Application No.: 07-05-007
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Witness: Gary H. Hayes
Date: ~~May~~ August ~~8~~3, 2007

Application No. 07-05-007
Exhibit No. SDGE-2E

REPLACEMENT/ERRATA

SAN DIEGO GAS & ELECTRIC COMPANY

PREPARED DIRECT TESTIMONY OF

GARY H. HAYES

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 8, 2007

#201897

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PREPARED DIRECT TESTIMONY OF

GARY H. HAYES

ON BEHALF OF SDG&E

I. INTRODUCTION

The purpose of my testimony is to recommend a fair and reasonable return on equity (ROE) for San Diego Gas & Electric Company (SDG&E). This testimony presents several methods one can use to determine ROE, discusses their application to SDG&E, and summarizes my findings.

Based on my studies, I conclude that SDG&E should be allowed to earn an 11.60% ROE in Test Year 2008.

II. CONCEPTUAL SETTING

Determining the rate of return demanded by a company's equity investors is a task that varies in difficulty, depending on the company in question. At one extreme, the return demanded by investors in a small, privately-held firm doing business in a new industry is not readily observed: there is paucity of data, both about the firm as well as about its environment. The analysis in this example relies heavily on judgment and intuition.

At the other extreme, the return expected by investors in a mature, publicly-traded American company can be deduced from observing the firm's stock price. Here, the analysis is scientifically rigorous and can be buttressed with reams of additional data that the firm must, by law, make available to the general public.

Somewhere between these two extremes lies SDG&E, which, as a wholly owned subsidiary of a publicly-traded company, must provide extensive data to the public, but has no stock price of its own. In a case like this, the analyst must deduce investors' expectations indirectly, much like an appraiser values someone's home. Here, both rigorous analysis and judgment have a place in the investigation.

My testimony thus relies on both analysis and judgment. Like the home appraiser, I look to the market's valuation of comparable assets – here, the stock prices of companies in the electric industry – to discern a reasonable ROE. The market data I obtain are hard evidence, but my selection of assets is based on reasonable judgment. Similarly, I process the data with precise economic models, but my application of these models depends heavily on subjective reasoning.

This written testimony will set forth the analytical components of my investigation and explain, wherever necessary, my application of informed judgment. Acknowledging the California Public Utilities Commission's (CPUC or the Commission) desire for straightforward ROE calculation and interpretation,[1] I have consciously attempted to keep the models – and my accompanying discussion below – as clear-cut as possible.

III. MODELING

I utilized four different approaches to determining an ROE for SDG&E. Three of them – the discounted cash flow model (DCF), the risk premium model (RP), and the capital-asset pricing model (CAPM) – have been part of CPUC cost-of-capital proceedings for years. A fourth, the Fama-French three-factor model (FF), made its first appearance in a California electric-utility proceeding in 2005 and was a topic of

[1] *See* Bohn, John A., Commissioner, memo dated February 9, 2007.

discussion in the Commission's January 2007 cost-of-capital workshop. All four of these models are used in cost-of-capital proceedings in other U.S. jurisdictions. Three of these models utilize market data from a set of proxy companies to arrive at an estimate. It is important to note that no single model is an infallible gauge of return – rather, each one is a piece of evidence about the true, underlying return and each one provides a sanity check on the other models' results. Such a multi-method approach mirrors the behavior of capital-market participants, who will gather and process as much data as practicable when assessing a potential investment.

A. The proxy group

The DCF, CAPM, and FF models depend, to one degree or another, upon data compiled from a proxy group: a set of publicly-traded companies that, in aggregate, reflect SDG&E's business and risk profiles. This is necessary because, as mentioned above, SDG&E has no publicly-traded common stock.

In developing my proxy group, I started with the three Value Line Electric Utility Industry groups (west, central, and east). I chose the Value Line groups because of the wealth of information Value Line offers on each company it covers and Value Line's ready availability to all parties in these proceedings (most public libraries carry printed Value Line materials). The Value Line electric groups are a good aggregate representation of SDG&E, which is primarily an electric utility (in 2006, 85% of the Company's property, plant and equipment and 77% of its operating revenues were electric-service related).

I then reduced the initial proxy group (which numbered 61 members) by excluding certain companies based on criteria proposed in the Commission's January 2007 cost-of-capital workshop. First, I dropped Allegheny, Aquila, CMS, El Paso

Electric, and Sierra Pacific, because these companies either pay no dividends or have skipped a dividend in one or more of the four quarters preceding Q1 2007. The reasoning behind this screen is that a regulated utility that has recently skipped a dividend may be suffering financial difficulties not typical of the industry in general. Moreover, a company that pays no dividends at all cannot be evaluated with the DCF model (discussed further below).

Second, I screened out a number of companies involved in some sort of restructuring activity. These included Duquense Light, Green Mountain Power, TXU, WPS Resources, and MDU Resources, all of which are merging with, acquiring, or being acquired by other parties. Other screened companies included Duke Energy, which recently restructured by spinning off its gas operations, and Portland General, which only a year ago began trading publicly. One reason for this type of screen is that the stock price of companies engaged in merger or acquisition activity can reflect deal-related premia not otherwise present in the price of an ongoing entity. Another reason is that companies which have drastically restructured or have just begun to trade in public markets do not possess sufficient history for regression-based models like CAPM or FF.

Finally, I excluded another six proxies – Central Vermont PS, CH Energy Group, Empire District Electric, MGE Energy, Puget Energy, and UIL Holdings – because Zacks Investment Research provides no long-term growth forecasts for these companies. This forecast is a crucial input in the DCF model described below.

The screening process left an electric-company proxy group of 43 members, listed in Attachment 1, which I employed in applying the DCF, CAPM and FF models. A proxy group this large produces reasonable results, as its size prevents a single member's outlying result from adversely affecting the overall outcome.

B. The DCF model

My first estimate of SDG&E's required return is based on a method originally documented in 1938.[2] Here, an equity's market price is equal to the discounted value of all its future dividends. With a few simplifications, this relationship can be expressed:

$$P_0 = D_1/(k - g),$$

where P_0 is the stock's current price, D_1 is the dividend to be received at the end of the year, k represents the investor's desired rate of return, and g is the forecasted dividend growth rate.

