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Exhibit Number	:	DRA-14
Commissioner	:	Ferron
ALJ	:	Wong
Witness	:	Laura Krannawitter

DIVISION OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

Report on the Results of Operations for San Diego Gas & Electric Company Southern California Gas Company General Rate Case

Test Year 2012

SDG&E Smart Grid Policy
Smart Grid Infrastructure

San Francisco, California
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SMART GRID INFRASTRUCTURE

I. INTRODUCTION

This exhibit presents the analyses and recommendations of the Division of Ratepayer Advocates (DRA) regarding San Diego Gas & Electric Company's (SDG&E) policies and forecasts of capital costs for smart grid infrastructure for Test Year (TY) 2012.

SDG&E maintains that the electric delivery system needs to evolve to adapt to the increasing levels of renewable generation, to assimilate storage technology, to absorb a potentially growing mobile demand (i.e., plug-in electric vehicles), to provide better information to the customer, to ensure security of assets and of customer information, and to serve customers with reliable electricity.

While the need for improvement and upgrades is there, what is in question, however, is how we go about the business of creating the optimal result. SDG&E would have the Commission approve a sudden and large budget in order to move aggressively ahead; it suggests going from zero ratepayer dollars for smart grid upgrades in 2009 and 2010 to $36.5 million in 2011 and $57.2 million in 2012. It would be far better to take a breath and look at the lessons to be learned from the 141[1] American Recovery and Reinvestment Act (ARRA) projects currently underway and to get better organized as a company before engaging in such large ratepayer expenditures. SDG&E was awarded $28,115,052 of the $4+ billion of smart grid funds[2] and California received $203,010,487 in Smart Grid Investment Grant (SGIG) monies[3] and $186 million in federal stimulus funding for smart grid regional and energy storage demonstration projects.[4] In other words, California has

[1] http://www.oe.energy.gov/american_recovery_reinvestment_act.htm; 99 smart grid investment grants plus 42 smart grid regional and energy storage demonstration projects.

[2] http://www.smartgrid.gov/project/san_diego_gas_and_electric_company

[3] http://www.oe.energy.gov/DocumentsandMedia/FINAL_Combined_SGIG_Selections--By_State_Updated_2011_06_10.pdf p. 2 of 13.

[4] http://www.cpuc.ca.gov/NR/rdonlyres/A3D6019B-3620-44B5-95D5-

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greatly benefitted from the infusion of significant federal investment. Therefore, before the Commission entertains expanding the smart grid pilots of SDG&E with ratepayer funds, it ought to heed the advice proffered by the paper entitled, "Accelerating Successful Smart Grid Pilots":[5]

> It is important to ensure that the public money being invested in smart grid pilots is spent appropriately and effectively to realize the true value of the investment being made.

With SDG&E's proposals for smart grid, it is as if SDG&E is asking for the next generation of system upgrades to adapt to the incremental sources of supply (which are more variable in production compared to base-loaded facilities) and demand. In other words, SDG&E wants a "smarter" grid because it is not starting from ground zero. Investments have been made in the past to evolve the system. Therefore, SDG&E is asking to go to the next level.

In today's economic environment, most consumers are asking themselves what spending can be deferred and utilities should do the same. The consumer has been overwhelmed with many economic phenomena since the last GRC (state and federal budget difficulties, unclear messages regarding the state of the housing foreclosure markets, more restrictive bank lending practices, stubbornly high unemployment, etc.).

As ratepayer advocates, DRA cannot ignore the larger economic context. Without belaboring all the local, state and federal economic data;[6] and without listing the increasing capital burdens being placed on electric consumers during the past five years; rates are higher than necessary. This means that *more than ever*, the Commission must use restraint and mindfulness when setting revenue requirements.

(continued from previous page)
5ADFDAD714C7/0/2010_Smart_Grid_Annual_Reportzafmjd_v5.pdf

[5] http://www3.weforum.org/docs/WEF_EN_SmartGrids_Pilots_Report_2010.pdf, page 18.

