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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

The Application of Louisville Gas and Electric)
Company for Approval of its 2004 Compliance) CASE NO. 2004-00421
Plan for Recovery by Environmental Surcharge)

Testimony of Carl G. K. Weaver
Appearing on behalf of the Office of
The Attorney General for the Commonwealth of Kentucky
Office of Rate Intervention

March 2005

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3 Testimony of
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5
6 The Application of Louisville Gas and Electric Company
7 For Approval of its 2004 Compliance Plan for
8 Recovery by Environmental Surcharge

9
10 Case No. 2004-00421
11
12
13

14 **Q. Please state your name, address and occupation.**

15 A. My name is Carl Weaver. My address is 4713 Wengers Mill Road,
16 Linville, Virginia 22834. I am an emeritus professor of finance at James Madison
17 University.

18 **Q. What is the purpose of your testimony in this proceeding?**

19 A. My testimony has three purposes. First, I will present the results of a study
20 that I performed regarding the cost of equity for use in Louisville Gas and Electric
21 Company's (LG&E's) 2004 Compliance Plan for Recovery by Environmental
22 Surcharge. Second, I will explain why the lower end of the cost of capital range,
23 using that cost of equity, should be used for determining the Monthly
24 Environmental Surcharge Factor. Third, I will explain why the cost of pollution
25 control bonds should be used as the cost of long-term debt in the capital structure
26 that is used to determine the rate of return.

27 **Q. Have you provided a description of your qualifications to perform this**
28 **study?**

29 A. Yes, it is included as Appendix I of this testimony.

30 **Q. Have you prepared an exhibit to support your testimony?**

1 A. Yes, it was prepared by me, and it is included as part of this testimony.

2

3 **I. Economic Principles for Determining the Cost of Equity**

4 **Q. What economic principles are mandated for determining the cost of capital**
5 **for regulated utilities?**

6 A. The economic principles for determining the cost of capital for regulated
7 utilities have been set forth in the Bluefield Water Works & Improvement Co. v.
8 P.S.C. of West Virginia, 262 U.S. 679 (1923), and F.P.C. v. Hope Natural Gas
9 Co., 302 U.S. 591 (1944), Supreme Court decisions.

10 The Court, in the *Bluefield* case stated:

11 The return should be reasonably sufficient to assure confidence in the
12 financial soundness of the utility and should be adequate, under efficient
13 and economical management, to maintain and support its credit and enable
14 it to raise the money necessary for the proper discharge of its public
15 duties. A rate of return may be reasonable at one time and become too
16 high or too low by changes affecting opportunities for investment, the
17 money market and business conditions generally.

18

19 From a financial perspective, there are three distinct points in the above
20 quotation that apply to the rate of return. First, the target return on equity must be
21 adequate, under efficient operating conditions, to assure the financial integrity of
22 the business and enable the utility to attract capital. Second, it should be
23 competitive with other opportunities for investment, and third, the target equity
24 rate should be changed as the level of interest rates and equity cost rates in the
25 capital market change.

26 **Q. What additional criteria did the *Hope* case provide?**

1 A. Again, from a financial perspective, the *Hope* case more precisely defines
2 what is meant by “financial integrity” and “capital attraction.” In the *Hope* case
3 the Court stated:

4 ... It is important that there be enough revenue not only for operating
5 expenses, but also for the capital costs of the business. These include
6 service on the debt and dividends on the stock... By that standard, the
7 return to the equity owner should be commensurate with the return on
8 investments in other enterprises having corresponding risks. That return,
9 moreover, should be sufficient to assure confidence in the financial
10 integrity of the enterprise, so as to maintain its credit and to attract capital.

11
12 These principles have been confirmed in the Permian Basin Area Rate Cases, 390
13 U.S. 747 (1968) and the Federal Power Comm. V. Memphis Light Gas & Water
14 Division, 411 U.S. 458 (1973).

15 **Q. How do your findings assure compliance with your interpretation of those**
16 **economic principles?**

17 A. The evaluation models that I have selected for determining the cost of
18 equity capital rely on the opportunity cost principle. This reliance on the
19 opportunity cost principle assures compliance with the requirements of *Bluefield*
20 and *Hope*.

21 **Q. What is the opportunity cost principle?**

22 A. The opportunity cost principle is discussed in Appendix II to this
23 testimony.

24 **Q. What cost of equity evaluation models do you use in your analysis?**

25 A. I use two versions of the discounted cash flow (DCF) technique, the
26 constant-growth DCF model and the multi-stage DCF model; the Capital Asset
27 Pricing Model (CAPM); and the bond-yield-plus-risk premium approach (bond-

1 risk-premium or BYRP). These methods are also discussed in Appendix II of this
2 testimony.

3 **Q. What type of information do the costs of equity evaluation models require?**

4 A. The costs of equity evaluation models require data obtained from the stock
5 market, from stock market analysts, and from the underlying companies.

6 **Q. How did you get the stock market data for this study?**

7 A. I selected a group of electric companies that have common stock traded in
8 the capital market. I had to use a proxy group of companies to determine the cost
9 of equity for use in the environmental surcharge because LG&E does not have
10 outstanding common stock that is traded in the capital market.

11 **Q. Dr. Weaver, what steps did you take to determine the cost of equity in your
12 analysis?**

13 A. My analysis was done in four distinct steps. First, I examined economic
14 data to gain information about investor expectations regarding capital costs rates.

15 Second, I tested the group of nine companies that I selected for obtaining
16 data in Case No. 2003-00433 to determine if they still meet the selection criteria.
17 Three did not, and two additional companies did. I eliminated the three companies
18 and added the two companies to form a new group of eight companies that in my
19 opinion have, as close as possible, similar risks to LG&E.

20 Third, I examined data that provides information about the risk differences
21 between the group of selected companies and LG&E.

22 Last, I used evaluation models to estimate the cost of equity for the revised
23 group of eight companies and for the original group of nine companies used in
24 Case No. 2003-00433.

1 **Q. What is the range that contains the cost of equity for the electric utility**
2 **component of LG&E?**

3 A. The range that contains the cost of equity for the electric utility operations
4 is from 9.75% to 10.25%.

5 **Q. Do you have a Schedule in your Exhibit that summarized these results?**

6 A. Yes. Schedule 1 of my Exhibit shows those results. The top half of that
7 Schedule shows the cost of equity for the two groups of companies – the original
8 group of nine companies from Case No. 2003-00433 and the revised group of
9 eight companies.

10 The first column shows the recommendations that were made in Case No.
11 2003-00433. These findings had used data from the original nine companies that
12 were found suitable for use in that Case. The average of those results was 9.49%
13 prior to any adjustments being made.

14 The second column of that Schedule shows the results using the same nine
15 companies with updated or current data. The average of these results was 9.30%.
16 This is 19 basis points lower than the results found using data at the time of
17 testimony preparation for the previous Case.

18 The third column shows the results using current data for the revised
19 group of eight companies. These results average 9.21%. Its results are 28 basis
20 points lower on average than the results found in Case No. 2003-00433.

21 The lower half of Schedule 1 shows the two adjustments that I made in
22 Case No. 2003-00433. The first adjustment was to the two DCF results. This was
23 made because the forecasts for ten-year government bond interest rates indicated
24 that they were expected to be 95 basis points higher in the near term future. At the

1 time of that Case, constant maturity 10-year government bond rates were close to
2 4.05%. The CBO projection for 10-year Treasury Notes for 2004-2005 was
3 expected to average 5.00%.

4 Currently, these ten-year government bond interest rates are expected to
5 be 100 basis points higher. The February 15, 2005 constant maturity 10-year
6 government bond rate was 4.10% and the CBO 2005-2006 forecast averages
7 5.10%. The adjustment itself is 50 basis points because the adjustment is applied
8 to only the two DCF model's results. The other two methods already use the
9 forecasted rates in their implementation.

10 In Case No. 2003-00433, I made a second adjustment of 25 basis points
11 because of the ESM elimination. I made a similar adjustment to my results in this
12 proceeding. The Order from Case No. 2003-00433 in which the ESM was
13 eliminated was dated June 20, 2004. Confirmed knowledge of its elimination is
14 less than one year old. The data used for this study originated, for the most part, in
15 the second half of 2004 or in early 2005. The 25 basis point adjustment was made
16 in this Case because the effect of the elimination may not fully be assimilated into
17 the data.

18 **II. Economic Analysis**

19
20 **Q. Dr. Weaver, what economic measures did you consider in your review of**
21 **present and prospective economic conditions?**

22 A. I considered current and forecasted data about the business cycle as
23 measured by the real rate of change in the Gross Domestic Product (GDP), the

1 index of Leading Economic Indicators, the inflation rate as measured by the
2 Consumer Price Index (CPI), and interest rates.