In CPUC cost of capital proceedings, this formula is rearranged into the following equivalent expression:

$$k = [D_0(1+g)]/P_0 + g,$$

where D_0 is the prior year's dividend, k is the investor's required rate of return, or ROE in cost-of-capital parlance. There exist many variations on this equation that attempt to account for, among other things, changes in dividend growth rates, financing of the company, and flotation costs. I used this particular version of the model because of its simplicity, minimal data requirements, and prior acceptance by the CPUC.

In applying the DCF model, I gathered the following data for each of the companies in the proxy group:

[2] Williams, J.B., *The Theory of Investment Value*, (Cambridge: Harvard University Press, 1938).

1. Growth forecast. There exist few, if any, consensus estimates of long-term utility dividend growth rates. For this reason, practitioners utilize long-term earnings growth estimates when applying the DCF model. The thinking here is that although dividends and earnings may not grow at the same rate in any given year, it seems reasonable to expect that over the long term, a company's dividend payout will increase at approximately the same rate as its accounting earnings. Such an assumption allows one to efficiently apply the DCF model to large proxy groups. In my modeling, I used the five-year growth forecast provided by Zacks Investment Research, a service previously accepted in CPUC cost-of-capital proceedings and to which I have access through Bloomberg LLC's online service.

2. Current dividend (D_0). Here, I used each proxy company's full-year 2006 dividend, as reported by Value Line.

3. Current price (P_0). To avoid using a starting price that might embody a temporary market anomaly, I calculated P_0 as the average closing price on each proxy's common stock between January 3, 2007 and March 30, 2007. By doing so, I smooth out any anomalous fluctuations in the stock price, and align the P_0 value with the earnings-growth forecasts, most of which had been updated as of March 30, 2007.

My detailed DCF calculations are tabulated in Attachment 2. To attain SDG&E's expected return, I calculated a market-capitalization weighted average of the group's results. This is necessary because the DCF method, like the CAPM and FF methods below, is based on the market value of equity. Doing so produced an ROE of 11.11%.

C. The RP model

Another approach to estimating a utility's ROE is to study the historical spread between the return on utility common stock and the return on bonds. This spread – the "risk premium" after which the model is named – is then added to a projected bond yield to determine the Test Year ROE. The essence of this approach is that the historical relationship is the best available predictor of what the future holds.

The RP model has been presented in CPUC cost-of-capital proceedings for at least fifteen years. I have chosen to present it again in this year's application because of its intuitive foundations, ease of calculation, and because it provides another datapoint and cross check in appraising SDG&E's required return.

There are no traditional textbook models in this category, and from my observations there seem to be almost as many RP variations as there are practitioners. For this analysis, I chose to study the difference in return between the Standard & Poor's (S&P) Utility Index and bond returns for reasons explained below. This actually results in two comparisons: utility stocks vs. utility bonds and utility stocks vs. Treasury bonds. As Professor Roger Morin explains:

> Because a utility's cost of capital is determined by its business and financial risks, it is reasonable to surmise that its cost of equity will track its cost of debt more closely than it will track the government bond yield…the risk premium analysis should be performed using both the government bond yield and the utility bond yield, and both sets of results weighted in arriving at a final estimate of the utility's cost of equity.[3]

My two RP models therefore utilized the following elements:

1. S&P Utility Index return. This index is based on a proprietary portfolio of around 30 utility stocks maintained by S&P. While this third-party index is not identical to the proxy group used in my other models, it does provide decades of history that would otherwise be difficult and time-consuming to compile.

[3] Morin, Roger A., *New Regulatory Finance*, (Vienna, VA: Public Utilities Reports Inc., 2006), p. 113.

The dataset I used here is something of a hybrid. S&P discontinued its original utility index at the end of 2001, replacing it with the S&P 500 Utilities Index, for which data is available beginning in 1989. To obtain a long enough time series (the importance of which is discussed below), I appended the 2002 - 2005 S&P 500 Utilities Index returns to the legacy Utilities Index returns through 2001. To do so, I made the assumption that two sizeable utility portfolios should exhibit approximately the same return behavior over time.

2. Mergent Aa Utility Bond return. Mergent, once the publishing arm of Moody's Investor Service, calculates the yield on a proprietary portfolio of Aa-rated utility bonds with an average maturity of 30 years. I chose historical Aa bond returns for the first stocks-to-bonds comparison because there exists a readily available forecast of the Aa utility bond yield (see below). To derive annual returns from the yield data, I utilized an approach suggested by Professor Morin.[4]

3. Long-term government bond return. In conducting the second stocks-to-bonds comparison, I obtained historical long-term government bond returns from Morningstar's (previously Ibbotson's) *Stocks, Bonds, Bills, and Inflation 2007 Yearbook*. This widely used publication, discussed further below, compiles return histories for numerous types of securities, including the twenty-year Treasury bond.

4. Time horizon. In determining a timeframe for this analysis, I considered two important factors. First, a risk premium should be based on enough history to capture conditions that could plausibly be repeated in the future (e.g., wars, economic booms, inflation). Second, in the case of a regulated utility, a risk premium should reflect returns earned in a particular regulatory setting. To fulfill these two

[4] *Op. cit*., p. 118.

criteria, I examined stock and bond returns realized between 1937 and 2006. This seventy-year series captures a variety of political and economic conditions, and is most relevant to utility returns as it starts in the year the Public Utility Holding Company Act of 1935 became effective.

5. Bond yield forecasts. For the two RP models (as well as the CAPM and FF models that follow below) I obtained my 2008 interest rate forecasts from the April 2007 version of Global Insight's *U.S. Economic Outlook*. Global Insight, formed several years ago by the merger of DRI (Data Resources, Inc.) and WEFA (Wharton Econometric Forecasting Associates), is well known by the CPUC, which over the years has used all three firms' data in many types of proceedings, among them cost of capital. Specifically, for the first RP model, I used Global Insight's Aa utility bond yield forecast; for the second RP model, I projected the 20-year Treasury yield by averaging Global Insight's 10-year and 30-year Treasury yield forecasts.

The average risk premium derived from taking the difference between utility stock returns and utility bond returns came to 4.63%. I added this figure to Global Insight's 2008 Aa bond yield forecast of 6.23% to arrive at an ROE of 10.86%. (See Attachment 3.)