[6] http://www.msnbc.msn.com/id/43687588/ns/business-us_business/t/housing-slump-far-worse-you-think/ ; http://gregor.us/california/spikes-and-dips-in-both-us-and-california-jobs-data/ ; http://www.laedc.org/reports/Forecast-2011-04.pdf pages 65-70; http://newsroom.ucla.edu/portal/ucla/ucla-anderson-forecast-economy-208096.aspx; http://www.msnbc.msn.com/id/43946055/ns/business-us_business/

DRA, aware of both the progress needed **and** the burdens of the ratepayers, 1) recommends a more modest budget for smart grid investments, 2) suggests necessary ratemaking mechanisms to protect the customers, and 3) urges the Commission to manage the smart grid process over a longer time period. DRA recommends a more measured deployment of smart grid technology. This approach should not negatively affect the leadership role of California in the national dialogue regarding smart grid policies.

Finally, it might be useful for the Commission to examine the cumulative effect of technological changes that are being thrust upon the ratepayers of California. Given the shortened cycles of technological adoption rates,[7] consumers are being asked to embrace more technologies at faster paces than ever before. The backlash and the non-adopters (i.e., the "opt out" crowd) ought to be considered. Age and education are significant factors to consider when designing policies that will potentially affect every household. To quote a National Technology Scan survey, "one in five US households has never used email."[8] Another statistic shows that 18 percent of US households do not have Internet access;[9] the percentage was 29% in 2006. Standards will help to ensure there are no stranded investments, but standards are still forming. In fact, FERC just issued an order regarding its inability to open up a rulemaking proceeding designed to adopt interoperability standards because consensus could not be reached.[10] Authorized interoperability standards are now further into the future than anticipated. Another helpful fact gleaned from research suggests that, "Americans often adopt entertainment products and services more rapidly than communication devices."[11]

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[7] http://www.isgtw.org/visualization/isgtw-image-week-technology-adoption-rates-historical-perspective;

[8] http://www.parksassociates.com//blog/article/one-in-five-u-s--households-has-never-used-e-mail-

[9] http://www.pff.org/issues-pubs/books/factbook_10th_Ed.pdf page 4.

[10] http://www.ferc.gov/EventCalendar/Files/20110719143912-RM11-2-000.pdf

[11] Stet, p. 22.

II. DRA's RECOMMENDATION

For the non-IT portion[12] of capital spending alone, SDG&E asks for and DRA recommends the following:

	Recorded		Forecasted			
				Millions of Dollars		
	2009	2010	2010	2011	2012	TOTAL
Smart Grid Portfolio	$0	$0	$0	$36.568	$57.269	$93.837
DRA recommends			$0	$7.731	$12.41	$20.142

This recommendation is consistent with the position DRA has taken in the most recent SCE GRC.[13]

III. SUMMARY OF RECOMMENDATIONS

The following summarizes DRA's recommendations:

- Allow $4.5 million in 2011 and $6.2 million in 2012 for storage.
- Allow $392.6 thousand in 2011 and 2012 for dynamic line ratings.
- Allow $368.7 thousand in 2011 and 2012 for synchrophasors.
- Allow $1.45 million in 2011 and 2012 for SCADA on capacitors.
- Allow $2.98 million in 2012 for SCADA on substations and other facilities.
- Allow $521 thousand in 2011 and 2012 for smart transformers.
- Allow $0 for public access charging facilities.
- Allow $0 for wireless fault indicators.
- Allow $0 million for 2011 and 2012 Phase identification.
- Allow $0 in 2012 for conditioned based maintenance expansion.
- Allow $500 thousand in 2011 and 2012 for integrated test facility.

II. DISCUSSION

There is currently a smart grid Rulemaking proceeding at the CPUC, R.08-12-009. This is the perfect forum for formulating Commission policy and giving

[12] The smart grid IT dollars are discussed in Exh. DRA-21.

[13] A.10-11-015, Exh. DRA-7.

guidance about proper investments, coordination with other agency efforts and defining design considerations/parameters. The capital dollars involved in updating the grid are astronomical.[14] The Commission is moving fast, but it is time to slow down. The Commission is asking all the right questions, and California can still maintain its leadership role in the national dialogue about smart grid policies, practices and protocols by setting a good example.

Important themes are being vetted in the workshops of the smart grid rulemaking workshops. Some of them are: 1) consumer issues, including privacy; 2) technical and policy issues concerning the smart grid and its effects on the distribution networks of electric utilities; 3) technical and policy issues concerning the smart grid and its effects on the transmission network for electric power and energy storage within California; 4) technical and policy issues related to the deployment of plug-in electric vehicles; and 5) the best regulatory approach for conducting regulatory reviews of smart grid infrastructure investments. We should be further along in this Rulemaking before authorizing the sums of money requested by SDG&E.

