Application of San Diego Gas & Electric Company (U-902-E) for Adoption of an Advanced Metering Infrastructure Deployment Scenario and Associated Cost Recovery and Rate Design.	Application 05-03-015

CHAPTER 19

Prepared Rebuttal Testimony

of

SCOTT KYLE

SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

SEPTEMBER 7, 2006

TABLE OF CONTENTS

Chapter 19
Prepared Rebuttal Testimony
Of
SCOTT KYLE
SAN DIEGO GAS & ELECTRIC COMPANY

I. Introduction and Overview

My rebuttal testimony begins with a review of certain conclusions from the Division of Ratepayer Advocates (DRA) and Utility Consumer Action Network's (UCAN) testimony with which San Diego Gas and Electric (SDG&E) does not agree. The appropriateness of SDG&E's chosen financial analysis timeframe for Advanced Metering Infrastructure (AMI) and the implications of its incremental financial analysis are addressed in detail in separate sections following the overview. Next, SDG&E's rebuttal response is summarized, and then specific statements from the DRA and UCAN's testimony are addressed individually. The last section of this testimony recaps SDG&E's previous responses to data requests by DRA and UCAN, which are relevant to this rebuttal.

The DRA testimony written by Ted Geilen and the UCAN testimony written by William Marcus and Jeff Nahigian inaccurately characterizes SDG&E's 34 year net present value (NPV) evaluation timeframe as inappropriate and/or overly complex and as overstating the net benefits. Rather, SDG&E's methodology is comprehensive, transparent, and represents standard academic and industry practice for proper financial valuation and analysis and in fact is a conservative estimate of the net benefits[1]. Reducing the evaluation timeframe to 17 years using the methodology proposed by DRA witness Geilen, and UCAN witnesses Marcus and Nahigian, would significantly understate the forecasted net benefits associated with SDG&E's AMI deployment by ignoring important

[1] *On the Theory of Forecast Horizon in Equity Valuation*: James A. Ohlson and Xiao-Jun-Zhag, Journal of Accounting Research, vol. 37, no. 2 (Autumn 1999):437-449 – Synopsis: "Equity valuation models are typically composed of an explicit forecast horizon and an estimate of continuing value. (In this article,) the authors theoretically examine the impact of the explicit forecast horizon length on valuation error. Specifically, they find that under certain condition, valuation error decreases monotonically as forecast horizon length increases."

real world factors like system growth and meter replacements, as well as ignoring the "continuing" or "going concern" value to ratepayers created by a fully operational AMI system.[2] In financial models, continuing value is often also referred to as "terminal value".[3]

On page 1-1 of Ted Geilen's testimony at line 16: Table 1-1, DRA Adjustments to SDG&E Application, DRA suggests five line items that reduce SDG&E's proposed net present value of revenue requirement (PVRR) in 2006 dollars from $64 million positive ($783 million in benefits, less $719 million in costs) to $110 million negative ($504 million in benefits, less $614 million costs). The first line item proposes to reduce SDG&E's benefits by $153 million and costs by $105 million, for a net reduction of $48 million, due to shortening the investment evaluation timeframe from 34 to 17 years. That proposed DRA adjustment, in and of itself, reduces DRA's proposed PVRR for SDG&E's proposed AMI deployment to $16 million positive ($630 million in benefits, less $614 million in costs). This adjustment is described by Ted Geilen as "2 lifetime -> 1 lifetime". UCAN espouses a similar argument in Chapter 1, page 16[4], stating that "The program is not cost-beneficial if estimated over 15-20 years, as shown by SDG&E's own responses to UCAN DRs 5-1 and 5-2, attached to Mr. Nahigian's testimony."

//

//

//

[2] *Choosing the Right Valuation Approach*: Robert Parrino, CFA, CFA Institute Conference Proceedings, CFApubs.org (2005): 17 – "Although straightforward, (the adjusted book value approach) is not very useful for valuing a typical operating business because the value of a typical operating business is greater than the sum of the values of the individual identifiable assets. The reason for this is that a typical operating business has something called 'going-concern value'."

[3] *Analysis for Financial Management, 7th Edition*, Robert C. Higgins, McGraw Hill-Irwin (2004):328-331 – "Terminal values of growing businesses can easily exceed 60 percent of firm value, so it goes without saying that proper selection of the forecast horizon and terminal value are critical to the successful application of discounted cash flow approaches to business valuation."

[4] Also in Chapter 2, page 26.

Both the DRA's "2 lifetime -> 1 lifetime" adjustment and UCAN's timeframe revision are actually incorrect methods of eliminating almost all of the net terminal value benefits from SDG&E's business case. Had DRA and UCAN made their timeframe adjustments in a manner consistent with accepted professional financial analysis standards, there actually would have been no impact at all to SDG&E's business case results.[5] Moreover, SDG&E's analysis was already quite conservative to begin with in terms of terminal value, as is explained in more detail below.