The difference between utility stock returns and government bond returns over seventy years averaged 5.23%, which, when I added it to the average of Global Insight's 2008 10- and 30-year Treasury yield forecasts (5.13%), produced an ROE of 10.36%. (See Attachment 4.)

D. The CAPM method

Another approach to estimating ROE is based on William Sharpe's investigations during the mid-1960s into the relationship between risk and return. His findings resulted in a now-popular model, the CAPM, which proposes that the required return on a given security is equal to the risk-free rate of interest plus a premium that reflects the company's risk relative to that of the whole market. Algebraically, this is expressed:

$$r^* = r_f + \beta(r_m - r_f)$$

where:

r^* is the return demanded by investors (and called ROE in ratemaking),

r_f is the rate of return on a Treasury security,

$r_m - r_f$ is the market risk premium, and

β (beta) is a company-specific multiplier of general market risk.

There are several good reasons for the CPUC to consider this approach when assessing SDG&E's 2008 ROE. First, the method is relevant in the real world: practitioners utilize CAPM to measure mutual fund performance, establish company values in fairness opinions, and – in just about every jurisdiction but the Federal Energy Regulatory Commission – set utility rates. Second, the model is based on market returns – which embody the prices investors are actually willing to pay for assets – as opposed to some form of bookkeeping data. Finally, because the model has been widely used for such a long time, practitioners today have ready access to the data needed for CAPM calculations.

As one of those practitioners, I used certain well-known datasets when conducting my CAPM calculations:

1. Beta (β). An analyst can either calculate this variable or obtain it from any number of sources.[5] I have chosen to use the betas published by Value Line because (1) they are a third-party calculation, (2) Value Line calculates them for each member of my proxy group, and (3) they are adjusted to acknowledge a documented tendency of beta to revert to one.

2. Market risk premium ($r_m - r_f$). The crux of the CAPM is the average difference between the return on the entire market and the return on risk-free Treasury bonds. This figure, like the premia determined in my RP models above, must be based on enough history to capture states of the world that might be witnessed again someday, for without this quality, the premium fails as a reasonable estimator of future returns.

I turned to a widely used and well-regarded resource for this figure: Morningstar's *Stocks, Bonds, Bills, and Inflation Yearbook*, which provides a market risk premium based on 80 years of history (1926 – 2006), a period sufficient to produce reasonable CAPM modeling results. Specifically, the yearbook calculates the "long-horizon expected equity risk premium" by subtracting annual 20-year Treasury bond income returns from annual large-company stock returns, as represented by the S&P 500 Index. Through 2006, this difference averaged 7.1%.

3. Risk-free rate (r_f). The tenor of the CAPM's risk-free rate should match the life of the asset in question. In the case of an ongoing concern like SDG&E, the analyst will assume an extremely long (if not infinite) asset life – which for purposes of the CAPM, calls for the longest risk-free rate available. Here, I used an average of Global Insight's forecasted 10-year and 30-year Treasury bond yields to properly match

[5] Harrington, James (Senior Editor), *Stocks, Bonds, Bills, and Inflation 2007 Valuation Edition Yearbook*, (Chicago: Morningstar, Inc., 2007), p.127.

the risk-free rate with the market risk premium, which is based on the 20-year Treasury bond (see above).

Using the inputs described above, I ran the calculations for my 43-member proxy group; the CAPM produced a weighted-average result of 11.73%. Attachment 5 presents my calculations in detail.

E. The FF model

Another ROE approach has appeared before the CPUC recently. The result of research by the University of Chicago's Eugene Fama and Dartmouth's Kenneth French, this three-factor equation was presented in A.02-05-033, A.02-11-007, and A.05-05-011. Although the CPUC did not accept the FF evidence in these proceedings, Commissioner Bohn stated after the January 2007 cost-of-capital workshop:

> The commission should remain open to receiving evidence from new additional models should parties wish to provide such. We should always welcome new and better tools and ways of tackling problems.[6]

However, the Commissioner went on to exhort the participants:

> Next I strongly recommend that the applicants and intervenors provide justification for all of the modeling decisions underlying the results.[7]

Acknowledging these parameters, I will attempt in this section to (1) demonstrate that this new approach is indeed reasonable and useful, and (2) thoroughly explain my application of the FF model.

The natural question that comes to mind is, "what is the FF model?" In short, it is an enhancement of the CAPM. During the late 1980s, an abundance of new securities-

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[6] *Op. cit.*
[7] *Ibid*.

history data became available at the same time that desktop computing power was exponentially increasing. This happy coincidence allowed researchers to test hypotheses about the efficacy of factors other than, or in addition to, the CAPM's market risk premium in explaining returns.

In the 1990s, Professors Fama and French launched a series of inquiries into CAPM's ability to explain equity returns, concluding that a CAPM-like equation that included a size factor, SMB, and a distress factor, HML, would perform better than the original.

SMB, which stands for "small minus big," measures the additional return investors have earned by holding the stocks of smaller market-capitalization firms. The intuition behind this factor is that small firms, which are generally undiversified and have less cushion capital, will be more sensitive to risk factors than larger firms. This variable is calculated as the average return on the smallest 30% of publicly-traded stocks (those listed on the NYSE, AMEX and NASDAQ) minus the average return on the largest 30% of publicly-traded stocks.

HML, which stands for "high minus low," measures the additional return earned by investors on companies with high book-to-market ratios, i.e., those companies whose market capitalization does not exceed by much their accounting book value (known as "value stocks" in Wall Street parlance). Behind this factor is the idea that companies with a high book-to-market (B/M) ratio have fallen onto some sort of hard times and are closer to bankruptcy than their low book-to-market peers. This variable is calculated as the average return on publicly-traded stocks that have B/M ratios above the 50^{th} percentile minus the average return on those with B/M ratios below the 50^{th} percentile.

Putting it all together, the model looks like this[8]:

$$r_A = r_f + \beta_A(r_m - r_f) + s_A SMB + h_A HML$$

where:

r_A is the return demanded by investors on asset A (and called ROE in ratemaking),

r_f is the rate of return on a Treasury security,

β_A is a multiplier of general market risk specific to asset A,

$r_m - r_f$ is the market risk premium,

s_A is asset A's exposure to size risk,

SMB is the small-minus-big return described above,

h_A is asset A's exposure to financial distress, and

HML is the high-minus-low return described above.