After the issuance of the California rulemaking, the Federal Government appropriated $4.5 billion through the American Recovery and Reinvestment Act (ARRA or Recovery Act) "to modernize the electric grid" through activities including the smart grid programs authorized by EISA. California is moving forward with some important pilots, in fact, California utilities (public and privately owned) are getting a healthy portion of federal dollars to increase the understanding of what is a prudent investment in the electric grid and other related infrastructure.[15] California is not falling behind.

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[14] Under the ARRA, DOE invested over $4 billion in smart grid strategies; this was matched by more than $5 billion from utilities and industry. http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc-smart-grid-june2011.pdf page 51.

[15] $65 million to SCE; $25 million to PG&E; $28 million to SDG&E; http://www.smartgrid.gov/recovery_act/project_information

Also at the federal level, the Federal Energy Regulatory Commission (FERC) issued a *Proposed Policy Statement and Action Plan* on Smart Grid[16] on March 19, 2009. On July 16, 2009 FERC adopted a Smart Grid Policy Statement.[17]

In June 2009, the United States Department of Energy (DOE) issued a final Funding Opportunity Announcement (FOA) pertaining to the Smart Grid Investment Grant (SGIG) Program and a final FOA pertaining to the Smart Grid Demonstrations Program. California received over $389 million from SGIG and the demonstration project funds. In June 2010, DOE funding helped NARUC organize a "smart grid school" at the annual Mid-Atlantic Conference of Regulatory Utility Commissioners.[18] In a July 2011 joint report with FERC to Congress, DOE cited its 10 years worth of funding and technical assistance on demand response and smart grid issues to approximately 30 states. One of the many themes that run through this report is "leveraging." DOE aptly discusses the need to "leverage existing initiatives," "leverage tools developed by DOE (and presumably others)," and "leveraging the actions of one entity to support the efforts of others." With so many global capital demands competing for available funds, it is imperative that policy leaders refrain from duplicative efforts in the learning phase of smart grid. It is essential that the pilots that are selected add to the knowledge base of determining real benefits of smart grid and that utilities absorb the lessons from others and incorporate those lessons learned into their own evaluation and decision-making processes.

Technical solutions and policy guidelines are still forming. Policymakers are currently vetting very important issues of security, standards, NERC compliance, performance/reliability goals, and appropriate metrics for evaluation. There are

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[16] *Smart Grid Policy*, 126 FERC ¶ 61, 253, Proposed Policy Statement & Action Plan (March 19, 2009).

[17] *Smart Grid Policy*, 128 FERC ¶ 61, 060, July 16, 2009.

[18] http://www.ferc.gov/legal/staff-reports/07-11-dr-action-plan.pdf p. 6.

many important questions to ask. In the meantime, the customer needs to know that there is a reason why rates are going up. In order to have the most successful smart grid program in the US, California ought to 1) learn from the many smart grid pilots currently underway, 2) utilize one-way balancing accounts for the pilots that are approved, 3) create a meaningful message for customers about smart grid, and 4) refrain from signing blank checks to the IOU's because smart grid is perceived to be the next panacea.

At the state level, smart grid policies have been the subject of California legislation. Governor Schwarzenegger, on October 11, 2009, signed Senate Bill (SB) 17 (Padilla) into law.[19] This bill, along with others regarding conservation, greenhouse gases, renewable energy goals, and electric vehicles, set a very high standard for the delivery and use of electric energy. The combined result of these efforts suggests that California wants to be exemplary; that it needs to set the gold standard for energy markets, infrastructure and programs.

While the notoriety and leadership brings investment dollars and green jobs to our state and stimulates innovation, we need to stay in third gear and stop trying to jump into fifth gear. If there is anything to be learned from electric restructuring, it should be that when there is a compelling topic of interest and large dollars are involved, it is better to take a little more time in guiding utilities on what is best.[20] "[W]e understand that **we have a great responsibility to do this right** (emphasis added)."[21] Now is the time to translate that understanding into wisdom and make good decisions about how we move forward.

[19] SB 17 (Padilla) (Chapter 327, Statutes of 2009).

[20] For example, the divestiture of hydro facilities was considered and rejected after a long process of evaluation and legislative intervention.

[21] President Peevey, Speech on Smart Grid on May 11, 2011.

