

**BEFORE THE
PUBLIC UTILITIES COMMISSION OF OHIO**

**In the Matter of the
Application of Columbus
Southern Power Company
and Ohio Power Company
for Authority to Establish a
Standard Service Offer
Pursuant to § 4928.143, Ohio
Rev. Code, In the Form of
an Electric Security Plan**

**Case No. 11-346-EL-SSO
Case No. 11-348-EL-SSO**

**In the Matter of the
Application of Columbus
Southern Power Company
and Ohio Power Company
for Approval of Certain
Accounting Authority.**

**Case No. 11-349-EL-SSO
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**DIRECT TESTIMONY OF JAMES BURNS RILEY
ON BEHALF OF ORMET PRIMARY ALUMINUM CORPORATION**

May 4, 2012

1 **Q. PLEASE STATE YOUR NAME, TITLE, AND PLACE OF BUSINESS.**

2 A. My name is James Burns Riley. I am the Chief Financial Officer of Ormet Corporation
3 ("Ormet Corp."), which is the parent corporation of Ormet Primary Aluminum
4 Corporation ("Ormet"). My business address is 43840 State Route 7, P.O. Box 176,
5 Hannibal, OH 43931.

6 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

7 A, I am testifying to explain the impact that the proposed rate increase will have upon
8 Ormet.

1 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**
2 **PROFESSIONAL EXPERIENCE.**

3 A. I hold a BBA degree in Industrial Management from The University of Cincinnati. I also
4 hold an MBA from Miami University in Finance. Prior to my current position I have
5 held executive level financial positions for over 25 years.

6 **Q. HOW LONG HAVE YOU BEEN WITH ORMET CORP.?**

7 A. I have been in my current position with Ormet Corp. since July 1, 2007.

8 **Q. PLEASE DESCRIBE YOUR RESPONSIBILITIES AT ORMET AND TO WHOM**
9 **YOU REPORT.**

10 A. My responsibilities include the oversight of all financial and IT functions and I report to
11 Mr. Michael Tanchuk, President and CEO.

12 **Q. WHAT IS ORMET'S PRIMARY BUSINESS?**

13 A. Ormet owns and operates an aluminum smelter in Hannibal, Ohio and an alumina
14 refinery in Burnside, Louisiana.

15 **Q. PLEASE DESCRIBE THE HANNIBAL FACILITY.**

16 A. The Hannibal Facility, encompassing 256 acres, is located on the Ohio River in Hannibal,
17 Ohio. It consists of six potlines, and as currently operated, it is the second largest
18 aluminum smelter in the United States, with the capability of producing approximately

1 271,000 metric tons of molten aluminum annually. The Hannibal Facility provides over
2 1050 high-paying jobs in the economically depressed region of southeastern Ohio.

3 **Q. HOW IS THE ECONOMIC VIABILITY OF AN ALUMINUM SMELTER**
4 **DETERMINED?**

5 A. Economic viability to an aluminum smelter is essentially determined by the relationship
6 between the retail market price of an aluminum smelter's product, aluminum, and its
7 costs, of which electricity is the largest component, consisting of more than 30 percent of
8 production cost during 2011 when taking into consideration the credit received from the
9 Unique Arrangement. If Ormet had not received the credit from the Unique
10 Arrangement, its electricity cost would have been 37 percent of the smelter cash
11 operating cost.

12 **Q. WHAT ARE THE PRINCIPAL OPERATING COSTS OF ORMET'S**
13 **ALUMINUM SMELTER IN HANNIBAL, OHIO?**

14 A. One of the largest principal costs for the production of aluminum products is electricity.
15 The Hannibal aluminum smelter currently utilizes up to 505 MW of electricity 24 hours
16 per day, 365 days per year. Electricity is a fundamental raw material in the aluminum
17 industry. The cost of electricity consumed in producing aluminum in the United States is
18 approximately 25 percent of the cash cost of competitive North American smelters.
19 However, when electric rates are excessive, particularly when the retail price of
20 aluminum is low, aluminum reduction facilities simply cannot operate.

1 **Q. HOW IS THE RETAIL PRICE OF ALUMINUM DETERMINED?**

2 A. Ormet has no ability to affect the selling price of its product. The selling price of basic
3 aluminum has two components. The majority of the price is set by the global supply and
4 demand, and is set by prices published on the London Metal Exchange (“LME”)
5 representing approximately 93 percent of the total price. The other approximately 7
6 percent of the price is determined by the Mid West Premium which represents a premium
7 for aluminum sourced in our region. Ormet’s ability to compete globally is therefore
8 determined by its cash cost of production.

9 **Q. WHY IS IT IMPORTANT FOR ORMET TO HAVE STABLE ACCESS TO**
10 **ELECTRICITY AT RATES AT WHICH IT CAN REMAIN COMPETITIVE?**

11 A. If Ormet is to keep its Hannibal Facilities in operation, it must be able to procure
12 electricity at a price that will enable it to remain competitive. Ormet’s power supply
13 must be stable. Ormet operates at about a 98.5 percent load factor around the clock.
14 Electricity is a vital raw material for the production of aluminum. The six potlines Ormet
15 operates at its Hannibal Facilities must be kept energized at all times to keep the metal in
16 them molten. If electricity to the potline is reduced sufficiently that the metal solidifies,
17 it takes several months and millions of dollars to bring the potline back into operation.

18 **Q. DOES THIS MEAN IT IS IMPOSSIBLE FOR ORMET TO PARTICIPATE IN**
19 **DEMAND RESPONSE PROGRAMS?**

20 A. Not necessarily. Ormet has some ability to reduce the voltage to a potline for a limited
21 period of time without causing the molten aluminum to solidify. However, this capability

1 is limited to approximately 30-45 minutes in duration and a frequency of 60-75 minutes
2 per potline per day, depending on ambient temperature. The plant must maintain an
3 overall energy balance for each potline, so in order to participate in any demand response
4 program, Ormet would need a program that accommodates these limitations.

5 **Q. PLEASE DESCRIBE ORMET'S CURRENT FINANCIAL SITUATION.**

6 A. Ormet emerged from bankruptcy on April 1, 2005 and restarted its smelter operations in
7 Hannibal, Ohio commencing in December 2006 with the first line and completing the
8 start-up of the sixth line on November 28, 2007. The cost of the restart and the working
9 capital build forced Ormet to issue significant new equity and incur debt. Ormet is highly
10 leveraged and when the legacy costs for pensions and retiree health care are included,
11 Ormet faces a formidable hurdle in times of lower prices for the aluminum sold (i.e.
12 sold in ingot form) as electricity rates continue to climb.

13 Ormet's reported 2011 net income of \$137.6 million includes two large one-time benefits
14 of \$126.9 million that will not be repeated in future years. The largest was non-cash
15 income from a net tax benefit of \$102.5 million. In addition, a gain of \$24.4 million was
16 realized from the sale of Ormet's marine terminal and land in Louisiana. Overall free
17 cash flow (cash from operating activities less capital expenditures) consumed \$47.4
18 million of cash in 2011.

19 A significant portion of the \$47.4 million cash expenditure in 2011 was the restart of the
20 Burnside alumina facility at a cost of \$36.8 million. The restart of this facility was made
21 possible primarily by the decrease in the cost of natural gas which is a significant cost
22 component of the refining of bauxite into alumina. This enabled Ormet to be able to

1 supply alumina to the Hannibal Facilities more cheaply by refining it in Burnside than by
2 purchasing it on the market. Thus, even though the restart of the Burnside facility did
3 require an up-front cash expenditure by Ormet Corp., the purpose of that expenditure was
4 to reduce costs at the Hannibal Facility.

5 Ormet funded the \$47.4 million free cash flow shortfall by borrowing \$19.2 million net
6 and selling the marine terminal and land mentioned above for \$27.6 million. Excluding
7 the restart of the Burnside Facility and the sale of the marine terminal, Ormet still had a
8 negative free cash flow despite the benefit that we received from the Unique
9 Arrangement.

10 **Q. DOES ORMET EXPECT ITS CURRENT FINANCIAL SITUATION TO**
11 **CONTINUE?**

12 A. Although we anticipate that the price of aluminum will increase over the long term, we
13 are concerned that the increases in the cost of electricity that we are incurring this year
14 will more than offset any improvement in the LME price of aluminum over the course of
15 2012.

16 **Q. DOES ORMET HAVE A UNIQUE ARRANGEMENT WITH AEP OHIO?**

17 A. Yes, Ormet entered into a Unique Arrangement that was approved by the Commission in
18 2009.

1 **Q. WHAT IS THE PURPOSE OF ORMET’S UNIQUE ARRANGEMENT?**

2 A. The purpose of the Unique Arrangement is to support the maintenance of over 1000 jobs
3 in southeastern Ohio by helping Ormet bridge the turbulent economic situation over the
4 last several years so that it can stay in business in Ohio for the long term. Although the
5 degree of support is capped and declines over time, it accomplishes this by reducing the
6 cost of electricity to reduce the negative cash flow Ormet would otherwise realize when
7 the LME price of aluminum falls. Specifically, it establishes a discount for the price of
8 electricity when the LME is below the price that would allow Ormet to pay the full GS-4
9 tariff and still produce the minimum cash flow necessary to sustain operations and pay its
10 required legacy costs. Since the discount is capped, it may not be adequate to eliminate
11 all negative cash flows if the price reaches very low levels.

12 **Q. PLEASE DESCRIBE THE UNIQUE ARRANGEMENT.**

13 A. The Unique Arrangement has the net effect of indexing the price Ormet will pay for
14 power to levels of the LME price for aluminum. It establishes each year the LME price
15 for aluminum at which Ormet can afford to pay the AEP Ohio GS-4 Tariff rate that
16 would otherwise be applicable to Ormet (the Target Price) and fully fund its legacy cash
17 obligations while keeping the Hannibal Facilities running and preserving jobs. To the
18 extent that the annual LME price falls below the Target Price, a discount in the form of a
19 credit is provided. Conversely, Ormet pays a premium if the annual LME price exceeds
20 the Target Price. The maximum discount that Ormet can receive in each year is capped,
21 and the cap decreases over the term of the Unique Arrangement until it phases out
22 entirely in the last year of the Unique Arrangement.

1 **Q. HOW DOES THE GS-4 TARIFF RATE AFFECT THE RATES ORMET PAYS**
2 **UNDER THE UNIQUE ARRANGEMENT?**

3 A. The maximum discount that Ormet is eligible for under the Unique Arrangement each
4 year is a fixed dollar amount, tied to the AEP Ohio tariff rate that would otherwise be
5 applicable to Ormet, which is currently the GS-4 tariff. The maximum discount
6 decreases over time, decreasing from \$60 million to \$54 million for 2012 and then by
7 another \$10 million each year after that. In other words, the minimum rate that Ormet
8 can pay for electricity in 2012 is the sum of what Ormet would pay under the GS-4 tariff,
9 minus \$54 million. In 2013, it will be the GS-4 tariff rate minus \$44 million, and so on
10 and so forth.

11 **Q. SO WHAT HAPPENS IF THE GS-4 TARIFF RATE INCREASES?**

12 A. In years like this year when Ormet will consume the full discount, the ultimate rate that
13 Ormet will pay for power increases on a dollar-for-dollar basis with the GS-4 tariff rate.
14 If the GS-4 tariff rate that would be applicable to Ormet increases by \$10 million, then
15 the rates that Ormet will pay under the Unique Arrangement will also increase by \$10
16 million.