To determine a particular company's expected return with this approach, one must first regress the company's excess return, typically on a monthly basis, against (1) the market risk premium, (2) the SMB return, and (3) the HML return over an appropriate number of months to generate company-specific β_A, s_A, and h_A coefficients. (This is the same process that produces the CAPM's β variable.) Once this is done, the analyst multiplies the coefficients by the long-term historical averages for $r_m - r_f$, *SMB*, and *HML*,

[8] Notation cf. Tuck School of Business at Dartmouth, Case 03-111, *Understanding Risk and Return, the CAPM, and the Fama-French Three-Factor Model*, p. 10.

respectively. Adding the risk-free rate to the sum of these products produces r_A, the company's ROE. (Again, this is the same process as the CAPM.)

In its evaluation of FF evidence during A.05-05-011, the Commission posed the quite reasonable question, "why should the CPUC consider this model?" I believe there are a number of reasons for the CPUC to include FF results in an ROE assessment.

First, the FF model is not a new, untested formula dropping in from academia. It has behind it a solid track record of research and has been the topic of extensive debate. Almost fifteen years ago, Fama and French published their first findings in this area[9] and followed up with further research and refinement in 1995 and 1996.[10,11] Their findings were apparently compelling, for they ignited a firestorm of debate and additional research.

Nowadays, the FF model is used routinely by financial economists as they research investments, returns, and relative performance, as it is a useful tool with which to interpret return data on a wide number of asset types.[12] Today's business students know about it, too: over time, the model has found its way into the pages of finance textbooks.

Use of the FF model is not limited to just the halls of the academy; it has expanded into the investing world as well. There are at least two investment firms that explicitly orient their investment strategy to Fama and French's three-factor research, and reports by the popular mutual-fund investor resource, Morningstar, feature a "style box" that plots a mutual fund's strategy along size and value axes.

9 Fama, E., and K. French, "The Cross-Section of Expected Stock Returns," *Journal of Finance*, 47:427-465 (June 1992).
10 Fama, E., and K. French, "Size and Book-to-Market Factors in Earnings and Returns," *Journal of Finance*, 50:131-155 (March 1995).
11 Fama, E., and K. French, "The CAPM is Wanted, Dead or Alive," *Journal of Finance*, 51:1947-1958 (December 1996).
12 See, e.g., Sanning, et al., "Alternative Investments: The Case of Wine," *Working Paper* (November 2006).

Other professional practitioners have begun to utilize the FF model. Valuation experts now add FF results to fairness opinions issued in mergers-and-acquisitions transactions. Noteworthy is the Delaware courts' acceptance – and in one case, utilization – of FF evidence in asset-valuation disputes.[13]

From the perspective of the everyday ROE analyst, the FF model is very accessible. Unlike another well-known multifactor approach, the Arbitrage Pricing Theory, the FF model's variables are not the subject of ongoing study – in their research, Fama and French clearly state which three factors one should use when studying returns. To further aid the analyst, Professor French maintains a free, continuously updated database of the three FF factors' monthly values. To use the FF three-factor model, the analyst needs only (1) the historical returns of the asset in question, (2) a spreadsheet program, and (3) a working knowledge of ~~ordinary least squares~~multiple regression (which most students of the social sciences encounter sometime during their coursework).

The record in A.05-05-011 showed that Fama-French had not been observed in other regulatory jurisdictions, but things are starting to change: aside from its three California appearances, the FF method has also made its debut in Massachusetts and Nevada.[14,15]

In D.05-12-043, the Commission asked whether FF is more accurate or useful than the old standards. Accuracy, when measured as an equation's ability to predict returns (called R^2 by statisticians) is improved by the FF factors; that is, the one-factor CAPM has an R^2 of about .85 (with 1.0 representing complete predictive power), while

[13] See 2003 Del. Ch. LEXIS 136.
[14] Moul, Paul R., "Direct Testimony of Paul R. Moul, Managing Consultant, P. Moul & Asssociates, Concerning Cost of Equity," Commonwealth of Massachusetts Department of Telecommunications and Energy, October 17, 2005.
[15] See 2006 Nev. PUC LEXIS 91, April 27, 2006.

the three-factor FF model has an R^2 of 0.95.[16] Therein lies the model's usefulness: as a cross check on its sibling, the CAPM. Further enhancing this model's accuracy is its temporal stability: in the CPUC's January cost-of-capital workshop, Dr. Paul Hunt of Southern California Edison presented evidence that the FF model retains its high explanatory power over time.

To wrap up my testimony on why the CPUC should accept FF modeling evidence, I propose two thoughts. First, as I discuss above, determining a non-traded utility's ROE is an appraisal process – one that is more meaningful with more datapoints than fewer. Says Professor Morin:

> No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment.[17]

Second, there was a time – prior to 1964, and probably a few years thereafter – when the CPUC did not consider CAPM evidence in ROE proceedings. I was not there to witness it myself, but one day this changed – and now, as stated in D.05-12-043, CAPM is a model with which the CPUC is comfortable.[18]

I believe the foregoing discussion satisfies Commissioner Bohn's directive to justify the use of a new approach. Turning to my application of the FF method, I started by gathering the following data:

1. SML, HML, and $r_m - r_f$. These three factors are available from Kenneth French's website[19] – probably one of the most "directly from the oracle" resources of the entire ROE exercise. I utilized the annualized monthly average return on

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[16] Tuck School of Business at Dartmouth, Case 03-111, *Understanding Risk and Return, the CAPM, and the Fama-French Three-Factor Model*, pp. 8 - 9.
[17] *Op. cit*., p. 428.
[18] D.05-12-043, p. 31.
[19] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

each variable from July 1926 through December 2006, in keeping with the notion of using the longest time period available.

2. Risk-free rate (r_f). Fama and French utilize a risk-free rate in their studies equal to the yield on the one-month Treasury bill. Global Insight does not provide a forecast of the one-month Treasury bill, so I applied their forecast of the shortest available Treasury security, the three-month bill. My years of experience in the capital markets inform me that this particular substitution is reasonable.