A. SDG&E Culture

SDG&E, specifically, has a culture where the desire to be the first player around the track is prevalent. This has been true in the past and it is true now. A few examples from its history are as follows: SDG&E quickly accepted the introduction of direct access into the electricity market, SDG&E did not hesitate evaluating the investment into liquefied natural gas (LNG) facilities, SDG&E is almost fully deployed on AMI, 95% of SDG&E's transmission system is controlled via SCADA, 60% of SDG&E's distribution system is underground, and SDG&E ended the rate freeze first back in 2000. SDG&E, being more nimble at change than the other two IOU's, can embrace the coming tides of change more effectively. This is not a bad thing. It does mean, however, that extra care must be given when a review of its capital wish list occurs in the GRC cycle.

The current GRC is ripe with new examples of how SDG&E wishes to skip a few gears and shift from low gear into fifth gear. In this chapter, DRA will only address the smart grid dollars, but there are other areas such as sustainable communities, where SDG&E is also getting ahead of itself.

After the GRC was filed, Application A.11-06-006 was filed by SDG&E on June 6, 2011. Not surprisingly, the Smart Grid Deployment Plan (DP) was filed, a month early by SDG&E. DRA has not fully digested its 354 pages, but the bottom line describes the estimated cost of smart grid deployments to run $3.5 billion[22] for 2006-2020. This is the amount for SDG&E.[23] A breakdown of the $3.5 billion details shows that there is $1.42 billion in SDG&E's Test Year 2012 GRC alone. It also highlights that the Commission has already approved $1 billion towards

[22] http://www.sdge.com/smartgrid/deployment/costs.shtml

[23] California Energy Markets, No. 1137, July 8, 2011, p. 9 states that PG&E is seeking $800 million to $1.25 billion in capital spending over the next 20 years and SCE is estimating $1.8 billion for years 2011-2014. SCE reluctantly provided estimates for costs and benefits for the 2015-2020 timeframe.

investments in smart meters and OpEx 20/20. Other requests will take place in active proceedings before the CPUC and FERC.[24]

The Deployment Plan (DP) demonstrates that SDG&E already has invested in advanced infrastructure.[25] They are being reviewed thoroughly in this GRC and has been approved in the past.[26] It would have been useful if SDG&E had presented a better GRC based historical context of capital spending for budgets that now fall under the "smart grid" rubric, since it has been developing a smarter grid for a while. The Deployment plan helps that effort, but there isn't enough time to sort out the 354 pages in the time given to complete an analysis. It confirms that there are dollars and projects in many places. A helpful briefing by SDG&E on July 20 highlighted the changing assessments of project ideas (i.e., condition based management (CBM), security) even within the time period between the GRC filing and the filing of the deployment plan (7 months.) This amount of uncertainty and volatility of details, coupled with the slower progress of standards argues for restraint. The magnitudes of complexity being introduced into the system, the levels of system integration that are being touted, and the multitude of security concerns are yet another reason for exercising caution.

With that as the background, DRA discusses below the individual smart grid capital requests.

B. Smart Grid Capital Requests

1. STORAGE

The largest share of the smart grid capital dollars are designated for what SDG&E deems "renewable growth, energy storage". Table 14-1 compares DRA's

[24] A.05-03-015, A.06-12-009, A. 08-07-023, A.10-07-009, A.11-03-002, A. 11-05-020, A.11-06-031 and FERC docket ER08-1407; ER09-1601; ER10-2235; ER11-xxxx.

[25] SCADA, self-healing systems, dynamic ratings on lines, etc.

[26] June 6, 2011 Smart Grid Deployment Plan pages 60 and 61 or sections 3.2.2 and 3.2.3. http://www.sdge.com/regulatory/documents/a-11-06-006/Deployment%20Baseline.pdf; see

(continued on next page)

and SDG&E's TY 2012 forecasts of Budget Code 10261, the capital expenditures for energy storage related to renewable growth:

Table 14-1
Capital Expenses for TY 2012
For Energy Storage
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[27] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Budget Code 10261 Intermittency mitigation	$6.200	$29.790	$23.590	380%

SDG&E's request includes a $25.193 million capital expenditure in 2011 for which DRA recommends $4.5 million. SDG&E further requested $29.790 million in 2012. DRA recommends $6.2 million for 2012.