II. SDG&E's Analysis Timeframe is Realistic and Accurate

SDG&E chose a 34 year project evaluation timeframe in order to be conservative, yet accurate and realistic, in estimating their AMI system's "going concern" or "terminal" value[6]. Since there is no established market available for use in valuing fully functional AMI systems, performing a specific analysis of the projected incremental SDG&E AMI projected cash flows for 34 years significantly reduced the risk of overstating terminal value. This was initially explained in Scott Kyle's testimony, and again in several data request responses to both the DRA and UCAN, which are included below for reference.

SDG&E had originally hoped that providing a financial model with so much transparency into the numbers would help decision-makers focus on more significant and important issues, like input data assumptions and their impact on results, rather than

[5] *Valuation, Measuring and Managing the Value of Companies, 4th Edition*, Tim Koller, Marc Goedhart, David Wessels, McKinsey & Company (2005):271-277 – "A thoughtful estimate of continuing value is essential to any valuation because continuing value often accounts for a large percentage of a company's total value. Three misunderstandings about continuing value are common. First is the misperception that the length of the explicit forecast affects the company's value. …some analysts incorrectly infer that a large continuing value relative to the company's total value implies that value creation occurs primarily after the explicit forecast period. **While the length of the explicit forecast period you choose is important, it does not affect the value of the company; it only affects the distribution of the company's (net present) value between the explicit forecast period and the years that follow** (emphasis added)."

[6] SDG&E has incorporated the concept of terminal value as part of the financial analysis and project evaluation process in several previous filings before the CPUC. The most recent filings before the CPUC that incorporated this concept included the Generation RFP R.01-10-024, Otay Mesa PPA Rehearing R.01-10-024, and SONGS Steam Generation Replacement (SGRP) A.06-04-018. In each of these filings, SDG&E made reference to a 30 year Combined Cycle Plant that was introduced into the analysis as replacement energy for either existing Power Purchase Agreements (PPA), or energy output from a nuclear power plant. In all cases, the analysis period was shorter than the 30 year economic life of the replacement plant. A terminal value was used to properly capture relevant costs that extended past the financial analysis evaluation time period.

getting sidetracked on modeling methodology and technique. SDG&E could have just as easily constructed and presented its AMI financial model to characterize the net present value of all net benefits after the first 17 years as a single terminal value amount, thereby complying literally with the California Public Utilities Commission's (CPUC) requested 17 year investment horizon. In so doing, we would have used supplemental work papers to show how that single terminal value was derived, based on analyzing seventeen more years of specifically forecasted cash flows. Instead, SDG&E chose to show its entire analysis in one place. The important point is, as stated previously in footnote 5, results are exactly the same either way.

Briefly, SDG&E's testimony indicated that the PVRR of its AMI deployment was $52,270,000 in 2006 dollars for the specific cash flows that were modeled from 2007 (SDG&E's first deployment year) through 2038, plus $7,724,000 in 2006 dollars for the PVRR terminal value of all subsequent projected cash flows, for a total PVRR of $59,994,000. Restating the analysis to portray only 17 years worth of specific cash flows would have resulted in reporting ($54,379,000) in 2006 dollars for PVRR from the specific cash flows modeled from 2007 through 2023, plus $114,374,000 in 2006 dollars for the PVRR terminal value of all subsequent projected cash flows, for the same total PVRR of $59,994,000.

To develop a materially realistic and reasonable PVRR, the "going concern" or "terminal" value of significant items like the ongoing depreciation of growth and replacement meters had to be addressed. Those meters will account for 13.9% of SDG&E's AMI meters in service by 2023. This represents 238,000 customers. On average, those meters will not reach the end of their useful lives until 2031 (8 more years), during which time every other meter on SDG&E's AMI system will have been replaced as well.

It makes no sense to analyze an investment of several hundred million dollars based on simplified, unrealistic assumptions, such as using remaining net book value at year 17 as surrogate for terminal value[7], as proposed by the DRA, or using pro-rated net

[7] *Analysis for Financial Management, 7th Edition*, Robert C. Higgins, McGraw Hill-Irwin (2004):328-331 – "…liquidation value usually grossly understates a healthy business's terminal value. Because most businesses expand over time, if due only to inflation, many analysts (also) believe (the "no growth perpetuity" method) understates the terminal value of a typical business."

benefits associated with the first installation cycle's worth of un-depreciated meters as a surrogate for terminal value, as proposed by UCAN. Rather, SDG&E chose to specifically model enough additional years of costs and benefits to capture the "going concern" value of the AMI system, while pushing the point in time when more simplified assumptions about terminal value would have to be made so far into the future that their impact on PVRR would be negligible in present value terms[8]. Again, SDG&E's intent by using this methodology was to be more conservative about the impact of terminal value on the PVRR and reduce long-term estimating risk (see related discussion in DRA Data Request 021, Attachment B).