3 **Q. What does the real rate of change in GDP indicate and why is it important?**

4 A. The real rate of change in GDP provides the inflation-adjusted rate at
5 which finished goods and services are produced in our domestic economy.
6 Positive values indicate a growing economy and negative values indicate a
7 declining economy.

8 The rate of economic growth provides a mixed message for investors. Too
9 high a growth rate could be inflationary. This inflation would be caused by the
10 demand for goods and services outstripping the supply. A too low or negative
11 growth rate indicates a recession. In fact, a “rule of thumb” definition for a
12 recession is two consecutive quarters of declining GDP.

13 **Q. What do you mean by “too high” or “too low” a growth rate in GDP?**

14 A. I believe that an ideal growth rate should normally be in a range from 2%
15 to 5%. An annual growth rate that is less than 2% indicates that economic output
16 is increasing too slowly and the economy might be headed toward a recession. An
17 annual growth rate that is above 5% tends to indicate that the economy is over-
18 heating and could become inflationary, particularly when the economy is near full
19 employment. However, when the economy is in the early stages of a recovery,
20 such as occurred in the third quarter of 2003 and has less than full employment,
21 the rate may exceed 5% without being inflationary.

22 **Q. What are the recent changes in GDP?**

23 A. Between 1994 and 2004, the economy grew at an average annual rate of
24 3.4%.

1 A recession occurred in 2001. The growth in GDP was 0.8% that year.
2 The National Bureau of Economic Research assigned March 2001 as the
3 beginning of the recession and November 2001 as its ending date.

4 **Q. Dr. Weaver, Schedule 2 also shows information about the consumer price
5 index. What information does this convey and why is it important?**

6 A. The consumer price index provides a measure of inflation. Capital market
7 equity cost rates and interest rates contain a premium for expected inflation so
8 that investors can maintain the purchasing power of the dollars that they have
9 invested. When inflation rates are expected to increase, equity cost rates and
10 interest rates will also increase. When inflation is expected to remain low, longer-
11 termed capital market cost rates will also remain at a lower level, given the
12 prevailing level of risk-free interest rates.

13 **Q. What has recent inflation been?**

14 A. In the 1994 to 2004 period, inflation averaged 2.5%.

15 **Q. What is the expected GDP real rate of growth for the near-term future?**

16 A. Forecasts for GDP are shown in Schedule 3. For the four-year period 2005
17 through 2008, the GDP growth rate is expected to be between 3.2% and 3.8%.
18 These forecasts are somewhat lower than earlier forecast for this period.
19 However, this growth rate is within what I consider to be an ideal range for
20 investment growth -- neither too high nor too low.

21 **Q. What are the near-term expectations about inflation?**

22 A. Four-year forecasts for inflation are also shown in Schedule 3. Both the
23 Value Line and the Congressional Budget Office forecasts indicate that inflation

1 is expected to remain within a range that is between 1.9% and 2.5% over the next
2 four years.

3 **Q. Do you have other information that confirms the reasonableness of these**
4 **growth forecasts?**

5 A. Yes. I examined the Index of Leading Economic Indicators (LEI) to obtain
6 information about the GDP growth forecasts. These data are shown in Schedule 4.
7 As shown in the second column, the percentage change in the monthly LEI Index
8 was positive from May 2003 through May 2004. It has been negative from June
9 2004 through October 2004. It was positive for November and December and in
10 January 2005, it was negative again.

11 The LEI provides information about likely changes in GDP but it does not
12 indicate when the changes in GDP will occur or the magnitude of those changes.
13 It generally leads changes in GDP by one to three quarters. The negative LEI
14 measures in late 2004 help explain why the forecasts for real growth in GDP for
15 the period 2005 through 2008 are lower than ones previously published. Both
16 Value Line and the CBO forecasted the real GDP growth rate to be lower in 2005
17 than it was in 2004. The 2004 real rate of change in GDP was 4.4% and the two
18 forecasts indicate that it will be either 3.4% or 3.8%.

19 **Q. What interest rate data did you examine?**

20 A. I looked at recent and forecasted short and long-term government bond
21 rates.

22 **Q. What do these forecasts for interest rates indicate?**

1 A. The forecasts for 3-month Treasury Bills and 10-year Treasury Bonds are
2 shown in Schedule 5. According to the forecasts, both short-term rates and long-
3 term rates are expected to slowly increase from 2005 through 2008.

4 The Value Line short-term 3-month rates are forecasted to increase from
5 2.6% in 2005 to 3.5% in 2008. The CBO forecast these 3-month rates to increase
6 from 2.8% in 2005 to 4.6% in 2008.

7 The CBO and Value Line forecasts for 10-year treasury notes are close to
8 one another. These are expected to increase from 4.7% or 4.8% in 2005 to
9 between 5.5% and 5.8% in 2008. This represents an 80 to 100 basis points
10 increase.

11 **Q. Dr. Weaver, what do recent changes in interest rates indicate?**

12 A. Changes in interest rates over the two month period from December 15,
13 2004 to February 15, 2005 are shown in Schedule 6. During this period, the
14 Federal Funds rate and the 3-month T-bill rate have increased 24 basis points.
15 One to three year constant maturity rates are between 15 and 19 basis points
16 higher.

17 Ten and twenty year government bond constant maturity rates decreased
18 over this period. The rates on these long-term securities increased in the first
19 month but decreased in the second month. On February 15, they were close to the
20 same level that they were on December 15. The possibility of a looming economic
21 slowdown could be a reason why interest rates on long-term bonds have not had a
22 net increase over the December 15 to February 15 period.

23 **Q. How do you expect the growth in economic activity and change in interest**
24 **rates to affect the cost of equity for electric utilities?**

1 A. The cost of equity for electric utilities should slowly increase over the
2 near-term future. This will be caused by the gradual increase in interest rates.

3

4 **III. Company Verification and Selection**

5 **Q. What was the next step in your cost of equity study?**

6 A. I applied the same criteria that I used to select the companies for obtaining
7 data in Case No. 2003-00433 to determine if the nine companies still meet those
8 same criteria.

9 **Q. What were those criteria?**

10 A. The criteria that I examined included Value Line's financial strength
11 rating, Value Line's recommendation about whether an investor should purchase
12 that company's stock, whether or not the company had recently sold or purchased
13 major assets, whether it was involved in merger activities, whether it had a
14 contiguous operating system, the company's fuel mix used for electrical
15 generation, its electric revenues as a percent of total revenues and its equity as a
16 percent of total capital.

17 **Q. Using those criteria, would you have selected those same nine companies to
18 obtain data for your cost of equity analysis in this proceeding?**

19 A. No. Three of those companies no longer met the selection criteria when
20 current data was used. Two other companies that were rejected from the sample in
21 the study for Case No. 2003-00433 were now eligible for inclusion in the sample.

22 **Q. What are the names of those companies?**

23 A. The companies that do not currently meet the criteria are Ameren, Empire
24 District, and PNM Resources. The ones that now meet the criteria and should be

1 added are Alliant Energy, and WPS Resources. Eight companies now meet those
2 selection criteria.

3 **Q. What criteria do the companies that were eliminated no longer meet?**

4 A. Ameren and PNM had major asset acquisitions. Ameren acquired Illinois
5 Power Company and PNM acquired TNP Enterprises. These acquisitions amount
6 to 19% and 10% of each respective company's total capital. Empire District's
7 common stock was not recommended by Value Line.

8 **Q. Dr. Weaver, why didn't you include companies that recently had major asset
9 purchases or recently had major asset divestitures?**

10 A. Major asset acquisitions or divestitures change the earnings expectations
11 of a company undergoing such a purchase or sale. In addition it changes the risk
12 associated with the company's earnings expectations. Time is required for a
13 company's earnings data to gain the reliability it previously had prior to the
14 acquisition or divestiture.

15 **Q. How did you define whether an asset acquisition or divestiture was "major"
16 or not?**

17 A. I used the Value Line estimate of the dollar value of the acquisition or
18 divestiture and took it as a percent of the Value Line estimate of the company's
19 2004 total capital. If the acquisition or divestiture was 10% or greater than the
20 estimated total capital, I considered it major.

21 **Q. Why weren't the companies that you added included in the cost of equity
22 study you performed for Case No. 2003-00433?**

23 A. Alliant Energy had been eliminated for use in the previous study because
24 it was divesting some of its assets. This divestiture has now been completed. WPS

1 Resources had been eliminated from the previous study because it had a ratio of
2 electrical revenues as a percent of total revenues that was below 60%.

