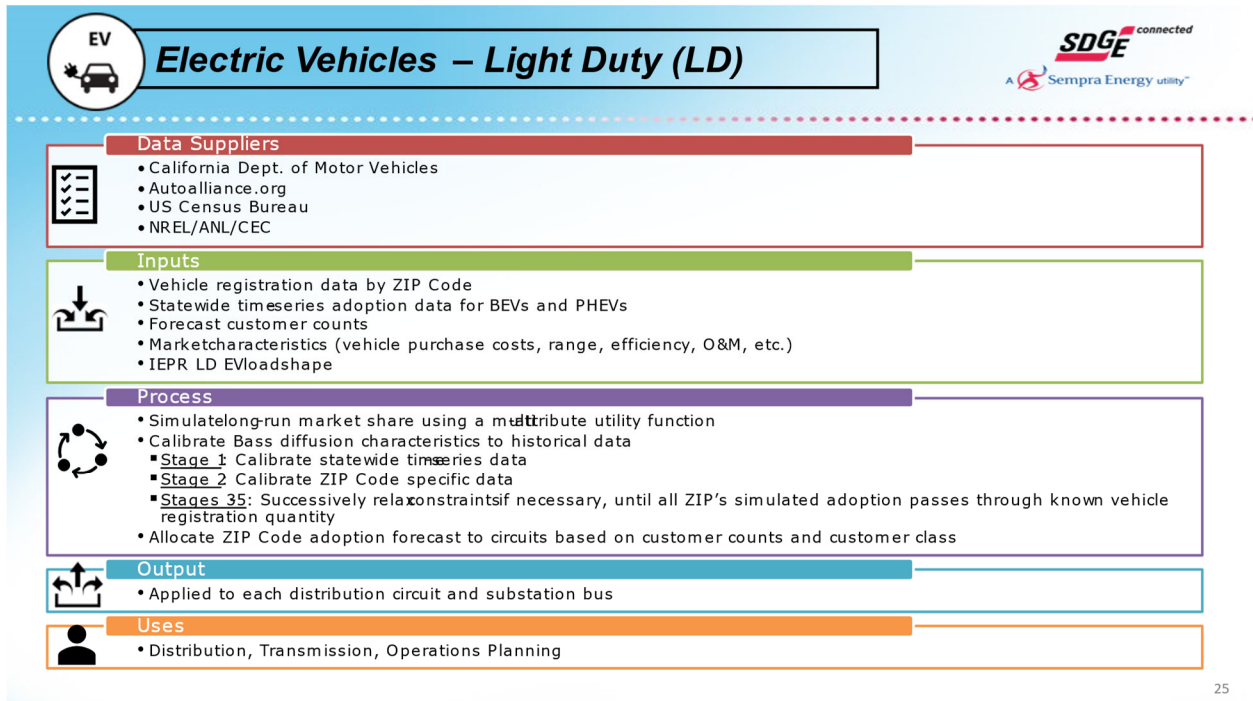
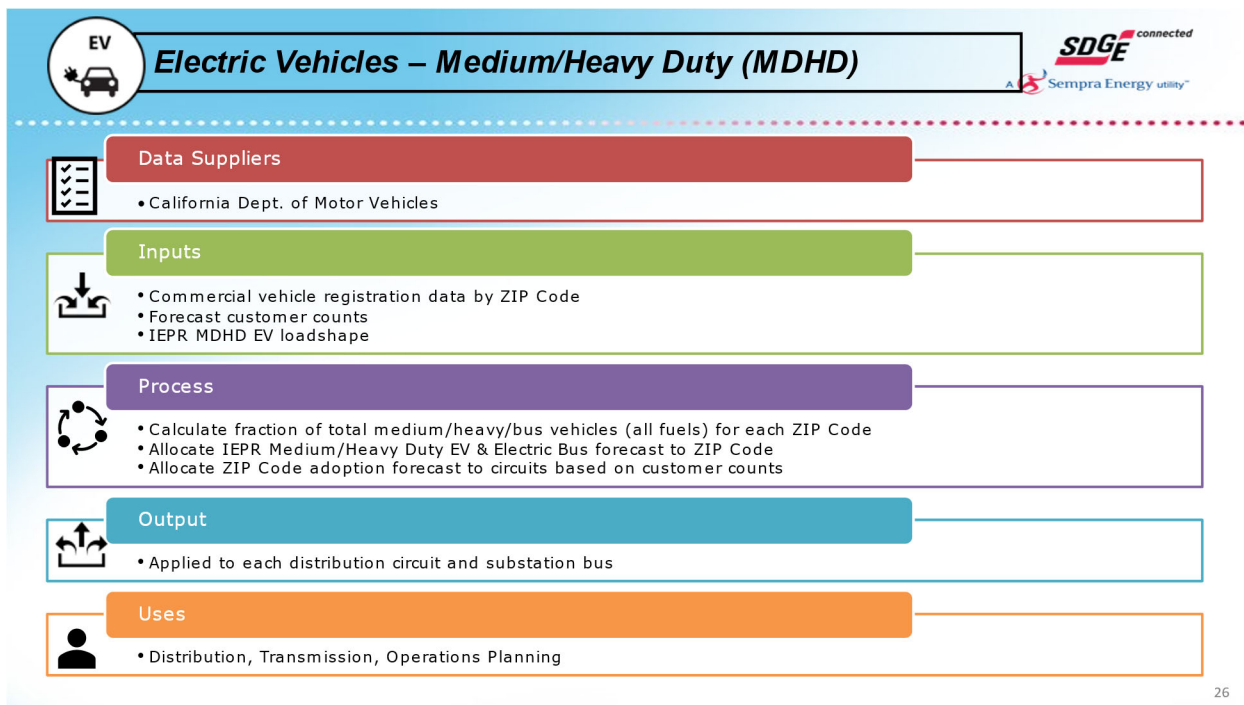


Figure 8 – Electric Vehicle disaggregation

SDG&E based their medium/heavy duty vehicle allocations on the stock of existing medium and heavy duty vehicles obtained from the California Department of Motor Vehicles (DMV).³⁹ Vehicle stock was available at the ZIP Code level of aggregation. ZIP Code level forecasts were then allocated to individual circuits based on customer counts.

³⁸ From DFWG meeting on May 13th, 2021

³⁹ <https://data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code>



26

Figure 9 – MDHD Electric Vehicle disaggregation

EV Data Sources

Key data sources used in the EV allocation process are illustrated in Table 3.

Model Input	Source(s)
Historical Time-Series EV Sales (State-wide)	Auto Alliance Vehicle Sales Data Viewer ⁴⁰
Snapshot EV Registration Data by ZIP code	California Department of Motor Vehicles (snapshot through end 2019) ⁴¹
Average Vehicles/Customer	Calculated from above DMV data and current customer counts from SDG&E
Customer Counts	SDG&E (current), US Census (2010) and American Community Survey (2016) (forecast growth by ZIP), California Energy Commission (forecast growth by utility) ⁴²
Fuel Costs	Energy Information Administration (historical) ⁴³ , California Energy Commission (forecast change) ⁴⁴

⁴⁰ <https://autoalliance.org/energy-environment/advanced-technology-vehicle-sales-dashboard/>

⁴¹ <https://data.ca.gov/dataset/vehicle-fuel-type-count-by-zip-code>

⁴² CED 2019 Load Modifiers - Mid Baseline Mid AAEE - corrected MDHD

⁴³ https://www.eia.gov/electricity/data/state/avgprice_annual.xlsx

⁴⁴ <https://efiling.energy.ca.gov/getdocument.aspx?tn=223205>

Vehicle Cost, Range, Efficiency, Maintenance Cost	NREL ⁴⁵ , ANL ⁴⁶ , EIA ⁴⁷ , CEC ⁴⁸
Vehicle Incentives	Clean Vehicle Rebate Project ⁴⁹
Tax Credits	Internal Revenue Service ⁵⁰

Table 16 - Key Data sources for Electric Vehicles disaggregation

Demand Response

SDG&E used sector regression trend models based on the ratio of enrolled LMDR participants to total available customers to determine the allocation factors. Due to the low impact of LMDR and the uncertainty related to the upcoming change to time of use rates, LMDR has minimal effect on the final forecast. Figure 9⁵¹ describes the LMDR disaggregation.