3. Company returns. For each of the 43 companies in my proxy group, I calculated monthly total returns (price appreciation plus dividends) for the five-year period January 2002 through ~~January~~ December 2006. I chose to conduct my calculations over this horizon for two reasons: first, the period immediately prior to 2002 was punctuated by the California Energy Crisis, Enron's spectacular failure, and other stresses in the energy industry. Second, as the *Stocks, Bonds, Bills and Inflation 2007 Yearbook* observes:

> The amount of history included in commercial calculations done by commercial beta services is fairly consistent at five years. Using five years of data is a rather arbitrary decision that attempts to use as much data as possible without including irrelevant historical data.[20]

Thus, by using five years of data, I conformed my analysis to industry standards.

My FF modeling details are tabulated in Attachment 6. I first regressed each company's monthly excess returns against the monthly market risk premium, monthly SML returns, and monthly HML returns, thereby generating each proxy's β_A, s_A, and h_A coefficients. From there, I multiplied each of these coefficients by the historical $r_m - r_f$, *SML,* and *HML* premia, and added these products together along with the risk-free rate to

[20] *Op. cit.*, p. 106.

arrive at each company's ROE. The weighted average of these results produces an ROE for SDG&E of 13.89%.

IV. SUMMARY

Table 1, below, lists my modeling results. Following CPUC precedent, I took the simple average of these figures, 11.59%, and then rounded it to 11.60% to simplify subsequent rate-of-return and revenue-requirement calculations.

Table 1
Modeling Results

Method	ROE (%)
DCF	11.11
RP model 1	10.86
RP model 2	10.36
CAPM	11.73
Fama-French	13.89
Arithmetic average	11.59
Rounded value	11.60

In conclusion, the evidence produced by my various analyses indicates that 11.60% is a fair and reasonable Test Year 2008 ROE for SDG&E.

This concludes my prepared direct testimony.

V. STATEMENT OF QUALIFICATIONS

I, Gary Hugh Hayes, am employed by Sempra Energy as a Finance Manager. My principal responsibilities include the analysis of financing and capital-structure issues as well as the execution of financial transactions. I possess a Bachelor of Science degree in business and accountancy from Wake Forest University and a Master of Business Administration degree from Dartmouth College. I have held a variety of financial positions in the defense, automotive, oil, and banking industries. I joined SDG&E's Financial Services Department in 1995; since the formation of Sempra Energy, I have served primarily in the Treasury Department. I have testified before the CPUC in several proceedings, including MICAM, securities-issuance authority, and cost of capital.

Attachment 1

San Diego Gas & Electric Company
ROE Proxy Group

Company	**Ticker**
AEP	AEP
Allete	ALE
Alliant Energy	LNT
Ameren	AEE
Avista Corporation	AVA
Black Hills Corporation	BKH
Centerpoint Energy	CNP
CLECO Corporation	CNL
Consolidated Edison	ED
Constellation Energy Group	CEG
Dominion Resources	D
DPL	DPL
DTE Energy	DTE
Edison International	EIX
Energy East Corp	EAS
Entergy Corporation	ETR
Exelon Corp	EXC
FirstEnergy	FE
FPL Group	FPL
Great Plains Energy	GXP
Hawaiian Electric	HE
Idacorp	IDA
NiSource	NI
Northeast Utilities	NU
NSTAR	NST
OGE Energy	OGE
Otter Tail Corporation	OTTR
Pepco Holdings	POM
PG&E Corporation	PCG
Pinnacle West	PNW
PNM Resources	PNM
PPL Corporation	PPL
Progress Energy	PGN
PSEG	PEG
Scana Corporation	SCG
Sempra Energy	SRE
Southern Corporation	SO
TECO Energy	TE
Unisource Energy	UNS
Vectren Corporation	VVC
Westar Energy	WR
Wisconsin Energy	WEC
Xcel Energy	XEL

Attachment 2

San Diego Gas & Electric Company
Discounted Cash Flow (DCF) Model

	(1)	(2)	(3)	(4)	(5)=(2)*[1+(4)]	(6)=(5)/(3)+(4)
	MV_E	D_0	P_0	g	D_1	k
AEP	19.00	1.50	44.95	4.17%	1.56	7.65%
Allete	1.40	1.45	47.42	5.00%	1.52	8.21%
Alliant Energy	5.30	1.15	40.55	4.00%	1.20	6.95%
Ameren	10.40	2.54	52.31	7.00%	2.72	12.20%
Avista Corporation	1.20	0.57	24.46	5.50%	0.60	7.96%
Black Hills Corporation	1.20	1.32	37.26	6.00%	1.40	9.76%
Centerpoint Energy	5.70	0.60	17.58	16.00%	0.70	19.96%
CLECO Corporation	1.50	0.90	25.66	12.00%	1.01	15.93%
Consolidated Edison	12.60	2.30	48.70	3.50%	2.38	8.39%
Constellation Energy Group	14.00	1.47	76.73	12.33%	1.65	14.48%
Dominion Resources	30.00	2.76	84.86	8.67%	3.00	12.20%
DPL	3.40	1.00	29.60	6.33%	1.06	9.92%
DTE Energy	8.40	2.06	47.04	5.67%	2.18	10.30%
Edison International	14.80	1.08	46.52	8.25%	1.17	10.76%
Energy East Corp	3.70	1.17	24.50	3.50%	1.21	8.44%
Entergy Corporation	21.10	2.16	97.16	10.80%	2.39	13.26%
Exelon Corp	43.00	1.60	63.62	10.50%	1.77	13.28%
FirstEnergy	20.00	1.80	61.89	6.00%	1.91	9.08%
FPL Group	24.20	1.50	57.95	9.36%	1.64	12.19%
Great Plains Energy	2.60	1.66	31.57	4.33%	1.73	9.82%
Hawaiian Electric	2.20	1.24	26.52	5.17%	1.30	10.09%
Idacorp	1.60	1.20	35.76	5.00%	1.26	8.52%
NiSource	6.60	0.92	23.95	3.50%	0.95	7.48%
Northeast Utilities	4.50	0.73	29.14	13.00%	0.82	15.83%
NSTAR	3.70	1.21	33.20	6.00%	1.28	9.86%
OGE Energy	3.50	1.33	38.88	5.00%	1.40	8.59%
Otter Tail Corporation	1.00	1.15	32.72	4.50%	1.20	8.17%
Pepco Holdings	5.10	1.04	26.50	4.00%	1.08	8.08%
PG&E Corporation	17.20	1.32	47.01	7.80%	1.42	10.83%
Pinnacle West	4.90	2.03	48.69	6.67%	2.17	11.12%
PNM Resources	2.10	0.86	30.76	7.25%	0.92	10.25%
PPL Corporation	14.00	1.08	37.07	10.33%	1.19	13.54%
Progress Energy	12.70	2.42	48.91	4.25%	2.52	9.41%
PSEG	18.80	2.28	72.38	10.75%	2.53	14.24%
Scana Corporation	4.90	1.65	45.57	4.67%	1.73	8.46%
Sempra Energy	15.00	1.19	59.05	7.00%	1.27	9.16%
Southern Corporation	27.00	1.54	36.29	4.50%	1.61	8.93%
TECO Energy	3.50	0.76	16.91	6.00%	0.81	10.76%
Unisource Energy	1.30	0.84	37.50	10.00%	0.92	12.46%
Vectren Corporation	2.20	1.23	28.12	4.50%	1.29	9.07%
Westar Energy	2.40	0.98	26.75	4.00%	1.02	7.81%
Wisconsin Energy	5.70	0.92	47.69	8.40%	1.00	10.49%
Xcel Energy	9.50	0.89	23.67	5.00%	0.93	8.95%
Cap-weighted proxy group average						11.11%