3 **Q. Why did you use those same nine companies in this case along with the**
4 **revised group of eight companies?**

5 A. I used them because it increases the information that is available for
6 estimating the cost of equity. It provides information from two groups of
7 companies – the original group and a revised group.

8 **Q. Do you expect to find much difference between the two groups of companies?**

9 A. No. Six of the companies in each group are the same. Because of this large
10 overlap of companies, the average of the data obtained from each group should be
11 close to one another.

12 **Q. What difference in the cost of equity determined from the two different**
13 **groups of companies should be expected?**

14 A. The cost of equity found by updating the data for the group of nine
15 companies should be somewhat higher than the cost of equity found using data
16 from the revised group of eight companies.

17 **Q. Why would that difference be expected?**

18 A. The overall risk is higher for the nine companies used in Case No. 2003-
19 00433 than for the revised group. The reason for the higher risk is that one of the
20 company's common stock was not recommended by Value Line and two of the
21 companies had major asset acquisitions. Less certainty is associated with their
22 expected earnings and a higher return will be required.

23 **Q. Dr. Weaver, do you have supporting Schedules that show how the selection**
24 **criteria were applied to choose the revised group of eight companies?**

1 A. Yes, Schedules 7 through 12 in my Exhibit show how the selection criteria
2 were applied.

3 **Q. Would you describe these Schedules?**

4 A. Yes. Schedule 7 shows the 61 companies that are in the current edition of
5 Value Line. The current Value Line Financial Strength Rating for each company
6 and their previous Financial Strength Rating at the time of Case No. 2003-00433
7 is also shown in that Schedule. Eight companies had their Financial Strength
8 Rating increased and none were decreased.

9 **Q. What is the Financial Strength Rating?**

10 A. The Financial Strength Rating is an assessment of financial leverage,
11 business risk, company size, and other factors made by Value Line analysts for
12 each of the companies that they follow. A “B” rating is considered average. A
13 Financial Strength Rating of “C” is below average.

14 **Q. What information does Schedule 8 provide?**

15 A. Schedule 8 provides the names of the companies that were eliminated and
16 the reasons for their elimination. The remaining eight companies that were not
17 eliminated are shown in the last category on page 2 of Schedule 8.

18 **Q. What do the remaining Schedules show?**

19 A. Schedules 9 through 12 provide the data for the various groups of
20 companies that are shown on Schedule 8. For example, Schedule 9 provides the
21 fuel used for generation for the twenty-eight companies that remained at that step
22 of the analysis. Schedule 10 shows the product mix as a percent of revenues for
23 the fifteen remaining companies at that step. The capitalization amounts and

1 capital structures for the ten remaining companies are shown in Schedules 11 and
2 12.

3 **Q. Dr. Weaver, after applying the selection criteria, how many companies**
4 **remained?**

5 A. Eight.

6 **Q. What were names of the eight companies that remained?**

7 A. The eight companies that remained were: Alliant Energy, Corp.; Cinergy Corp.;
8 DTE Energy; FPL Group, Inc.; MGE Energy; Progress Energy; Southern
9 Company; and WPS Resources, Corp.

10

11 **IV. Risk Analysis**

12 **Q. How did you use the information provided by the risk analysis?**

13 A. I used the information from the risk analysis to determine if an adjustment
14 to the results of the cost of capital analysis is needed. The use of capital market
15 price data from these companies, after being adjusted for any risk difference
16 between the selected companies and LG&E, cause the results to be in compliance
17 with the *Bluefield* and *Hope* mandates.

18 **Q. How did you proceed with your risk analysis?**

19 A. I first examined cash flow measures of the eight companies and compared
20 them with the same cash flow measures for LG&E. I then compared the capital
21 structures of the selected companies with LG&E. This was followed by a
22 comparison of debt measures, and accounting measures. Lastly, I examined Value
23 Line's measures and Standard & Poor's measures of the group of companies to
24 determine the homogeneity of the selected group.

1 **Q. Dr. Weaver, would you explain your cash flow analysis?**

2 A. I evaluated cash flow ratios for the years 2002 and 2003 for each of the
3 eight companies. I then compared the average of the ratios for the eight
4 companies with the same ratios for LG&E. The ratios examined were the cash
5 flow coverage of interest, total dividends, investing activities, and net income.

6 **Q. How do the cash flow ratios indicate the similarity of the companies?**

7 A. Companies that are similar to one another with respect to risk generally
8 have similar cash flow coverage of interest, dividends, investments, and quality of
9 earnings.

10 **Q. What source document do you use to construct the cash flow ratios?**

11 A. The cash flow measures are taken from the Cash Flow Statement that is
12 compiled by each company and accompanies its Balance Sheet and Income
13 Statement as one of its principal financial statements.

14 **Q. What accounting standard governs the Cash Flow Statement?**

15 A. FASB 95 provides the methods for preparing the Cash Flow Statement.

16 **Q. Did you use the same interest coverage measures that are used by Standard
17 & Poor's?**

18 A. No. Standard & Poor's excludes changes in working capital in its
19 calculation of the amount of cash available from operating activities. The
20 coverage ratios that I use are calculated from "cash flow from operating
21 activities" that is defined by FASB 95. It includes changes in working capital.

22 The exclusion of working capital may be inconsequential when only minor
23 changes occur in the current asset or current liability accounts. However, when
24 large changes occur, the amount of cash available for coverage would be either

1 over- or under-stated unless the changes in working capital are recognized in the
2 cash flow statement. For this reason, the coverage calculated according the FASB
3 95 provides better information for the analysis.

4 **Q. What Schedules show the cash flow coverage ratios for the revised group of**
5 **eight selected companies?**

6 A. Data for each of the eight selected companies and for LG&E are shown on
7 Schedules 14 through 23. A summary of the cash flow coverage is shown in
8 Schedule 13.

9 **Q. What does the cash flow coverage of interest indicate?**

10 A. The cash flow coverage of interest expense indicates how many times cash
11 flow from operating activities before interest is paid covers the interest expense
12 that was incurred in the year of measurement. It is calculated as cash flow from
13 operating activities plus interest expense and this quantity is divided by interest
14 expense. A low ratio would indicate a greater risk because the firm might have
15 difficulty making its contractual interest payments. A higher ratio would indicate
16 less risk.

17 **Q. What is the cash flow coverage of interest for the revised group of eight**
18 **companies?**

19 The average for the eight-company group is 4.84 times coverage. This
20 compares with a 7.23 times coverage for LG&E. The magnitude of this coverage
21 indicates that all of the companies have ample coverage to make interest
22 payments and there is little risk of default on outstanding debt. LG&E has nearly
23 two times more coverage than the average for the eight companies and is less
24 risky.

1 **Q. Please describe the cash flow coverage of total dividends.**

2 A. The cash flow coverage of dividends shows the number of times that cash
3 flow from operating activities covers the common and preferred dividend
4 payments. Companies that have a low coverage might have the risk of having to
5 reduce or even eliminate a dividend payment.

6 **Q. What is the cash flow coverage of dividends for LG&E relative to the eight
7 companies?**

8 A. The eight-companies cover their total dividend payments an average of
9 3.23 times. LG&E covers its dividend payments 25.88 times. The abnormally
10 high ratio for LG&E is the result of not making a common dividend payment in
11 2003. It did make a preferred dividend payment that year.

12 In 2002, when it made both a common and preferred dividend payment,
13 its coverage was 2.90 times. LG&E's coverage was lower than the eight-company
14 group when comparing the single year 2002. The average for the eight-company
15 group for 2002 was 3.33. The 3.33 times coverage when compared to the 2.90
16 coverage indicates that LG&E had greater risk than the eight companies. Its
17 coverage was lower than the eight-company group in the year it did make a
18 common dividend payment. In 2003 it did not make a common dividend payment.

19 The purpose of the measure is to determine the risk that it might forego a
20 dividend payment. In LG&E's case in 2003, that chance is 100%. The risk impact
21 of forgoing the dividend payment was probably not as great since LG&E is
22 wholly owned by E.ON. The parent company probably was aware of the need to
23 forego the dividend and may have participated in the decision.

24 **Q. What does the cash flow coverage of investing activities represent?**

1 A. The cash flow coverage of investing activities indicates how many times
2 cash flow from operating activities covers long-term investments in plant and
3 other assets. A ratio greater than 1.0 indicates that internally generated funds are
4 sufficient to cover investments provided that there were no dividend payments or
5 payments to cover maturing financial assets. When the coverage after dividends
6 and maturities exceed the proportion of equity in the capital structure, the
7 company can meet its external financing with debt and not have its capital
8 structure equity ratio decline.