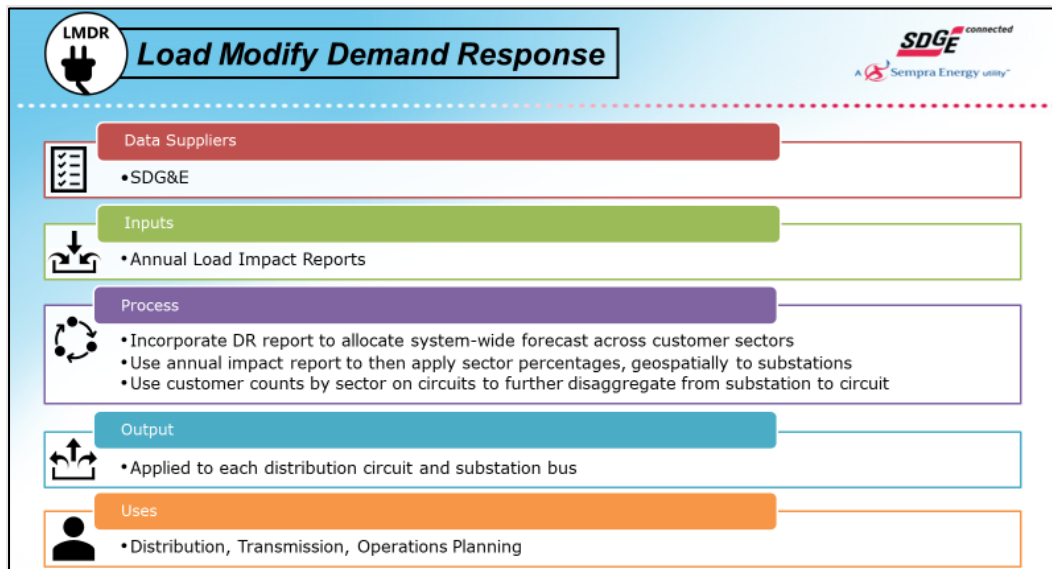


Figure 9 – LMDR disaggregation

Disaggregation Methods

Disaggregation methods used for each DER vary based on the availability of data, the maturity of the DER technology, resource constraints, and practical considerations. Each of these characteristics impacts the level of rigor applied to the disaggregation method. For example, for a DER with limited market adoption data, analysts are limited to simple disaggregation methods. However, for a DER with plentiful time series data on adoption location and customer characteristics, more complex methods can be utilized.

- Proportional Allocation.** A proportional allocation method disaggregates the DER forecast to circuits based on utility data for the circuit (load, energy, or number of customers). Based on

⁴⁵ <https://www.nrel.gov/docs/fy18osti/70455.pdf>

⁴⁶ <https://www.anl.gov/es/vision-model-download>

⁴⁷ <https://www.eia.gov/outlooks/aeo/data/browser/>

⁴⁸ <https://efiling.energy.ca.gov/getdocument.aspx?tn=221893>

⁴⁹ <https://cleanvehiclerebate.org/eng>

⁵⁰ <https://www.irs.gov/businesses/plug-in-electric-vehicle-credit-irc-30-and-irc-30d>

⁵¹ From DFWG meeting on May 13th, 2021

these data, a fraction is computed for each circuit as the ratio of the data value for that circuit divided by the total across all circuits. For example, the ratio may be calculated as the amount of energy on a circuit divided by the total energy across all circuits and may be based on either historic or forecast load data. Another approach is to use adoption of one technology to drive adoption patterns for another technology. Refinements and complexity are introduced by including sector or rate class data (e.g., residential and non-residential) to compute the ratios.

- **Propensity Models.** Propensity models base the disaggregation on customer characteristics that are used to compute a propensity score. Based on the score, a fraction is computed for each area as the ratio of the score for that area divided by the sum of the scores across all areas. The scores are typically computed using statistical methods (e.g., regression, machine learning) with cross section data that identify key variables that are correlated with customer adoption and estimate scoring weights or parameters for these variables. For example, the propensity models could be estimated using ZIP code data, in which case the models relate historical adoptions to customer characteristics in each ZIP code.
- **Adoption Models.** This approach uses a bottom-up adoption forecast based on observed adoption patterns and estimated adoption model parameters. Generally, these models are based on time-series data that capture changes in adoption through time. These models are S-Curve models (e.g., Bass Diffusion Models) and they forecast technology adoption considering the characteristics of early adopters, factors that drive market potential, and adoption rates applied to the remaining potential. Figure 10 shows a generalized S-Curve model which forecasts cumulative (red) and incremental (blue) adoptions through time. The bottom-up adoption forecasts for all areas are used to compute a set of fractions that are then used to allocate DER impacts.

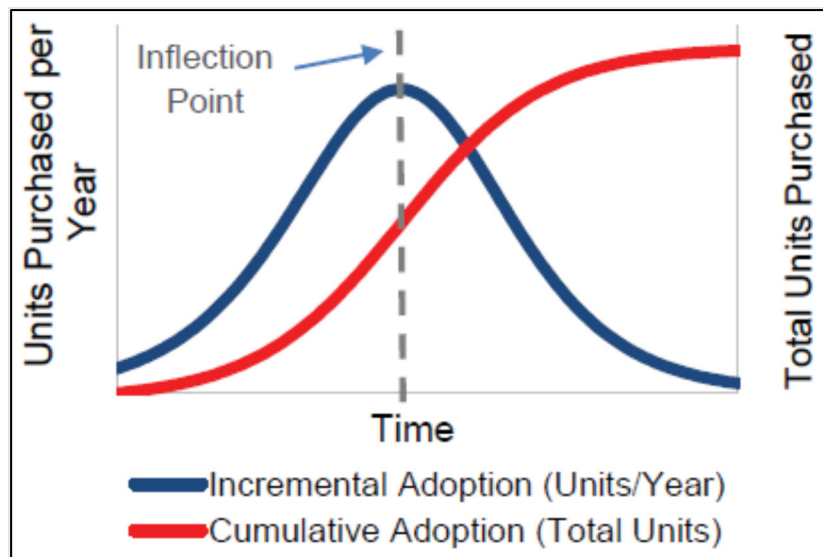


Figure 10 – Generalized S-Curve Model

**2021 Grid Needs Assessment Tables of
San Diego Gas & Electric Company**

GNA_ID	Facility ID	Substation	Bank or Circuit ID	Distribution Service Identified	Primary Driver of Grid Need	Anticipated Upgrade Date	Facility Type	Equipment Rating	Equipment Units	Deficiency 2021	Deficiency 2022	Deficiency 2023	Deficiency 2024	Deficiency 2025	Deficiency 2021 (%)	Deficiency 2022 (%)	Deficiency 2023 (%)	Deficiency 2024 (%)	Deficiency 2025 (%)	
GNA_2021_0001	2021_0209	Border	536	Thermal, Backtie	Demand Growth, DER Growth		Distribution Line		MW					0.86						7%
GNA_2021_0002	2021_0279	San Ysidro	1202	Thermal	Demand Growth, DER Growth	6/1/2025	Distribution Line	12.47	MW						4%	1%				
GNA_2021_0003	2021_0405	El Cajon	549	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Line	12.47	MW	0.44	0.17									
GNA_2021_0004	2021_0475	Spring Valley	730	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Line	12.47	MW	0.36	0.37	0.37	0.4	0.44	3%	3%	3%	3%	3%	4%
GNA_2021_0005	2021_0533	North City West	832	Thermal, Backtie	Demand Growth, DER Growth	6/1/2025	Distribution Line	12.47	MW					0.05						0%
GNA_2021_0006	2021_0635	Chicarita	502	Thermal	Demand Growth, DER Growth	6/1/2024	Distribution Line	12.47	MW				0.03	0.17						1%
GNA_2021_0007	2021_0902	Jamacha	JM30	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Line	30	MVA	0.59	0.47	0.48	0.55	0.66	2%	2%	2%	2%	2%	2%
GNA_2021_0008	2021_0982	Spring Valley	730	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Segment	3.74	MW	1.21	1.21	1.21	-	-	32%	32%	32%			
GNA_2021_0009	2021_0983	Chicarita	502	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Segment	10.39	MW	0.83	0.85	1.00			8%	8%	10%			
GNA_2021_0010	2021_0984	Apline	356	Thermal	Demand Growth, DER Growth		Distribution Segment		MW											
GNA_2021_0011	2021_0985	Jamacha	92	Thermal, Backtie	Demand Growth, DER Growth	6/1/2021	Distribution Segment	10.39	MW	0.85	0.87	0.87			8%	8%	8%			
GNA_2021_0012	2021_0986	Santee	396	Voltage	Demand Growth, DER Growth	6/1/2021	Distribution Segment		Vpu	0.00	0.00	0.00			0.04%	0.04%	0.02%			
GNA_2021_0013	2021_0987	Ash	450	Thermal, Backtie	Demand Growth, DER Growth	6/1/2022	Distribution Segment	11.02	MW	0.21	0.21	0.21			2%	2%	2%			
GNA_2021_0014	2021_0988	San Marcos	1094	Thermal, Backtie	Demand Growth, DER Growth	6/1/2022	Distribution Segment	10.39	MW	0.27	0.27	0.42			3%	3%	4%			
GNA_2021_0015	2021_0989	Clairemont	277	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Segment	3.74	MW	0.04	0.06	0.08			1%	2%	2%			
GNA_2021_0016	2021_0990	Scripps	437	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Segment	2.70	MW	0.35	0.35	0.35			13%	13%	13%			
GNA_2021_0017	2021_0991	Mission	701	Thermal	Demand Growth, DER Growth	6/1/2022	Distribution Segment	2.70	MW		0.02	0.02					1%	1%		
GNA_2021_0018	2021_0992	Clairemont	276	Thermal	Demand Growth, DER Growth	6/1/2021	Distribution Segment	2.70	MW	0.08	0.10	0.10			3%	4%	4%			
GNA_2021_0019	2021_0993	Torrey Pines	266	Thermal	Demand Growth, DER Growth	6/1/2023	Distribution Segment	12.06	MW			0.15						1%		

