

TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017

A word was inadvertently omitted from SDG&E's initial response to Question 5 (b). A corrected response, in redline format, is provided below.

Please provide an electronic response to the following question. A hard copy response is unnecessary. The response should be provided on a CD sent by mail or as attachments sent by e-mail to the following:

Haley de Genova
The Utility Reform Network
785 Market Street, Suite 1400
San Francisco, CA 94103
legalassistant@turn.org

Elise Torres
The Utility Reform Network
785 Market Street, Suite 1400
San Francisco, CA 94103
etorres@turn.org

Eric Borden
The Utility Reform Network
785 Market Street, Suite 1400
San Francisco, CA 94103
eborden@turn.org

For each question, please provide the name of each person who materially contributed to the preparation of the response. If different, please also identify the SDG&E witness who would be prepared to respond to cross-examination questions regarding the response.

For any questions requesting numerical recorded data, please provide all responses in working Excel spreadsheet format if so available, with cells and formulae functioning.

For any question requesting documents, please interpret the term broadly to include any and all hard copy or electronic documents or records in SDG&E's possession.

DATA REQUEST

1. Regarding SDG&E's testimony, page JCM-19, lines 7 to 8, state: "Unmanaged charging can increase peak net load, potentially leading to the need for additional local generation resources and capacity investments."
 - a. Please provide the planning criteria that drive the decision to build additional local generation resources.

SDG&E Response (provided by J.C. Martin):

The planning criteria that drive the decision to build additional local generation resources are the California Independent System Operator (CAISO) Reliability

TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017

Requirements and Transmission Planning Process (TPP). Please see the CAISO web site for more details: <https://www.caiso.com/planning/Pages/default.aspx>.

- b. How many additional Megawatts of load must be added to SDG&E's system during the net peak to trigger the need for new, additional generation resources? Please provide all assumptions, sources, and calculations related to this response.

SDG&E Response (provided by J.C. Martin):

In theory one Megawatt of added system net peak load could trigger the need for new additional generation resources. However, the Commission is the ultimate decision making authority regarding the need for new additional generation resources.

- c. Please provide SDG&E's current forecast of when (year) additional local generation resources will be required to be built to meet net peak load and how much additional generation will be required. Please provide the source(s) and all assumptions, including the amount of (net) load increase from 2016 to the year indicated.

SDG&E Response (provided by J.C. Martin):

SDG&E is in the process to procure additional local generation (preferred resources) by 2022 to meet local capacity reliability need. Please see CPUC D.14-03-004, and D.15-05-015 as well as the CAISO 2016-2017 Transmission Plan (pages 105, 106, and 114). Please see response 1.d. below for the forecast of net peak load.

- d. Please provide SDG&E's forecast of net peak load (MW) through 2035, including the month, day, time, and hour it is expected to occur.

**TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017**

SDG&E Response (provided by J.C. Martin):

Below is SDG&E's forecast of net peak load (MW).

Year	Net System Peak
2017	4,015
2018	4,042
2019	4,078
2020	4,084
2021	4,094
2022	4,150
2023	4,191
2024	4,233
2025	4,267
2026	4,305
2027	4,310
2028	4,405

The above information is a product of SDG&E's 2017-2028 Demand Forecasts, submitted to the California Energy Commission ("CEC") by SDG&E on May 5, 2017, in support of the CEC's 2017 Integrated Energy Policy Report ("IEPR") process. This is net of forecasted solar and wind generation in the greater San Diego region.

The forecast only goes out to 2028 and does not provide the month, day or hour that the net system peak demand is expected to occur per the requirements of the IEPR forms and instructions. However, over the last several years the net system peak demand occurs in the early evening hours due to the large increase in both rooftop and utility-scale solar, and during hot weather that generally occurs between July and September.

2. Regarding response to TURN DR-02, question 21b:

TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017

- a. Please explain what the “tax credit” is mentioned in the response. For example, does this relate to bonus depreciation? Please provide all applicable references to IRS rules or anything else relevant in the response.

SDG&E Response (provided by Mike Calabrese):

“Tax Credit” is referring to the benefit for the tax “deduction” for self-developed software which is often part of regulatory/rate filings. Internal Revenue Code (IRC) Section 174 allows a deduction for research and experimental expenditures. IRS Revenue Procedure 2000-50 provided that the costs of developing computer software can be treated as research and experimental expenditures deductible under IRC 174.