III. Incremental Analysis is a Widely Accepted Economic Principle

SDG&E's modeling methodology reflects well understood, commonly accepted financial and economic evaluation principles, based on the concept of incremental cost and benefit cash flow analysis[9]. The incremental nature of the analysis has the effect of isolating costs and benefits related to a project or decision over the long term, independent of whether subsequent newer and better technologies come along later. That is because in incremental analysis, only the new costs and benefits associated with any system or technology upgrade are compared with existing costs and benefits to determine the economic net present value of the new investment. If an investment makes sense under those terms, it is irrelevant to the current decision whether or not a better technology or solution comes along five or even fifty years later. Each new solution must stand on its own, incrementally, with respect to costs and benefits, compared to the baseline in effect at the time, which in this example would be SDG&E's currently proposed AMI system. In other words, from an economic analysis perspective the customer is assumed to receive the benefits and costs associated with each layer of system upgrades (including the initial installation) independently and indefinitely, as long

[8] *Analysis for Financial Management, 7th Edition*, Robert C. Higgins, McGraw Hill-Irwin (2004):328-331 – "The FMV (Fair Market Value) of a business equals the present value of all future free cash flows. …because companies typically have an indefinitely long life expectancy, the literal application of this equation would have us estimating free cash flows for perhaps hundreds of years into the far distant future.

[9] Fundamentals of Corporate Finance, 5th Edition, Stephen A. Ross, Randolph W. Westerfield, and Bradford D. Jordan, McGraw Hill-Irwin (2001): p.279 - "The relevant cash flows for the analysis of a capital budgeting project are the incremental cash flows associated with the project, which consist of any and all changes in the firm's cash flows that are a direct consequence of accepting the project." See also http://www.mhhe.com/business/finance/rwj/fund/overview.mhtml

as that service continues to be provided, because each new design change must justify its additional (incremental) costs on the basis of new (incremental) even greater savings.

Perhaps this important financial analysis concept can be visualized using the following analogy. Each decision point, or layer of technology, can be thought of like a row of bricks in the foundation of a pyramid. You would not add a new row unless doing so is better than doing nothing at all, based only on the net value added by the new row. Similarly, the new row only receives credit for the additional value it adds, not the value associated with the full height of the pyramid.

Assuming that there will still be some sort of AMI system in existence 17 or 34 or 100 years from now, once the functionality is established initially, the customer benefits associated with the first decision to invest in AMI extend indefinitely. Any subsequent upgrades must create even more benefit than their costs, and be justified solely on the incremental net benefit produced, over and above the net benefit provided by all previous upgrades to the system. Otherwise there is no reason to upgrade, and the current state of technology, costs, and benefits would continue unchanged.

IV. Summary

In SDG&E's opinion, DRA and UCAN are confusing readers who are not financial professionals, and creating misconceptions about the technical merits of SDG&E's AMI financial evaluation methodology and model with their fanciful rhetoric. See the "Detailed Rebuttal" section below for specific examples in DRA and UCAN's testimony. None of the adjustments made by DRA or UCAN to SDG&E's PVRR or NPV results related to the analysis timeframe employed by SDG&E conform to accepted financial analysis standards, and therefore that aspect of their testimony should be disregarded.

SDG&E believes that the financial model, methodology, and resulting PVRR submitted in its filing, given the data input values, reflect the most appropriate results for evaluating the overall net benefits that will accrue to customers as a result of SDG&E's proposed AMI deployment. SDG&E's AMI modeling and financial analysis approach is realistic and reasonable. It attempts to provide the most meaningful possible valuation and PVRR information possible for use in the decision making process. SDG&E's PVRR model and methodology reflect standard financial analysis techniques, in conformance

with valuation due diligence norms used commonly and generally accepted by the professional investment community.

V. Detailed Rebuttal

1. DRA, Chapter 1, page 1-1, line 6: "SDG&E's AMI application is not cost effective as proposed."
    a. SDG&E categorically disagrees. SDG&E's proposal is clearly cost effective for rate payers, with a PVRR of $60.0 million. Only by reducing SDG&E's analysis timeframe, and eliminating important, legitimate long-term costs and benefits associated SDG&E's AMI system in the process, is DRA able to conclude that SDG&E's proposal is not cost effective. As discussed above in detail, DRA's analytical techniques are at odds with accepted and acceptable financial analysis standards practices.
2. DRA Chapter 1, page 1-8, line 11: "We do not believe we can predict, with sufficient confidence, the needs of San Diego ratepayers and the economics of energy industry starting in year 2025, to determine the AMI system best suited to replace the currently proposed system."
    a. This statement is true. However, it is irrelevant with respect to the financial analysis, as discussed in detail in Section III above. Assuming an investment decision's incremental costs and benefits make sense, whether or not a better technology or solution comes along five or fifty years later is irrelevant to the current decision, because any new solution will have to stand on its own, incrementally with respect to costs and benefits, compared to whatever baseline is in effect at that time.
3. DRA Chapter 1, page 1-9, line 6: "SDG&E's complex assertions about the trailing or "horizon value" of the AMI system have no merit. Old technology is more likely to exhibit disposal costs than resale value."
    a. As also mentioned in response to DRA Data Request 21, question 6 (Attachment B), seasoned electric utility personnel are sure to remember deregulation in the late 1990's. Utilities and the CPUC were very concerned about stranded costs associated with possibly selling older power plants for less than their net book value. In fact, power plant sales