Confidential information is highlighted in black and redacted

**2021 Distribution Deferral Opportunity Report of
San Diego Gas & Electric Company**



2021 DISTRIBUTION DEFERRAL
OPPORTUNITY REPORT OF SAN DIEGO
GAS & ELECTRIC



Contents

- 1. Purpose 3
- 2. Background 3
- 3. Executive summary 3
 - 3.1 Confidentiality of Data 4
 - 3.2 Data Access Portal..... 4
- 4. Discussion..... 4
 - 4.1 DDOR Planned Investment Determination 5
 - 4.2 Locational Net Benefits Analysis (LNBA) 6
 - 4.2.1 LNBA Data Sources..... 6
 - 4.2.2 LNBA Deferral Timeframe 7
 - 4.2.3 LNBA Deficiency Need..... 7
 - 4.3 Key Operational Requirements..... 8
 - 4.4 Determining Candidate Deferral Opportunities 9
 - 4.4.1 Candidate Deferral Opportunities – First Screening 10
 - 4.4.2 Technical Screen 10
 - 4.4.3 Timing Screen..... 10
 - 4.5 Candidate Deferral Opportunities - Second Screening 10
 - 4.6 DPAG Candidate Deferral Opportunities Prioritization 11
 - 4.6.1 Cost Effectiveness 11
 - 4.6.2 Forecast Certainty 11
 - 4.6.3 Market Assessment..... 12
 - 4.7 Review of Project and/or Contingency Costs for prior DIDF solicited projects 12
- 5. Regulatory timelines and expected milestones in the DIDF process..... 13
- 6. Updates to the DDOR..... 14
 - 6.1 Ownership models 14
 - 6.2 Equipment to enable DER Integration 14
 - 6.3 Value-Stacking..... 15
 - 6.4 DERs As the First Contingency Solution 15
 - 6.5 Timing Screen..... 16
 - 6.6 DIDF and GO 131-D conflicts..... 16
- Appendix A – August 16, 2021 DDOR 18
 - DDOR - Planned Investments..... 18

DDOR – Candidate Deferrals.....	19
Appendix B – August 16, 2021 Prioritization Metrics Workbook	20
DDOR – LNBA Data.....	20
DDOR – Prioritization Metrics Data	20

Tables

Table 1 - Summary of the Number of Planned Investments by Project Type	5
Table 2 - Summary of the Number of Planned Investments by Distribution Service	5
Table 3 - Summary of the Number of Planned Investments by In-Service Date	5
Table 4 - Summary of the Number of Planned Investments by LNBA Range	5
Table 5 - LNBA Data Sources.....	7
Table 6 - Deferral Timeframes	7
Table 7 - Planned Investment Study Timeframe.....	8
Table 8 - Summary of Candidate Deferral Opportunities by Project Type	9
Table 9 - Summary of the Number of Candidate Deferral Opportunities by Distribution Service	9
Table 10 - Summary of the Number of Candidate Deferral Opportunities by In-Service Date	9
Table 11 - Summary of the Number of Candidate Deferral Opportunities by LNBA Range	10
Table 12 - Cost Effectiveness Metric.....	11
Table 13 - Forecast Certainty Metric	12
Table 14 - Market Assessment Metric	12
Table 15 - Solicitation Schedule	14

1. Purpose

San Diego Gas and Electric (SDG&E) hereby submits its 2021 Distribution Deferral Opportunity Report (DDOR) in compliance with Ordering Paragraph (OP) 2.d of Decision (D.) 18-02-004 (Decision), the Administrative Law Judge’s Ruling issued May 7, 2019 (May 2019 Ruling), the Administrative Law Judge’s Ruling issued May 11, 2020 (May 2020 Ruling), revised Attachment A submitted by the ALJ on June 12, 2020 and further revised on August 11, 2020, and the Administrative Law Judge’s Ruling issued June 21, 2021.

2. Background

On February 15, 2018, the California Public Utilities Commission (Commission or CPUC) issued the Decision on Track 3 Policy Issues, Sub-track 1 on Growth Scenarios and Sub-track 3 on Distribution Investment Deferral Framework. This Decision directed the Investor-Owned Utilities (IOUs or utilities) to file a Grid Needs Assessment (GNA) by June 1 of each year and a Distribution Deferral Opportunity Report (DDOR) by September 1 of each year (included with this Report as Appendix A).¹ The May 2019 Ruling directed the IOUs to provide additional GNA/DDOR reporting requirements and moved the annual filing date for the GNA and DDOR to August 15.^{2,3}

The DDOR is intended to provide stakeholders with an overview of each IOU’s new planned investment(s) to address needs identified in the GNA and serves as the basis for discussions with the Distribution Planning Advisory Group (DPAG). Those discussions are intended to help identify and prioritize candidate projects that can be deferred by cost-effective Distributed Energy Resources (DER) procured via the Commission-approved Competitive Solicitation Framework (CSF).

3. Executive summary

SDG&E’s 2021 DDOR is for the 2021–2025 five-year distribution planning period and provides an overview of twelve (12) planned investments associated with the nineteen (19) verified needs identified in the 2021 GNA. As a result of applying the initial screening criteria to identify preliminary candidate deferral opportunities (*i.e.*, technical and timing screens), SDG&E has identified two (2) potential candidate projects for deferral by cost-effective DER in SDG&E’s 2021-2022 DIDF cycle. SDG&E will review the results of this initial screening with the DPAG. For any candidate deferral projects, SDG&E will also discuss with the DPAG the second round of screening criteria Economic/Financial and Forecast Certainty, and then finalize the candidate deferral list, as applicable.

The final candidate deferral list, if applicable, will be prioritized for viability based on the adopted characterization metrics: Cost Effectiveness, Forecast Certainty, and Market Assessment. To initiate the CSF process to procure cost-effective DER solutions, SDG&E will request authority from the Commission via a Tier 2 Advice Letter to be filed by November 15, 2021.

¹ Decision, at OP 2.d.

² R.14-08-013 *Order Instituting Rulemaking to Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769*, at 9.

3.1 Confidentiality of Data

This public version of SDG&E’s 2021 DDOR reflects the redaction of data conforming with the “15/15 rule” criteria.⁴ Within Appendix A, SDG&E redacts DDOR project data for two (2) planned investment projects located on circuits that are determined to be subject to the 15/15 confidentiality rule.

3.2 Data Access Portal

In compliance with Commission directives, SDG&E is filing its 2021 DDOR on August 16, 2021.⁵ Corresponding with the filing of this DDOR report, applicable data from the DDOR report can be downloaded via a link within the DRP data access portal.⁶ The data access portal will include a common layer that identifies both DDOR and Locational Net Benefit Analysis (LNBA) data for the locations described in this DDOR. Applicable 2021 DDOR and LNBA data is available within this common layer, which “pops-up” atop the circuit models in the DRP data access portal. As required by May 2020 Ruling, SDG&E is including in the DRP data access portal a sortable layer that shows planned transmission projects whose primary drivers are comparable to the four distribution services identified by the Commission for deferral by DERs.⁷ All non-confidential data can be viewed and downloaded via Application Programming Interface (API) capabilities upon the next planned monthly data portal update⁸

4. Discussion

As part of SDG&E’s distribution capacity planning process and as identified in SDG&E’s 2021 GNA, SDG&E predominantly identified 13 new needs that involve only distribution peak thermal capacity and 5 new needs that involve both distribution peak thermal capacity and back-tie capacity. For purposes of SDG&E’s 2021 DDOR, SDG&E uses the word “peak thermal” to represent “distribution capacity”, “back-tie” to represent “reliability (back-tie)” and “microgrid” to represent “resiliency (microgrid).” As part of developing the DDOR, SDG&E analyzed each of these needs to determine appropriate mitigation projects.