Notes

MV_E: Market capitalization, in billions of dollars. (Value Line Investment Survey, Feb. 9, 2007 - Mar 30, 2007.)

D_0: Full-year 2006 dividend. (Value Line Investment Survey, Feb. 9, 2007 - Mar 30, 2007.)

P_0: Average daily closing price, 1/3/2007 - 3/30/2007. (Bloomberg LLC)

g: Mean 5-year growth estimate (Zacks).

Market cap: As reported by Value Line Investment Survey, Feb. 9, 2007 - Mar 30, 2007

Attachment 3

San Diego Gas & Electric Company
Risk Premium (RP) Model 1

Year	S&P Utility Index return	Moody's Aa utility bond return	Risk premium
1937	-36.93%	3.19%	-40.12%
1938	19.54%	9.20%	10.34%
1939	11.26%	5.43%	5.83%
1940	-16.52%	4.43%	-20.95%
1941	-28.38%	3.46%	-31.84%
1942	17.36%	4.77%	12.59%
1943	37.45%	4.16%	33.29%
1944	20.65%	3.56%	17.09%
1945	57.89%	6.06%	51.83%
1946	-7.00%	2.52%	-9.52%
1947	-10.41%	-3.08%	-7.33%
1948	5.41%	5.57%	-0.16%
1949	27.83%	6.68%	21.15%
1950	4.60%	1.81%	2.79%
1951	17.10%	-3.15%	20.25%
1952	15.36%	2.47%	12.89%
1953	9.62%	2.86%	6.76%
1954	22.37%	5.85%	16.52%
1955	10.16%	0.45%	9.71%
1956	7.16%	-8.31%	15.47%
1957	7.90%	6.40%	1.50%
1958	36.88%	-5.10%	41.98%
1959	5.00%	-3.66%	8.66%
1960	22.52%	9.29%	13.23%
1961	22.47%	4.01%	18.46%
1962	4.25%	8.12%	-3.87%
1963	9.47%	1.86%	7.61%
1964	16.11%	3.96%	12.15%
1965	1.34%	-1.16%	2.50%
1966	-1.72%	-2.42%	0.70%
1967	0.22%	-10.36%	10.58%
1968	5.28%	-2.14%	7.42%
1969	-14.38%	-11.58%	-2.80%
1970	19.45%	11.73%	7.72%
1971	-0.07%	11.54%	-11.61%
1972	5.12%	11.64%	-6.52%

Year	S&P Utility Index return	Moody's Aa utility bond return	Risk premium
1973	-13.45%	-2.29%	-11.16%
1974	-14.29%	-6.98%	-7.31%
1975	32.24%	9.35%	22.89%
1976	22.70%	20.93%	1.77%
1977	4.16%	3.49%	0.67%
1978	3.96%	-2.29%	6.25%
1979	8.79%	-11.51%	20.30%
1980	13.01%	-5.10%	18.11%
1981	9.40%	-2.85%	12.25%
1982	30.20%	48.80%	-18.60%
1983	20.16%	9.64%	10.52%
1984	19.95%	15.29%	4.66%
1985	30.00%	35.87%	-5.87%
1986	37.87%	32.42%	5.45%
1987	-5.74%	-11.36%	5.62%
1988	14.80%	16.68%	-1.88%
1989	34.68%	14.84%	19.84%
1990	0.33%	8.60%	-8.27%
1991	14.25%	17.95%	-3.70%
1992	12.46%	14.11%	-1.65%
1993	10.95%	20.82%	-9.87%
1994	-3.83%	-10.77%	6.94%
1995	37.49%	31.51%	5.98%
1996	3.83%	-2.09%	5.92%
1997	18.58%	17.47%	1.11%
1998	15.47%	8.01%	7.46%
1999	-1.72%	-10.20%	8.48%
2000	32.78%	13.23%	19.55%
2001	-17.90%	13.18%	-31.08%
2002	-29.54%	12.41%	-41.95%
2003	25.51%	18.63%	6.87%
2004	23.65%	11.47%	12.18%
2005	16.65%	8.07%	8.58%
2006	20.53%	0.91%	19.62%
Average risk premium, 1937 - 2006			4.63%
2008 Aa utility bond yield forecast			6.23%
2008 ROE			10.86%

Notes
Original S&P Utilities Index discontinued year-end 2001. Returns from 2002 based on S&P 500 Utilities Index (S5UTIL) on Bloomberg LLC.

Bond returns derived from Mergent Bond Record yield data following Morin (2006).

2008 bond yield forecast from Global Insight US Economic Outlook, April 2007.