There is no doubt that storage is an important contributor to the electric system. It has an important functionality within the electric system, it helps with hedging efforts, it can help manage peak moments, and it is likely to complement renewable generation. It is so important, in fact, that the Commission has opened up an OIR[28] to

> (1) review, analyze and establish, if appropriate, opportunities for the development and deployment of energy storage technologies throughout California's electricity system;
> (2) remove or lessen any barriers to such development and deployment;
> (3) review and weigh the associated costs and benefits of such development and deployment; and
> (4) establish how those costs and benefits should be distributed.[29]

(continued from previous page)
also D.04-12-015 and D.08-07-046.

[27] Exh. SDG&E-11, p. 21.

[28] R.10-12-007.

[29] R.10-12-007 Scoping Memo, May 31, 2011, p. 2.

The Storage Rulemaking is currently designed as a two phase proceeding with invaluable questions being asked. Before the Commission signs off on $54.983 million investment (2011 and 2012), some of these questions need to be vetted.

SDG&E is proposing to install two types of energy storage systems over the 2011 and 2012 timeframe. SDG&E is proposing to install 50kW batteries (Community Energy Storage (CES) devices) on 25 circuits, and install 8 MW of substation energy storage. The goal of the nearly $60 million investment is better management of the renewable energy fluctuations.

There are 9 states that received funding for 16 projects related to energy storage with ARRA Grid Regional and Storage Demonstration Project funding.[30] There are 5 projects alone in California,[31] and 4 of these relate to testing various battery technologies. There is a project in Detroit Michigan that is testing CES benefits with regard to electric vehicles. The description suggests that it will also have solar systems integration as well. Many of the projects appear to be testing technologies and how they might either regulate generation or reduce carbon emissions. The total value of the 16 storage projects is estimated to be near $760 million, with ARRA supplying 24% of the funding. With such efforts being done nationally, and the CPUC's efforts to investigate storage in a Rulemaking, DRA is proposing a scaled back version of the storage project. DRA is suggesting 1 circuit gets CES batteries in 2011 and 1 circuit gets CES in 2012 along with a commensurate level of substation energy storage. Given the information available, and until satisfactory answers are found to the above questions, DRA estimates the cost to be $4.5 million in 2011 and $6.2 million in 2012. To proxy the effort, DRA first unitized the 4 circuits in 2011 and the 7 circuits in 2012 and came up with $6.298 million and $4.255 million. Then it chose to use the numbers in increasing progression to represent the cost per circuit per year, assuming that a

[30] http://www.oe.energy.gov/DocumentsandMedia/SG_Energy_Stor_Projects_20110104.pdf

[31] http://www.oe.energy.gov/DocumentsandMedia/FINAL-REV_Combined_SGDP_Selections_2011_01_04.pdf p. 4 of 5.

commensurate amount of substation equipment was also placed into the annual amounts.

2. DYNAMIC LINE RATINGS

The next area of review will be dynamic line ratings. SDG&E has nearly 1,000[32] distribution circuits. The DP mentions that the SDG&E transmission system has several lines with dynamic ratings. In the current GRC, SDG&E seeks to install dynamic rating technology onto 10 distribution circuits per year. DRA is proposing that 2 circuits receive dynamic line ratings per year, or 20% of SDG&E's request. There are 13 electric distribution systems related projects receiving over $254 million in SGIG funding; and many project descriptions mention reducing system losses, improving system reliability, and optimizing the grid's operations. DRA would rather see a more limited effort at this time so that SDG&E can "leverage" its efforts against those that are being done elsewhere in the nation.

Table 14-2
Capital Expenses for TY 2012
Dynamic Line Ratings
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[33] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Dynamic line ratings	$.392	$1.963	$1.570	400%

3. SYNCHROPHASORS

The next area for review is synchrophasors. SDG&E is proposing to install 4 of them in 2011 and 7 of them in 2012 along with a phasor data collector at each substation. SDG&E's testimony suggests that this technology will be partnered with storage technology in order to mitigate the intermittency of renewable generation.

Section 3.4.4.4 of the DP describes the efforts with synchrophasors that began in 2007 with the aid of CEC funding. All of the 10 transmission related SGIG

[32] 995 distribution circuits are identified in Bialek's GRC testimony; while 997 distribution circuits are listed in the DP.