9 The higher the coverage, the less likely the company will be forced to seek
10 substantial external financing for plant construction or other asset acquisitions.
11 Therefore, a high ratio indicates greater protection from the vagaries of the capital
12 market and shows a lower amount of risk.

13 **Q. What was the cash flow coverage of investing activities for the eight-**
14 **companies and for LG&E?**

15 A. The eight companies' cash flow coverage of investing activities averaged
16 0.87 times and LG&E's average was also 0.87 times. There is equal risk.

17 **Q. What does the cash flow coverage of net income indicate?**

18 A. The cash flow coverage of net income is a measure of the quality of
19 earnings. It represents the number of dollars of cash flow from operating
20 activities per dollar of net income reported on the income statement. It is
21 calculated as the cash flow from operating activities from the cash flow statement
22 divided by net income from the income statement.

23 **Q. What did you find about this coverage measure for the eight companies and**
24 **LG&E?**

1 A. The eight companies' average coverage was 2.45 times while the coverage
2 for LG&E it was 2.09 times.

3 **Q. How do you interpret this quality of income measure?**

4 A. All of the companies have a good quality of reported net income. The
5 eight companies have \$2.45 in cash flow from operating activities for each \$1.00
6 in reported net income. LG&E has \$2.09 in cash flow from operations for each
7 \$1.00 of its reported net income. Both LG&E and the eight companies' magnitude
8 of coverage indicate that they have nearly equal risk.

9 **Q. Dr. Weaver, you indicated that you examined the capital structures next.
10 What did you conclude from this examination?**

11 A. The capital structures are shown in Schedule 25. Schedule 24 provides the
12 capitalization data from which the capital structures were constructed. Each
13 company's capital structure was measured as the percentage of long-term debt,
14 short-term debt, preferred stock, and common equity to total capital.

15 **Q. What measure for the capital structure of LG&E did you use?**

16 A. The capital structure for LG&E was the book value capital structure as of
17 December 31, 2004 that was provided in response to question 10 of the Request
18 for Information Posed by the Attorney General dated January 26, 2005.

19 **Q. What capital structure did you use for the eight companies?**

20 A. I used the December 31, 2003 capital structures.

21 **Q. Isn't this mismatching 2004 data with 2003 data?**

22 A. Yes, but it is consistent with the usage of the cost of equity study. The data
23 for determining the cost of equity is based upon stock market data and a portion
24 of those data are the result of investors evaluating the annual financial information

1 that is available to them, which was the year-end 2003 accounting information.
2 Much of the data used for the cost of equity determination originated in 2004 and
3 early 2005 some of which is based on that accounting information. It is important
4 to select companies that appear as similar to LG&E as possible when the latest
5 available LG&E data was used..

6 **Q. How does the average capital structure for the eight companies that you**
7 **selected compare to the capital structure for LG&E?**

8 A. The average capital structure for the eight companies is similar to the
9 capital structure LG&E. Both LG&E and the eight companies have 49.7% equity
10 and 50.3% leverage items in their capital structures. LG&E has a little more short-
11 term debt and preferred stock and a little less long-term debt.

12 **Q. What is the implication of having the same percentage of leverage?**

13 A. Leverage is an indicator of financial risk. The eight companies have the
14 same amount of financial risk as LG&E.

15 **Q. What debt measures did you consider?**

16 A. I examined Moody's Bond Ratings and the 2001-2003 average number of
17 times interest earned ratios.

18 **Q. What were the bond ratings of LG&E and the eight companies that you**
19 **selected?**

20 A. The bond ratings are shown in Schedule 26 of my Exhibit. LG&E has an
21 "A1" bond rating. In the eight-company group, three companies have a higher
22 bond rating at "Aa1," "Aa2," and "Aa3." The other five companies have lower
23 bond ratings. Of the five companies, three have an "A3" rating, one a "Baa1" and

1 one a “Baa2.” The ratings indicate that the eight companies, as a group, have
2 more financial risk than LG&E.

3 **Q. What do the times interest earned ratios show?**

4 A. LG&E has a 3-year average times interest earned ratio of 5.70 times. The
5 average for the eight companies is 3.22 times. The greater coverage that LG&E
6 has indicates that it has less financial risk.

7 **Q. What accounting and financial measures did you examine?**

8 A. I compared the average of the 2001 through 2003 dollar value of the total
9 assets of the companies, the sales to plant and equipment ratio, and the sales to
10 total assets ratio. The results of these comparisons are shown in Schedule 27.

11 **Q. Dr. Weaver, how does the dollar value of the total assets of the eight
12 companies compare with LG&E?**

13 A. LG&E is smaller than the average of the eight companies. The average
14 dollar value of assets for the eight-company group is 5.7 times greater than
15 LG&E. Smaller companies are considered to be more risky than larger
16 companies because larger companies have more economical access to the capital
17 markets and have greater diversity with regard to generation capability and
18 customer base.

19 The risk factor, access to capital markets, does not adversely affect LG&E
20 as much as it would if was a stand-alone company. It has economical access to the
21 capital market through E.ON North America and Fidelity. Its generation diversity
22 is increased by having a subsidiary relationship with KU. This causes this risk
23 factor to be somewhat mitigated.

24 **Q. What do you conclude with regard to the total asset size measure?**

1 A. LG&E is a little more risky than the eight-company group.

2 **Q. What does the sales to plant and equipment ratio show?**

3 A. The sales to plant and equipment ratio indicates the number of dollars of
4 sales from each dollar invested in plant and equipment. It is a measure of the asset
5 utilization intensity. The more dollars worth of sales per dollar invested in assets,
6 given a similar profit margin, the greater the utilization and the more profitable
7 the investment in assets. Companies that have larger sales to plant and equipment
8 ratios are less risky. This ratio must be considered in conjunction with other ratios
9 because a lower ratio could be the result of a newer, less depreciated plant, or by
10 higher quality, more expensive equipment.

11 **Q. What is the sales to plant and equipment ratio for LG&E?**

12 A. The sales to plant and equipment ratio for LG&E is 0.44 as compared to
13 0.70 for the eight-company group. This indicates that LG&E is more risky.

14 **Q. What does the sales to total assets ratio show?**

15 A. The sales to total assets ratio is calculated as sales divided by total assets.
16 It is similar to the sales to plant and equipment ratio. It represents the number of
17 dollars of sales for each dollar invested in total assets. It is a measure of the
18 intensity of use of the company's assets to produce sales.

19 **Q. How does it measure the intensity of use of the company's assets?**

20 A. Companies that have more sales revenues per dollar of total assets would
21 either have higher prices for the electricity that they sell, have more fully
22 depreciated assets, or sell more energy per dollar invested in net assets. Price
23 differences for the electricity that is sold are mitigated because the companies are
24 regulated. The value of comparable assets would be mitigated when the

1 companies have a mixture of generating plants with respect to age. Consequently,
 2 differences in the sales to total assets ratio would be caused primarily by
 3 differences in the intensity of use of the assets to produce electricity. Companies
 4 that have flatter peak loads would be able to have greater intensity of use of assets
 5 than companies that have greater load variability over the course of a day

6 **Q. What were your findings from your examination of the sales to total assets
 7 turnover?**

8 A. The sales to total assets turnover, also in Schedule 27 of my Exhibit,
 9 shows that LG&E achieves \$0.38 in sales for each \$1.00 invested in assets as
 10 compared to \$0.41 for the eight companies. LG&E's asset utilization is nearly
 11 equal to the eight-company group. This mitigates the difference in the sales to
 12 plant and equipment ratio. LG&E has a little more risk than the eight companies.