The below tables show a high-level overview of the 12 new capital planned investments corresponding with the 19 needs identified in the 2021 GNA.

Table 1 summarizes the Planned Investments by project type within SDG&E’s Distribution Planning Region. The Planned Investments consist of substation banks, circuits, and distribution line segment projects.⁹ A summarizing matrix is shown in Appendix A.

⁴ R.14-08-013, *Administrative Law Judge’s Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company’s Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004* (July 24, 2018).

⁵ Decision and Administrative Law Judge’s Ruling Modifying the Distribution Investment Deferral Framework Process (filed 5/07/19).

⁶ SDG&E’s Interactive Map & Integration Capacity Analysis is available at: <https://www.sdge.com/more-information/customer-generation/enhanced-integration-capacity-analysis-ica>.

⁷ Peak thermal, reliability (“back-tie”), voltage support and resiliency (“microgrids”).

⁸ As mentioned in SDG&E’s Advice Letter 3420-E filed August 12, 2019, within SDG&E’s modified plan to implement a DRP data access portal, SDG&E strives to implement updates to the data access portal by the first week of each month.

⁹ See 2021 GNA, footnote 6.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	0	3	9	12

Table 1 - Summary of the Number of Planned Investments by Project Type

Table 2 summarizes the Planned Investments by Distribution Service. The majority of Planned Investments are for distribution peak thermal needs. Note that the total needs exceed the total number of projects because some projects address multiple needs.

Distribution Service				Total
Peak Thermal	Voltage	Back-Tie	Microgrid	
18	1	5	0	24

Table 2 - Summary of the Number of Planned Investments by Distribution Service

Table 3 summarizes the Planned Investments by in-service date. Ten (10) Planned Investments have an in-service date within the next three years, and two (2) Planned Investments have an in-service date of 2024 or later.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	10	0	0	2	12

Table 3 - Summary of the Number of Planned Investments by In-Service Date

Table 4 summarizes the Planned Investments by LNBA range using methodology described in Section 4.5.

LNBA Range (\$/kW-yr)			Total
\$0-100	\$100-500	>\$500	
8	1	2	11
LNBA Range (\$/Vpu-yr)			Total
\$0-\$100,000	\$100,000-\$500,000	>\$500,000	
1	0	0	1
LNBA Range (\$/KWh-yr)			Total
\$0-100	\$100-500	>\$500	
0	0	0	0

Table 4 - Summary of the Number of Planned Investments by LNBA Range

4.1 DDOR Planned Investment Determination

DDOR project determination began by thoroughly reviewing needs identified in the GNA to develop the optimal solution to address those needs. This assessment began by reviewing circuit characteristics, such as phase imbalance, timing of need, available circuit ties, nearby circuits with available capacity, reactive power flow, and the relative ease with which new infrastructure could be built. SDG&E's distribution planning engineers analyze these aspects, among others, to determine a least cost, best fit and just-in-time solution to mitigate the problem.

Typically, the least cost solution to resolve identified needs is to utilize existing equipment, which can also allow for rapid implementation. These solutions include phase balancing, where load is measured and moved between the three phases to balance the utilization of the existing conductors. The practice of phase balancing is an operations function, performed on a near-term basis, and is therefore not eligible as a deferrable service. As such, forecast needs solved by phase balancing are not shown on the DDOR report. A similar solution to a need is to transfer load using existing switches or equipment. These projects are also operational in nature and have little to no associated capital investment. Because of the immediacy and low costs involved, these project types are considered to be of a *de minimis* nature and are not shown in the DDOR.

If needs cannot be appropriately mitigated using existing equipment, the option of installing new equipment is explored. New or reconducted cable or conductor, for example, can enable a load transfer or increase the capacity of the otherwise constrained asset. These projects are usually higher in cost than utilizing existing equipment due to the cost of purchasing and installing the new equipment.

Often the costliest option is to install a new circuit or substation transformer, which provides additional capacity to a larger area. These projects are often pursued in areas with significant growth and/or constraints.

4.2 Locational Net Benefits Analysis (LNBA)

The LNBA values were calculated using the methodology approved by the Commission and incorporated in the public version of the LNBA tool created by Energy and Environmental Economics, Inc. (E3).¹⁰

4.2.1 LNBA Data Sources

In the development of the LNBA tool, generic financial variables were used to approximate the deferral value for projects identified by the three utilities. Many of the factors used by SDG&E for the calculating the deferral value of DDOR projects are consistent with values already present within the LNBA tool. SDG&E updates two utility-specific variables: the Operations and Maintenance (O&M) Factor and the Book Life.

Input	UG Feeder	OH Feeder	Source
Discount Rate	7%	7%	Standard Assumption in E3 LNBA Calculator
Revenue Requirement Multiplier	1.5	1.5	Standard Assumption in E3 LNBA Calculator
Equipment Inflation	2.0%	2.0%	Standard Assumption in E3 LNBA Calculator
O&M Inflation	2.0%	2.0%	Standard Assumption in E3 LNBA Calculator

¹⁰ E3 LNBA Tool V2.11; <https://e3.sharefile.com/share/view/sb2965cf362c48399>.

O&M Factor	1.9%	7.4%	SDG&E Rule 2
Book Life	30	30	Book life to match SDG&E GRC

Table 5 - LNBA Data Sources

4.2.2 LNBA Deferral Timeframe

One variable used when calculating the LNBA value is the deferral period. Deferral timeframes would typically depend on the type of forecast deficiency and planning horizon to calculate LNBA values. The May 2020 Ruling requires SDG&E to calculate LNBA values that assume a 10-year deferral timeframe (i.e., 2021 through 2030 for this DIDF cycle).

2030 is the tenth year of this DIDF cycle; 2021 being the first year. If the need for any particular project is not identified through the tenth year, then that project’s largest identified need within the 10-year timeframe will be used for purposes of calculating LNBA values for the remaining years. LNBA values begin in the first year of the need and extend through the 10-year timeframe. For example, for a need and associated project with an in-service date in year four, but no identified need beyond year five, the LNBA calculation would begin in year four and extend the year five need through year ten (2030 for this DIDF cycle). The planning horizons for different project types are shown in Table 10.

Project Type	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Pre- and Post-Application projects, banks, circuits, & line segments	X									
		X								
			X							
Pre- and Post-Application projects, banks, circuits				X						
					X					
Pre- and Post-Application Projects						X				
							X			
								X		
									X	
										X

Table 6 - Deferral Timeframes

- X – Indicates potential first year of project need
- Blue cells indicate the deferral period

4.2.3 LNBA Deficiency Need

Another variable used when calculating the LNBA value is the magnitude of the grid need deficiency. The magnitude of the grid need deficiency is deemed to be the largest forecast deficiency within the appropriate planning horizon. SDG&E uses a forecast planning horizon that is based on i) a three-year period, ii) a fixed five-year period, or iii) a fixed ten-year period, as discussed below.

- i. Fixed three-year horizon

As explained in SDG&E’s 2021 GNA, SDG&E assesses the need for line segment upgrades only during the first three years of the five-year planning horizon. The first year of the deferral period for line segment needs is therefore 2021, 2022, or 2023.

Line segment needs reflect the granular allocation of DER impacts based on a system-level forecast of DER additions. Compared to needs identified for distribution circuits or substation transformer banks, where forecast DER impacts are cumulative, line segment needs are inherently uncertain and highly sensitive to individual customer decisions regarding actual DER adoption. Because individual customer adoption of DERs significantly influences line segment needs, infrastructure solutions tend to be short-term in nature. Due to the high level of forecast uncertainty associated with line segment needs that may arise beyond the third year of SDG&E’s distribution planning horizon, SDG&E does not assess whether there may be line segment needs during years four and five of SDG&E’s five-year planning horizon.

ii. Fixed five-year horizon

Distribution planning engineers identify solutions within the 5-year distribution planning horizon for newly identified bank and circuit issues. Bank and circuit issues are given a fixed five-year deficiency timeframe. This method was used in the 2018, 2019 and 2020 DIDF cycles.

iii. Fixed ten-year horizon

The May 2020 Ruling Reform 7 directed the IOUs to use a 10-year horizon for Pre- and Post-Application projects to identify deficiencies for cost-effective deferral opportunities via DERs.¹¹ SDG&E interprets this direction as requiring that the deferral period for all identified needs ends in the tenth year of the planning horizon, or year 2030.