[33] Exh. SDG&E-11, p. 22.

projects that received over $152 million in funding related to the installation or increased use of synchrophasors. While they are designed with the transmission system in mind, there are lessons to be learned since these 10 projects are aimed at finding ways to improve monitoring, improve critical decision making on the grid operations, reducing congestion and integrating renewables. DRA is proposing to install one per year in 2011 and 2012 at a cost of $368, 750 per installation.[34]

Table 14-3
Capital Expenses for TY 2012
Synchrophasors
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[35] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
synchrophasors	$.368	$2.581	$2.212	600%

4. SCADA

The next few areas relate to SCADA. SDG&E has utilized SCADA in various types of equipment for years. In its DP, SDG&E describes its transmission system as 95% controlled by SCADA. In A.06-12-009 IT testimony, SDG&E states that distribution SCADA has been deployed since 1985. It also suggested that the number of field devices continues to increase per year. SDG&E intended from the last GRC to expand distribution SCADA. Without the benefit of historical data with regard to SCADA, it is difficult to put the current request into context. In A.02-12-028 in project 01833 SDG&E requested dollars to upgrade distribution SCADA. In that filing, SDG&E articulated that funding shouldn't exceed more than $800,000 each year. It also mentioned that prior to A.02-12-028, the expenditures came from the 93240 budget.

It is clear that the company is technology forward. What isn't clear is SDG&E's accounting of SCADA or historical levels. This area, in particular, is

[34] $368,750 is derived from SDG&E workpapers for 2011 whereby 4 circuits received the technology at a cost of $1.475 million.

[35] Exh. SDG&E-11, p. 23.

frustrated by SDG&E's failure to present historical detail, actual spending levels and context with its proposals.

SDG&E describes its desire to further deploy SCADA down to lower levels: capacitors and substations. SDG&E seeks to fully deploy SCADA onto its capacitors in 7 years and onto its substation facilities in 5 years. DRA is suggesting a slower roll out. The numbers represent the programs taking twice as long as SDG&E would propose.

Table 14-4
Capital Expenses for TY 2012
SCADA
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[36] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Capacitors	$1.450	$2.902	$1.452	100%
Substations & Other	$2.980	$5.964	$2.984	100%

5. SMART TRANSFORMERS

The next area of inquiry is for distribution line transformers. SDG&E's estimates assume an aggressive rollout of electric vehicles (EV) in 2011. Consistent with more modest EV rollout projections touted by DRA in the SCE GRC,[37] DRA is recommending that the rollout will not take place as quickly as the company estimates and that the level of transformer monitoring for 700 cars per year should be used as a proxy for both 2011 and 2012.

Table 14-5: **Capital Expenses for TY 2012**

Smart Transformers
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[38] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Smart transformers	$.521	$.521	$0.000	0%

[36] Exh. SDG&E-11, pp. 25 and 26.

[37] Exh. DRA-6 in A.10-11-015.

[38] Exh. SDG&E-11, p. 28.

6. CHARGING STATIONS

The next area relates to charging stations for EVs. Although a recent Commission decision articulated interim ratemaking policy for charging station infrastructure,[39] DRA is proposing $0 towards the investment in public access charging facilities. Until larger volumes of EV's penetrate SDG&E's territory, DRA does not support the use of ratepayer funds for such an effort.

EPRI released a report on the potential roles that utilities might have with regard to transportation and charging stations.[40] This report reaches some interesting conclusions about system impacts, penetration levels, where to focus efforts (i.e., on the devices closest to the customer,) and the implication for older systems (including underground systems.) This same report also discusses roles for utilities with regard to charging stations. It raises a lot of caveats about the EV owner's behaviors, home configurations, and penetration levels. While it also suggests that the utilities have a positive role to play in keeping costs down for charging stations, it overwhelmingly demonstrates how much more information needs to be gleaned about the EV owners, their homes and habits before SDG&E can make reasonable investments in charging station infrastructure. The next GRC cycle is the best place for these dollars to be evaluated.

Table 14-6
Capital Expenses for TY 2012
EV Charging Stations
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[41] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
EV charging stations	$0.000	$5.230	$5.230	%

[39] D.11-07-029.

[40] http://my.epri.com/portal/server.pt/gateway/PTARGS_0_241402_317_205_776_43/http%3B/uspalecp604%3B7087/publishedcontent/publish/epri_report_defines_potential_roles_for_utilities_as_electric_vehicles_take_to_the_road_da_795076.html

[41] Exh. SDG&E-11, p. 31.

