

UCAN DATA REQUEST
UCAN-SDG&E-DR-02
SDG&E VEHICLE GRID INTEGRATION PROJECT
A.14-04-014
SDG&E RESPONSE
DATE RECEIVED: SEPTEMBER 2, 2014
DATE RESPONDED: SEPTEMBER 22, 2014

1. Please provide the cost effectiveness results assuming EV purchases are reduced as follows:
 - a. **TWO** incremental EV purchases due to each MuD VGI Pilot Program installation and **FOUR** incremental EV purchases due to each workplace VGI installation and
 - b. **ONE** incremental EV purchases due to each MuD VGI Pilot Program installation and **TWO** incremental EV purchases due to each workplace VGI installation.

(NOTE: This reduces the SDG&E assumption in (1) by 50 percent and in (2) by 75 percent with the goal of determining how sensitive the positive cost effectiveness results are to the EV adoption assumptions).

SDG&E Response to Question 1a:

This sensitivity assumes 2 incremental EV adoptions per MuD VGI site installation and 4 EV adoptions per Workplace VGI site installation. Illustrative results presented in Chapter 6 (Prepared Direct Testimony of J.C. Martin, revised July 29, 2014) assumed an average of 6 incremental EV adoptions per VGI site installation – 10 for MuD and 2 for Workplace. These sensitivity assumptions are used across both EV charging scenarios: SDG&E VGI Rate scenario and Non-utility Flat Fee scenario.

The sensitivity assumptions reduce total incremental EV adoptions, thus total vehicles are decreased, reflecting a decrease in most test component absolute values. Utility and 3rd party Charger and Admin costs are unchanged. Customer Charger costs increase slightly since more single family chargers are installed. (A single family charger installation is assumed for each incremental Workplace adoption. The sensitivity assumes 4 Workplace incremental EV adoptions while Chapter 6 assumed 2 Workplace adoptions.) Electric Supply costs increase slightly in the SDG&E VGI Rate scenario, since a larger proportion of vehicles are charging at single family residences under TOU and Tiered rates which have higher Electric Supply costs relative to the VGI rate.

The sensitivity result shows all cost effectiveness tests remain positive in both EV charging scenarios. VGI net impacts are reduced for all tests by between \$11.5 to \$13.5 NPV millions, VGI net impacts for the PCT test remains positive. VGI net impact shows the difference between the two scenarios, or the relative benefit of the SDG&E VGI Rate scenario compared to the Non-utility Flat Fee scenario, and is comparable to VGI Net Impact shown in Chapter 6 Table 6-11.

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Response to Question 1a (Continued)

Cost Effectiveness Tests - Illustrative Detailed Results									
Sensitivity Analysis - Assume Reduced EV Additions: 2 incremental EV per MuD and 4 per Workplace Installation									
(NPV \$ Millions)									
Test Component		SDG&E VGI Rate Scenario				Non-utility Flat Fee Scenario			
		RIM	PCT	TRC	SCT	RIM	PCT	TRC	SCT
EV Customer Costs & Benefits	Incremental Vehicle Cost		(\$526.2)	(\$526.2)	(\$526.2)		(\$526.2)	(\$526.2)	(\$526.2)
	Utility Bills	\$488.2	(\$475.1)			\$489.1	(\$473.6)		
	Commercial Charging Fees		(\$34.4)				(\$40.6)		
	Gasoline Savings		\$940.1	\$940.1	\$940.1		\$940.1	\$940.1	\$940.1
	Federal Tax Credits		\$292.9	\$292.9	\$292.9		\$292.9	\$292.9	\$292.9
	State Tax Credits		\$88.7				\$88.7		
EV Charger & Admin Costs	Utility Charger and Admin Costs	(\$79.1)		(\$79.1)	(\$79.1)				
	Third Party Charger and Admin Costs			(\$37.7)	(\$37.7)			(\$109.7)	(\$109.7)
	Customer Charger Costs		(\$126.4)	(\$126.4)	(\$126.4)		(\$126.4)	(\$126.4)	(\$126.4)
Electric Supply Costs	(\$289.1)		(\$289.1)	(\$289.1)	(\$293.8)		(\$293.8)	(\$293.8)	
Societal Benefits	Avoided Gasoline CO2				\$49.1				\$49.1
	LCFS Benefit				\$97.9				\$97.9
	Criteria Pollutant Benefit				\$42.6				\$42.6
Grand Total		\$119.9	\$159.7	\$174.5	\$364.1	\$195.3	\$154.9	\$176.9	\$366.5
Total Costs		\$368.2	\$1,162.1	\$1,058.6	\$1,058.6	\$293.8	\$1,166.9	\$1,056.1	\$1,056.1
Total Benefits		\$488.2	\$1,321.8	\$1,233.0	\$1,422.7	\$489.1	\$1,321.8	\$1,233.0	\$1,422.7
C/B Ratio		1.33	1.14	1.16	1.34	1.66	1.13	1.17	1.35