13 **Q. Dr. Weaver, would you summarize your risk measures?**

14 A. Yes. A summary of the measures is as follows:

15 Risk Summary

16			Selected	
17	<u>Measure</u>	<u>LG&E</u>	<u>Companies</u>	<u>Result</u>
18	CF x Int. Cov.	7.23x	4.84x	< risk
19	CF x Div. Cov.	nr	3.33x	> risk
20	CF x Inv. Act.	0.87x	0.87x	~= risk
21	Qual. of Earnings	2.09x	2.45x	~= risk
22	Cap. St. Lev.	50.3%	50.3%	~= risk
23	Moody's Bond Rat.	A1		< risk
24	Times Int. Earned	5.70	3.22	< risk
25	Total Asset Size	\$2.7B	\$15.5B	> risk
26	Sales to P&E	0.44	0.70	> risk
27	Sales to Tot. Assets	0.38	0.41	~= risk

28 Key: ~= risk (approximately equal risk)
 29 < risk (LG&E has less risk)
 30 > risk (LG&E has greater risk)
 31 nr – not relevant
 32

33 **Q. What do you conclude from this summary?**

1 A. LG&E and the eight-company group have about the same risk. They have
2 nearly equal risk in cash flow coverage of investing activities, quality of earnings,
3 leverage, and total asset utilization. LG&E has less risk in the cash flow interest
4 coverage measure, Moody's Bond Ratings, and times interest earned. LG&E has
5 greater risks regarding cash flow times dividend coverage, total asset size, and
6 fixed asset utilization. In those instances where LG&E has either greater or less
7 risk, the differences are not great except in the total asset size category. Their
8 access to the capital market through E.ON North America and Fidelity and the
9 generation diversity by its subsidiary relationship with KU mitigate this risk
10 difference.

11 **Q. What other risk measures did you evaluate?**

12 A. I examined published risk measures from Value Line and Standard and
13 Poor's.

14 **Q. Why do you examine published risk measures?**

15 A. Many investors rely on published risk measures to make their stock
16 purchase and sell decisions. Value Line and Standard & Poor's are two widely
17 recognized investment data and advisory services. These publications provide
18 information for evaluating the risks of the selected companies and indicate the
19 degree of similarity of these companies.

20 **Q. What Value Line measures did you consider?**

21 A. I considered Value Line's Stock Price Stability Index, Safety Rating, and
22 Beta. These measures are shown in Schedule 30 of my Exhibit.

23 **Q. What does Value Line's Stock Price Stability index measure and what does it**
24 **indicate?**

1 A. The Stock Price Stability Index is based upon a ranking of the standard
2 deviation of weekly percent changes in the price of a stock over the last five
3 years. The top 5% have the least amount of percentage price changes and are
4 assigned an index value of 100; the next 5% an index value of 95, and so forth.

5 **Q. What is the Stock Price Stability Index for the eight companies in the revised**
6 **company list that was selected for obtaining data for the cost of equity**
7 **determination for LG&E?**

8 The Stock Price Stability Index is shown in the first column in Schedule
9 28. The stock price stability ratings for the group of eight companies range from
10 100 to 90. This indicates that these companies are in the top 15% of the most
11 stable companies based on stock price fluctuations that Value Line follows. The
12 closeness of the index values indicates that these eight companies are very similar
13 to one another with respect to earning expectations relative to their risk. The
14 average for the eight companies is 96. This would be in the top 10% of the Value
15 Line Stock Price Stability Index.

16 **Q. What is the Value Line Safety Rank?**

17 A. The Value Line Safety Rank is a combination of Value Line's Financial
18 Strength rating and the Stock Price Stability index. A rating of "1" is in the safest
19 20% of the companies that Value Line follows; a rating of "2" is the second safest
20 20% and so forth.

21 **Q. What does this measure indicate for eight electric companies?**

22 A. The Safety Rank for the eight companies averages 2. The average of 2
23 indicates that Value Line analysts believe that these companies have above
24 average safety.

1 **Q. What is Beta?**

2 A. Beta is an estimate of systematic risk—risk that is common in all
3 companies. Systematic risk could be caused by something like a change in the
4 rate of inflation, a political event, a war, or a change in social-economic
5 conditions. Systematic risk cannot be eliminated through diversification.
6 Obviously, some companies have greater exposure to the occurrence of any single
7 event than other companies and therefore have more systematic risk.

8 Beta is estimated from the company's stock sensitivity to general changes
9 in stock market prices. A Beta that equals 1 represents an average company
10 whose stock price changes are nearly identical to the market. Companies that are
11 less risky have Betas less than one. Companies that are more risky have Betas
12 greater than one.

13 **Q. What were the Value Line Betas for the eight companies?**

14 A. The Value Line Betas for the eight companies chosen to obtain data for
15 the cost of equity analysis averages 0.73.

16 **Q. How do you interpret these Betas?**

17 A. The selected electric companies have low systematic risk relative to an
18 average company that has shares of common stock traded in the equity market.
19 An average company would have a Beta of 1 as compared to the eight companies'
20 average Beta of 0.73.

21 **Q. What Standard & Poor's measures did you include in this analysis?**

22 A. I included Standard & Poor's Fair Value Rank, Relative Strength Rank,
23 and Beta. These are shown in Schedule 29 of my Exhibit.

24 **Q. Please describe Standard & Poor's Fair Value Rank measure.**

1 A. Standard & Poor's Fair Value Rank is a proprietary quantitative model that
2 ranks the stocks according to being the most overvalued, group 1, to the most
3 undervalued, group 5. This measure used to be called the Standard & Poor's
4 Outlook.

5 **Q. What was the Fair Value Rank for the eight-company group?**

6 A. The eight-company group is neither over- nor under-valued. The average
7 for the group is 2.6. A ranking of 3 would be neither over-valued nor under-
8 valued. The ranking of 2.6 indicates that, according to the Standard & Poor's
9 model, the eight-company group is slightly over valued.

10 **Q. What is the Standard & Poor's Relative Strength rank and what does it
11 show?**

12 A. The Standard & Poor's Relative Strength Rank reports, on a scale of 1 to
13 99, how the stock has performed relative to the other companies that Standard &
14 Poor's follows. Companies that have a "1" have the lowest Relative Strength and
15 companies that have a "99" have the highest Relative Strength.

16 The Relative Strength Rank for the eight companies selected for obtaining
17 data averaged 41. A 50 would represent the Relative Strength Rank for an
18 average company. This indicates that these companies' earnings growth has not
19 performed as quite well as the average company followed by Standard & Poor's.

20 **Q. What was Standard & Poor's Beta?**

21 A. Standard & Poor's Beta for the eight companies averaged 0.08. This is
22 shown in the right hand column of Schedule 29. According to this measure, these
23 companies have low systematic risk.

24 **Q. Why are the Value Line and the Standard & Poor's Betas different?**

1 A. Both investment services use regression analysis to calculate Beta. Value
2 Line regresses the past five-years of week-ending stock price data on the New
3 York Stock Exchange Index. Standard & Poor's calculates its Beta by regressing
4 the past five-years of month-ending stock prices on the S&P 500 Index. Value
5 Line makes a statistical adjustment to its Beta estimate. The Standard and Poor's
6 results are not adjusted. The adjustment or lack thereof accounts for the large
7 difference.

8 **Q. What do you conclude from your analysis of the published risk measures?**

9 A. The published risk measures indicate that the eight companies are similar
10 to one another with respect to risk. Furthermore, these companies have low risk
11 relative to other companies that have stock available on the major exchanges and
12 are followed by the investment advisory services.

13

14

IV. The Cost of Equity

15 **Q. Dr. Weaver, you stated earlier that you use the constant-growth DCF model,**
16 **the multi-stage growth DCF model, the CAPM, and the Bond-Yield-Risk**
17 **Premium methods. How do you combine the information from your**
18 **economic analysis, risk analysis, and from these methods to make your**
19 **recommendation?**

20 A. Once I obtain the information from the use of each of the equity valuation
21 models, I consider the implications from the risk and economic analysis on the
22 results, and use judgment to make a final recommendation.

23 **Q. Do you weigh all of the models equally or do you value the output of some**
24 **models more than others?**

1 A. I place the greatest emphases on the DCF constant growth model. I believe
2 that this method has greater use by participants in the capital market than the other
3 methods. I believe that the CAPM is used by a fairly large number of investors.
4 These two models, the constant growth DCF model and the CAPM receive the
5 most emphases in college finance courses. The DCF model has been in existence
6 in college finance courses for nearly 50 years and the CAPM has been in existence
7 for 40 years. Also, investor advisory services provide estimates of earnings
8 growth and betas.

9 The multistage DCF model and the Bond-Yield-Risk Premium models are
10 not used as much. These are occasionally mentioned in finance text books but I
11 am not aware of any where these latter two models are emphasized. The bond-
12 yield-risk premium method is an *ex post* rather than an *ex ante* method. It
13 provides guidance as to what an average risk premium might be over a longer
14 period of time, but is less valuable for estimating the cost of equity for the
15 immediate future. For this reason, I also place a smaller weight on these methods
16 than on the DCF analysis.

17 **Q. In what order will you present your cost of equity analysis?**

18 A. First, I will present the constant-growth DCF model results. Next, I will
19 discuss and present the results of the multi-stage DCF model. After this, the
20 CAPM and Bond-Yield-Risk Premium results are discussed and presented.