17 **Q WILL THE UNIQUE ARRANGEMENT PROTECT ORMET FROM RATE**
18 **INCREASES UNDER THE AEP OHIO PROPOSAL IN THIS PROCEEDING?**

19 A. No. Although the Unique Arrangement has been a huge success to date and has
20 accomplished exactly what was intended, enabling Ormet to restart all of its potlines and
21 rehire approximately 160 employees in order to maintain a workforce of 1050, the

1 increases in the cost of electricity that we have incurred and that are proposed in this
2 proceeding may overwhelm the benefits that were created by the Unique Arrangement
3 and undo all that has been accomplished.

4 **Q. WHY WON'T THE UNIQUE ARRANGEMENT BE SUFFICIENT TO PROTECT**
5 **ORMET?**

6 A. Ormet is currently using the full discount allowed because of the depressed LME price
7 for aluminum and the significant increases in the GS-4 tariff rate. Because the maximum
8 discount declines each year and the GS-4 rate is proposed to increase again we currently
9 anticipate that we will need to use the full discount for 2012. The cap on the discount is
10 measured against the GS-4 tariff rate that would otherwise be applicable to Ormet,
11 therefore, for each dollar that the GS-4 tariff rate is increased, Ormet must pay another
12 dollar -- Ormet's rates will increase on a dollar-for-dollar basis with the proposed rate
13 increases.

14 **Q. HOW WILL THE PROPOSED RATE INCREASE IMPACT ORMET?**

15 A. If approved as proposed by AEP Ohio, it could cause Ormet to curtail all or part of its
16 operations at the Hannibal Facilities.

17 **Q. WHY IS ORMET STILL CONSUMING THE FULL DISCOUNT AVAILABLE**
18 **TO IT UNDER THE UNIQUE ARRANGEMENT?**

19 A. The tariff rate for electricity that would otherwise be applicable to Ormet has risen at a
20 significantly faster pace than the LME price of aluminum has risen. LME prices have
21 remained volatile. In the Spring of 2011, they increased to approximately \$2750 per

1 metric tonne in the 2nd quarter of 2011, but then fell sharply again over the summer and
2 into the fall and are now at approximately \$2050 per metric tonne. The LME price for
3 aluminum has not yet risen to the level that would allow Ormet to pay AEP Ohio's full
4 cost of electricity GS-4 tariff rate.

5 Meanwhile, since the LME-based rate went into effect in 2010¹ the delivered GS-4 tariff
6 rate applicable to Ormet has risen from \$45.08/MWh to the current rate of \$51.96/MWh,
7 an increase of 15 percent. The actual rate paid by Ormet has increased at an even faster
8 rate due to the 2010 restart of the two potlines that had been idled and the phasing out of
9 the discount. Ormet's actual costs of delivered electricity have increased from
10 \$25.14/MWh in 2010 to the current rate of \$39.60/MWh -- an increase of **58 percent**
11 over three years. In fact, the actual delivered rate that Ormet now anticipates paying for
12 2012 of \$39.65/MWh is virtually identical to the delivered cost of the GS-4 tariff rate of
13 \$39.78/MWh otherwise applicable to Ormet in 2009 when the Unique Arrangement was
14 implemented.

15 The phase-out of Ormet's discount under the Unique Arrangement and the anticipated
16 escalation for the delivered cost of electricity puts into significant jeopardy the long term
17 viability of the Hannibal smelter and 1050 high-paying jobs.

¹ Under the Unique Arrangement, Ormet paid a fixed price for electricity for calendar year 2009.

1 **Q. HAS ORMET TAKEN ANY STEPS TO REDUCE ITS RELIANCE UPON THE**
2 **DISCOUNT PROVIDED BY THE UNIQUE ARRANGEMENT?**

3 A. Yes. Ormet has focused on improving the energy requirements of the potlines. Over the
4 last two years, there has been a significant reduction in demand. Historically, the
5 Hannibal facility typically required greater than 535 MW at full capacity. Through
6 process improvements and capital investment, the current demand level is approximately
7 500 MW. This is a demand reduction of approximately 35 MW. In addition, the plant
8 has recently achieved historical, 50 plus year records for reduced voltage, increased metal
9 production, increased pot cell life, and labor per metric tonne of production.

10 **Q. HAVE THE STEPS ORMET HAS TAKEN RESULTED IN ANY**
11 **IMPROVEMENT IN ORMET'S ABILITY TO PAY FOR ELECTRICITY?**

12 A. Yes. Ormet's ability to pay for electricity has increased significantly while the contract
13 has been in effect. For example, in 2009, Ormet filed a Schedule for 2010 that set an
14 LME Target Price of \$3,036 based on a projected tariff rate of \$44.62/MWh. In 2010,
15 both the Target Price and the projected tariff rate for calendar year 2011 increased --
16 Ormet submitted a Target Price of \$3,392 based on a rate projection of \$48.02/MWh.
17 However, in 2011, although the Schedule filed by Ormet for 2012 reflected another
18 substantial rate increase with the projected tariff rate rising to \$51.17, it filed a substantial
19 decrease in the Target Price, decreasing it to only \$2,846.² These Schedule filings

² The actual delivered tariff rate to be applicable to Ormet for most of 2012 has yet to be determined, but the rate effective as of April 1, 2012 is \$51.96.

1 demonstrate that even while AEP Ohio's rates were increasing from 2010 to 2012,
2 Ormet's Target Price decreased by 6 percent. This makes it clear that Ormet is getting
3 stronger over time, although unfortunately, AEP Ohio's rates have increased so rapidly
4 that Ormet is still in danger, even with the Unique Arrangement in place.

5 **Q: PLEASE SUMMARIZE YOUR CONCLUSIONS.**

6 A. The cost of electricity has been rising rapidly while the LME has been depressed,
7 reflecting difficulties in the global economy. The bottom line is that Ormet cannot
8 absorb the rate increases and may be forced to curtail all or part of its operations and
9 eliminate jobs. We are sympathetic to AEP's need to protect its shareholders, but
10 strongly object to costs being assigned to us for which we are neither the cause nor the
11 beneficiary. Our survival will depend on this Commission's recognition of these facts
12 and its ability to balance the needs of Ormet, other customers and AEP.

13 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

14 A. Yes, it does.

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**DIRECT TESTIMONY OF PAUL COOMES
ON BEHALF OF ORMET PRIMARY ALUMINUM CORPORATION**

May 4, 2012

1 **Q. PLEASE STATE YOUR NAME, ADDRESS, AND PROFESSION.**

2 A. My name is Paul A. Coomes. My address is 3604 Trail Ridge Road, Louisville, KY
3 40241. I am a consulting economist. I have a Ph.D. in economics from the University of
4 Texas. I have been a faculty member of the University of Louisville since 1985.

5 **Q. HAVE YOU TESTIFIED BEFORE THE PUBLIC UTILITY COMMISSION OF**
6 **OHIO BEFORE?**

7 A. Yes, for a similar case in 2009. Also, I have testified several times before the Kentucky
8 Public Service Commission.

1 **Q. WHY ARE YOU HERE TODAY?**

2 A. I have been retained by Ormet Primary Aluminum Corporation (Ormet) to analyze the
3 likely economic and fiscal impacts in the region if the Hannibal smelter were to close. I
4 have prepared a report, dated July 30, 2011, which I hereby incorporate and adopt the
5 contents of in its entirety into this testimony. A brief summary is below.

6 **Q. WHAT ARE YOUR MAIN FINDINGS?**

7 A. My primary objective was to measure the economic importance of the smelter operations
8 to the regional economy. My approach was to simulate what would likely happen to jobs,
9 payroll, and tax revenues were the plant to close. Ormet employs around 1,000 people
10 and pays wages and salaries annually of about \$63 million, plus excellent fringe benefits.
11 Employees live in eighteen counties in three states, of which sixty percent reside in Ohio.
12 Activity at Hannibal has ebbed and flowed over the past decade, reflecting changing
13 conditions in the international market for aluminum. Were the plant to close, I estimate
14 that the total net annual impact in the region would be a loss of 3,117 jobs and \$238
15 million in total employee compensation. State and local governments in Ohio would lose
16 about \$9 million annually in tax revenues.

17 **Q. HOW IMPORTANT IS THE ALUMINUM INDUSTRY TO THAT REGION?**

18 A. The Ormet smelter is among the largest private sector employers in the regional
19 economy, and clearly the largest industrial employer in Monroe County. Federal data
20 reveal that \$52.1 million of the County's \$118.0 million in total wages and salaries are
21 attributed to the manufacturing industry, of which Ormet is essentially the only firm.
22 With the average pay of \$61,000, no other place of work in the County comes close to
23 this employment opportunity. Moreover, employee benefits are very lucrative. The

1 company reports that its contributions to the social security and Medicare programs for
2 its employees, plus the value of retirement, health insurance, and other fringe benefits are
3 almost as large as the base wages and salaries.

4 **Q. BRIEFLY, WHAT METHODS DID YOU USE TO ANALYZE THE**
5 **IMPORTANCE OF THE ALUMINUM SMELTERS TO THE REGIONAL**
6 **ECONOMY?**

7 A. Because aluminum operations serve primarily national and international markets, they
8 bring new dollars into the regional economy. I use standard regional economic impact
9 methods to evaluate the total economic and fiscal impacts of the loss of the two plants.
10 Region-specific economic multipliers were obtained by simulations of an input-output
11 model, IMPLAN, for the primary aluminum production industry there. This industry is
12 defined according to the North American Industrial Classification System (NAICS),
13 using code 331312.

14 The IMPLAN model provides estimates of indirect (inter-industry purchases) and
15 induced (household spending) effects on sales, jobs, and payrolls for export-based
16 expansions or contractions of any of 440 local industries. For example, the job multiplier
17 for the primary aluminum production industry in the Hannibal region economic area is
18 3.026, meaning that for every job at the aluminum smelter, another 2.026 jobs are created
19 elsewhere in the regional economy. Similarly, the employee compensation multiplier for
20 the industry there is 2.329, meaning that for every dollar of payroll created at the
21 aluminum smelter another \$1.329 in payrolls are created in other sectors around the
22 region. These economic multipliers were used to estimate the likely total impact of a
23 shut-down on jobs and payrolls in the region. By comparing the growth in tax receipts to

1 the growth in payrolls historically, I calculate 'effective' tax rates and use those to
2 estimate the amount of income and sales taxes linked to the aluminum industry payrolls.

3 **Q. THE ORMET ALUMINUM PLANT HAS ADJUSTED ITS PRODUCTION**
4 **VOLUME AND EMPLOYMENT LEVELS SEVERAL TIMES OVER THE PAST**
5 **DECADE TO REFLECT CHANGING PRICE AND COST CONDITIONS. DO**
6 **THESE ADJUSTMENTS SHOW UP IN PUBLICLY AVAILABLE DATA ON**
7 **THE REGIONAL ECONOMY?**

8 A. Yes, it is clear in federal data on employment and wages in Monroe County. For
9 example, in 2005 and 2006, when the facility was idle, wages and salaries fell in the
10 County about \$40 million per year. When all six potlines were again operating in 2008,
11 County wages and salaries rebounded to their 2004 levels, about \$130 million annually.
12 Then, when the facility operated with only four potlines during most of 2009 and 2010,
13 County wages and salaries fell accordingly, to about \$120 million per year. And
14 preliminary data for 2011 show the full recovery in County payrolls after all six potlines
15 were back in operation last year.