7. WIRELESS FAULT INDICATORS

The next area of review is wireless fault indicators (FCI). This project proposes to install wireless FCIs on all non-SCADA switches and all cable poles with switches in the distribution system over a five year-period (2011-2015). While the wireless approach represents the next generation of fault finding technology, this is an area ripe for deferral. This is not a must have technology and there is a recession. This is an "it would be nice" option. As such, with ratepayer necessity in mind, DRA recommends a postponement of this roll out.

Table 14-7
Capital Expenses for TY2012
Wireless Fault Indicators
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[42] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Wireless fault indicators	$0.000	$2.199	$2.199	%

8. PHASE IDENTIFICATION

The next area of review is phase identification. Based upon the limited information provided for the $9 million dollar three year project, it is questionable why this isn't in the IT testimony. Much of what is described for the purpose of phase identification speaks to obtaining accurate information so that better decisions and analysis can take place. SDG&E proposes to institute some process (it's not clear if it is hardware or software) that will enable SDG&E to better know its system and its real time characteristics. There are worker safety benefits and better planning and operations. What SDG&E failed to discuss was the actual labor and non-labor contents of the $9 million. What exactly is involved? What is it installing? On how many places? What is meant by covering the entire system- which nodes or infrastructure will be receiving the phase identification system? Effort was given to describe the benefit of this effort, but little detail was given on the actual project

[42] Exh. SDG&E-11, p. 32.

components and installation. DRA suggests a better showing in the next GRC before dollars are authorized.

Table 14-8
Capital Expenses for TY 2012
Phase Identification
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[43] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Phase identification	$0.000	$4.027	$4.027	%

9. CONDITION BASED MAINTENANCE

The next area of review is Condition Based Maintenance (CBM) expansion. DRA recommends $0 for this effort. SDG&E is proposing to eliminate 4kV substations in the long run, so efforts to utilize CBM on them are counter-productive. Additionally, SDG&E, in a July 20th briefing said that it is going to withdraw this request. DRA isn't sure how SDG&E will formalize this statement, but it recommends elimination of the project.

Table 14-9
Capital Expenses for TY 2012
Condition Based Maintenance
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[44] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
CBM	$0.000	$.752	$.752	%

10. TEST FACILITY

The last area of review relates to the construction of an upgraded test facility. While it seems reasonable to create a facility to test products that are being developed with regard to smart grid, SDG&E already has a test facility. It seeks to add more to it. With the further delays in National Institute of Standards and Testing

[43] Exh. SDG&E-11, p. 33.

[44] Exh. SDG&E-11, p. 34.

(NIST) consensus standards, it makes more sense to slow down this effort. DRA recommends a slower acquisition of equipment for this effort, so that some of the discussions at NIST can be incorporated into the choices.

Table 14-10
Capital Expenses for TY2012
Integrated Test Facility
(In Millions of 2009 Dollars)

Description (a)	DRA Recommended (b)	SDG&E Requested[45] (c)	Amount SDG&E>DRA (d=c-b)	Percentage SDG&E>DRA (e=d/b)
Integrated test facility	$.500	$1.340	$.840	168%

[45] Exh. SDG&E-11, p. 35.

Table 14-11 summarizes DRA's and SDG&E's 2010-2012 forecasts of smart grid capital expenditures:

Table 14-11
Smart Grid Capital Expenditures for 2010-2012
(In Thousands of Nominal Dollars)

Description	DRA Recommended			SDG&E Requested[46]		
	2010	2011	2012	2010	2011	2012
Storage	$0	$4.500	$6.200	$0	$25.193	$29.790
Dynamic line ratings	$0	$.392	$.392	$0	$1.963	$1.963
Synchrophasors	$0	$.368	$.368	$0	$1.475	$2.581
SCADA capacitors + substations	$0	$1.450	$4.430	$0	$2.902	$8.866
EV related transformers + charging stations	$0	$.521	$.521	$0	$2.047	$5.751
Wireless fault indicators	$0	$0	$0	$0	$1.302	$2.199
Phase identification	$0	$0	$0	$0	1.184	$4.027
CBM expansion	$0	$0	$0	$0	$0	$.752
Integrated test facility	$0	$.500	$.500	$0	$.502	$1.340
Total	$0	$7.731	$12.411	$0	$36.568	$57.269

C. Customer Awareness and Education

The pace at which SDG&E seeks to implement all the aforementioned technology is not only faster than the penetration rates of the various technologies, but much faster than the general public can understand and accept. For optimal implementation, their cooperation and acceptance is imperative. In the paper "Accelerating Successful Smart Grid Pilots", the author stated:

> … if we fail to engage consumers appropriately at this early stage in the process, we may end up in a situation where the prevailing public view of smart grid is skewed by a small number of cases where poor execution has led to a broader perception that smart grid is not delivering value to the consumer.