21 **Q. What is required to implement the constant growth DCF model?**

22 A. The constant-growth DCF method requires an estimate for growth and a
23 dividend yield.

24 **Q. How did you determine the growth estimate for use in the DCF model?**

1 A. I use historical data from Value Line and forecast data from analysts'
2 estimates of earnings growth from Zacks, Reuters Investor Services (formally
3 Multex), Thomson Investor Network (formally I/B/E/S) and Value Line. The use
4 of the historical data and analysts' forecasts are discussed in Appendix II.

5 **Q. What is the purpose of using historical growth rates?**

6 A. The objective of using historical data to formulate a growth estimate is to
7 emulate those investors who use the DCF model with a historical growth rate
8 when making their buy and sell investment decisions. The historical data that I
9 use is the compound growth rate that occurred over a recent period. When this is
10 implemented in the DCF model, the analyst implicitly assumes that the growth
11 that occurred in that past period will continue. For this reason, I believe that the
12 results obtained using forecasts data are more valuable. Analysts' forecasts are
13 future oriented. However, the results obtained using historical data provide a good
14 starting place for the analysis.

15 **Q. What historical growth rates did you use?**

16 A. I used the annual compound growth rate for earnings per share (EPS) and
17 cash flow per share (CFS) for the period 1994 to 2005. The 2005 estimates for
18 EPS and CFS were estimated by Value Line.

19 **Q. Why did you use 1994 through 2005 as the span of time for determining the
20 historical growth?**

21 A. The economic analysis indicates that a period of economic growth is
22 expected in the near-term future. This period encompasses a full economic cycle
23 and includes the recession that occurred in 2001. By ending the observations in
24 2005, the data represents the latest that is available.

1 **Q. What were the rates of economic growth that occurred in the period from**
2 **1994 to 2005?**

3 A. During that period, economic growth, as measured by the change in real
4 GDP, was in a range between 0.8% and 4.4%. Data for each year is shown in
5 Schedule 2.

6 **Q. What method did you use to measure the historical growth?**

7 A. I measured the historical growth rates using the geometric mean. The
8 geometric mean provides the measure of the compound rate of growth that
9 occurred over the period being used, 1994 to 2005. I calculated the compound rate
10 of growth for each of the eight companies and then I used the arithmetic mean to
11 determine the average growth rate. I used the same method for the updated nine
12 companies.

13 **Q. What were the companies' compound growth rates for EPS and CFS from**
14 **1994 through 2005?**

15 A. The growth rates in EPS and CFS are shown in Schedules 30 and 31.
16 Each Schedule has two pages – one using updated data for the original nine
17 companies used in Case No. 2003-00433 and the other using current data for the
18 revised group of eight companies.

19 Over the 1994 to 2005 period, EPS for the original nine-companies chosen
20 for obtaining data in Case No. 2003-00433 grew at the average of the compound
21 growth rates at 2.84%. EPS for the revised set of eight companies grew at the
22 average of the compound growth rates at 3.23%.

1 CFS grew at the average of the compound growth rates at 2.46% for the
2 nine companies. CFS for the revised set of eight companies grew at the average of
3 the companies' compound growth rates at 2.86%.

4 **Q. Which growth rate do you believe is most important, the growth in EPS or**
5 **the growth in CFS?**

6 A. I think that, from a historical perspective, both provide measures of the
7 ability to pay dividends because dividends are a cash outflow. When projected
8 data is used, I think that growth in EPS is a better indicator.

9 **Q. What analysts' forecast did you use for making your DCF estimates using**
10 **projected data?**

11 A. I used four sources that I previously mentioned for obtaining data for the
12 growth forecasts. These were Zacks, Reuters Investor Services, Thomson Investor
13 Network, and Value Line.

14 **Q. How are these forecasts compiled?**

15 A. Zacks, Reuters, and Thomson survey security analysts on a monthly basis
16 and they publish the average of the individual estimates. Value Line employs in-
17 house analysts who make three to five-year forecasts for EPS and CFS.

18 **Q. What were the projected growth rates?**

19 A. The growth forecasts for the original nine companies, for which the data
20 was updated, averaged 4.49%. The average forecast for the revised group of eight
21 companies is 4.51%. These forecasts of the EPS growth rates are shown in
22 Schedule 32, pages 1 and 2.

23 **Q. How did you implement these data in the constant growth DCF model?**

1 A. I combine the growth rate measures with the average expected dividend
2 yields for each group of companies – the nine company group and the eight
3 company group.

4 **Q. How did you calculate the expected dividend yield and what are the results?**

5 A. A current dividend yield was calculated by dividing the annual dividend
6 rate by the average week ending stock price for the weeks beginning September
7 16, 2004 through February 14, 2005. The annual dividend rate was determined by
8 multiplying the most recent quarterly dividend amount by four. Schedule 33,
9 pages 1 and 2, shows these calculations. The average current dividend yield for
10 the nine companies was 4.62%. The average dividend yield for the revised eight-
11 company group was 4.49%.

12 **Q. Why did you select the weeks from September 16 through February 14 to
13 determine the average week ending stock prices?**

14 A. September 16 through February 14 represents a full four months of data.
15 These data are current and therefore, reflect investor's current expectations. Four
16 months encompasses a sufficient period to wash out any abnormalities in the data.
17 Furthermore, the stability of these stock's prices can be noted by examining the
18 prices.

19 **Q. Why did you use the dividend rate rather than the actual amount of
20 dividends paid in the previous year to calculate the dividend yield?**

21 A. Dividends are paid quarterly. The rate, based on the latest quarterly
22 dividend amount multiplied by four, is generally higher than the sum of the latest
23 four quarterly dividend payments. This compensates for not compounding the
24 quarterly dividend payments.

1 **Q. How did you apply the dividend yield to the DCF model?**

2 A. The DCF model requires an expected dividend yield rather than a current
3 or most recent yield. The expected yield is determined by multiplying the current
4 yield by one plus the growth rate. The growth-adjusted dividend yields are added
5 to the growth rates and provide an estimate for the cost of equity.

6 **Q. What are the DCF results?**

7 A. The DCF results are shown in Schedule 34, pages 1 and 2. The results for
8 the original set of nine companies averaged 8.57% when both projected and
9 historical growth rates are used. When only projected growth rates are used, the
10 result was 9.16%.

11 Page 2 of Schedule 34 shows the DCF results for the revised set of eight
12 companies. The result was 8.58% when both projected and historical growth rates
13 were used and 9.04% when only projected growth rates were used.

14 **Q. Did you use both average and historical growth rates when you made your
15 final recommendation?**

16 A. No, I only used projected growth rates. In my opinion, these are more
17 representative of expected economic conditions for the immediate future.

18 **Q. Did you make a flotation cost adjustment to these results?**

19 A. No

20 **Q. What did the multi-stage DCF model indicate that the cost of equity should
21 be?**

22 A. The multi-stage DCF model, as shown in Schedule 35, pages 1 and 2,
23 indicates that the cost of equity should be 8.71% for the nine-company group and
24 8.65% for the eight company group..

1 **Q. How did you implement the multi-stage DCF model?**

2 A. The multi-stage DCF model is a technique where a change in a growth
3 rate converges on a forecasted growth rate incrementally over time. In this
4 implementation, I assume that the growth rate converges from the actual 2003-
5 2004 rate to the analysts' forecasts in four years. Once a forecasted rate is
6 achieved, it is maintained into perpetuity.

7 **Q. Why are the multi-stage DCF model's results lower than the DCF constant
8 growth model using analysts' forecasts?**

9 A. The DCF constant growth model assumes that analysts' forecasts are
10 instantly achieved as soon as the forecast is made and then it continues into
11 perpetuity. The multi-stage DCF model assumes that the analysts' forecasts are
12 gradually achieved and then maintained in perpetuity. I believe that the multi-
13 stage model, with respect to the achievement of the forecasted growth rate, is
14 more realistic.

15 **Q. Were there any other steps required for the implementation of the multi-
16 stage model?**

17 A. Yes, I determined the perpetuity value for the dividends in the terminal
18 year of the analysis. The terminal year's dividend amount was divided by the
19 calculated rate of return minus each company's long-term growth rate ($k-g$). This
20 is the formula for determining the present value for a perpetual data series. Since
21 the rate of return is the rate being calculated and it is the same as the variable "k"
22 that is needed for the perpetuity calculation, an iteration technique must be used.