16 **Q. DOES THAT CONCLUDE YOUR TESTIMONY TODAY?**

17 A. Yes, thank you.

Paul A. Coomes, Ph.D.

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Academic training

Ph.D. in Economics, 1985, University of Texas, Austin TX; Fields: Control Theory, Mathematical Programming, Econometrics; Dissertation: "Optimal Stochastic Control and U.S. Agricultural Policy"

M.S. in Economics, 1975, Indiana University, Bloomington IN

B.S. in Economics, 1973, Brescia College, Owensboro KY

Professional experience

Professor of Economics, and National City Research Fellow, College of Business, University of Louisville, July 1999 forward.

Executive Director, School of Economics and Public Affairs, College of Business and Public Administration, University of Louisville, August 1996 to June 1999.

Associate Professor of Economics and National City Research Fellow, College of Business and Public Administration, University of Louisville, January 1995 to June 1999.

Associate Professor of Economics, College of Business and Public Administration, University of Louisville, 1992-1999.

Assistant Professor of Economics, School of Business, University of Louisville, 1985-1991.

Teaching Assistant, Economics Department, University of Texas, Spring 1983 and 1985.

Research Associate, Bureau of Business Research, University of Texas, Fall 1981 to Summer 1983.

Assistant Director, Center for Applied Economic Research, University of Kentucky, 1981.

Consulting Economist, May to December 1980.

Manager, Kentucky Economic Information System, Kentucky Council of Economic Advisors, University of Kentucky, Lexington, January 1977 to May 1979.

Instructor, Brescia College, Owensboro KY, 1975-76 academic year.

Courses taught

Urban Economics (Ph.D. and undergraduate levels), Intermediate Microeconomic Theory, Economic Analysis and Forecasting (MBA and undergraduate levels), Senior Seminar in Economics, Principles of Economics, Economic Foundations for MBA students.

Other relevant experience, distinctions

Dissertation committee member for 8 successful doctoral students in Urban Affairs program

Member, Board of Directors, Wellspring, 2011 to present

2007 and 2010 Faculty Distinguished Service Award, College of Business, University of Louisville

2004 Chairman's Award, KentuckianaWorks

2003 Community Service Award, Greater Louisville Inc Technology Network
Member, Board of Directors, Bluegrass Institute for Public Policy, 2004 to 2005
Member, Board of Directors, Thomas D. Clark Foundation, 1998 to 2005
Consulting Editor (Economics), *The Louisville Encyclopedia*, 2000
First Place Winner, Research Publication Category, American Council of Economic Development, 1996
Associate Editor, *Journal of Urban Affairs*, 1995 to 1998
President, Kentucky Economic Association, 1993-94
Frankenthal Group faculty research award, academic years 1990-91 and 1991-92
Board of Directors, Kentucky Economics Association, 1988-1991
1988 Distinguished Faculty Service Award, School of Business, University of Louisville.
Speaker's Bureau, University of Louisville
Co-developer of *MODLER BLUE* software for advanced econometrics work on microcomputers, by contract with Alphametrics Corporation, Philadelphia, 1985-86
Editor, *Kentucky Economy: Review and Perspective*, a quarterly publication of the Kentucky Council of Economic Advisors, Vol. 2, No. 2 through Vol. 3, No. 1
Staff member, Indiana Public Interest Research Group (INPIRG), Bloomington IN, 1974-75

Professional organization memberships

American Economic Association
North American Regional Science Association
Kentucky Economics Association

Academic journal articles

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with Glenn Blomquist, Chris Jepsen, Brandon Koford, and Ken Troske, "Estimating the Social Value of Higher Education: Willingness to Pay of Community and Technical Colleges", North American Regional Science Association meetings, New York, November, 2008.

with William Hoyt, "A Model of Metropolitan Housing", North American Regional Science Association meetings, Savannah, November, 2007.

with William Hoyt, "A Model of Metropolitan Building Permits", Federal Reserve of St. Louis BERG Conference, St. Louis, May 2007.

with William Hoyt, "The Quantity and Price of New Housing Units in Metropolitan Areas", North American Regional Science Association meetings, Toronto, November, 2006.

with William Hoyt, "State Income Taxes and the Destination of Movers", Allied Social Science Association meetings, Boston, January 2006.

with Barry Kornstein, "Metropolitan Clusters: Stability of Membership over Time", North American Regional Science Association, Seattle, November 2004.

"Economic Conditions in Markets Around Kentucky", Federal Reserve Bank of St. Louis, meetings in Memphis, September 2004.

with Barry Kornstein, "Metropolitan Clusters: How Many Market Types are There", North American Regional Science Association, Philadelphia, November 2003.

with Darren Scott and Alexei Izyumov, "The Initial Location Choice of Legal Immigrants Among US Metro Areas", Southern Regional Science Association meetings, Louisville, March 2003.

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- "Measurement Systems for Regional Economic Development", at Federal Reserve Bank of Dallas conference *Can Cities Control Their Destiny?*, San Antonio, TX, August 1999.
- "An Economic Indicator System for Metropolitan Areas", Regional Economic Indicators Workshop, Braga, Portugal, June 1998
- "Comprehensive Measures of Metropolitan Area Performance: Accounting for Economic Development", Southern Regional Science Association annual meetings, Baltimore, MD, April 1996.
- "Long Range Economic and Demographic Forecasting in Support of Local Land Use Planning", North American Regional Science Association meetings, Cincinnati, OH, November 1995.
- "Long Range Economic and Demographic Forecasting in Support of Local Land Use Planning", Kentucky Economic Association annual meeting, Lexington, KY, October 1995.
- "Greater Louisville Forecasts of Jobs, People and Income: 1995 to 2020", Kentucky Economic Association annual meeting, Lexington, KY, October 1994.
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- "Measuring the Impact of the Kentucky Derby", Kentucky Economics Association annual meeting, Lexington KY, October 25, 1991.
- "Using Linked Input-Output/Econometric Models to Analyze Economic Development Proposals", Association of University Business and Economic Research, 1991 Fall Conference, St. Petersburg, FL, October 9, 1991.
- "Using a Metropolitan Area Econometric Model to Analyze Economic Development Proposals", Kentucky Economic Association meeting, Lexington KY, September 14, 1990.
- "Research Tools for Economic Development", presentation to State Governments/Higher Education Partnership Conference, Louisville KY, December 5, 1989
- "Tools for Evaluating the Benefits of Economic Development Proposals", presentation to Leadership Kentucky conference, Erlanger KY, October 13, 1989.
- "Regional Information Sources, Applications and Techniques of Analysis", invited presentation at MODLER/DATAVIEW Users' Conference and Training Session, Philadelphia PA, October 10-11, 1989
- "An Earnings-Weighted Job Index for Cities", Kentucky Economic Association meeting, Louisville KY, September 29, 1989
- "Input-Output Studies and Econometric Models", American Chambers of Commerce Research Association, San Diego, CA, June 1989.
- "The Recovery of Louisville and Other Midwestern Cities", The Economic Roundtable, Louisville KY, February 28, 1989
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- "Filtering Provisional Regional Employment Estimates by Industry", presented at 5th Annual Regional Modelling Conference, Louisville, KY, May 3, 1988

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"Using Your Model to Improve Preliminary Estimates of Regional Income and Employment", presented at 41st Annual Conference of Association of University Business and Economic Research, San Francisco, CA, November 3, 1987.

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"Forecasting the Present in Regional Economies," (revised), presented at Seventh International Symposium on Forecasting, Boston, May 1987

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"PLEM: A Computer Program for Passive Learning Stochastic Control Experiments," presented at Fifth IFAC/IFORS Conference on Dynamic Modeling of National Economies, June 1986, Budapest, HUNGARY.

"An Optimal Control Approach to Managing Unemployment Insurance Trust Funds," Third Annual Regional Economic Modeling Conference, University of Louisville, May 1986.

Reviewing and Refereeing

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European Journal of Operational Research

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books for:

Dryden Publishing Company

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- with Barry Kornstein, "The Economic Impact of Events in 2005 at the Kentucky Fair and Exposition Center and the Kentucky International Convention Center", for the Kentucky State Fair Board, January 2006, 19 pages.
- with Margaret Maginnis, "Louisville's Health-Related Economy 2006", for the Greater Louisville Health Enterprises Network, May 2006, 77 pages.
- with Barry Kornstein, "Kentucky's Economic Competitiveness: A Call for Modernization of the State's Fiscal Policies", November 2004, 73 pages.
- "The Economic Importance of Owensboro's Riverport", for Owensboro Riverport Authority, October 2004, 12 pages.
- with Barry Kornstein and Raj Narang, "The Economic Importance of Military Activity in Kentucky: 2004 Update", with Raj Narang and Barry Kornstein, January 2004, 32 pages.
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- with Ted Strickland, "The Size, Characteristics, and Performance of Technology-intensive Industries in the Louisville Area Economy", for Greater Louisville Inc Technology Network, October 2003, 56 pages.
- with Mark Berger et al, "Kentucky Labor Supply and Demand Surveys", for Kentucky Cabinet for Workforce Development, November 2002, University of Kentucky and University of Louisville, 84 pages.

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- with Michael Price, "The Louisville Labor Force: Trends and Issues", Workforce Investment Board, October 1999, 20 pages.
- with Barry Kornstein, "The Intrastate Distribution of Kentucky State Government Revenues and Expenditures", Fiscal Year 1996-97", August 1999, 16 pages.
- with Alexei Izymov and Babu Nahata, "Attracting Immigrants to Urban Areas", C.S.&E. Foundation, August 1999, 50 pages.
- with Barry Kornstein, "The Economic Impact of the Breeders' Cup Race", Churchill Downs, July 1999, 18 pages.
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with Barry Kornstein, "Economic and Fiscal Impact Models", Kentucky Economic Development Cabinet, 2011-12, \$28,000.

with Barry Kornstein, and Shaheer Burney, "The Economic Importance of Military Activity in Kentucky: 2012 Update", Kentucky Commission on Military Affairs, June 2012, \$30,000.

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with Barry Kornstein, "Updates to Occupational Outlook, Human Capital Scorecard", for KentuckianaWorks, July 2011 to June 2012, \$40,000.

with Barry Kornstein, "The Economic and Fiscal Impact of Kentucky's Distilling Industry", for the Kentucky Distillers Association, 2011-12, \$25,000.

"Economic and Fiscal Performance Measures of Downtown Louisville", Downtown Development Corporation, 2011, 2012, 2013, \$75,000.

with Barry Kornstein, "Updates to Occupational Outlook, Human Capital Scorecard", for KentuckianaWorks, July 2010 to June 2011, \$40,000.

"Water Demand Forecasts for the Cleveland Region", for Cleveland Division of Water, November 2009 to March 2010, \$30,000.

"Forecasts of Metro Government Revenues", for Louisville-Jefferson County Government, January to July, 2009, \$9,000.

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"The Economic and Fiscal Impact of Changes at Fort Knox", for Lincoln Trail Area Development District, July 2009 to December 2010, \$40,000.