generated astounding net book value multiples, selling for as much as 20 times their net book values. The investor community values assets in terms of the projected cash flows they will generate, and any going concern, such as a power plant, or in this case a fully functioning AMI system that could be privatized, i.e., sold to an outsourcing company, has significant ongoing value. The DRA's comment is designed to cast doubt on the validity of SDG&E's projected ongoing value after the first 17 years of system operation. SDG&E believes that disregarding the positive incremental net benefits over a reasonable foreseeable future associated with the initial decision to install an AMI system introduces bias and error into the decision-making process and does grave disservice to the public interest by ignoring significant net benefits associated with this proposal. The fact is that utility infrastructure investments have very long lives. If the CPUC, DRA, and UCAN ignored the proper determination of terminal value in the interest of simplicity when previously analyzing PG&E's AMI proposal, that omission should not be allowed to prejudice the decision-making process and proper financial evaluation of SDG&E's AMI proposal.

4. DRA Chapter 1, page 1-9, line 8: "In order to accept that the system will directly create benefit in 2038, one would have to assume that AMI technology had not advanced sufficiently to cause a significant upgrading of SDG&E's AMI technology (no technology redesign cost was included in SDG&E's analysis)."

    a. See Section III above. The DRA's statement is at odds with all accepted academic and professional financial analysis standards on this subject. Each investment decision should be evaluated on the basis of its incremental cash flows. Therefore, a hypothetical decision to upgrade to new technology at some point in the future should have nothing to do with the current decision.

5. DRA Chapter 1, page 1-9, line 11: "When the technology is upgraded, the subsequent benefits should accrue to that new technological system upgrade – not the 2006 version of AMI."

a. This is absolutely untrue. A financial analysis prepared that way would mislead decision makers by taking credit for non-incremental benefits that have nothing to do with adopting the new technology, because such benefits would continue to be received by ratepayers, regardless of whether any upgrades ever took place or not.

6. DRA Chapter 1, page 1-9, line 14: "As I write this chapter, I am 35 years old, with a (nearly) full head of hair. I will be bald and retired by 2038 – the last year for which SDG&E claims credit under the current AMI technology. I don't expect that in my retirement I will be using the same PCS cell phone technology that I use today. I don't expect that I will be using the Pentium PC computer technology I use today. I don't believe SDG&E will be using 2006 AMI technology when I head down to Florida in 2035."

a. SDG&E agrees completely. However, as described in Sections II and III above, this has nothing to do with the validity of the financial analysis that a reasonable and prudent decision maker would employ to decide the merits of SDG&E's AMI proposal. The statement is merely a cute sound-bite. The real point is that every investment has some appropriate terminal value beyond the investment evaluation time period.

7. DRA Chapter 1, page 1-9, line 23: "DRA questions, however, whether these meters would be left in place in the second mass deployment. It seems far more likely that SDG&E will upgrade the technology of the entire system when age requires the replacement of 4/5ths of the original 2008-2010 mass installation in 2026.

a. Again, this misses the point. Any such upgrades would have to stand on their own in terms of incremental net benefit, over and above the net benefit already provided by the 1st generation system; and at least the level of net benefits provided by the 1st generation system would continue to accrue to the ratepayer, regardless of whether or not any upgrades took place.

8. DRA Chapter 1, page 1-9, line 26: "It is, at best, speculative to assign a positive residual value for two-decade-old computers, cell phones or AMI technologies."

a. This also misses the point. The very reason SDG&E chose to extend the analysis timeframe was to minimize the impact of any residual value estimates on the overall PVRR. Terminal value estimates are supposed to capture the going concern value of the entire installed system, not just individual components.

9. DRA Chapter 1, page 1-9, line 20: "DRA has included the benefits that the growth and replacement meters can be expected to produce over the remainder of their lifetimes, as recommended by SDG&E in its response to data Request #43. We have also included the residual book value in the costs."

a. See DRA Data Request 43, question 1 (Attachment E). The truth of this statement is not evident from Table 1-1 in DRA's testimony. The starting cost and benefit numbers used by DRA clearly do not match any of the numbers provided by SDG&E's referenced data request response.

10. DRA Chapter 1, page 1-9, line 28: "Furthermore, SDG&E's business case fails regardless of whether any costs and benefits are assigned to growth and replacement meters after 2026."

a. See DRA Data Request 43 (Attachment E). This is yet another non-standard approach to financial analysis from DRA. SDG&E answered their hypothetical data request under protest, because the methodology was logically flawed. SDG&E does not support this conclusion at all.