23 **Q. Why did you use the internal rate of return to determine the cost of equity
24 for the multi-stage DCF model?**

1 A. The DCF model is an internal rate of return model.

2 **Q. Do you have another example where the perpetuity model is used in financial**
3 **models?**

4 A. The constant growth DCF model is a perpetuity model when it is used in
5 the form to estimate a stock's price. This model is $P = D_1 / (k - g)$.

6 **Q. You indicated that you also used the CAPM. What do these results show?**

7 A. The average CAPM return for both sets of companies 9.57%. Pages 1 and
8 2 of Schedule 36 show the various combinations of data and the calculations of
9 these results. Schedule 39 also provides notes that provide the sources for the data
10 items. The reason that both Schedules show the same result is that the average
11 beta for the nine company group is the same as the average beta for the eight
12 company group.

13 **Q. Dr. Weaver, how did you determine the bond-yield-equity-risk-premium?**

14 A. I performed a study of the equity-risk-premiums for both the nine
15 companies and the eight companies. To determine the risk premiums, I subtracted
16 the realized annual holding period returns (HPR) on equity for the period 1993-
17 2004 from the composite one-year constant maturity interest rates on Treasury
18 securities. (1992 prices and dividends were needed to determine the 1993 HPR.)
19 In this determination, I examined every possible combination of annual holding
20 periods during the years 1993-2004.

21 Pages 1 through 4 of Schedule 37 show the calculations for each step in
22 the risk premium study for the original nine companies. The average equity-risk-
23 premium for the nine companies was 4.61%. The calculation of the equity-risk-

1 premium for the revised eight-company group is shown in Schedule 38, pages 1
2 through 4. The average risk premium for the eight company group was 4.45%.

3 **Q. How did you use this risk premium?**

4 A. I added the risk premium to the average of the forecasted long-term rates
5 used in the CAPM study. Schedule 36 provides the sources for these rates. The
6 forecasted rates were:

7	CBO-3 year forecast	4.83%
8	CBO-9 year projection	5.50%
9	Value Line-5 year projection	<u>5.10%</u>
10	Average	5.14%

11

12 **Q. What do you find the bond-yield-risk-premium result to be?**

13 A. The risk premium for the nine companies, 4.61%, was added to the 5.14%
14 forecasted ten-year bond interest rate to provide a cost of equity estimate of
15 9.75%. The risk premium for the eight companies at 4.45% when added to the
16 forecasted ten-year interest rate provides an estimate of 9.59%.

17 **Q. Dr. Weaver, you stated that you determined the risk premiums using annual
18 holding period returns and then added this risk premium to forecasted long-
19 term rates. Aren't you miss-matching one-year risk premiums and long-term
20 bond rates?**

21 A. No. Long-term bond rates already contain an inflation premium and a
22 marketability premium. Therefore, the only risk that needs to be accounted for is
23 the equity risk premium.

24 **Q. Dr. Weaver, would you please summarize your findings for the electric
25 companies?**

1 A. The outcomes of the models for the electric companies are summarized
2 below:

	Nine Companies <u>Updated Data</u>	Eight Companies <u>Revised</u>
3		
4		
5		
6	Constant-growth DCF*	9.16%
7	Multi-stage DCF	8.71%
8	CAPM	9.57%
9	Bond-yield-equity-risk premium	<u>9.75%</u>
10	Average	9.30%
11		9.04%
12		8.65%
13		9.57%
14		<u>9.59%</u>
15		9.21%

11
12 * Projected growth rates only.

13
14
15 **Q. Did you make adjustments as a result of the risk or economic analysis?**

16 A. I found that the risk difference between LG&E and the eight companies
17 was small and no adjustment is necessary. I concluded from my economic
18 analysis that capital market cost rates will be slowly increasing over the next two
19 to four years. These increasing rates are already reflected in the outcomes of
20 CAPM and Bond-Yield-Equity-Risk-Premium models because forecasted 10-year
21 interest rates were used to implement those models. This is why the results for the
22 CAPM and Bond-Yield-Equity-Risk Premium models are somewhat higher than
23 the results of the two DCF models. I did adjust the two DCF results.

24 **Q. How did you determine the amount of adjustment to make to the DCF
25 results?**

26 A. On February 15, 2005, 10-year constant maturity bond rates were 4.10%.
27 (February 14 was the last stock price observation date used for computing the
28 dividend yield.) The CBO projected the 10-year Treasury Note rate for 2004-2005
29 to average 5.10%. These projections indicate that these rates are expected, over
30 the next two years, to be 100 basis points higher than the February 15th rate. The

1 two sets of DCF results should be adjusted and be 100 basis points higher. The
2 CAPM and BYRP models were implemented with the higher forecasted rates.

3 This will cause the average of the four models to increase by 50 basis
4 points ($2 \times 100 / 4$). The 9.30% average, when adjusted becomes 9.80%. The
5 9.21% average, when adjusted becomes 9.71%. These adjustments are shown in
6 Schedule 1.

7 **Q. Did you make any other adjustments?**

8 A. Yes. I also made a 25 basis point adjustment to compensate for any risk
9 increase associated with the elimination of the ESM.

10 **Q. Why did you make that adjustment?**

11 A. The Order from Case No. 2003-00433 in which the ESM was eliminated
12 was dated June 20, 2004. Confirmed knowledge of its elimination is less than one
13 year old. The data used for this study originated, for the most part, in the second
14 half of 2004. The adjustment was made because the effect of the elimination may
15 not fully be assimilated into those data. The adjustment will not be needed in
16 future LG&E costs of equity studies because the effects of the elimination will
17 have had time to be fully assimilated into the data.

18 **Q. Do you determine your final recommendation solely on the basis of these
19 average values?**

20 A. I consider the average values but, as I have previously discussed, place a
21 greater weight on the DCF constant-growth results. These were close to 9.00%.
22 The combination of the 50 and 25 basis point adjustments cause the 9.00% to
23 become 9.75%. This becomes the low-end of the range. The eight-company
24 adjusted average was 9.96% and the nine company adjusted average was 10.05%.

1 The mid-point is close to 10.00% so the range for the cost of equity should be
2 between 9.75% and 10.25%.

3
4

5 **VI. The Surcharge Should Be Determined Using the**
6 **Lower-end of the Cost of Equity Range**

7

8 **Q. You have found that the range that contains the cost of equity is between**
9 **9.75% and 10.25%. What return within that range do you recommend?**

10 A. I recommend that the cost of equity that is used to determine the
11 Environmental Cost Recovery Surcharge be set between 9.75% and 10.00%, at
12 the lower-end of that range.

13 **Q. Why do you believe that the lower-end of the range that contains the cost of**
14 **equity should be used to determine the Environmental Cost Recovery**
15 **Surcharge?**

16 A. There are three reasons why the lower-end of the cost of equity range
17 should be used. First, the Environmental Compliance operation is a somewhat
18 self-contained operation within LG&E. Second, there is little risk associated with
19 the environmental compliance revenues and expenses. Third, financial theory
20 about risk and return indicates that there is a risk/return trade-off and lower risk
21 securities have a lower required rate of return.

22 **Q. Dr. Weaver, will you please explain why you say that the Environmental**
23 **Compliance operation is a somewhat self-contained operation within LG&E?**

24 A. Environmental compliance is a self-contained operation because it has its
25 own revenue source, the surcharge factor; its own assets, the environmental plant
26 and equipment; and its own costs and expenses; its own rate base, the "Total
27 Environmental Compliance Rate Base;" and for purposes of setting the surcharge,

1 its own rate of return. It could be considered as being somewhat akin to the gas
2 distribution operations of the company but it has less independence from the
3 electric operations.

4 **Q. Why do you say that the environmental compliance operation has less
5 independence from the electric operations than LG&E's gas operations?**

6 A. The environmental compliance operations and the electric operations are
7 mutually dependent upon one-another. The electric operations could not operate if
8 they did not meet environmental regulations. The revenues of the environmental
9 compliance operations are collected as a surcharge on the jurisdictional customer
10 bills so they could not be collected if there were no electric sales and billing.

11 **Q. Why did you say that there is little risk associated with the environmental
12 revenues and expenses?**

13 A. There is little risk associated with the amount of revenue that is collected
14 under the Environmental Surcharge Tariff because the amounts to be collected are
15 known and measurable. The billing month lags the current expense month by two
16 months. The Net Jurisdictional environmental compliance plan revenue
17 requirement is set as a percent of the average of the twelve months of actual
18 revenues collected, net of the environmental surcharge revenues. The current
19 expense month precedes the billing month by two months and there is a true-up
20 adjustment to account for any over/under recovery.