Response to Question 1b:

This sensitivity assumes 1 incremental EV adoption per MuD VGI site installation and 2 EV adoptions per Workplace VGI site installation. Illustrative results presented in Chapter 6 assumed an average of 6 incremental EV adoptions per VGI site installation – 10 for MuD and 2 for Workplace. These sensitivity assumptions are across both EV charging scenarios: SDG&E VGI Rate scenario and Non-utility Flat Fee scenario.

The sensitivity assumptions reduce total incremental EV adoptions, thus total vehicles are decreased, reflecting a decrease in most test component absolute values. Utility and 3rd party Charger and Admin costs are unchanged. Customer Charger costs are unchanged with no change in single family chargers installed. (The sensitivity assumes 2 Workplace incremental EV adoptions consistent with Chapter 6.) Electric Supply costs increase slightly in the SDG&E VGI Rate scenario, since relatively more vehicle charging takes place at single family residences under TOU and Tiered rates which have higher Electric Supply costs relative to the VGI rate.

The sensitivity result shows all Cost-Benefit tests remain positive in both EV charging scenarios. VGI net impacts are reduced for all tests by between \$13.5 to \$16 NPV millions, VGI net impacts for the PCT test remains positive. VGI net impact shows the difference between the two scenarios, or the relative benefit of the SDG&E VGI Rate scenario compared to the Non-utility Flat Fee scenario, and is comparable to VGI Net Impact shown in Chapter 6 Table 6-11.

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Response to Question 1b (Continued):

Cost Effectiveness Tests - Illustrative Detailed Results									
Sensitivity Analysis - Assume Reduced EV Additions: 1 incremental EV per MuD and 2 per Workplace Installation									
(NPV \$ Millions)									
Test Component		SDG&E VGI Rate Scenario				Non-utility Flat Fee Scenario			
		RIM	PCT	TRC	SCT	RIM	PCT	TRC	SCT
EV Customer Costs & Benefits	Incremental Vehicle Cost		(\$520.0)	(\$520.0)	(\$520.0)		(\$520.0)	(\$520.0)	(\$520.0)
	Utility Bills	\$484.4	(\$471.4)			\$484.8	(\$470.6)		
	Commercial Charging Fees		(\$34.2)				(\$37.3)		
	Gasoline Savings		\$930.7	\$930.7	\$930.7		\$930.7	\$930.7	\$930.7
	Federal Tax Credits		\$289.3	\$289.3	\$289.3		\$289.3	\$289.3	\$289.3
	State Tax Credits		\$87.6				\$87.6		
EV Charger & Admin Costs	Utility Charger and Admin Costs	(\$79.1)		(\$79.1)	(\$79.1)				
	Third Party Charger and Admin Costs			(\$37.7)	(\$37.7)			(\$109.7)	(\$109.7)
	Customer Charger Costs		(\$125.9)	(\$125.9)	(\$125.9)		(\$125.9)	(\$125.9)	(\$125.9)
Electric Supply Costs		(\$288.2)		(\$288.2)	(\$288.2)	(\$290.6)		(\$290.6)	(\$290.6)
Societal Benefits	Avoided Gasoline CO2				\$48.6				\$48.6
	LCFS Benefit				\$96.9				\$96.9
	Criteria Pollutant Benefit				\$42.2				\$42.2
Grand Total		\$117.1	\$156.2	\$169.2	\$356.9	\$194.3	\$153.8	\$174.0	\$361.7
Total Costs		\$367.3	\$1,151.4	\$1,050.9	\$1,050.9	\$290.6	\$1,153.8	\$1,046.1	\$1,046.1
Total Benefits		\$484.4	\$1,307.6	\$1,220.1	\$1,407.8	\$484.8	\$1,307.6	\$1,220.1	\$1,407.8
C/B Ratio		1.32	1.14	1.16	1.34	1.67	1.13	1.17	1.35