11. UCAN, Chapter 2, page 26, footnote 7: "SDG&E states that its business case analysis is based on a 32-years (sic) forecast of costs and benefits; that is then discounted over an even longer 34-year period (Chapter 13, p. SK-6). However, to make it more confusing, the model SDG&E uses to run its business case analysis spans a 33-year period (Workpapers to Chapter 13)."

a. It is hard to image how UCAN could have been confused by this after reading the whole paragraph of referenced testimony in context. It says, "SDG&E's DCF analysis, as well as its revenue requirements present value (PVRR) analysis, uses a projected evaluation horizon of 34 years, including a terminal year of 2039, and an initial year, 2006. The 2006 initial year is needed simply to compute net present values in 2006 dollars,

despite the fact that costs and benefits do not begin until 2007. In other words, SDG&E forecasted 32 years of costs and benefits, but the DCF and PVRR analyses contain 34 years."

b. Perhaps UCAN did not understand that the 34th year contains only a final terminal value estimate, which is not the same thing as specifically cash flowed annual "costs and benefits". Rather, it is a proxy for the net present value of the project's continuing net benefit cash flows from a ratepayer standpoint beyond year 33.

12. UCAN, Chapter 2, page 27: "The Commission directed the utilities to use a 15-year evaluation period (Chapter 13, p. SK-6). SDG&E ignored that directive. It claims that it is necessary to use an evaluation period of 34 years because its phased deployment schedule makes it difficult to calculate a "terminal value" over a 15 year period.

a. The comment again demonstrates a lack of understanding about what terminal value is intended to represent. Terminal value is not calculated "over a 15 year period". It is a single value at the end of the analysis timeframe that captures the net present value in that year of all the remaining net benefits associated with a decision or project. As previously stated in Section II, SDG&E's treatment was technically accurate, conservative, and would return the same PVRR result, whether stated as a single value or expanded into a longer evaluation period.

13. UCAN, Chapter 2, page 28: "SDG&E chose a 34-year evaluation period to dilute the affect the assumed terminal value would have on its NPV calculation. By extending the evaluation period large dollar values get significantly discounted. This kind of "bookkeeping" is not just creative but it is downright fanciful."

a. As Wharton professor Dr. David Wessels stated more eloquently than I can in his textbook, which is quoted above in footnote 5 of this rebuttal, the analysis timeframe has nothing to do with the NPV result; it only determines how much of the NPV is specifically cash flowed vs. lumped into one year and called "terminal value". This topic was addressed in the original filing, multiple data request responses, and has been elaborated

upon further in this rebuttal. UCAN's inaccurate rhetoric could be very misleading to individuals who are not financially astute.

14. UCAN, Chapter 2, page 29: "While parties may argue over the useful life of the AMI investment, PG&E's analysis is superior to SDG&E's because it was based on evaluating the project over the useful life of the initial AMI investment."

    a. Actually, PG&E's analysis was seriously flawed, as described already in point 3 of this Section V above, and affirmed in footnotes 1, 2, 3, 7, and 8 above. It seems unreasonable that SDG&E should be forced to "dumb down" its analysis and ignore significant realistic costs and benefits in the process, just because PG&E justified their AMI system without doing a thorough or technically sound economic evaluation. PG&E did not explicitly model meter failures. PG&E's analysis literally assumed decommissioning their AMI system between years 16 and 20, 1/5th of their customers per year, ultimately leaving them with no meters at all. Personally I am much more concerned about what people would say if SDG&E turned in a financial evaluation like that, than I am about having to defend the fact that we did it right.

15. UCAN, Chapter 2, page 30: "Fortunately, discovery by UCAN and the Division of Ratepayer Advocates (DRA) provides the Commission with necessary analysis to properly consider SDG&E's business case over a period of time that does *not* (sic?) assume one full AMI replacement cycle. …it is important for the Commission to understand that SDG&E's business case analysis is not cost effective based on the business case analysis framework's required 15-year evaluation period or an extended PG&E-like 20-year period.

    a. As recapped in Section IV above, UCAN's results are fatally flawed, as they completely ignore terminal value. This was disclosed and cautioned against by SDG&E in its response to UCAN Data Request 5, questions 1 and 2 (Attachment A), yet neither DRA nor UCAN chose to provide their own replacement terminal value assumptions. Instead, they have submitted misleading results in their testimony, accompanied by unsupportable arguments for their point of view.

16. UCAN, Chapter 2, page 31: "As this table shows, SDG&E's AMI project is not close to cost effective using a 15-year evaluation period, and might arguably be marginally cost effective over a 20-year period under the Societal Cost Test.
    a. UCAN's results ignore Terminal Value, as previously discussed, and are therefore incomplete and misleading.
17. UCAN, Chapter 2, page 32: "As demonstrated later in this chapter, SDG&E has included close to $265 million (NPV) in benefits that are both questionable and remain largely outside the Commission's adopted framework (apart from demand response benefits and the value of capacity discussed in other chapters to UCAN's testimony). Remarkably, if SDG&E were to include every single one of these questionable benefits, over the mandated 15-year evaluation period, AMI is still not cost effective."
    a. This is incorrect. As stated in footnote 5 and demonstrated in Section II above, if SDG&E were to restate its case using a 15 year or a 250 year analysis timeframe, it would make no difference in the resulting PVRR. The correct answer should be exactly the same either way. The fact that PG&E didn't do a proper terminal value analysis should not set a precedent for SDG&E and become "the Commission's adopted framework".

This concludes my prepared rebuttal testimony.