21 **Q. Dr. Weaver, you say that there is "little risk" rather than no risk. Why do
22 you say that there is even "little risk" associated with the revenues?**

1 A. There is the risk in a given billing month where the monthly retail revenue
2 may differ from the twelve-month average revenue. The True-up Adjustment
3 corrects for over- or under-collections since:

4 ...over collections reduce the Current Period Jurisdictional Environmental
5 Surcharge Factor (“CESF”) and under collections increase the CESF.
6 Thus, ECR over- and under-collections are regularly and continuously
7 adjusted each month by the True-up mechanism in the ECR Tariff.
8 (Response of Company Witness Conroy to Supplemental Request for
9 Information Posed by the Attorney General Dated February 23, 2005,
10 question 1.)
11

12 The True-up Adjustment assures that the total amount of revenues that are
13 associated with the Commission approved Compliance Plan for Recovery by
14 Environmental Surcharge is collected. The revenue risk is in the timing difference
15 because the True-up Adjustment creates an additional month’s lag. Since the time
16 value of money has a cost there is a minor amount of risk from that source. Other
17 risk sources would be from “acts of God,” war, terrorism, or something of that
18 nature

19 **Q. The third reason you gave for using the lower-end of the range that contains**
20 **the cost of equity is that financial theory indicates that there is a risk and**
21 **return trade-off and where there is lower risk, there is a lower required rate**
22 **of return. Would you comment on this?**

23 A. I explain the concept of risk and how it relates to the risk and return trade-
24 off in Appendix II, beginning on page 3, line 14 and continuing through page 6.
25 This provides the reasons why, in this situation where there is little risk, a lower
26 return is required and the cost of equity should be set near the lower end of its
27 range.

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VII. CAPITAL STRUCTURE AND OTHER CAPITAL COST RATES

Q. What capital structure should be used for determining the overall rate of return for the ECR Surcharge?

A. The rate of return should be a weighted average cost of capital so that the when the return is applied to the Total Environmental Compliance Rate Base the revenues will provide a reasonable return on the compliance-related capital expenditures. The revenues must be sufficient to pay the short-term interest costs that are incurred during the construction of the pollution control assets; pay the interest cost on the pollution control bonds that were sold to raise capital to pay off the short-term debt; provide an amount to pay preferred stock dividends; and leave an amount remaining to provide a return to the common stockholders for the equity used to pay for the pollution control assets.

Q. What capital structure should be used to determine the rate of return?

A. The capital structure should be the same as the capital structure of the overall company.

Q. Why is the overall company's capital structure the one that should be used to determine the mix of debt, preferred stock and common equity financing of the pollution control assets?

A. Investors in the capital market, through their stock buy and sell decisions, indirectly dictate the capital structure that a company should have. The amount of financial risks that a company has is estimated by the individual investors who are constantly making stock purchase and sale decisions by comparing their investment alternatives. If a capital structure seems to have too high a proportion of debt, investors will assign greater financial risks to that company's outstanding

1 financial instruments. When the risks relative to the return are too high, investors
2 will not desire to purchase that company's stock and its stock price will fall.

3 If the capital structure seems to have too low a proportion of debt, equity
4 investors would be penalized because a greater amount of equity is required to
5 finance the firm's assets. Its earnings per share are unnecessarily diluted and
6 again the stock's price will fall.

7 Since a firm's optimal capital structure is determined by investor actions
8 in the capital market, the company's overall capital structure, which management
9 deems appropriate, should be used for determining its weighted average cost of
10 capital.

11 This doesn't mean that each time external financing is done, the company
12 issues capital in the proportions of its capital structure and that structure is always
13 maintained. It means that, in the long-run, a company issues debt, preferred stock,
14 or common equity based on management's perception of its optimal capital
15 structure and the capital market's acceptance of that type of financing. The capital
16 structure is always converging on the structure that is considered to be optimal.

17 **Q. Should the capital structure be adjusted to reflect only electric operations, or**
18 **to reflect only environmental compliance operations?**

19 A. Technically it should be adjusted if there are different capitalizations for
20 the electric operations or the environmental compliance operations. However,
21 LG&E uses the same allocation adjustment to each capital component to separate
22 its electric and gas operations and the environmental compliance operations are
23 not separated. The percentages of short-term debt, long-term debt, preferred stock,
24 and common equity are the same in each of the operating component capital

1 structures and these are the same as the capital structure of the total company. For
2 LG&E, no adjustment is necessary.

3 **Q. Should any other adjustments be made to the electric capitalization?**

4 A. It is not necessary since adjustments are made on a pro rata basis to all
5 components of capital. For example, Appendix E to the Order in Case No. 2003-
6 00433 indicates that the adjustments to the electric capitalization are allocated to
7 each capital component on a pro rata basis. As a result, the dollar amount of
8 capitalization changes but the percentage of the capital components in the capital
9 structure will remain the same.

10 **Q. What capital structure do you recommend be used.**

11 A. I recommend that the December 31, 2004 structure be used. The
12 capitalization amounts and cost rates for debt and preferred stock were provided
13 by Company Witness Scott in response to question 10 of the Attorney General's
14 January 26, 2005 request for information. Work papers for the cost rates were
15 provided in response to question 11. I have examined them and accept the cost
16 rates used for short-term debt and preferred stock. I do not agree with the cost rate
17 used for long-term debt.

18 **Q. Why do you disagree with the total company cost of long-term debt?**

19 A. The cost of pollution control bonds should be used as the cost of long-term
20 debt for the environmental compliance assets. Company management would be
21 imprudent if it uses any other form of higher cost long-term debt when it has
22 access to the lower costs pollution control financing.

23 **Q. Why should only lower cost pollution control financing be used for long-term**
24 **debt?**

1 A. The total cost of total long-term debt is higher than the cost of pollution
2 control bonds. The total cost of long-term debt includes pollution control bonds,
3 long-term notes payable to Fidelity Corp., and redeemable preferred stock. There
4 are also long-term/short-term interest swaps which add to the cost of the
5 outstanding debt. Since the overall cost of debt is higher than the cost of pollution
6 control bonds, the Environmental Recovery Surcharge rate of return would be
7 higher from use of the total cost of long-term debt. This would result in the
8 surcharge being higher than the actual capital costs that are required on the
9 environmental assets.

10 **Q. What is the cost of the pollution control bonds?**

11 A. The cost of pollution control bonds is 2.301%. This calculation was done
12 in the same manner as done by the Company in response to question 11 in the
13 Response to Request for Information Posed by the Attorney General Dated
14 January 26, 2005. The Commission has found this method acceptable in past
15 proceedings. This calculation is shown in Schedule 39 of my Exhibit.

16 **Q. Do you believe that the capital cost rates should be updated as conditions in
17 the capital market change?**

18 A. Yes. The pollution control bonds used to calculate the cost of long-term
19 debt are variable rate bonds. If interest rates change, the new pollution control
20 bond interest rates should be used for the cost of long-term debt in the
21 determination of the rate of return.

22 **Q. Do you believe that the capital structure ratios may be updated beyond the
23 test-year and before a final decision is made on the case?**

1 A. Yes, provided that the changes are minor so that there is only a small
2 change in the company's financial risk. If the company's financial risk changes too
3 much, the cost of equity determination could be wrong and no longer valid. I
4 believe that minor changes, which are approved by the Commission as being
5 prudent and that do not change the financial risk of the company, can be included
6 in the rate of return determination. Changes that effect the financial risk of the
7 company beyond the test-year should not allowed.

8 **Q. What is LG&E's overall cost of capital?**

9 A. LG&E's overall cost of capital is in a range from 6.014% to 6.263%. This
10 calculation is shown in Statement 40 of my Exhibit. As I previously stated, the
11 lower part of this range should be used to for the rate of return used in the
12 Environmental Cost Recovery Surcharge tariff.

13 **Q. Dr. Weaver, does this complete your testimony?**

14 A. Yes.

AFFIDAVIT

The affiant, Carl G. K. Weaver, being duly sworn, deposes and states that the prepared testimony, attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in Case No. 2004-00426 An Application of Louisville Gas and Electric Company for Approval of its 2004 Compliance Plan for Recovery by Environmental Surcharge, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct testimony.

Affiant further states that he will be present and available for cross-examination and for such additional direct examination as may be appropriate at the hearing in these cases when scheduled by the Public Service Commission, at which time affiant will further affirm the attached prepared testimony as his direct testimony in such case.



Carl G. K. Weaver

Commonwealth of Virginia
City of Harrisonburg

Subscribed and sworn to before me by Carl G. K. Weaver on this 15 the day of March, 2005.

My commission expires: August 31 2005



Notary Public