The following illustrates the study timeframe for the different types of investments:

- Planned Investments (line segments): three-year study horizon
- Planned Investments (bank & circuit): five-year study horizon.
- Planned Investment (Pre- and Post-Application projects¹²): 10-year study horizon

Project Type	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Planned Investments (line segments)										
Planned Investments (banks & circuits)										
Pre/Post Application Projects										

Table 7 - Planned Investment Study Timeframe

Blue cell indicates the study horizon

4.3 Key Operational Requirements

SDG&E’s distribution system is planned and designed to support safe and reliable operation, including in emergencies. The needs addressed and services provided by the planned investments that are listed in the DDOR may include distribution peak thermal, back-tie, voltage support, or microgrid services, or a

¹¹ May 2020 Ruling, Attachment A.

¹² Pre- and Post-Application projects as defined in 2021 Grid’s Needs Assessment of San Diego Gas and Electric

combination of these. The back-tie service supports unplanned (e.g., car-pole contact) and planned outages (e.g., maintenance), by providing the capacity for switching (e.g., to maintain or restore service) on a typically limited basis. Details of the back-tie service can be found in the 2019 DDOR Appendix B.¹³ Further operational requirements for these services, including dispatch, can be found in the Technology Neutral Pro Forma (TNPF) contracts which govern DER providers’ provision of distribution deferral services.¹⁴

4.4 Determining Candidate Deferral Opportunities

Preliminary candidate deferral opportunities are those projects that pass the technical and timing screens from the DDOR Planned Investment list. As shown in SDG&E’s 2021 GNA filing, there are two (2) needs that require new capital investment in either 2024 or 2025. SDG&E will review candidate deferral opportunities with the DPAG and the Independent Professional Engineer.

Table 11 summarizes the Candidate Deferral Opportunities by Project Type.

	Project Type			Total
	Substation Bank	Circuit	Line Segment	
SDG&E	0	2	0	2

Table 8 - Summary of Candidate Deferral Opportunities by Project Type

Table 12 summarizes the Candidate Deferral Opportunities by Distribution Services.

Distribution Service				Total
Peak Thermal	Voltage	Back-Tie	Microgrid	
2	0	1	0	3

Table 9 - Summary of the Number of Candidate Deferral Opportunities by Distribution Service

Table 13 summarizes the Candidate Deferral Opportunities by In-Service Date.

In-Service Date					Total
2021	2022	2023	2024	2025	
0	0	0	0	2	2

Table 10 - Summary of the Number of Candidate Deferral Opportunities by In-Service Date

Table 14 Summarizes the Candidate Deferral Opportunities by LNBA Range using methodology described in Section 4.4.

LNBA Range (\$/kW-yr)			Total
\$0-100	\$100-500	>\$500	

¹³ 2019 Distribution Deferral Opportunity Report San Diego Gas and Electric, Appendix B

¹⁴ SDG&E has considered SCE’s day-ahead dispatch requirement as required by reform #47 in the revised Attachment A submitted by the ALJ on June 12, 2020. SDG&E’s specific dispatch requirements will be set forth in the contracts under which DER providers provide distribution services to SDG&E. These contracts are a product of the Competitive Solicitation Framework (CSF) and will be used with various modifications in the Request For Offer (RFO) solicitation process, the Standard Offer Contract pilot and the Partnership Pilot.

1	0	1	2
LNBA Range (\$/Vpu-yr)			Total
\$0-\$100,000	\$100,000-\$500,000	>\$500,000	
0	0	0	0
LNBA Range (\$/KWh-yr)			Total
\$0-100	\$100-500	>\$500	
0	0	0	0

Table 11 - Summary of the Number of Candidate Deferral Opportunities by LNBA Range

4.4.1 Candidate Deferral Opportunities – First Screening

The application of screens to the Planned Investments list (Appendix A) results in the identification of the Candidate Deferral Opportunities. The Decision requires the application of two screens: a technical screen and a timing screen. These screens are described in the following sections.

4.4.2 Technical Screen

The purpose of the Technical Screen is to identify the distribution services DERs can provide to potentially defer a distribution project, and whether there are any technical deferral limitations associated with certain projects. The definitions for the key distribution services that DERs can provide were adopted by Decision 16-12-036, *Decision Addressing Competitive Solicitation Framework and Utility Regulatory Incentive Pilot*, issued December 22, 2016.¹⁵

4.4.3 Timing Screen

The purpose of the Timing Screen is to ensure cost-effective DER solutions can be procured with sufficient time to fully deploy and begin commercial operation in advance of the forecast need date. Three years (by Year Four) is the earliest year considered adequate to successfully procure, contract, design, develop, market, and deploy DER solutions for these services. This was established in the DIDF stakeholder process.¹⁶

4.5 Candidate Deferral Opportunities - Second Screening

Once the Candidate Deferral Opportunities list is published in the DDOR Report, the DPAG will advise and assist in applying the remaining two deferral screens (*i.e.*, Economic/Financial and Forecast Certainty) to help finalize the Candidate Deferral Opportunities list. Projects that are removed from the DDOR Candidate Deferral Opportunities list will remain in the DDOR Planned Investment list but will not be considered for DER solicitation.

¹⁵ See, D. 16-12-036, *Decision Addressing Competitive Solicitation Framework and Utility Regulatory Incentive Pilot* (December 22, 2016), at Ordering Paragraph 2. The Commission adopted four key distribution services that DER can provide: distribution capacity, voltage support, reliability (back-tie), and resiliency (microgrid).

¹⁶ Track 3 Sub-track 3: Distribution Investment Deferral Framework Workshop, December 12, 2016.

4.6 DPAG Candidate Deferral Opportunities Prioritization

After initial screens have identified planned distribution projects that are feasible for deferral, the DPAG will advise on the prioritization of the Candidate Deferral Opportunities list to support the determination of which planned distribution projects should be considered for competitive solicitation. These candidate deferral opportunities will be prioritized based on the categories of Cost Effectiveness, Forecast Certainty, and Market Assessment. Pursuant to DIDF Reform #20 of the May 2020 Ruling, the IOUs collaborated on the development of a *Joint Prioritization Metric Workbook Template* for the 2021-2022 DIDF cycle. The prioritization workbook is designed to prioritize projects relatively suitable to be deferred. As required by DIDF Reform #22 of the May 2020 Ruling the *Joint Prioritization Metric Workbook Template* is attached as Appendix B with all cells unlocked.

When there are less than three candidate deferral opportunities, candidate deferral opportunities are considered Tier 1 projects unless there are “red flags” associated with a project in which case the project will be deemed Tier 3. The Commission-adopted staff proposal requires that at least one Tier 1 candidate deferral project be offered for the Partnership Pilot and at least one Tier 1 candidate deferral project be offered for the Standard Offer Contract pilot.¹⁷

4.6.1 Cost Effectiveness

The cost-effectiveness metric is intended to provide a relative indication of how likely DER resources can cost-effectively defer a planned investment.

- **LNBA Value:** The deferral value of distribution investment
- **Unit Cost of Traditional Mitigation (\$):** Cost of the traditional mitigation project designed to meet the maximum capacity need for each project.

Criteria	Higher Ranking	Lower Ranking
LNBA value	High LNBA value	Low LNBA value
Unit Cost of Traditional Mitigation (\$)	High project costs	Low project costs

Table 12 - Cost Effectiveness Metric

4.6.2 Forecast Certainty

The forecast certainty metric is intended to give a relative indication of the certainty of forecast grid needs.

- **Grid Need Certainty:** The IOU-specific, maximum grid need certainty score of all the assets associated with a project.
 - **Weather factor adjustment:** Significant weather events can have a large effect on load. There is more forecast certainty in areas with less weather sensitivity.

¹⁷ The staff proposal for the Partnership Pilot states that “the IOUs would be required to propose at least one Tier 1 opportunity” (p. 40). The staff proposal for the Standard Offer Contract pilot states that the “IOUs would be required to launch at least one Tier 1 candidate deferral opportunity” (p. 52).