- b. Please explain if the tax credit mentioned is available in years past 2019, indicating which years and the amount (%) deductible.

SDG&E Response (provided by Mike Calabrese):

The tax deduction for self-developed software is not available past 2019.

- c. Why does the tax credit only affect 2019? Please explain.

SDG&E Response (provided by Mike Calabrese):

The tax deduction (referred to as tax credit) occurs in 2018 for the one-year pilot programs, and occurs in 2019 only for the Residential Home Charging Program. The deduction in both programs involves the development and installation of the IT software/Billings system which initially has to be completed and only occurs in the first year before any other construction is started.

- d. If the tax credit is available for years past 2019, please indicate the annual and total effect on the program’s cost, revenue requirement, and rate increases/decreases if the benefit is flowed through to ratepayers. Please provide all assumptions, calculations, and workpapers.

SDG&E Response (provided by Mike Calabrese):

TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017

The deduction (tax credit) for self-developed software is not available past years 2019.

3. Please provide the charging assumptions for customers signed up for an EV TOU rate in the Chapter 8 “Reference Case.” Please explain where is this indicated in the cost-effectiveness model and how this affects results?

SDG&E Response (provided by J.C. Martin):

Please see the attached work book (“TURN DR-03 Residential Load Shapes Q3-Q4.xlsx”). TOU rate customers include Standard Rate Individual Load Profiles for both “BEV TOU_Home – L1” and “PHEV40 TOU_Home – L1.” These intermediary load shapes or Optimized Charging Profiles are contained within the proprietary E3 PEV Grid Impacts model. These load shapes or Optimized Charging Profiles are used to calculate T&D Upgrades, Incremental utility/CAISO system costs & benefits, bill impacts, and Emission impacts. Please see Chapter 8, Appendix A, Figure 1 for the E3 Grid Impact Model Logic Progression.

4. Regarding TURN-01, question 10, attachment “Res Results Scenario A with TURN DR1 Q10dc Analysis:”
 - a. Please provide an explanation/definition for the marginal cost categories for each item (marginal energy, marginal losses, marginal A/S, Marginal RPS, Marginal Gen Capacity, Marginal T&D Costs). This should include how these values are modeled/calculated and applicable examples.

SDG&E Response (provided by J.C. Martin):

The explanation/definition for marginal cost categories are consistent with the categories used by E3 in the CPUC Avoided Costs 2016 Interim Update (Available at: <http://www.cpuc.ca.gov/General.aspx?id=10710>). All of these marginal costs, except Marginal T&D Costs, are model/calculated using the CPUC Avoided Cost 2016 Interim Update. The marginal/incremental T&D costs are modeled/calculated as described in Chapter 8, Appendix A, section 3.5.2.

- b. Please explain the theoretical basis for why the values “absent” and “with” program would be higher or lower (e.g. why the program is expected to reduce costs for each of these categories). Please provide separately for each marginal

**TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017**

cost category as in part (a) and use quantitative examples where possible or helpful to the explanation.

SDG&E Response (provided by J.C. Martin):

The theoretical basis for why the values “absent” and “with” program would be higher or lower is that the load shapes (Charging Profiles) are optimized to be representative of electric vehicle operators under a given tariff/rate to minimize customer bills, subject to physical and behavioral constraints. The values “absent” the program optimize charging under SDG&E’s DR and EV-TOU-2 rates and L1 chargers, while the values “with” program are optimized under SDG&E’s proposed Residential Grid Integrated Rate (GIR) and L2 chargers. The GIR is described in Witness Fang’s Chapter 5. Please see the attached work book (“TURN DR-03 Residential Load Shapes Q3-Q4.xlsx”), the “with” program load profiles are the VGI Rate Individual Load Profiles for both “BEV VGI_Home – L2” and “PHEV40 VGI_Home – L2”.

- c. What are the on-peak charging assumptions for drivers in the reference case (“Absent Program”) on a tiered rate versus TOU rate? The response should include what percentage of charging occurs on-peak for drivers on a TOU rate and DR rate.