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- with Paminder Jassal, Barry Kornstein, and Greg Virgin, "The Economic Importance of Military Activity in Kentucky: 2008 Update", December 2008, \$30,000.
- with Barry Kornstein, "Economic Impact Modeling System for Hospitals", for Kentucky Hospital Association, May to December, 2007, \$25,000.
- with Ken Troske, "The Economic Value of the Kentucky Community and Technical College System", for KCTCS, joint with University of Kentucky, \$260,000, January to December, 2007.
- "The Economic Impact of 2007 Events at the Kentucky Horse Park", for Kentucky Horse Park, January 2007 to June 2008, \$35,000.
- with Tom Rockaway, "Changes in Water Use Patterns", for the American Water Works Association Research Foundation, November 2006 to August 2008, \$301,000.
- with Michael Price, "Updates to Occupational Outlook, Human Capital Scorecard", for KentuckianaWorks, \$60,000, June 2006 to June 2007.
- "Update to Strategic Plan", for Kentucky Commission on Military Affairs, \$20,000, June to December 2006.
- with William Hoyt (UK) "Property Taxation Practices and Impacts throughout the United States since Proposition 13", for National Center for Real Estate Research, \$37,000, July 2005 to June 2006.
- "Louisville's Health Related Economy", for the Greater Louisville Health Enterprises Network, \$35,000, January to June 2006.
- "Economic and Demographic Forecasting Model, with Forecasts, for Regions in Kentucky", for Louisville Gas and Electric Company, \$20,000, November 2005 to June 2006.
- "The Economic Impact of 2005 Events at the Kentucky Fair and Exposition Center, and the Louisville International Convention Center", for Kentucky Fair Board, \$36,000, January 2005 to June 2006.
- "Revenue Forecasting Model, with Forecasts", for Louisville-Jefferson County Metro Government, \$30,000, July 2004 to June 2005.
- "The Economic Importance of Owensboro's Riverport", for Owensboro Riverport Authority, October 2004, \$15,000, July to December 2004.
- "Economic and Demographic Forecasting Model, with Forecasts, for Regions in Kentucky", for Louisville Gas and Electric Company, \$20,000, July 2004 to December 2004.
- with Michael Price, "Occupational Characteristics and Forecasts for 24-County Louisville Economy", plus other labor-related projects, sponsored by KentuckianaWorks, April 2004 to June 2005, \$70,000.
- "The Intrastate Distribution of Kentucky State Government Revenues and Expenditures, FY 2003", sponsored by Greater Louisville Inc, Northern Kentucky Chamber of Commerce, TRI-ED

- economic development group in northern Kentucky, and Lexington Urban County Government, March to December 2004, \$24,000.
- “Capacity and Performance of Philanthropy, Charitable Giving, and the Public Sector in Owensboro-Daviess County Kentucky”, for the Hager Educational Foundation, February to December 2003, \$15,000.
- “The Economic Importance of Military Activity in Kentucky: 2004 Update”, for the Kentucky Commission on Military Affairs, May 2003 to February 2004, \$20,000.
- with Ted Strickland, “The Technology Industry in the Louisville Economy”, for Greater Louisville Inc Technology Network, March to December 2003, \$20,000.
- with Michael Price, “Labor Supply Analysis of the Louisville Market”, KentuckianaWorks, July 2002 forward, \$25,000.
- with Barry Kornstein, “Comparative Study of Light Rail Systems”, Transit Authority of River City, July 2002, \$20,000.
- “Economic Impact Model for Hospitals in Kentucky”, Kentucky Hospital Association, November 2001, \$18,000.
- with Bruce Gale, “Labor Market Supply and Demand Study”, Kentucky Workforce Cabinet, September 2001, \$155,000.
- “Economic, Demographic and Water Sales Forecasts for the 23-County Regional Economy”, for the Black and Veatch Corporation/Louisville Water Company, July 2001, \$33,000,
- with Nan-Ting Chou and Barry Kornstein “Economic, Demographic and Industrial Electricity Forecasts for the Louisville Area”, for the Louisville Gas and Electric Company, \$10,000.
- “Economic Development Strategies for Kentucky Regions”, Kentucky Economic Development Cabinet, July 2001, \$20,000.
- “Economic Analysis of Kentucky Fair Board Events During 2001”, Kentucky Fair Board, February 2001, \$30,000.
- “Economic Monitoring System for Louisville’s Health-Related Economy”, Greater Louisville Inc, January 2001, \$27,000.
- “Economic Analysis Tools” for Industry Inc. of Owensboro, December 2000, \$10,000.
- with Michael Price, “Economic Performance Measures for Kentucky Regions”, Kentucky Economic Development Cabinet, November 2000, \$50,000.
- with Barry Kornstein, “An Economic Analysis of the Gainsborough to Rembrandt Art Show”, Speed Art Museum, September 2000, \$15,000.
- “The Economic Importance of Arts and Cultural Attractions in the Louisville Area”, Greater Louisville, Inc., November 1999, \$18,000.
- with Michael Price, “Labor Force Analysis of the Louisville Economic Area”, Workforce Investment Board, October 1999, \$25,000.
- with Alexei Izymov and Babu Nahata, “Analysis of Immigration Patterns Among US Cities”, CS&E Foundation, August 1999, \$56,000.
- “The Economic Impact of the Breeders’ Cup Race”, Churchill Downs, October 1998, \$18,000.
- “The Fiscal Impact of UPS Operations in Louisville”, United Parcel Service, Fall 1998, \$6,000.

"Strategic Marketing Plan for Military Assets in Kentucky", the Kentucky Commission on Military Affairs, 1998-99, \$200,000.

with Steve Gohmann, "The Economic Impact of the Hospital Industry in Kentucky", Kentucky Hospital Association, Winter 1997-98, \$25,000.

with John Vahaly, "The Economic Impact of Military Activities in Kentucky", Kentucky Commission on Military Affairs, Fall 1997, \$25,000.

"An Economic Impact Model for the Owensboro, Kentucky Regional Economy", Industry Incorporated, Owensboro, Spring 1997, \$5,000.

"The Economic Impact of 1997 Events at the Kentucky Fair and Exposition Center and Commonwealth Convention Center", for the Kentucky State Fair Board, 1997, \$20,000.

with Nan-Ting Chou, "Long-Term Economic and Demographic Forecasts for the Louisville Market, including Forecasts of Electricity and Water Sales by Customer Type", for the Louisville Gas and Electric Company and the Louisville Water Company, five year contract beginning 1997, at \$20,000 per year.

"The Economic Impact of Louisville's Downtown Medical Center", for Jewish Hospital, July 1996, \$6,000.

"Agribusiness in the Louisville Area Economy", for Louisville Area Chamber of Commerce and Kentucky Department of Agriculture, March 1995 to February 1996, \$25,000.

with Michael Price, "Database on Municipal Finances", Jefferson County Governance Task Force, Louisville Area Chamber of Commerce, September 1995, \$8,000.

with Michael Price, "Sub-Area Forecasts of People, Housing and Jobs: 1995 to 2020", for Jefferson County Comprehensive Land Use Plan, Louisville Area Chamber of Commerce and Greater Louisville Economic Development Partnership, September 1994 to August 1995, \$30,000.

with Michael Price and Nan-Ting Chou, "Greater Louisville Forecasts of Jobs, Population and Income: 1995 to 2020", for Jefferson County Comprehensive Land Use Plan, Louisville Area Chamber of Commerce and Greater Louisville Economic Development Partnership, December 1993 to July 1994, \$65,000.

with Stephan Gohmann, "The Impact of the University of Louisville on the Louisville Economy", for President's Office, University of Louisville, September 1994, \$6,000.

"The Economic and Fiscal Impact of the Downtown Medical Center", for Jewish Hospital Corporation, June 1994, \$6,000.

with Bruce Gale, "The Economic Impact of Events at the Kentucky Fair and Exposition Center and the Commonwealth Convention Center", for the Kentucky Fair Board, Summer 1993, \$18,000.

Economic impact study for ARCO Aluminum, June 1993, \$6,000.

Economic consultant to Bank One of Kentucky, 1993 to 1995, \$10,000 per year.

Economic consultant to General Electric Company, Winter 1992-93, \$4,000.

Economic consultant to Louisville Water Company, 1992-95, \$5,000 per year.

Economic consultant to Galloway Appraisal Company, Louisville, August 1992.

Principal Investigator, "A Cost Comparison Between the Archdiocese of Louisville School System and the Jefferson County Public School System" and "Public Tax Savings from the Operation of

Catholic Schools in Jefferson County Kentucky, for the Archdiocese of Louisville, November 1993 to February 1994, \$5,000.

Principal Investigator, "The Archdiocese of Louisville Factbook", for the Archdiocese of Louisville, December 1992 to January 1993, \$5,000.

Principal Investigator, "The Intra-State Distribution of Kentucky State Government Revenues and Expenditures", for Louisville Area Chamber of Commerce, funded by Greater Louisville Economic Development Partnership, November 1991 to August 1992, \$20,000.

Principal Investigator, "Economic Development Electronic Information Network", sponsored by a grant from First National Bank, 1990 to 1995, \$25,000 per year.

Principal Investigator, "The Impact of the 1991 Kentucky Derby and 1991 Breeders' Cup", sponsored by the Equine Industry program at the University of Louisville, February 1991 to July 1992, \$30,000.

Co-Principal Investigator with Dennis Olson, "Analysis and Critique of Louisville Gas and Electric Company's 1988 Load Forecast, December 1989, \$3,000.

Principal Investigator and Creator, "Economic Performance Index for Cities" for the Greater Louisville Economic Development Partnership, through the University Bureau of Economic Research, 1987 to 1993, \$20,000 per year.

Principal Investigator, "Economic Impacts of Economic Development Initiatives", retainer with City/County Office for Economic Development to evaluate the economic and fiscal impact of proposed initiatives, 1989 to 1994, \$20,000 per year.

Co-Principal Investigator with Dennis Olson, Dennis Glennon and Julia Lane, Economic Development Modelling System, funded by City of Louisville and Jefferson County through Bureau of Economic Research, University of Louisville, June to December, 1988, \$120,000.

Long Range Economic Forecasts of the Louisville Economy, for Louisville Gas and Electric Company, through Bureau of Economic Research, University of Louisville, annual, 1987 to present, \$6,000 per year.

Co-Principal Investigator with John Bernardo and Charles Hultman, "Impact of Increased User Fees on Kentucky's Waterborne Transportation," for Kentucky Department of Commerce, by Office of Research, College of Business and Economics, University of Kentucky, April 1982, 105 pages, \$15,000.

Other Consulting, Service

Economic consultant, Brown-Forman, 2007, 2008, 2010, 2011.

Economic consultant, expert witness, for Kentucky Industrial Utility Customers, 2010, 2011.

Economic consultant, Gallatin Steel Corporation, 2010.

Economic consultant, PPL Corporation, 2010.

Economic consultant, expert witness, for Noranda Aluminum, 2009-10.

Economic consultant, expert witness, for Ormet Aluminum, 2008-12.

Economic consultant to E.ON (LGE, KU), 2009.

Economic consultant to Home Builders Association of Louisville, 2008-09.

Economic consultant to Century and Rio Tinto aluminum companies, 2007, 2009, 2011.

Economic consultant to Nally and Haydon Holdings, Bardstown, 2006-07.

Economic consultant to Amazon corporation, 2006

Member of Transition Team, Governor Ernie Fletcher, November-December 2003, pro bono.

Economic Consultant to Elizabethtown Tourism and Convention Bureau, July 2003.

Economic Consultant to Bullitt family, per their real estate development of farm.

Member, Merger Transition Task Force, City of Louisville and Jefferson County Governments, 2001-2002, pro bono.

Expert witness before Kentucky Public Service Commission, E.ON acquisition of Powergen, August 2001.

Consultant to Indiana 21st Century Fund, dispersing \$50 million to commercialize high tech ideas, May 2000.