- Customer-Specific Development: The project need is a result of general or specific customer growth.
- Historical Load: Forecast load with historical measurements or anticipated growth.
- Year of Need: The earliest starting year among all assets associated with a project.

Criteria	Higher Ranking	Lower Ranking
Weather factor adjustment	Average weather factor applied compared to overall system	Above-average weather factor applied compared to overall system
Customer-specific development	Numerous customer requests for new load	Fewer customer requests for new load
Historical load	Forecast peak with minimal variation from recent years' peak	Forecast peak with significant variation from recent years' peak
Year of Need	2024 needs	2025 needs

Table 13 - Forecast Certainty Metric

4.6.3 Market Assessment

The Market Assessment metric is intended to give a relative indication of how likely DER resources can be sourced that will successfully meet the DER distribution service requirements.

- Duration: The maximum number of hours that DER is needed in a peak day, during the deferral period, to meet the need that the project mitigates
- Capacity Need (MW)/Circuit: The max capacity need per number of circuits to which DERs can connect and meet the grid need.
- Operational Requirement: The operational requirement of the need.
- Number of Grid Needs: The number of grid needs that the project mitigates.

Criteria	Higher Ranking	Lower Ranking
Duration	Shorter durations	Longer durations
Capacity Need (MW)/Circuit:	Less thermal needs per circuit	Larger thermal needs per circuit
Operational Requirement	Day ahead dispatch	Real time or Islanded dispatch requirements
Number of Grid Needs	Smaller number of grid needs	Larger number of grid needs

Table 14 - Market Assessment Metric

4.7 Review of Project and/or Contingency Costs for prior DDF solicited projects

SDG&E does not currently have any distribution projects undergoing solicitation for distribution services from the prior DDF cycle(s). Therefore, no project costs or contingency costs have been identified for prior deferral projects.

5. Regulatory timelines and expected milestones in the DIDF process

The tentative schedule below reflects dates and milestones aligning with Commission directives pertaining to the adopted DIDF, as updated in subsequent Decisions and/or Rulings.¹⁸

Activity	Date
Open First Pre-Screening Period for Potential Partnership Pilot Aggregators	July 15 th ¹⁹
Close First Pre-Screening Period for Potential Partnership Pilot Aggregators	August 14 th
GNA and DDOR published	August 16 th
Post Approved Aggregators from July 15 th Application Period to SDG&E Partnership webpage.	September 15 th
Launch RFO solicitation process and/or subscription period ²⁰ for Standard Offer Contract (SOC) pilot (includes issuance of SOC price sheet)	September 15 th ²¹
IPE Final Report	October 21 st
Submit Tier 2 Advice Letter for approval to open Partnership Pilot subscription periods	November 15 th ²²
Open Second Pre-Screening Period for Potential Partnership Pilot Aggregators	December 15 th ²³ (assuming Advice Letter not protested)
Close Second Pre-Screening Period for Potential Partnership Pilot Aggregators	January 14 th (assuming Advice Letter not protested)
Open Partnership Pilot subscription period	January 15 th (assuming Advice Letter not protested)
Post Approved Aggregators from December 15 th Application Period to SDG&E Partnership webpage.	February 14 th (assuming Advice Letter not protested)
Close Partnership Pilot subscription period	Earlier of when 120% of need is met or contingency date reached.
Utility makes informational-only filing that includes signed Partnership Pilot contracts.	Following closure of the Partnership Pilot subscription period. ²⁴
Contracts for Standard Offer Contract pilot tendered	When pricing sheets indicate at least 90% of need is met. ²⁵

¹⁸ Decision, at 69.

¹⁹ "Will occur July 15th of each year and last 30 days." Staff proposal, Table 2 at p. 23.

²⁰ "Providers then submit pricing sheets...during the subscription period." Staff proposal at p. 53.

²¹ "(Utilities) shall launch the Requests for Offers annually, on September 15. Pilot in the Requests for Offer process." D. 21-02-006, OP 11.

²² "a final cost cap submission date of November 15 within the Tier 2 Advice Letter requesting to launch subscription periods for the Partnership Pilot." D.21-02-006, OP 2 d).

²³ "offered 30 days before each...tariff subscription launch." Staff proposal, Table 2 at p. 23.

²⁴ "the IOUs would file an Information-Only Submittal...with Energy Division for each planned investment that includes project descriptions, an offer and procurement outcomes summary, the executed contracts..., and any other information as required by Energy Division." Staff proposal at p. 43-44.

²⁵ "When the 90% acceptance trigger is met, IOUs sign contracts with providers." Staff proposal at p. 53.

Close subscription period for Standard Offer Contract	Earlier of when pricing sheets indicate 100% of need is met or contingency date is reached.
Close RFO, aka notify the short list	No later than January 15 th
File Tier 2 Advice Letter Requesting Approval of Contracts	No later than March 15 th

Table 15 - Solicitation Schedule

6. Updates to the DDOR

Several narrative topics were identified as part of the May 2020 Ruling to be included within the GNA/DDOR. The following sections pertain to DER ownership models, DER integration, value-stacking, contingency solutions, energy reconciliation for bundled customers, the timing screen, and DIDF conflicts with GO 131-D.

6.1 Ownership models

Consistent with the DRP Pilot, any eligible DER provider – whether SDG&E or a third-party – can offer cost-effective DER solutions to defer planned distribution infrastructure projects. As referenced in the May 2020 Ruling, Reform 44: “The IOUs shall encourage bids for all forms of resource ownership (*e.g.*, utility-owned, third-party owned, customer-owned, joint ownership) in their DIDF RFOs, allowing for bid participation and evaluation without any bias towards a specific ownership model.” This sentiment aligns with SDG&E’s procurement process, wherein greater participation could further benefit ratepayers.

6.2 Equipment to enable DER Integration

The integration equipment that enables DERs to provide services in the DIDF varies considerably by type of DER and by specific application. These requirements will be addressed by the interconnection agreement under which a DER providing distribution service interconnects with the distribution grid, and within the TNPF contract in which SDG&E and the DER provider set forth the rights and obligations of the parties to provide the contracted distribution services. Where the integration equipment is on the utility side of the meter and supports grid safety and reliability, it is not feasible for third parties to own and control the equipment. Third parties, unregulated by the Commission, cannot own and control distribution infrastructure, as they are not responsible for grid safety and reliability, and it would be impractical for them to assume the liability that would protect the utility from the financial consequences of mis-operation of utility infrastructure.

When a DER provider relies on a large number of DERs to supply the required services, SDG&E will require communication with the DERs to provide visibility into their collective operation to ensure grid reliability is not jeopardized. Ownership of these communication channels, and the point at which third-party-owned communication systems interface with the utility’s communication system, will need to be determined.

In 2018, the Commission directed the IOUs to submit Grid Modernization Plans (GMP) in their next General Rate Case (GRC).²⁶ SDG&E will address needs (*e.g.* equipment, cost estimates, deployment

²⁶ D.18-03-023 *Decision on Track 3 Policy Issues, Sub-Track 2 (Grid Modernization)* (March 22, 2018), at Ordering Paragraph 7.

approach) for broader system and longer-term DER integration. As such, the status and timing of such integration strategies is aligned with SDG&E's next GRC.

6.3 Value-Stacking

SDG&E supports value-stacking to potentially enhance value to consumers. SDG&E's approach includes identifying needs that DERs could cost-effectively provide, incorporating them into competitive solicitations, and allowing and encouraging participants to seek other parties (e.g. other Load Serving Entities) that may have additional needs that the DER could satisfy. This approach focuses on optimal outcomes (e.g., more competitive offers) for consumers, by linking the value-stacking opportunities to the needs and the service provider's interest (e.g., compatible with business model) and ability to deliver them (e.g., contractual obligations).

6.4 DERs As the First Contingency Solution

DIDF reform #49 states that "the IOUs shall identify DERs as the first contingency in their contingency planning process, and where third-party procurement is unsuccessful, shall consider full or partial IOU-ownership of a DER solution." SDG&E has already committed to considering DERs as a contingency solution in the event that the DER selected in the distribution deferral RFO fails. SDG&E previously stated in Advice Letter 3309-E that:

Should DER projects fail to deliver according to the terms of the contracts negotiated between SDG&E and the DER provider, SDG&E will evaluate potential solutions based on the timing and conditions. To the extent practical and allowed by time, SDG&E will explore alternatives to address the contingency, including DER through existing bids received. SDG&E will then pursue implementing an applicable solution to maintain safe and reliable operation. SDG&E will follow Commission approval and cost recovery processes for all costs incurred to mitigate the DER failure.