SDG&E Response (provided by J.C. Martin):

Please see workbook “Res Results Scenario A with TURN DR1 Q10dc Analysis” worksheet “AdditionalMetrics,” where Column “O” is the “absent” program Percent On Peak. Tier rate results include Column “A” Technology: BEV DR Slow and PHEV40DR Slow, TOU rate results include Column “A” Technology: BEV Slow and PHEV40 Slow.

- i. Does this assumption differ for SDG&E’s cost-effectiveness model presented in Chapter 8? Please explain if yes.

SDG&E Response (provided by J.C. Martin):

No.

**TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017**

- d. Please provide all assumptions with sources regarding how marginal generation capacity costs are calculated in the two scenarios. The response at a minimum should include:
 - i. What year additional capacity is expected to be required under both scenarios?

SDG&E Response (provided by J.C. Martin):

Marginal generation capacity costs are calculated in the two scenarios using the E3 in the CPUC Avoided Costs 2016 Interim Update (Available at: <http://www.cpuc.ca.gov/General.aspx?id=10710>). The E3 CPUC Avoided Costs 2016 Interim Update model uses a 2016 resource balance year, based on the May 3, 2016 Proposed Decision of Commissioner Florio in R.14-10-003, which essentially set the Resource Balance Year to zero (see Avoided Cost 2016 Interim Update documentation p. 17, <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=12504>)

- ii. How this affects the marginal generation calculation. &

SDG&E Response (provided by J.C. Martin):

A resource balance year of 2016 would result in the use of the long-run capacity cost for all years. (see Avoided Cost 2016 Interim Update documentation p. 18, <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=12504>)

- iii. If this is a local (SDG&E) or statewide assumption.

SDG&E Response (provided by J.C. Martin):

This would be the assumptions from the Avoided Cost 2016 Interim Update which are a mixture of Statewide and Southern California assumptions.

TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017

5. In the Technical Appendix to Chapter 8 (Appendix A), page 8, E3 states “In other words, this analysis assumes a percentage of free riders that is comparable to those typically used in energy efficiency program valuation in California.”
- a. Please provide all sources for the “Implied Net-to-gross ratios” shown in Table 4.

SDG&E Response (provided by J.C. Martin):

The “Implied Net-to-gross ratios” are based on the vehicle adoption assumptions provided in work papers. Please see the work paper “E3 SB350 TE GIR Inputs(Final).xlsx,” worksheet “Program Adoption” provides the Total Vehicles and worksheet “Reference Adoption” provides the Free Riders found in Technical Appendix A, Table 4, page 8.

- b. Please provide all evidence, sources, and an explanation for why energy efficiency and electric vehicle adoption under SDG&E’s program net-to-gross ratios are expected to be similar.

SDG&E Response (provided by J.C. Martin):

The net-to-gross ratios for energy efficiency and the Residential Program Vehicle forecast in Technical Appendix Table 4 are comparable, but not necessarily expected to be similar.

6. In the cost-effectiveness tests and underlying spreadsheets provided to TURN (e.g. “Res Results Scenario A” and “Res Results Scenario B”) please explain whether the “Gasoline Cost” includes avoided CO2 emissions. If so, please explain the methodology behind this calculation (and applicable references in the Excel spreadsheets) and if not, please explain why not.

SDG&E Response (provided by J.C. Martin):

Gasoline Savings represents the reduction in gasoline purchases due to lower demand for gasoline. E3 assumes monetized GHG emission costs for gasoline are embedded in the gasoline prices. Fuel Usage is documented in Appendix A section 3.2 starting on page 9, and Gasoline Costs are documented in Appendix A section 4.4.5 starting on page 24.

**TURN DATA REQUEST
TURN-SDG&E-DR-03
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E CORRECTED RESPONSE
DATE RECEIVED: May 17, 2017
DATE RESPONDED: June 1, 2017
DATE CORRECTED: August 22, 2017**

7. Please estimate the percentage of single family homes in SDG&E's territory that require a panel upgrade to install a Level 2 charging station.

SDG&E Response (provided by Randy Schimka):

SDG&E's estimate for single family homes in the region that would require a panel upgrade to install a Level 2 charging station is approximately 5-10%.

In those cases, it may be advantageous to install a 15 or 20 amp lower-powered Level 2 solution instead of a full power 32 amp Level 2 EVSE.