Economic Consultant to Kentucky Economic Development Corporation, May-July, 1999.

Economic consultant to the City of Los Angeles and the Milken Institute for Job and Capital Creation, 1996-1998.

Economic consultant to Bullitt County (Kentucky) Tourist Commission, January to March, 1997.

Economic consultant to Harrison County (Indiana) Chamber of Commerce.

Economic consultant to Kentucky Utilities Company.

Member of Task Force, Jefferson County Governance Project, 1995, pro bono.

Economic consultant to Bullitt County (Kentucky) Tourist Commission, October-December 1994.

Economic consultant to Carroll County (Kentucky) Economic Development Corporation, July 1994.

Economic consultant to Perry County (Indiana) Economic Development Corporation, June 1993 forward.

Expert testimony, Reynolds Metal Company, April 1993.

Chairman of research committee, Louisville Area Chamber of Commerce, 1992-93, pro bono.

Member of Steering Committee, Regional Economic Development Strategy (REDS), Louisville Area Chamber of Commerce, 1992-94, pro bono.

Member of research committee, Goals for Greater Louisville, 1991-92, pro bono.

Economic consultant to Chi-Chi's restaurant company, 1990-91.

Computer system design and purchasing consultant to Kentucky Indiana Planning and Development Authority (KIPDA), pro bono, February 1989, pro bono.

Member, Delphi Panel on long-range utility forecasts, Louisville Gas and Electric Company, May 1987.

Forecasts for the Retail Automotive Sales and the Coal Industry in central and eastern Kentucky, for First Security National Bank, Lexington, KY, with Charles G. Renfro and Associates, 1980.

Study of the Impact of the Proposed Coal Gasification Plant on the Economies of Daviess and Henderson Counties, KY, for U.S. Department of Energy, with Charles G. Renfro and Associates, 1979.

**The Estimated Economic and Fiscal Impacts
of the Ormet Aluminum Smelter Operation in Hannibal, Ohio**

by
Paul A. Coomes, Ph.D.
Consulting Economist

a research report for
The Ormet Corporation

July 30, 2011

EXECUTIVE SUMMARY

Ormet Corporation, headquartered in Hannibal Ohio, is a major producer of primary aluminum in the United States. The operation is on the Ohio River at the southeastern edge of the state, across the border from West Virginia. It currently employs around 1,000 people and pays wages and salaries annually of about \$63 million. Employees live in eighteen counties in three states, of which sixty percent reside in Ohio. Activity at Hannibal has ebbed and flowed over the past decade, reflecting changing conditions in the international market for aluminum.

The Ormet Corporation is interested in learning about and documenting the regional economic importance of its operations, so they can better communicate the ramifications of rising electricity costs should prices reach a threshold such that the smelting operations were financially threatened. The purpose of this report is to document and communicate the regional economic and fiscal importance of this aluminum plant.

I have used regional data and industry-specific multipliers to estimate the economic and fiscal impacts of the operation. These estimates can be used to quantify the likely impact were the plant closed due to low aluminum prices or high electricity prices. I estimate that the total net annual impact in the region is 3,117 jobs and \$238 million in total employee compensation. State and local governments in Ohio would lose about \$9 million annually in tax revenues. These estimates are for the economic and fiscal categories most easily quantified. There are other impacts, though they are harder to measure with any precision. Local real estate and retail markets are linked to the payrolls at the smelter. Social indicators, like unemployment and crime, also are related to the plant's employment levels, as are public costs for unemployment benefits, retraining, and social services.

BACKGROUND

Aluminum is made from alumina, or aluminum oxide, essentially by passing enormous electric current through steel 'pots' containing a cryolite-alumina mixture. This process is often called reduction, because the electrolysis process separates alumina into its elements, one of which is the aluminum metal. The process is also called smelting. The molten aluminum is siphoned off the pots and formed into crucibles, which when cooled become the familiar ingots traded on the international metals market¹. Alumina is made from bauxite, most of which is obtained from Australia, Brazil, Guinea, and Jamaica. Ormet has an alumina production facility in Louisiana. Because of the extremely large electricity requirements, most aluminum smelting is done near sources of inexpensive electricity, such as hydroelectric plants. Moreover, since the least cost method of shipping alumina and aluminum is by barge, smelters are often located on major rivers such as the Ohio.

The Ormet smelter is among the largest private sector employers in the regional economy, and clearly the largest industrial employer in Monroe County. The Ohio Department of Development produces statistical profiles for each county². It shows the top employers in Monroe County to be:

Monroe County Government
Ormet Corporation
Riesbeck Food Markets
Safe Auto Insurance Group
Slay Transportation Company
Switzerland of Ohio Local Board of Education
Extendicare/Woodsfield Nursing Center

The government, grocery, insurance, school and nursing home organizations exist to serve the local market, and hence do not bring in new dollars to the regional economy. Ormet and Slay Transportation are apparently the only two major employers in the County that generate dollars there, through their sales of goods and services to the rest of the world.

Moreover, federal data reveal that \$52.1 million of the County's \$118.0 million in total wages and salaries for 2010 are attributed to the manufacturing industry, of which Ormet is essentially the only firm³. With the average pay of \$61,000, no other place of work in the County comes close to this employment opportunity. Moreover, employee benefits are very lucrative. The company reports that its contributions to the social

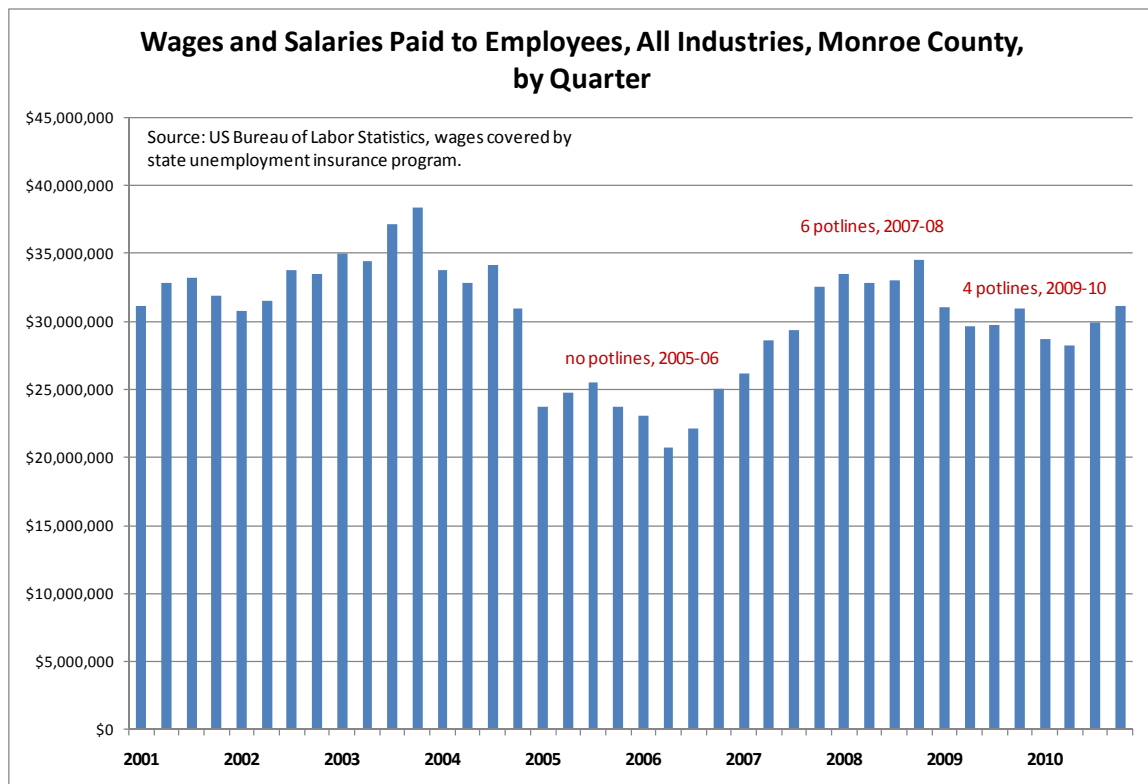
¹ See <http://mii.org/Minerals/photoal.html> for a simple explanation of the production process.

² See www.monroecountyohio.net/Cost%20of%20Business.html.

³ See US Bureau of Labor Statistics, Quarterly Census of Employment and Wages program www.bls.gov/data/.

security and Medicare programs for its employees, plus the value of retirement, health insurance, and other fringe benefits is almost as large as the base wages and salaries.

We can also now discern in published county-level economic data the effects of activity at the Ormet facility over the last decade. Indeed the total payroll in the County seems to ebb and flow with activity at the smelter. See chart below. The company emerged from bankruptcy in April 2005, but the Hannibal smelter lines had been operating well below capacity for two years prior. The facility was essentially idle from 2005 until late 2006, when it was restarted to take advantage of rising aluminum prices. BLS data show that wage and salary payments by all employers in Monroe County fell about 9 percent in 2004, another 26 percent in 2005, and a further 7 percent in 2006. County payrolls bounced back in 2007 after the smelter was brought back into full production. The smelter operated at full capacity in 2007 and 2008, and at partial capacity in 2009 and 2010, and the pattern carries over to the Monroe County payroll totals shown in the chart. All six potlines were back in production beginning in February 2011, so publicly available data on County payroll will show an uptick when it is released over the next year. Clearly, the local economy is very sensitive to production activity at Ormet.

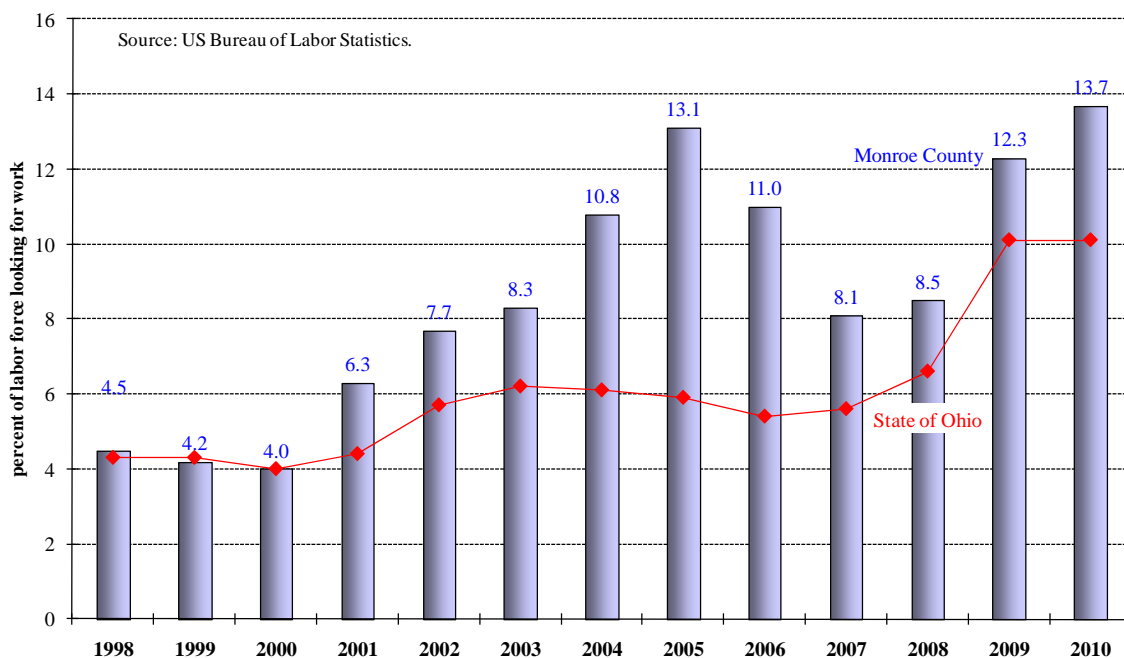


The effect of losing a large employer, particularly in a lightly populated county, goes far beyond the loss of payrolls. Often the company is the primary force in the local housing market, the largest contributor of property taxes to the local school system, the largest contributor of health care benefits and therefore the largest indirect customer of the

local hospital, and the largest contributor of dollars and time to local charities. Moreover, when a large plant closes, not only do public revenues fall but public costs go up. Other statewide employers and employees must contribute to pay for the unemployment benefits to laid off workers, increased Medicaid costs as families lose income and health insurance coverage, and overall increased social services costs. Crime rates tend to rise with unemployment, as do alcohol and drug addiction. Local community and technical colleges see enrollments surge as laid off workers try to retrain. And major community investments must be made in economic development efforts to replace the lost engines.