Relevant Testimony and Data Request Response Excerpts Previously Submitted to the DRA and UCAN

Attachment A

Excerpt from SDG&E's response to UCAN Data Request No 05, Questions 1 and 2

… SDG&E would also point out that a 15 or 20 year time horizon is not the most appropriate way to judge the economic viability of the proposed AMI investment. As discussed in Scott Kyle's chapter 13 testimony, page SK-5 (beginning on line 17) through page SK-7, line 6, SDG&E firmly believes that the 34 year analysis period is most appropriate because a 'terminal value' for the remaining benefits ~~from~~ (sic) that are generated from deployed assets must, in some form, be included in the benefits/costs calculations. In short, a 34 year analysis period allows the capture of at least two lifecycles of the major capital items in the case and minimizes the impact of the terminal value calculation or methodology on the final business case results. In the 15 and 20 year time horizon scenarios listed above, no terminal value calculation is included nor is it in scenarios 6 and 9 of the period ending in 2038 (due to the multitude of assumptions that would need to be developed regarding equipment replacement costs and future benefits) and therefore a comparison of these two scenarios to the SDG&E business case would need to be further refined to include the terminal year benefits in order to render a meaningful comparison.

Attachment B

Excerpt from SDG&E's responses to DRA Data Request No021, Question 6:

SDG&E originally chose a 34 year investment evaluation horizon to provide a revenue requirement net present value that would most appropriately support the decision making process from a ratepayer standpoint by minimizing the impact on the PVRR of modeling problems associated with staggered asset lives and terminal value, more effectively capturing the long-term benefits of the project in the process.

SDG&E's initial deployment spans three years. Subsequently, meters are added each year for growth and failure replacement. As a result, there is never a point in time where the entire system is "used up" or fully depreciated, which might be used to define an evaluation time period end point in a simpler project evaluation. The fact that there is always remaining value in the AMI assets in service at any point in time necessitates a terminal value assumption in the analysis. Proper terminal value assumptions attempt to identify the future market value to stakeholders of the assets. In the case of AMI, this means the value to ratepayers, net of any SDG&E-funded costs at that point in time that have not yet been recovered in rates.

Financial analysts typically use one or both of the following valuation techniques to establish terminal value: comparable market value or estimated discounted future net revenues. With no market in existence, only the second approach makes sense for AMI. One way to go about that would be to assume AMI will exist in perpetuity until replaced by a system justified as being even better on the basis of incremental net present value, thereby estimating terminal value based on the average net revenue beyond the terminal year in perpetuity. However, perpetuity creates its own kinds of problems by assuming a homogeneous future in a changing world. Therefore, SDG&E attempted to simplify, tying its terminal value estimate to the remaining depreciable life in the meters in the terminal year. This very conservative approach inherently understates the terminal value by failing to capture benefits beyond the terminal associated with a fully functional system or "going concern". This has been demonstrated clearly in recent years by market prices for power plants exceeding net book values by multiples of 5 to 20.

Although there is no doubt that a fully deployed AMI system would have significant terminal value, estimating that value accurately is difficult. This is why SDG&E is only comfortable using its original simplified AMI terminal value assumption within the context of an analysis period long enough to make that the terminal value assumption's impact the outcome of the NPV analysis minimal. 34 years represents the useful life of SDG&E's longest lived AMI assets, gas meters. It also captures two full replacement cycles of electric meters with 15 year lives. This evaluation period is necessary in order to specifically model most of the long term benefits associated with a fully functional AMI system, rather than relying on some kind of an arbitrary terminal value assumption for that.

A 17 year investment horizon comes nowhere close to capturing all the remaining benefit in a fully functional system from a net present value perspective, and therefore places that much more emphasis on the accuracy of a potentially flawed terminal value assumption, in terms of providing meaningful support to the decision making process.

In summary, a 34 year investment horizon captures the net benefits of the AMI system as a going concern for a long enough period prior to the terminal year to capture most of the associated PVRR. At the same time this assumption minimizes the potential for the discounted value of an overly-simplified, very uncertain terminal year estimate to significantly skew the overall PVRR value used for decision making.

Attachment C

Excerpt from SDG&E's response to DRA Data Request No 018, Question 14:

Estimating a terminal value for AMI is fraught with uncertainty. It is hard to imagine selling part, but not all, of a fully integrated and functioning utility distribution system to a third party, which is the underlying presumption that would be needed to establish a market price, and ultimately a terminal value. In the case of AMI, a more realistic assumption is that this system will exist in perpetuity until replaced by a system justified as being even better on the basis of incremental net present value.

Since SDG&E is not aware of any market driven benchmarks that are available for estimating AMI terminal value, the company used a proxy value, whose accuracy is very uncertain, and an extended analytical timeframe to minimize the materiality of that uncertainty's impact on the discounted net present value. In contrast, to address the original question, forecasting the purchase price of replacement hardware is a normal and customary part of almost every financial analysis. That type of estimating is performed regularly throughout all industries and generally relied upon with satisfactory results. In SDG&E's opinion, estimating the future replacement cost of AMI meters introduces far less uncertainty in the NPV analysis than trying to accurately estimate the terminal value of the entire system, especially were that estimate to be made in the relative near term.