SDG&E reaffirms its commitment to considering whether DERs not selected in the RFO would be a cost-effective solution for deferring distribution infrastructure in the event the selected DER fails to perform as required by SDG&E's TNPf contract.

In the distribution planning process leading up to the publication of the GNA/DDOR, SDG&E considers whether utility-owned DERs would be a cost-effective solution for addressing identified distribution needs. SDG&E's experience has been that utility-owned DERs are often not cost-effective solutions compared to conventional distribution infrastructure additions.

Additionally, depending on when it becomes known that the DER selected in the RFO is unable to perform as required by SDG&E's TNPf contract, the time available to implement a different DER solution may or may not be adequate to meet the need date. Nevertheless, SDG&E will consider full or partial utility ownership, along with other options, to determine the most cost-effective and feasible contingency solution.

6.5 Timing Screen

The timing screen was developed in the DIDF stakeholder process. SDG&E is not aware of new information or advances that would suggest DERs could successfully and cost-effectively defer planned distribution infrastructure for needs in years 2021, 2022 or 2023. Key milestones include: conduct the Commission directed Request For Offer (RFO) process; finalize the terms of the TNPFC; conduct required interconnection studies and build any identified system upgrades; design, permit, construct and test solutions; and/or market to, and contract with, customers willing to participate. SDG&E continues to evaluate and recommend enhancements to the process and timeline. In the IDER proceeding, SDG&E provided recommendations for Commission consideration.²⁷ Additionally, in D.21-02-006 the Commission has directed that the utilities conduct two pilots, the Partnership Pilot and the Standard Offer Contract pilot, to see whether there are other mechanisms by which DERs can be efficiently procured to cost-effectively defer planned distribution infrastructure.

6.6 DIDF and GO 131-D conflicts

SDG&E believes that there can be conflicts between the DIDF and General Order 131-D which could jeopardize reliability and raise customer costs. The distribution components of a Post-Application transmission project have already undergone engineering design and review and are aligned with the transmission project need and ultimate plan of service. If the distribution components are subsequently incorporated into the DIDF, any result that differs from the plan of service included in the General Order 131-D filing would presumably necessitate an amendment. The revised plan of service may require a new, and potentially lengthy, environmental reassessment. Conducting the DIDF RFO and amending the General Order 131-D filing based on the results of the RFO will take additional time and could jeopardize the in-service date of the transmission project with attendant consequences for grid reliability. Amending the General Order 131-D filing will also add costs, including FERC jurisdictional cost, to the process.

Pre-Application projects are driven by needs at the transmission level but may have distribution components. These projects may also be affected by conflicts between the DIDF and General Order 131-D. Pre-Application transmission projects are expected to require Commission review under General Order 131-D, but an application has not yet been submitted. In many cases, substantial environmental work has been initiated and the requisite General Order 131-D filing materials are in the process of being developed. It would be disruptive to inject a DIDF RFO solicitation in the middle of developing the filing materials. Depending on the results of the RFO solicitation, new environmental work may be required and could result in changes to in-progress environmental documentation. These changes could delay the General Order 131-D filing and jeopardize the in-service date of the transmission project with attendant consequences for grid reliability and costs, including FERC jurisdictional cost. SDG&E believes the most practical way to avoid conflicts between the DIDF and General Order 131-D is to exempt from the DIDF, (i) any distribution components that are part of a General Order 131-D submittal (Post-Application projects) and (ii) any distribution components that would be part of a transmission project for which a General Order 131-D submittal at a future date is required or, in SDG&E's judgement, may

²⁷ See SDG&E's February 15, 2019 response to the ALJ's *Ruling Directing Submittal of Proposals for Distributed Energy Resources Tariffs*. These sourcing enhancements could streamline the RFO process.

be required (Pre-Application projects). Implementing this exemption in the DIDF process is far superior to any consideration of changing the GO 131-D process.

The existing GO 131-D process works: there is no record to support any suggestion that local agency consultation and community outreach is inadequate. Changes to GO 131-D could complicate the long-standing exempt permitting status for the construction of electric distribution line facilities (facilities operated at a voltage under 50 kV). Adding requirements to GO 131-D, which is a California Environmental Quality Act (CEQA) permitting rule, could delay customer service connections and negatively impact electric system reliability. If there are issues associated with the Distribution Planning Process and local agencies' needs, the issues should be clearly articulated, evaluated, and resolved in the new ORDER INSTITUTING RULEMAKING TO MODERNIZE THE ELECTRIC GRID FOR A HIGH DISTRIBUTED ENERGY RESOURCES FUTURE R.21-06-017 proceeding on 7/2/2021, through clear evidence and under due process.