The linkage between smelter closures and local unemployment is clear from the public data on Monroe County. In the next chart I provide the official estimates of unemployment rates in Monroe and for the state of Ohio as a whole. The state of Ohio tracks the national unemployment rate fairly closely, and one can see the effects of the 2001-02 recession, with Ohio's unemployment rate rising from four to six percent, before falling in 2005. The 2007-09 recession was more severe in Ohio, with the unemployment rate jumping above 10 percent the last two years. Monroe County's rate has been consistently higher than the state average over the last decade. However, the pattern of unemployment in the County tends to follow activity at the aluminum smelter, rising when the smelter was idled during the 2004-06 period, falling in 2007-08 after the plant was back in full production, then rising again when production was limited to four potlines in 2009-10. Monroe's rate is likely to fall in 2011, now that the smelter is fully operating again. Preliminary monthly data for 2011 show a decline in the County unemployment rate of 3-4 percent compared to 2010.

**Estimated Unemployment Rates
Monroe County and State of Ohio**



METHODOLOGY

Because the aluminum and related manufacturing operations serve primarily national and international markets, they bring new dollars into the regional economy. In this sense, a shut-down of the smelter would have large and predictable negative economic and fiscal impacts in these Ohio and West Virginia counties. The activity supports thousands of jobs and millions of dollars in payrolls, and ultimately large tax revenues for Ohio and West Virginia state and local governments. In this section, I explain how I defined the regional economic footprint for purposes of this impact study, and discuss in some detail the input-output model and tax rate calculations used to measure the regional impacts.

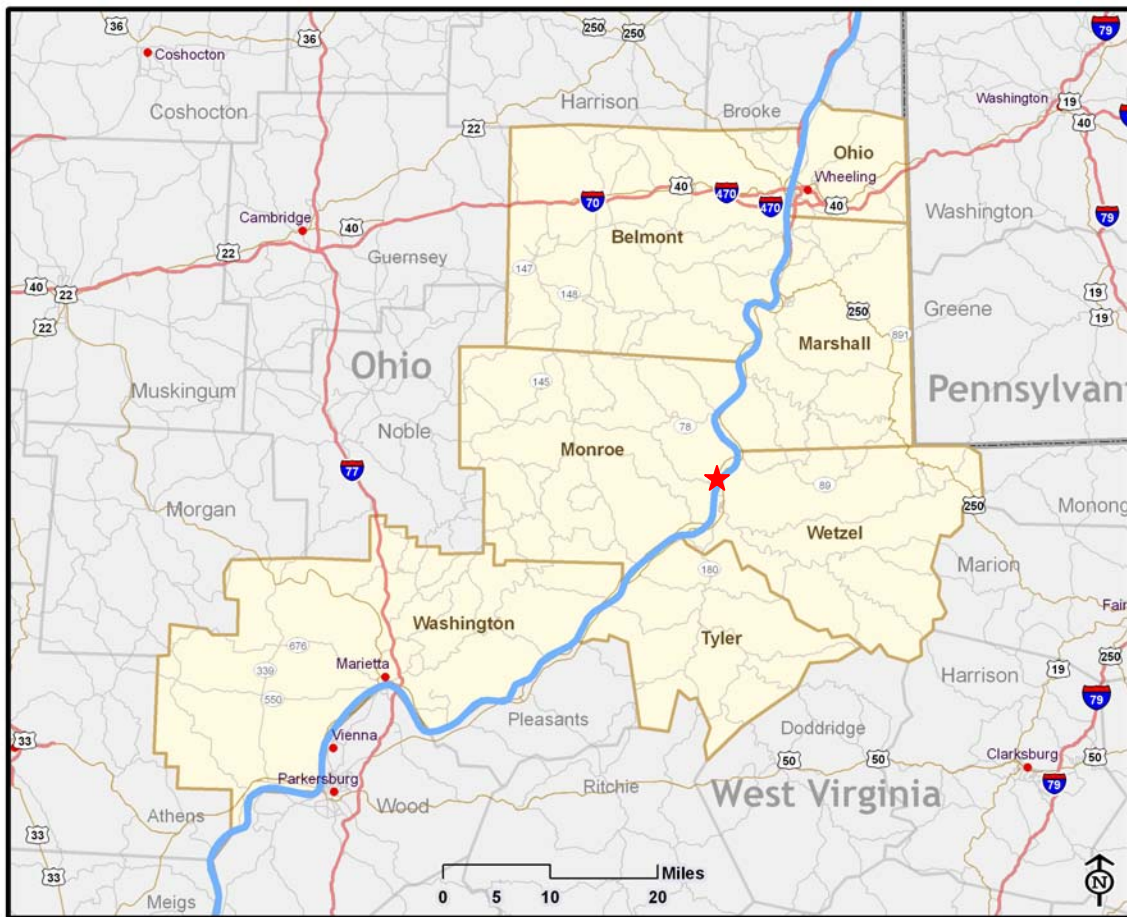
The Regional Economy

While Monroe County is the site for the aluminum plant, the economic and fiscal impacts permeate a much larger region. I define the impact region based on the geographic footprint of the workforce. Workers commute in to the aluminum plant, and take their paychecks to their home county, where they pay for housing and many retail and personal services. Ormet provided a breakdown of employment by county of residence for a pay period, as shown in the accompanying table. Workers reside in eighteen counties in three states. Note however that 96 percent of employees reside in the top seven counties, those nearest to Monroe County. Three of these counties are in Ohio and four are in West Virginia. Interestingly, almost as many workers live in West Virginia (427) as in Ohio (598).

The map on the next page shows the regional counties, major cities, road and water features in the economic impact area. The counties shaded yellow are the top places of residence for Ormet employees, and these are the ones we use to investigate impacts. The red star denotes the approximate location of the Ormet plant and Hannibal, Ohio.

The 2010 Census reveals that that region has been losing population. All counties in the region except Belmont lost residents the last decade, while the states of Ohio and West Virginia added residents. Overall, the seven-county region lost 8,700 people, a decline of 3.4 percent. Monroe County, site of the Ormet aluminum smelter and home

Ormet Hannibal Reduction Plant County of Residence of Employees			
County	State	Number	
Monroe	OH	337	
Wetzel	WV	226	
Belmont	OH	162	
Washington	OH	87	
Marshall	WV	75	
Tyler	WV	68	
Ohio	WV	33	
Pleasants	WV	10	
Wood	WV	8	
Guernsey	OH	6	
Jefferson	OH	3	
Harrison	OH	2	
Brooke	WV	2	
Jackson	WV	2	
Ritchie	WV	2	
Washington	PA	2	
Noble	OH	1	
Harrison	WV	1	
Total		1,027	



to one-third of the Ormet employees, has about 500 less residents now than at the beginning of the decade, a decline of 3.5 percent.

I have also organized some aggregate economic indicators on the counties in the region. Estimates for the last five year period available are shown in the next table. Clearly, the idling of the Ormet facility during part of the decade had a major effect on jobs and payroll in the region. Note that Monroe County suffered by far the greatest job loss, and was the only county to have less wages and salaries in 2009 than in 2001. Moreover, Monroe County had almost no growth in average pay per job during this period. Presumably all these indicators will improve now that the smelter is back to full production. However, it will be a year or two before there is sufficient data to measure the regional economic improvements.

Summary Economic Indicators for 7-County Region				
	2001	2009	Growth	Growth Rate
Jobs, wage and salary (excl. self-employed)				
Belmont, OH	25,447	24,292	-1,155	-4.5%
Monroe, OH	4,885	3,795	-1,090	-22.3%
Washington, OH	26,242	25,493	-749	-2.9%
Marshall, WV	11,686	11,379	-307	-2.6%
Ohio, WV	30,236	31,960	1,724	5.7%
Tyler, WV	2,551	2,322	-229	-9.0%
Wetzel, WV	4,910	4,546	-364	-7.4%
Total, 7-County Region	105,957	103,787	-2,170	-2.0%
Jobs, manufacturing industries				
Belmont, OH	1,641	1,112	-529	-32.2%
Monroe, OH	2,104	1,154	-950	-45.2%
Washington, OH	5,130	3,652	-1,478	-28.8%
Marshall, WV	2,297	1,423	-874	-38.0%
Ohio, WV	1,419	1,453	34	2.4%
Tyler, WV	875	631	-244	-27.9%
Wetzel, WV	130	109	-21	-16.2%
Total, 7-County Region	13,596	9,534	-4,062	-29.9%
Total wages and salaries paid				
Belmont, OH	\$593,018,000	\$770,843,000	177,825,000	30.0%
Monroe, OH	\$142,513,000	\$132,754,000	-9,759,000	-6.8%
Washington, OH	\$777,097,000	\$940,769,000	163,672,000	21.1%
Marshall, WV	\$392,524,000	\$476,473,000	83,949,000	21.4%
Ohio, WV	\$770,353,000	\$1,027,995,000	257,642,000	33.4%
Tyler, WV	\$76,531,000	\$86,396,000	9,865,000	12.9%
Wetzel, WV	\$104,732,000	\$119,413,000	14,681,000	14.0%
Total, 7-County Region	\$2,856,768,000	\$3,554,643,000	697,875,000	24.4%
Average wages and salaries per job				
Belmont, OH	\$23,304	\$31,732	\$4,703	20.2%
Monroe, OH	\$29,174	\$34,981	\$1,413	4.8%
Washington, OH	\$29,613	\$36,903	\$3,367	11.4%
Marshall, WV	\$33,589	\$41,873	\$3,581	10.7%
Ohio, WV	\$25,478	\$32,165	\$4,715	18.5%
Tyler, WV	\$30,000	\$37,208	\$4,674	15.6%
Wetzel, WV	\$21,330	\$26,268	\$2,587	12.1%
Total, 7-County Region	\$26,962	\$34,249	\$3,988	14.8%
Source: US Bureau of Economic Analysis; estimate for Monroe County manufacturing employment not disclosed for 2009, and value shown is for 2008.				

Input-output model of the region

I use standard regional economic impact methods to evaluate the economic and fiscal impacts of the aluminum plant. I purchased detailed economic data for the seven counties most impacted, and used them to build an IMPLAN input-output model of the region. The model is able to simulate the effects of changes in economic activity for any of 440 regional industries. It also can predict detailed inter-industry purchases and household spending related to industrial changes.