Attachment 4

San Diego Gas & Electric Company
Risk Premium (RP) Model 2

Year	S&P utilities index return	Long-term Treasury income	Risk premium
1937	-36.93%	2.66%	-39.59%
1938	19.54%	2.64%	16.90%
1939	11.26%	2.40%	8.86%
1940	-16.52%	2.23%	-18.75%
1941	-28.38%	1.94%	-30.32%
1942	17.36%	2.46%	14.90%
1943	37.45%	2.44%	35.01%
1944	20.65%	2.46%	18.19%
1945	57.89%	2.34%	55.55%
1946	-7.00%	2.04%	-9.04%
1947	-10.41%	2.13%	-12.54%
1948	5.41%	2.40%	3.01%
1949	27.83%	2.25%	25.58%
1950	4.60%	2.12%	2.48%
1951	17.10%	2.38%	14.72%
1952	15.36%	2.66%	12.70%
1953	9.62%	2.84%	6.78%
1954	22.37%	2.79%	19.58%
1955	10.16%	2.75%	7.41%
1956	7.16%	2.99%	4.17%
1957	7.90%	3.44%	4.46%
1958	36.88%	3.27%	33.61%
1959	5.00%	4.01%	0.99%
1960	22.52%	4.26%	18.26%
1961	22.47%	3.83%	18.64%
1962	4.25%	4.00%	0.25%
1963	9.47%	3.89%	5.58%
1964	16.11%	4.15%	11.96%
1965	1.34%	4.19%	-2.85%
1966	-1.72%	4.49%	-6.21%
1967	0.22%	4.59%	-4.37%
1968	5.28%	5.50%	-0.22%
1969	-14.38%	5.95%	-20.33%
1970	19.45%	6.74%	12.71%
1971	-0.07%	6.32%	-6.39%
1972	5.12%	5.87%	-0.75%

Year	S&P utilities index return	Long-term Treasury income	Risk premium
1973	-13.45%	6.51%	-19.96%
1974	-14.29%	7.27%	-21.56%
1975	32.24%	7.99%	24.25%
1976	22.70%	7.89%	14.81%
1977	4.16%	7.14%	-2.98%
1978	3.96%	7.90%	-3.94%
1979	8.79%	8.86%	-0.07%
1980	13.01%	9.97%	3.04%
1981	9.40%	11.55%	-2.15%
1982	30.20%	13.50%	16.70%
1983	20.16%	10.38%	9.78%
1984	19.95%	11.74%	8.21%
1985	30.00%	11.25%	18.75%
1986	37.87%	8.98%	28.89%
1987	-5.74%	7.92%	-13.66%
1988	14.80%	8.97%	5.83%
1989	34.68%	8.81%	25.87%
1990	0.33%	8.19%	-7.86%
1991	14.25%	8.22%	6.03%
1992	12.46%	7.26%	5.20%
1993	10.95%	7.17%	3.78%
1994	-3.83%	6.59%	-10.42%
1995	37.49%	7.60%	29.89%
1996	3.83%	6.18%	-2.35%
1997	18.58%	6.64%	11.94%
1998	15.47%	5.83%	9.64%
1999	-1.72%	5.57%	-7.29%
2000	32.78%	6.50%	26.28%
2001	-17.90%	5.53%	-23.43%
2002	-29.54%	5.59%	-35.13%
2003	25.51%	4.80%	20.71%
2004	23.65%	5.02%	18.63%
2005	16.65%	4.69%	11.96%
2006	20.53%	4.68%	15.85%
Average risk premium, 1937 - 2006			5.23%
2008 T_{20} yield forecast			5.13%
2008 ROE			10.36%

Notes
Original S&P Utilities Index discontinued year-end 2001. Returns from 2002 based on S&P 500 Utilities Index (S5UTIL) on Bloomberg LLC.

Treasury return data obtained from Morningstar Stocks, Bonds, Bills and Inflation 2007 Yearbook.

2008 Treasury yield forecast from Global Insight US Economic Outlook, April 2007.

Attachment 5

San Diego Gas & Electric Company
Capital Asset Pricing Model (CAPM)

	(1)	(2)	(3)	(4)	(5)=(2)+(3)*(4)
	MV_E	r_f	β	r_m - r_f	ROE
AEP	19.00	5.13%	1.35	7.1%	14.72%
Allete	1.40	5.13%	0.90	7.1%	11.52%
Alliant Energy	5.30	5.13%	0.95	7.1%	11.88%
Ameren	10.40	5.13%	0.75	7.1%	10.46%
Avista Corporation	1.20	5.13%	0.95	7.1%	11.88%
Black Hills Corporation	1.20	5.13%	1.10	7.1%	12.94%
Centerpoint Energy	5.70	5.13%	0.65	7.1%	9.75%
CLECO Corporation	1.50	5.13%	1.30	7.1%	14.36%
Consolidated Edison	12.60	5.13%	0.75	7.1%	10.46%
Constellation Energy Group	14.00	5.13%	0.95	7.1%	11.88%
Dominion Resources	30.00	5.13%	1.05	7.1%	12.59%
DPL	3.40	5.13%	0.95	7.1%	11.88%
DTE Energy	8.40	5.13%	0.75	7.1%	10.46%
Edison International	14.80	5.13%	1.05	7.1%	12.59%
Energy East Corp	3.70	5.13%	0.95	7.1%	11.88%
Entergy Corporation	21.10	5.13%	0.85	7.1%	11.17%
Exelon Corp	43.00	5.13%	0.90	7.1%	11.52%
FirstEnergy	20.00	5.13%	0.85	7.1%	11.17%
FPL Group	24.20	5.13%	0.85	7.1%	11.17%
Great Plains Energy	2.60	5.13%	0.95	7.1%	11.88%
Hawaiian Electric	2.20	5.13%	0.75	7.1%	10.46%
Idacorp	1.60	5.13%	1.05	7.1%	12.59%
NiSource	6.60	5.13%	0.95	7.1%	11.88%
Northeast Utilities	4.50	5.13%	0.90	7.1%	11.52%
NSTAR	3.70	5.13%	0.80	7.1%	10.81%
OGE Energy	3.50	5.13%	0.80	7.1%	10.81%
Otter Tail Corporation	1.00	5.13%	0.65	7.1%	9.75%
Pepco Holdings	5.10	5.13%	0.90	7.1%	11.52%
PG&E Corporation	17.20	5.13%	1.15	7.1%	13.30%
Pinnacle West	4.90	5.13%	1.00	7.1%	12.23%
PNM Resources	2.10	5.13%	1.00	7.1%	12.23%
PPL Corporation	14.00	5.13%	0.95	7.1%	11.88%
Progress Energy	12.70	5.13%	0.90	7.1%	11.52%
PSEG	18.80	5.13%	1.00	7.1%	12.23%
Scana Corporation	4.90	5.13%	0.85	7.1%	11.17%
Sempra Energy	15.00	5.13%	1.10	7.1%	12.94%
Southern Corporation	27.00	5.13%	0.70	7.1%	10.10%
TECO Energy	3.50	5.13%	1.05	7.1%	12.59%
Unisource Energy	1.30	5.13%	0.75	7.1%	10.46%
Vectren Corporation	2.20	5.13%	0.95	7.1%	11.88%
Westar Energy	2.40	5.13%	0.90	7.1%	11.52%
Wisconsin Energy	5.70	5.13%	0.80	7.1%	10.81%
Xcel Energy	9.50	5.13%	0.90	7.1%	11.52%
Cap-weighted proxy group average					11.73%