SDG&E's initial deployment spans three years. Subsequently, meters are added each year for growth and failure replacement. As a result, there is never a point in time where the entire system is "used up" or fully depreciated, which might be used to define an evaluation time period end point in a simpler project evaluation. The terminal value assumption for a PVRR analysis must reflect fully paying back the shareholders who initially funded the investment, to the extent that the initial costs have not yet been recovered in rates. It must also reflect the sharing of any additional gains with ratepayers, assuming that assets are sold for more than their net book value.

In SDG&E's analysis, the company assumed a liquidation event at the end of the analysis period that would generate a gain to ratepayers equal to the net book value of the assets in service. This is assumption has been used before in other similar analysis for

regulatory filings. Given the uncertainty of the terminal value estimate, the primary value of including it in the NPV analysis to begin with was simply to acknowledge the fact that there probably is some terminal value in every investment. A good way to minimize its impact on the overall conclusions of the NPV analysis was to push it far into the future. SDG&E's 34 year planning horizon happens to be the estimated replacement life of the longest lived AMI asset – gas meters. By extending the analysis and thus the discounting period that far, SDG&E significantly reduced the sensitivity of the NPV results to the extremely uncertain terminal value assumption.

In UCAN data request #5, questions 1 and 2, on this same subject, SDG&E was asked to rerun PVRR and societal NPV calculations under various shorter investment life assumptions than contained within the filing. The company has decided to respond to that data request incompletely, by ignoring terminal value, because we believe any near-term assumptions made about terminal value are so uncertain, and the impact on the NPV so great in proportion to all the other costs being analyzed, the decision making process will be better served by leaving it up to external evaluators to layer on their own assumptions about terminal value. For projects like AMI, SDG&E is only comfortable including a terminal value assumption in its analysis if the analysis period is long enough so that the NPV of the terminal value assumption does not materially impact the outcome of the analysis.

Attachment D

Excerpt from SDG&E's responses to DRA Data Request Nos 019 and 036, Question 1 (see also 043, which was the same question, but with additional response verbiage):

...SDG&E believes that for the requested analysis period (2007-2024), using the remaining book value alone as a proxy for terminal value significantly understates the PVRR of the case, due to the large number of growth and replacement meters that are installed after the (initial) deployment period (2011-2024).

Specifically, in 2024, the entire AMI meter population with remaining book life will be generating demand response and O&M benefits. Assuming a 17 year useful life for AMI electric meters (and gas modules), the AMI meter population will decline by approximately 17% in 2025, approximately 27% in 2026 and 2027, and by about 2% per year thereafter until 2040 when the remaining growth and failure replacement meters reach the end of their 17 year useful life. The significant (but declining) population is illustrated in the third attached Excel file ('Trailing Benefit Illustration') and the benefits associated with these meters is more closely reflected in the alternate approach offered (net O&M and trailing DR benefits)."

Attachment E

Excerpt from SDG&E's response to DRA Data Request No 043, Question 1:

The following table (using the same format as table EF 2-4 from the 3-28 and 7-14 application) summarizes the net present value of the SDG&E AMI business case, restated to reflect an analysis timeframe of 17 years as clarified in discussions between DRA (Mr. Ted Guilen) and SDG&E (Mr. Ed Fong). DRA clarified that it wanted SDG&E to use 2026 as the 'terminal year' in order to illustrate a 17 year useful life for the 'average' meter deployed during the mid-2008 through 2010 deployment period included in SDG&E's application. The terminal value column reflected in this table contains the NPV of the forecasted net book value of AMI assets as of December 31, 2026, and, as can be seen, the PVRR of the costs outweigh PVRR of the benefits using this approach by ~$5 million**. As discussed below, SDG&E believes this approach is severely flawed.** (emphasis added)**.**

Table EF 2-4 - Remaining Book Terminal Value

Present Value of Revenue Requirement
Loaded, Escalated, Present Value, Dollars in Millions

Revenue Requirement (ratepayer perspective)

Costs	**Total**	**2007-2010**	**2011-2026**
Capital	$ 443	$ 109	$ 333
O&M	$ 164	$ 50	$ 114
Total Costs	**$ 607**	**$ 160**	**$ 447**

Benefits	**Total**	**2007-2010**	**2011-2026**	**Terminal Value**
Capital	$ 51	$ 4	$ 42	$ 5
O&M	$ 211	$ 21	$ 190	
Avoided Capacity/Energy	$ 202	$ 22	$ 180	
Avoided /Reduced Theft	$ 49	$ 7	$ 42	
Transmission Deferral	$ 15	$ -	$ 13	$ 3
Avoided Programs	$ 73	$ 11	$ 62	
Total Benefits	**$ 602**	**$ 65**	**$ 530**	**$ 7**
NPV of Benefits	**$ (5)**	**$ (95)**	**$ 82**	**$ 7**