In IMPLAN the sector of interest for this study is number 172, Primary Aluminum Production. This industry is defined according to the North American Industrial Classification System (NAICS) code 331312. The official definition is as follows:

This U.S. industry comprises establishments primarily engaged in (1) making aluminum from alumina and/or (2) making aluminum from alumina and rolling, drawing, extruding, or casting the aluminum they make into primary forms (e.g., bar, billet, ingot, plate, rod, sheet, strip). Establishments in this industry may make primary aluminum or aluminum-based alloys from alumina.

www.census.gov/epcd/naics02/def/ND331312.HTM#N331312

Input-output models are all based on a table of estimated transactions among industries. An industry like aluminum must purchase many goods and services

Production Function, Primary Aluminum, Top 24 Intermediate Commodities Purchased	
Commodities purchased	per million dollars of aluminum output
Aluminum products	\$232,708
Electricity, and distribution services	\$168,429
Gold, silver, and other metal ore	\$70,122
Carbon and graphite products	\$43,224
Natural gas, and distribution services	\$40,521
Truck transportation services	\$36,752
Wholesale trade distribution services	\$22,772
Nonferrous metals (except copper and aluminum)	\$17,931
Management of companies and enterprises	\$15,309
Semiconductor and related devices	\$13,572
Other industrial machinery	\$10,722
Iron and steel and ferroalloy products	\$9,742
Aluminum products from purchased aluminum	\$9,356
Rail transportation services	\$6,540
Printed circuit assemblies (electronic assemblies)	\$6,258
Machined products	\$5,255
Coated, engraved, heat treated products	\$4,682
Used and secondhand goods	\$4,626
Refined petroleum products	\$4,404
Alkalies and chlorine	\$3,525
Services to buildings and dwellings	\$3,419
Paperboard containers	\$3,308
Management, scientific, and technical consulting services	\$3,056
Specialized design services	\$2,935
subtotal	\$739,168
plus other commodities not shown	\$69,251
total intermediate purchases	\$808,419
value added by industry	\$191,581
Total value of output	\$1,000,000
Source: IMPLAN, version 3	

from other industries to produce its finished product. Economists call the relationship between an output and its inputs a production function. IMPLAN's production function for primary aluminum is shown in the accompanying table, ranked by most important. The first entry, aluminum products, refers to purchased alumina. The model predicts that \$232,708 of alumina must be purchased for every \$1 million of aluminum produced. Next most important is electricity, at \$168,429, and so on. This is the foundation for the input-output model I have constructed for the Ormet seven county region. The model has information about the local availability of industrial supplies and retail spending opportunities, and makes adjustments to account for what must be imported into the region to produce aluminum and provide goods and services to the impacted households. The regional economic impact of the aluminum industry is derived from those linkages, often summarized by 'multipliers' showing the predicted change in total regional activity per change in industry activity.

The IMPLAN model provides estimates of indirect (inter-industry purchases) and induced (household spending) effects on sales, jobs, and payrolls for export-based expansions or contractions of any of 440 local industries. For example, the job multiplier for the primary aluminum production industry in the Hannibal region economic area is 3.026, meaning that for every job at the aluminum smelter, another 2.026 jobs are created elsewhere in the regional economy. Similarly, the employee compensation multiplier for the industry there is 2.329, meaning that for every dollar of payroll created at the aluminum smelter another \$1.329 in payrolls are created in other sectors around the region.

Regional economists often make the distinction between the indirect and induced components of a multiplier, and in some cases make separate estimates for each. The indirect effects refer to the linkages between the exporting industry (aluminum) and their industrial vendors (transportation, electricity, barges, tools, computers, insurance). When the directly impacted industry expands, it raises its purchases from its vendors, thus lifting their employment and payrolls. The induced effects refer to the impact of the new export-based sales on the local economy through the rounds of re-spending of the additional household income caused by the expansion. Regional sales of cars, groceries, building supplies, banking services, and so on are all sensitive to growth in disposable income. In the next table, I show the top 24 regional industries linked to primary aluminum activity, as predicted by the IMPLAN model. I simulated the impact of 1,030 aluminum jobs on the 7-county region, and investigated the decomposition of the impacts in terms of interindustry linkages and household purchases. One can see the largest inter-industry impacts are in power supply, trucking, and wholesale trade industries. Aluminum employees spend much of their paychecks in the region and this creates other jobs, primarily in retail and personal service industries. The greatest impact is on restaurants, followed by three health care industries.

Top 24 Regional Industries Linked to Primary Aluminum Industry			
Linked through interindustry purchases		Linked through household spending	
Electric power generation, transmission, and distribution	247.5	Food services and drinking places	116.0
Transport by truck	180.1	Private hospitals	63.3
Alumina refining and primary aluminum production	113.5	Offices of physicians, dentists, and other health practitioners	53.4
Wholesale trade businesses	81.3	Nursing and residential care facilities	43.9
Food services and drinking places	51.5	Retail Stores - Food and beverage	36.6
Business support services	50.5	Retail Stores - General merchandise	34.3
Maintenance and repair construction of nonresidential structures	39.0	Civic, social, professional, and similar organizations	26.4
Services to buildings and dwellings	33.0	Private household operations	25.5
Management of companies and enterprises	28.0	Retail Stores - Motor vehicle and parts	24.6
Automotive repair and maintenance, except car washes	23.8	Individual and family services	22.0
Mining coal	21.9	Real estate establishments	21.6
Employment services	21.8	Wholesale trade businesses	19.3
Legal services	20.6	Monetary authorities and depository credit intermediation activities	19.1
Accounting, tax preparation, bookkeeping, and payroll services	20.4	Retail Stores - Miscellaneous	19.0
Extraction of oil and natural gas	20.1	Medical and diagnostic labs and outpatient and other ambulatory care services	15.8
Monetary authorities and depository credit intermediation activities	19.3	Retail Stores - Building material and garden supply	15.5
Commercial and industrial machinery and equipment repair and maintenance	16.3	Retail Nonstores - Direct and electronic sales	15.0
Architectural, engineering, and related services	15.3	Home health care services	14.5
Other support services	15.3	Personal care services	13.1
Other state and local government enterprises	13.2	Retail Stores - Health and personal care	12.7
Investigation and security services	11.6	Retail Stores - Clothing and clothing accessories	12.4
Waste management and remediation services	11.1	Insurance carriers	12.2
Natural gas distribution	10.9	Private junior colleges, colleges, universities, and professional schools	12.0
Civic, social, professional, and similar organizations	10.1	Retail Stores - Gasoline stations	9.8
Subtotal	1,076.2	Subtotal	657.9
Total	1,231.5	Total	855.2

Source: IMPLAN, version 3, Sector 172 Primary Aluminum Production, Seven County Region, using 2009 county-level economic data.

Taxes and fiscal linkages

There are no good national sources of data on which to make estimates of the fiscal impacts of an industrial expansion or contraction in a region. The company has provided detailed records on direct tax payments to local and state governments, including property taxes, sales taxes, and electricity taxes. We aggregate these in our fiscal impact statement in the next section. However, the impacts on governments are much greater than these direct payments. Employees pay sales taxes when they spend their wages in the local economy, and are liable for income taxes in Ohio and West Virginia, depending on their county of residence. We can estimate these payments using published data on tax receipts from Ohio and West Virginia state governments, as well as tax information from city and county governments in the region. By comparing the growth in tax receipts to the growth in payrolls historically, I calculate 'effective' tax rates and use those to estimate the amount of income and sales taxes linked to the aluminum industry payrolls.

The calculations are shown in the table on the last page of this report. Good county-level detail is available for Ohio, and in West Virginia I rely on state totals only. Note, for example, that residents of the three Ohio counties paid an average of \$68.3 million in state individual income taxes the last five years for which data are published. This amounts to 3.9 percent of all wages and salaries paid in those counties. I use this as the

effective state income tax rate of Ohio County government, and apply it to the Ormet-related wages and salaries flowing to Ohio residents to estimate income tax payments. A similar calculation was made for Ohio state and local sales taxes generated. County level tax collections were not available for West Virginia, so we use the statewide average of income and sales tax collections as a share of wages and salaries paid there. We apply the resulting effective tax rates to the portion of Ormet-related wages and salaries predicted to flow to West Virginia residents.

Additional tax impacts are also likely, though much harder to quantify. For example, proprietors and corporations around the region are liable for state individual and corporate income taxes. Gasoline taxes, unemployment insurance taxes, insurance premiums taxes, building permit fees, motor vehicle sales taxes, and many other business tax categories would see some decline if the smelter were to shut-down. Employees would also pay less in the way of gasoline taxes, motor vehicle sales taxes, and there would be a dampening effect on the regional real estate market. These categories are much harder to measure than the income and general sales taxes, but fortunately are not as important dollar-wise as the main taxes I do measure in this report.

IMPACTS

In this section, I display and explain my estimates of the economic and fiscal impacts of the aluminum smelter. I am essentially simulating what would happen if the operation was removed from the region. The plant employs over 1,000 persons with an annual payroll of about \$63 million, plus \$39 million in employee benefits. Direct tax payments by the company plus tax withholdings for employees are over \$4 million.

Estimated Annual Economic and Fiscal Impacts of the Ormet Aluminum Facility in Hannibal, Ohio		
Direct impacts		
1	Jobs	1,030
2	Wages and salaries	\$62,907,823
3	Other employee compensation, labor costs	\$39,229,120
4	Taxes withheld or paid to Ohio state government	\$3,950,855
5	Taxes paid to local governments	\$415,991
Regional multipliers for primary aluminum		
6	Jobs - total	3.026
7	Employee compensation - total	2.329
Total impacts		
8	Jobs in region	3,117
9	Employee compensation in region	\$237,900,709
10	Income, sales, property and other taxes to Ohio state government	\$8,703,004
11	Income and sales taxes to West Virginia state government	\$6,086,803
12	Income, sales, and property taxes to local governments	\$415,991
13	Total tax revenues, all state and local governments	\$15,205,798

On lines 8 and 9, I provide estimates of the total effects – direct plus spinoff. Here I use economic multipliers to estimate the job and employee compensation impacts regionally. I estimate the total job impact in the 7-county region to be over 3,100 jobs, and the employee compensation impact to be about \$238 million annually. Employee compensation includes many company provided fringe benefits, most of which are not taxable. So, I estimate the share (62 percent) of the total employee compensation that is taxable wages and salaries, and use that to estimate fiscal impacts.

The company does not know the amount of Ohio and West Virginia state income taxes actually paid by their employees, since employees file income tax returns from their place of residence. The company does withhold state income taxes from workers paychecks, but have no way of knowing how much additional tax employees ultimately end up paying, or how big of a tax refund they receive each year. To estimate the state income taxes paid, I applied effective income tax rates, as described in the previous

section. These estimates are shown in lines 10 and 11. I estimate that Ohio state government is receiving about \$8.7 million annually in individual income taxes, sales taxes, and electricity taxes from Ormet-related activity⁴. West Virginia state government receives about \$6.1 million. And local governments receive over \$400,000 in tax revenues.

⁴ The full fiscal impact would be more than the tax receipts lost, since the state would have to incur tens of millions of dollars in costs for unemployment compensation and increased Medicaid expenditures in the region if the plant shut down and the employees lost their jobs.