Notes

MV_E: Market capitalization, in billions of dollars. (Value Line Investment Survey, 2/9/07-3/30/07.)

r_f: 2008 20-year Treasury yield. (Global Insight US Economic Outlook, April 2007.)

β: Beta, as published in the Value Line Investment Survey, Feb. 9, 2007 - Mar 30, 2007.

r_m - r_f: Market risk premium. (Morningstar Stocks, Bills and Inflation, 2007 Edition.)

Attachment 6

San Diego Gas & Electric Company
Fama-French (FF) Model

	MV_E	Coefficients β_A	s_A	h_A	ROE
AEP	19.00	1.2637	-0.2859	1.3385	20.62%
Allete	1.40	0.9843	0.3238	0.5144	16.08%
Alliant Energy	5.30	0.9492	0.3792	1.1528	19.15%
Ameren	10.40	0.4326	-0.1691	0.3808	9.70%
Avista Corporation	1.20	0.7599	0.6272	1.4864	20.05%
Black Hills Corporation	1.20	0.8271	0.5910	0.8076	17.08%
Centerpoint Energy	5.70	1.2812	1.6088	1.6928	27.96%
CLECO Corporation	1.50	1.5277	0.0681	1.4505	24.25%
Consolidated Edison	12.60	0.3118	-0.2689	0.5184	9.15%
Constellation Energy Group	14.00	0.3164	0.8864	0.7553	13.69%
Dominion Resources	30.00	0.8013	-0.3449	1.2698	16.50%
DPL	3.40	1.2929	0.5245	1.9467	26.20%
DTE Energy	8.40	0.6847	-0.4607	0.6347	12.09%
Edison International	14.80	0.9914	0.1461	1.0831	18.46%
Energy East Corp	3.70	0.6126	0.3364	0.5137	13.22%
Entergy Corporation	21.10	0.3666	-0.1022	0.5233	10.08%
Exelon Corp	43.00	0.4061	-0.0951	0.5792	10.69%
FirstEnergy	20.00	0.7102	-0.7697	0.7086	11.77%
FPL Group	24.20	0.6502	-0.2217	0.5622	12.15%
Great Plains Energy	2.60	0.9361	-0.5598	-0.1407	9.91%
Hawaiian Electric	2.20	0.4712	-0.0927	0.3815	10.22%
Idacorp	1.60	1.1110	-0.3370	0.4424	14.82%
NiSource	6.60	0.9423	-0.4356	0.7574	14.79%
Northeast Utilities	4.50	0.6164	0.1853	1.0816	15.64%
NSTAR	3.70	0.5871	-0.2828	0.3126	10.24%
OGE Energy	3.50	0.6774	0.1720	0.8927	15.14%
Otter Tail Corporation	1.00	0.4108	0.6920	0.2499	11.35%
Pepco Holdings	5.10	0.8514	-0.4346	0.9047	14.81%
PG&E Corporation	17.20	1.0883	0.4725	0.9104	19.30%
Pinnacle West	4.90	0.9741	-0.0150	0.5083	15.00%
PNM Resources	2.10	1.1537	-0.0066	0.4091	15.93%
PPL Corporation	14.00	0.6600	-0.2908	0.3612	11.03%
Progress Energy	12.70	0.7051	0.0668	0.5984	13.59%
PSEG	18.80	0.7624	0.1837	1.1053	16.89%
Scana Corporation	4.90	0.4693	0.0478	0.0283	8.85%
Sempra Energy	15.00	1.0276	-0.4817	0.4802	13.94%
Southern Corporation	27.00	0.0316	-0.1130	0.2378	6.02%
TECO Energy	3.50	0.8907	0.0319	0.9890	16.88%
Unisource Energy	1.30	0.6574	-0.1347	0.7448	13.37%
Vectren Corporation	2.20	0.6186	-0.3349	0.3243	10.39%
Westar Energy	2.40	1.1442	-0.0729	0.3379	15.31%
Wisconsin Energy	5.70	0.3284	0.0852	0.7740	11.57%
Xcel Energy	9.50	1.6902	0.1525	1.3976	25.50%
Cap-weighted proxy group average					13.89%

Notes

To determine proxy-company expected return (ROE), the following values were employed:

r_f = 4.91% = 2008 3-month T-bill yield. (Global Insight US Economic Outlook, April 2007.)

r_m = 7.80% = annualized arithmetic average of Fama-French market risk premium, 1926 - 2006.

SMB = 2.87% = annualized arithmetic average of Fama-French size premium, 1926 - 2006.

HML = 4.98% = annualized arithmetic average of Fama-French distress premium, 1926 - 2006.

MV_E = Market capitalization, in billions of dollars. (Value Line Investment Survey, 2/9/07-3/30/07.)

Coefficient definitions:

β_A: Market risk premium

s_A: Size facor

h_A: Distress factor