At a very minimum, SDG&E believes that the net O&M and Avoided Capacity/Energy benefits associated with the remaining useful life of meters installed up

to and including the 2026 terminal year must also be included in this analysis to more fairly characterize the PVRR resulting from this restated analysis. Using this approach, as shown in the table below, the PVRR of the benefits outweighs the PVRR of costs by ~$23 million. **SDG&E believes that even this PVRR result is still significantly understated, however, as further discussed below** (emphasis added)**.**

Table EF 2-4 - with O&M and DR Trailing Benefits

Present Value of Revenue Requirement
Loaded, Escalated, Present Value, Dollars in Millions

Revenue Requirement (ratepayer perspective)

Costs	**Total**	**2007-2010**	**2011-2026**
Capital	$ 443	$ 109	$ 333
O&M	$ 164	$ 50	$ 114
Total Costs	**$ 607**	**$ 160**	**$ 447**

Benefits	**Total**	**2007-2010**	**2011-2026**	**Terminal Value**
Capital	$ 51	$ 4	$ 42	$ 5
O&M	$ 227	$ 21	$ 190	$ 16
Avoided Capacity/Energy	$ 213	$ 22	$ 180	$ 11
Avoided /Reduced Theft	$ 49	$ 7	$ 42	
Transmission Deferral	$ 15	$ -	$ 13	$ 3
Avoided Programs	$ 73	$ 11	$ 62	
Total Benefits	**$ 629**	**$ 65**	**$ 530**	**$ 35**
NPV of Benefits	**$ 23**	**$ (95)**	**$ 82**	**$ 35**

SDG&E strongly encourages the DRA to evaluate the PVRR of SDG&E's AMI proposal using the methodology, timeframe, and results submitted in its March 28 application filing & July 14 amendment (utilizing a two lifecycle approach). SDG&E originally chose a 34 year investment evaluation horizon to provide a revenue requirement net present value that would most appropriately support the decision making process from a ratepayer standpoint by minimizing the impact on the PVRR of modeling uncertainty associated with staggered asset lives and terminal value. The 34 year evaluation horizon more effectively captures the long-term costs and benefits of SDG&E's AMI application.

SDG&E's initial deployment spans 2.5 years. Subsequently, meters are added each year for growth and failure replacement. As a result, there is never a point in time

where the entire system is "used up" or fully depreciated, which might be used to define an evaluation time period end point in a simpler project evaluation. The fact that there is always remaining value in the AMI assets in service at any point in time necessitates a terminal value assumption in the analysis. Proper terminal value assumptions attempt to identify the future market value to stakeholders of the assets. In the case of AMI, this means the value to ratepayers, net of any SDG&E-funded costs at that point in time that have not yet been recovered in rates.

Financial analysts typically use one or both of the following valuation techniques to establish terminal value: comparable market value, or estimated discounted future net revenues. With no market in existence for used AMI systems, only the second approach makes sense for AMI. One way to go about that would be to assume AMI will exist in perpetuity until replaced by a system justified as being even better on the basis of incremental net present value, thereby estimating terminal value based on the average net revenue beyond the terminal year in perpetuity. However, perpetuity creates its own kinds of problems by assuming a homogeneous future in a changing world. Therefore, SDG&E attempted to simplify, tying its terminal value estimate to the remaining depreciable life in the meters in the terminal year. This very conservative approach inherently understates the terminal value by failing to capture benefits beyond the terminal year associated with a fully functional system or "going concern". This has been demonstrated clearly in recent years by market prices for power plants exceeding net book values by multiples of 5 to 20.

Although a fully deployed AMI system would have significant terminal value, estimating that value accurately is difficult. This is why SDG&E is only comfortable using its original simplified AMI terminal value assumption within the context of an analysis period long enough to make that the terminal value assumption's impact the outcome of the NPV analysis minimal. 34 years represents the useful life of the longest lived assets included in the AMI case - gas meters. It also captures two full life cycles of electric meters, gas modules and AMI communication components which have a 17 year useful life as modeled. This evaluation period is necessary in order to specifically model most of the long term costs and benefits associated with a fully functional AMI system, rather than relying so heavily on an arguable near-term terminal value assumption.

The premise of this question (and other similar preceding questions - DRA data request (DR) 19 Q 1 supplemental and DRA DR 36 Q 1) is a 17 year analysis period. This analysis time horizon comes nowhere close to capturing all the remaining costs and benefits in a fully functional system from a net present value perspective, and therefore places that much more emphasis on the accuracy of a potentially flawed terminal value assumption, in terms of providing meaningful support to the decision making process. The additional pro-rated Terminal Value benefits inserted into the table above are designed to minimize the extent of this problem.

In summary, a 34 year investment horizon captures the net benefits of the AMI system as a going concern for a long enough period prior to the terminal year to capture most of the associated PVRR. At the same time this assumption minimizes the potential for the discounted value of an overly-simplified, very uncertain terminal year estimate to significantly skew the overall PVRR value used for decision making. As shown in SDG&E's 7-14-2006 application filing on page EF-23, table EF2-4, this analysis approach results in the PVRR of benefits outweighing the PVRR of costs by ~$60 million.