Appendix A – August 16, 2021 DDOR

DDOR - Planned Investments

GNA ID	DDOR ID	Facility ID	Substation	Bank / Circuit	Description	Equipment Involved	Additional Information	In-Service Date	Deficiency Need	Deficiency %	Equipment Units	Distribution Service	DER Service Eligible	Estimated LNBA Range (\$/KW-year)	Estimated LNBA (\$/Vpu-yr)	Estimated LNBA (\$/Kwh-yr)	Customer Count (Residential)	Customer Count (Commercial)	Customer Count (Industrial)	Indicative AACE Level	Prior DDOR project	
GNA_2021_0001	DDOR_2021_0001	2021_0209	Border	536	New Circuit	Trenching, Conductor, Sectionalizing					MW	Thermal, Backtie								5	N	
GNA_2021_0002	DDOR_2021_0002	2021_0279	San Ysidro	1202	Transfer with new equipment	Sectionalizing, Capacitors		6/1/2025	0.86	7%	MW	Thermal	Yes				2373	454	0	5	N	
GNA_2021_0005	DDOR_2021_0003	2021_0533	North City West	832	New Circuit	Trenching, Cable, Capacitor, Sectionalizing		6/1/2025	0.05	0.42%	MW	Thermal, Backtie	Yes				2925	266	0	5	N	
GNA_2021_0008	DDOR_2021_0004	2021_0982	Spring Valley	730	Reconductor	Conductor		6/1/2022	1.21	32%	MW	Thermal					1314	19	0	5	N	
GNA_2021_0010	DDOR_2021_0005	2021_0984	Alpine	356	Reconductor	Conductor					MW	Thermal								5	N	
GNA_2021_0011	DDOR_2021_0006	2021_0985	Jamacha	92	Reconductor	Conductor		6/1/2022	0.85	8%	MW	Thermal, Backtie					2493	305	0	5	N	
GNA_2021_0012	DDOR_2021_0007	2021_0986	Santee	396	New Voltage Regulator	Voltage Regulator		6/1/2022	0.00	0.04%	Vpu	Voltage					409	9	0	5	N	
GNA_2021_0013	DDOR_2021_0008	2021_0987	Ash	450	Reconductor	Conductor		6/1/2022	0.21	2%	MW	Thermal, Backtie					2479	110	0	5	N	
GNA_2021_0014	DDOR_2021_0009	2021_0988	San Marcos	1094	Reconductor	Cable		6/1/2022	0.27	3%	MW	Thermal, Backtie					1986	140	0	5	N	
GNA_2021_0015	DDOR_2021_0010	2021_0989	Clairemont	277	Reconductor	Conductor		6/1/2022	0.04	1%	MW	Thermal					2557	58	14	5	N	
GNA_2021_0016	DDOR_2021_0011	2021_0990	Scripps	437	Reconductor	Cable		6/1/2022	0.35	13%	MW	Thermal					528	9	0	5	N	
GNA_2021_0017	DDOR_2021_0012	2021_0991	Mission	701	Reconductor	Conductor		6/1/2022	0.02	1%	MW	Thermal					482	4	1	5	N	
Data below is taken directly from prior DDOR filings																						
GNA_2020_0001	DDOR_2020_0001	2020_0042									Amps	Thermal, Backtie								5	Y	
GNA_2020_0002	DDOR_2020_0001	2020_0047	GENESEE	744	New Circuit	Trenching, cable, capacitor, sectionalizing		6/1/2021	12	2%	Amps	Thermal, Backtie					0	7	0	5	Y	
GNA_2020_0003	DDOR_2020_0002	2020_0198	WINE	139	Transfer with new equipment	Cable, Sectionalizing		6/1/2021	43	7%	Amps	Thermal					2006	520	2	5	Y	
GNA_2020_0004	DDOR_2020_0003	2020_0403	EL CAJON	555	Transfer with new equipment	Sectionalizing, Capacitor		6/1/2021	73	12%	Amps	Thermal, Backtie					2	227	3	5	Y	
GNA_2020_0006	DDOR_2020_0001	2020_0831	GENESEE	GE3233	New Circuit	Trenching, cable, capacitor, sectionalizing		6/1/2021	5.06	8.7%	MW	Thermal, Backtie					7313	971	17	5	Y	
GNA_2020_0009	DDOR_2020_0004	2020_0920	NORTH CITY WEST	NCW3031	Transfer with new equipment	Cable		6/1/2021	2.3	4%	MW	Thermal					17014	1765	9	5	Y	
GNA_2020_0010	DDOR_2020_0005	2020_0978									Vpu	Voltage								5	Y	
GNA_2020_0011	DDOR_2020_0006	2020_0979	FELICITA	470	Reconductor	Conductor		6/1/2021	7	6%	Amps	Thermal, Backtie					87	96	0	5	Y	
GNA_2020_0012	DDOR_2020_0007	2020_0978	ELLIOT	382	Reconductor	Cable		6/1/2021	25	5%	Amps	Thermal, Backtie					507	97	2	5	Y	
GNA_2020_0013	DDOR_2020_0008	2020_0979	OLD TOWN	493	Reconductor	Conductor, cable		6/1/2021	50	10%	Amps	Thermal, Backtie					605	132	1	5	Y	
GNA_2020_0015	DDOR_2020_0009	2020_0983	ALPINE	356	Reconductor	Conductor		6/1/2021	1	1%	Amps	Thermal, Backtie					389	39	0	5	Y	
GNA_2020_0016	DDOR_2020_0010	2020_0984	CHOLLAS WEST	162	Reconductor	Conductor		6/1/2021	18	10%	Amps	Thermal, Backtie					400	73	0	5	Y	
GNA_2020_0017	DDOR_2020_0011	2020_0985	JAMACHA	93	Reconductor	Cable		6/1/2021	2	1%	Amps	Thermal					644	54	0	5	Y	
GNA_2020_0018	DDOR_2020_0012	2020_0986	MURRAY	401	Reconductor	Cable, Sectionalizing		6/1/2021	12	2%	Amps	Thermal, Backtie					1396	12	0	5	Y	
GNA_2020_0019	DDOR_2020_0013	2020_0987	SANTEE	1139	Reconductor	Cable		6/1/2021	10	8%	Amps	Thermal, Backtie					95	47	0	5	Y	
GNA_2020_0020	DDOR_2020_0014	2020_0988	DEL MAR	1081	New Capacitor	Capacitor		6/1/2021	-	1%	Vpu	Voltage					493	63	0	5	Y	
GNA_2020_0021	DDOR_2020_0015	2020_0989	CAMERON	448	Microgrid	Solar, Battery Storage		7/1/2021	2000	100%	kwh	Resiliency (Microgrid)					288	62	0	5	Y	
GNA_2020_0022	DDOR_2020_0016	2020_0990									kwh	Resiliency (Microgrid)								5	Y	
GNA_2020_0023	DDOR_2020_0017	2020_0991									kwh	Resiliency (Microgrid)								5	Y	
GNA_2020_0024	DDOR_2020_0018	2020_0992									kwh	Resiliency (Microgrid)								5	Y	
GNA_2020_0025	DDOR_2020_0019	2020_0993	BORREGO	8R3031	Microgrid	Hydrogen storage, battery storage		6/1/2022	17000	-	kwh	Resiliency (Microgrid)				111	2385	465	1	5	Y	
		2019_0134	Old Town	C105	New Circuit	Trenching, cable, capacitor, sectionalizing		6/1/2021	85	17%	Amps	Thermal, Backtie										Y
		2019_0216	Coronado	C376	New Circuit	Trenching, cable, sectionalizing		6/1/2020	71	23%	Amps	Thermal, Backtie										Y
					Transfer with new equipment	Trenching, cable, capacitor		12/1/2020				Thermal										Y
		2019_0376	Carlton Hills	C280	New Circuit	Trenching, cable, sectionalizing		6/1/2020	71	12%	Amps	Thermal, Backtie										Y
		2019_0464	Santee	C392	Reconductor	Cable		6/1/2020	22	4%	Amps	Thermal, Backtie										Y
		2019_0521	Melrose	C209	Transfer with new equipment	Cable		6/1/2020	24	4%	Amps	Thermal, Backtie										Y
		2019_0554	Pendleton	C300	New Capacitor	Capacitor		6/1/2020	1	1%	Amps	Thermal										Y
		2019_0976	Del Mar	C68	New Capacitor	Capacitor		6/1/2020	15	3%	Amps	Thermal										Y
					Reconductor	Conductor, Capacitor		6/1/2020				Thermal										Y
		2019_0978	Cannon	C303	Reconductor	Conductor, Capacitor		6/1/2020	26	5%	Amps	Thermal, Backtie										Y
2018_0002			Batiquitos	C757	Transfer with new equipment	Cable		6/1/2019	164	32.8%	Amps	Thermal, Backtie										Y
2018_0006																						Y
2018_0007																						Y
2018_0008			Jamacha	B30	New Transformer	Substation transformer bank	Cost estimates pending	6/1/2020	1.38	4.6%	MW	Thermal, Backtie				TBD						Y
2018_0009																						Y
2018_0011																						Y
2018_0018																						Y
2018_0020																						Y
2018_0022																						Y
2018_0024																						Y
2018_0026																						Y
2018_0027																						Y
2018_0030			Murray	C83	Reconductor	Cable		6/1/2019	12	6.9%	Amps	Thermal, Backtie				\$0-\$100						Y
2018_0031																						Y
2018_0035																						Y
2018_0036																						Y
2018_0038																						Y

Confidential information is highlighted in black and redacted

Confidential information is highlighted in black and redacted

DDOR – Candidate Deferrals

GNA ID	DDOR ID	Facility ID	Tier	Substation/Subtransmission line	Circuit	Operating Date	Unit Cost of Traditional Mitigation (\$1000s)	LNBA Value (\$/kW-Yr)	Contingency Plan	Distribution Service Required	Capacity (MW)	Energy Need (MWh)	Hour of Day	Duration	Time of Year	Yearly Frequency	Year						
GNA_2021_0002	DDOR_2021_0002	2021_0279	1	San Ysidro	1202	6/1/2025				Thermal							2021						
										Thermal											2022		
										Thermal												2023	
										Thermal													2024
										Thermal	0.86	7.74	14-22	9	June - October	62	2025						
										Thermal	1.46	16.03	13-23	11	June - October	92	2026						
										Thermal	1.58	17.35	13-23	11	June - October	92	2027						
										Thermal	1.51	16.65	13-23	11	June - October	92	2028						
										Thermal	1.45	15.95	13-23	11	June - October	92	2029						
										Thermal	1.39	13.88	14-23	10	June-October	92	2030						
GNA_2021_0005	DDOR_2021_0003	2021_0533	1	North City West	832	6/1/2025				Thermal, Backtie							2021						
										Thermal, Backtie											2022		
										Thermal, Backtie												2023	
										Thermal, Backtie													2024
										Thermal	0.05	0.16	18-20	3	June - October	30	2025						
										Thermal	0.15	0.46	18-20	3	June - October	30	2026						
										Thermal	0.24	0.71	18-20	3	June - October	30	2027						
										Thermal	0.32	0.97	18-20	3	June - October	30	2028						
										Thermal	0.41	1.65	18-21	4	June - October	30	2029						
										Thermal	0.51	3.05	18-23	6	June-October	30	2030						
										Back-tie	0.05	0.10	0 - 23	2	January- December	1	2025						
										Back-tie	0.15	0.31	0 - 23	2	January- December	1	2026						
										Back-tie	0.24	0.48	0 - 23	2	January- December	1	2027						
										Back-tie	0.32	0.65	0 - 23	2	January- December	1	2028						
										Back-tie	0.41	0.83	0 - 23	2	January- December	1	2029						
Back-tie	0.51	1.02	0 - 23	2	January- December	1	2030																

Confidential information is highlighted in black and redacted

Confidential information is highlighted in black and redacted

Appendix B – August 16, 2021 Prioritization Metrics Workbook

DDOR – LNBA Data

Refer to “2021 DDOR Prioritization Metrics.xlsx” tabs “LNBA General Inputs”, “LNBA Project Inputs”, and “LNBA Backend Results”

DDOR – Prioritization Metrics Data

Refer to “2021 DDOR Prioritization Metrics.xlsx” tabs “Introduction” and “Prioritization Metrics Template”.