[46] Exh. SDG&E-11.

The quote is, most likely, referring to the outcry against smart meters. Smart meters have had a mixed reception from consumers. The reasons are many, and since SDG&E is nearly fully deployed in smart meters, it would be wise to take inventory of consumers (both pro and con) before pushing the fast forward button on the remaining segments of the smart grid/smart management of electricity. Before SDG&E takes the next step, it would be better for utilities and policy-makers to address the consumer concerns of 1) product compatibility[47]; 2) consumer differentiation towards all things technical[48]; 3) privacy; 4) protection of personal information; 5) national security;[49] and 6) being overwhelmed with information, decision making and defenses. If the ultimate goal here is to deliver value to the customer, the utilities, vendors and policy-makers need to do a better job of communicating with the public about what is happening. If policies are driving this effort more than cost savings, it is important then not to delude the public about it.

Better answers are needed that are tailored to a non-homogeneous ratepayer constituency. For the early adopter, technologically savvy group, greater involvement, details, and choices make sense when designing a product that will require the customer to cut demand when supplies are not available or are costly. For those customers without internet, a different solution will be required in order to better manage the electric system. For busy customers who have smart meters, a simple budget-based option might make sense. Are there options available to those who have privacy or health concerns and who "opted out" of smart meters? Therefore, in order to get the functionality out of the system (i.e., reduced peak demand, system stability with greater amounts of renewables, lower greenhouse gas

[47] I.e. metaphorically - why doesn't my fax machine work with VOIP; or in this case, why doesn't my computer work with the web based product?

[48] The DSL connection issues come to mind; or in this case, why can't I just drive my new electric vehicle home and not worry about charging.

[49] http://blogs.hbr.org/cs/2010/10/why_the_smartgrid_might_be_a_s.html; http://www.thedailybeast.com/articles/2011/08/04/computer-hacking-attack-puts-china-back-in-spotlight.html.

emissions) the customers have to be comfortable with how it relates to them. If the change process isn't managed effectively, there may even be a point where consumers go off grid.

D. Conclusion

Smart grid policy, development, services and systems will involve an array of disciplines and industries. The grid, which was once the territory of transmission planners has now become the brainstorm of an interdisciplinary team of communications experts, energy managers, customer service specialists, grid managers, demand side programs planners, etc.

Like the telecommunications sector, technology is influencing policy in the energy sector. Much as the developments in switch technology helped to bring about "advanced"[50] communication services (voice mail, call waiting, and call forwarding), we are seeing more advanced, smarter network elements in the electricity industry. Unlike the telecommunications sector though, environmental philosophy is a major driver of evolutionary policies in the electricity sector. A few examples are: 1) the desire to reduce the levels of greenhouse gases that are emitted, 2) the desire to embrace renewable technologies, and 3) the desire to re-evaluate once through cooling (OTC) technologies for generation facilities. These desires are motivating the policy-makers to shape the evolution of the electricity market and determine which facilities receive investments.

Smart meters – one facet to the smart grid puzzle – are indeed becoming the new meter standard. By year end 2010 SDG&E had deployed 1,820,000 smart meters to its electric and gas customers. Technology and desires are shaping the future as it evolves. But merely focusing on technology isn't enough. Consideration must be given to the consumer who will fund these efforts, use the technology and adapt to the increasingly complex world of utilities. As stated by Michael Beehler,

[50] Telephony used to be called "basic telephone service." By today's standards, basic telephone service is probably something a bit beyond a dial tone from your land line's copper pairs. Services like voice mail, call waiting and call forwarding are not seen as extraordinary, but as add-on features.

from Burns and McDonnell, “The smart grid without smart customers will be a failure.”[51]

Greater effort is required to achieve the full potential of the smarter grid. The Commission must take full value from the lessons to be learned from the billions of federal dollars granted towards smart grid. We must answer some important questions about security, privacy and interoperability standards. We must communicate a meaningful message to the consumer that accurately states that they are going to be partners in the success of managing the supplies and demands on the electric system.

[51] http://www.slideshare.net/federicoblanco2009/061509-white-paper-deployment-strategy-for-the-smart-grid