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2. Using the same 1:2 ratio of MuD to Workplace VGI installations, please calculate the breakeven point where the NPV for each of the four tests equals zero, i.e., where benefit/cost =1.

SDG&E Response:

This sensitivity exploration of the 1:2 ratio of MuD to Workplace EV Additions adjusts the quantity of EV additions until the cost-test results are negative. Illustrative results presented in Chapter 6 assumed an average of 6 incremental EV adoptions per VGI site installation – 10 for MuD and 2 for Workplace.

All cost test results for both scenarios are positive even with no incremental EV additions. This indicates that both scenarios provide market level net benefits in all four cost-effectiveness tests regardless of assumed EV additions. These results indicate that the EV market in SDG&E’s service territory can sustain 550 charging systems at MuD and Workplace locations without assuming any EV additions.

The VGI net impact show negative RIM results regardless of how many EV additions assumed, consistent with the negative RIM VGI net impact reported in Chapter 6 Table 6-11. The TRC and SCT go negative for the VGI net impact at approximately 3 MuD and 6 Workplace EV additions. The PCT is zero for the VGI net impact at zero EV additions. VGI net impact shows the difference between the two scenarios, or the relative benefit of the SDG&E VGI Rate scenario compared to the Non-utility Flat Fee scenario, and is comparable to VGI Net Impact shown in Chapter 6 Table 6-11.

Cost Effectiveness Tests - Illustrative Detailed Results													
Sensitivity Analysis - Assume 1:2 ratio of MuD to Workplace EV Additions w/ Diminishing Quantities													
(NPV \$ Millions)													
Sensitivity Quantities		SDG&E VGI Scenario				Non-utility Flat Fee Scenario				VGI Net Impact			
Additional EVs per MuD Installation	Additional EVs per Workplace Installation	RIM	PCT	TRC	SCT	RIM	PCT	TRC	SCT	RIM	PCT	TRC	SCT
15	30	\$151	\$202	\$233	\$447	\$213	\$169	\$220	\$434	(62.5)	32.7	13.1	13.1
11	22	\$142	\$190	\$218	\$424	\$206	\$165	\$205	\$412	(63.6)	25.2	12.6	12.6
10	20	\$140	\$187	\$213	\$418	\$204	\$163	\$201	\$406	(63.7)	23.1	12.4	12.4
9	18	\$138	\$183	\$209	\$412	\$203	\$162	\$198	\$401	(64.5)	20.9	11.2	11.2
5	10	\$129	\$170	\$190	\$386	\$198	\$158	\$186	\$381	(69.7)	11.9	4.6	4.6
4	8	\$126	\$167	\$185	\$378	\$197	\$157	\$183	\$376	(71.5)	9.5	2.2	2.2
3	6	\$123	\$163	\$180	\$371	\$196	\$156	\$180	\$371	(73.4)	7.2	(0.1)	(0.1)
2	4	\$120	\$160	\$174	\$364	\$195	\$155	\$177	\$367	(75.3)	4.8	(2.4)	(2.4)
1	2	\$117	\$156	\$169	\$357	\$194	\$154	\$174	\$362	(77.2)	2.4	(4.8)	(4.8)
0.00001	0.00002	\$114	\$153	\$164	\$350	\$193	\$153	\$171	\$357	(79.1)	0.0	(7.1)	(7.1)

*Note - scenarios are infeasible with greater than 40 additional EVs per new Workplace installation.