Ormet Exhibit _____
PAC-2

Effective Tax Rate Calculations							
	2004	2005	2006	2007	2008	2009	Average, 2004 - 2009
Ohio state income taxes received from							
Belmont	\$29,443,682	\$30,132,266	\$30,851,757	\$32,715,522	\$33,220,505	\$30,326,621	\$31,115,059
Monroe	\$5,026,975	\$4,874,912	\$5,135,252	\$5,545,471	\$5,654,454	\$5,420,558	\$5,276,270
Washington	\$32,047,893	\$31,518,872	\$33,014,350	\$35,586,746	\$31,259,303	\$28,149,400	\$31,929,427
subtotal	\$66,518,550	\$66,526,050	\$69,001,359	\$73,847,739	\$70,134,262	\$63,896,578	\$68,320,756
Ohio state sales taxes received from							
Belmont	\$43,523,697	\$44,248,981	\$42,373,952	\$42,479,599	\$39,778,548	\$39,527,820	\$41,988,766
Monroe	\$4,244,878	\$4,419,030	\$4,424,459	\$4,980,664	\$5,540,973	\$5,270,437	\$4,813,407
Washington	\$32,924,951	\$32,839,308	\$34,507,745	\$35,936,595	\$35,430,960	\$33,100,653	\$34,123,369
subtotal	\$80,693,525	\$81,507,319	\$81,306,156	\$83,396,858	\$80,750,481	\$77,898,910	\$80,925,542
Ohio County County sales taxes received							
Belmont	\$11,870,099	\$12,067,904	\$11,556,532	\$11,585,345	\$10,848,695	\$10,780,315	\$11,451,482
Monroe	\$1,157,694	\$1,205,190	\$1,206,671	\$1,358,363	\$1,511,174	\$1,437,392	\$1,312,747
Washington	\$8,979,532	\$8,956,175	\$9,411,203	\$9,800,889	\$9,662,989	\$9,027,451	\$9,306,373
subtotal	\$22,007,325	\$22,229,269	\$22,174,406	\$22,744,598	\$22,022,858	\$21,245,157	\$22,070,602
Wages and salaries paid							
Belmont	\$682,957,000	\$710,658,000	\$727,781,000	\$745,058,000	\$776,099,000	\$770,843,000	\$735,566,000
Monroe	\$142,061,000	\$98,454,000	\$101,760,000	\$124,241,000	\$141,309,000	\$132,754,000	\$123,429,833
Washington	\$808,574,000	\$827,113,000	\$875,083,000	\$953,548,000	\$994,755,000	\$940,769,000	\$899,973,667
subtotal	\$1,633,592,000	\$1,636,225,000	\$1,704,624,000	\$1,822,847,000	\$1,912,163,000	\$1,844,366,000	\$1,758,969,500
Effective income tax rate, Ohio	4.1%	4.1%	4.0%	4.1%	3.7%	3.5%	3.9%
Effective sales tax rate, Ohio	4.9%	5.0%	4.8%	4.6%	4.2%	4.2%	4.6%
Effective sales tax rate, three Ohio counties	1.3%	1.4%	1.3%	1.2%	1.2%	1.2%	1.3%
West Virginia State Totals							
State income tax receipts (FY)	\$1,074,912,080	\$1,171,987,478	\$1,344,720,394	\$1,318,250,000	\$1,408,600,000	\$1,489,900,000	\$1,197,206,651
State sales and use tax receipts (FY)	\$1,051,461,638	\$1,095,339,835	\$1,157,982,670	\$1,018,000,000	\$1,026,900,000	\$1,180,983,000	\$1,101,594,714
Wages and salaries paid	\$21,902,972,000	\$22,862,225,000	\$24,185,698,000	\$25,281,832,000	\$26,806,002,000	\$26,815,530,000	\$22,983,631,667
Effective income tax rate, WV	4.9%	5.1%	5.6%	5.2%	5.3%	5.6%	5.2%
Effective sales tax rate, WV	4.8%	4.8%	4.8%	4.0%	3.8%	4.4%	4.8%
Sources for tax receipt data: Ohio Department of Taxation (http://tax.ohio.gov/channels/research/other_tax_statistics.stm),							
with state sales tax collections by county estimated from county sales tax, using ratio of tax rates (state 5.5%/county 1.5%);							
and West Virginia State Budget Office (www.budget.wv.gov/reportsandcharts/revenueuereports/Pages/default.aspx).							
Wage and salary data from the US Bureau of Economic Analysis.							

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of)	
Columbus Southern Power Company and)	
Ohio Power Company for Authority to)	Case No. 11-346-EL-SSO
Establish a Standard Service Offer)	Case No. 11-348-EL-SSO
Pursuant to §4928.143, Ohio Rev. Code,)	
in the Form of an Electric Security Plan.)	
In the Matter of the Application of)	
Columbus Southern Power Company and)	Case No. 11-349-EL-AAM
Ohio Power Company for Approval of)	Case No. 11-350-EL-AAM
Certain Accounting Authority.)	

ANSWERING TESTIMONY OF
WHITFIELD A. RUSSELL
ON BEHALF OF
ORMET PRIMARY ALUMINUM CORPORATION

Filed May 4, 2012

TABLE OF CONTENTS

	<u>Page</u>
The Importance Of Electricity Pricing To Aluminum Smelters	4
Ormet's Costs Of Power Are A Critical Factor In Its Ability To Compete	4
ESP II Would Impose Significant Rate Increases On Ormet	8
Other Ratepayers Benefit From Ormet's Continuation As A Customer Of AEP Ohio.....	11
Problems With The RSR.....	14
Proposed Solutions	16

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Ohio Power Company for Approval of)	Case No. 11-350-EL-AAM
Certain Accounting Authority.)	

**ANSWERING TESTIMONY OF
WHITFIELD A. RUSSELL
ON BEHALF OF
ORMET PRIMARY ALUMINUM CORPORATION**

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Whitfield A. Russell. I am a public utility consultant and principal of

Whitfield Russell Associates. My office is located at 4232 King Street,

Alexandria, VA.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of the Ormet Primary Aluminum Corporation ("Ormet").

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS.

A. I hold a Bachelor of Science degree in Electrical Engineering from the University

of Maine at Orono, a Master of Science degree in Electrical Engineering from the

University of Maryland, and a Juris Doctor degree from Georgetown University Law Center. I have been accepted as an expert on bulk power systems in more than 150 proceedings before State and Federal courts, administrative agencies and other tribunals in more than 30 States and in three Canadian provinces. I founded Whitfield Russell Associates in 1976. My Statement of Qualifications is attached.

Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?

A. My purpose is to address the Modified Electric Security Plan (“ESP II”) filed on March 30, 2012, by Columbus Southern Power Company and Ohio Power Company (together called AEP or AEP Ohio). If ESP II is approved as filed, GS-4 rates will have increased 50% from 2007. The cumulative effect of these increases is significant and threatens the ability of a large industrial user, like Ormet, to continue its Ohio operations.

In the present application, ratepayers are asked to guarantee AEP a several-year stream of non-fuel generation revenues through a mechanism called the Retail Stability Rider (“RSR”). AEP takes the position that it needs this guaranteed revenue as a means of protecting itself from the harms that might be occasioned by ESP II’s encouragement of customer shopping and competition in Ohio.

Although the RSR protects AEP from the financial harms caused by its recent loss of customers, it would force AEP’s ratepayers who aren’t even allowed to shop (such as Ormet) to pay for the potential benefits of shopping. It also would guarantee AEP several years of revenues from the more than 36% of its customers who have already left the Company (or given notice of that intent)

before the ESP II Application was even filed.¹ By definition, their exit has nothing to do with anything in the Application, and they were not driven to shop by any pro-competitive measures advanced by ESP II. Finally, ratepayers would be forced to guarantee revenues from customers who stop taking service from AEP for reasons wholly unrelated to shopping -- i.e., going out of business, leaving the State, conservation efforts, etc.

In short, the RSR forces ratepayers to protect AEP from competition, ensuring that it receives a steady stream of non-fuel revenues, no matter how many customers leave or why.

In my testimony, I will explain these and other problems with the RSR. I will also outline: (a) the importance of electricity pricing to aluminum smelters generally, (b) how Ormet's costs of power adversely affect its ability to compete, (c) how the ESP II would impose a significant rate increase on Ormet and threaten its ability to continue in business in Ohio, and (d) how Ormet's continuing operation in Ohio has benefited and will continue to benefit other Ohio ratepayers. I will also explain and support my recommendations for the following relief:

1. If the RSR is approved and implemented, any customers who cannot shop (including Ormet) should be exempted from it. Applying that rider to those parties would violate the principle of cost-causation in that they are not permitted either to engage in - or benefit from - shopping, the principal

¹ The target revenue in Exhibit WAA-6 is set based on generating revenues earned in 2011, including at least some revenues earned on the 36% of AEP's connected load which switched before the Application was filed. See Mr. Allen's testimony at 4:1-7 which indicates 26.1% of connected load had switched as of March 1, 2012, a percentage which would rise to 36.7% after pending and noticed load switches are accounted for.

cause of the lost revenues to be collected under the RSR. If these parties are not exempted, the RSR Rider should be redesigned to prevent a shift of benefits from high-load-factor customers to low-load-factor customers, a further violation of cost causation principles.

2. The Fuel Adjustment Clause ("FAC") should be redesigned to employ time-of-use energy charges. Ormet takes a disproportionately large portion of its energy during off-peak hours when fuel and purchased power costs are lower than average.

THE IMPORTANCE OF ELECTRICITY PRICING TO ALUMINUM SMELTERS

Ormet's Costs of Power Are a Critical Factor in its Ability to Compete

Q. PLEASE SUMMARIZE ATTRIBUTES OF ORMET'S LOAD AND ITS NEED FOR LOW-COST POWER.

- A. Ormet Primary Aluminum Corporation ("Ormet") operates an aluminum smelter at Hannibal, Ohio that purchases approximately 505 MW of power at approximately 98.5% load factor under a special contract tied to the GS-4 Rate Schedules of Ohio Power Company ("OPCo") and of Columbus Southern Power Company ("CSP"), (referred to jointly as AEP or AEP Ohio).

Ormet's cost of power represents approximately one-third of Ormet's total cost of making aluminum. Under the rates proposed in connection with ESP II, the cost of power to Ormet under the two GS-4 Rate Schedules is estimated to be approximately \$232 million per year.

**Q. YOU INDICATED THAT ORMET NEEDS LOW-COST POWER.
PLEASE EXPLAIN.**

- A. Ormet has been buying power from AEP Ohio at a discount from the GS-4 rates under the Special Contract it entered into in 2009. Despite that advantage, Ormet is once again threatened with the possibility of being forced to shut down all or part of its Hannibal operations. Ormet's margins have been severely squeezed by (a) low aluminum market prices, (b) substantial increases in the GS-4 rate and (c) the year-by-year decline in discounts required by Ormet's present Special Contract.

More generally, Ormet competes with aluminum smelters in a worldwide market. In many parts of the world, smelters are supplied at subsidized rates and/or from low-cost hydro/coal generating facilities. Ormet paid \$50.3/MWH in 2008 and \$35.8/MWH in 2009 whereas the global average cost of power to smelters was forecast to be \$30.7/MWH in 2009. Smelters in low-cost areas paid much less. For example, smelters in Africa were forecast to pay \$15.4/MWH in 2009 and smelters in Russia were forecast to pay \$18.1/MWH.²

As recently as June 2000, there were 23 smelters operating in the United States. Ten of those smelters were then operating in the Pacific Northwest on low-cost hydro power supplied by BPA or public bodies (e.g., Chelan County PUD). Most of those 23 smelters are now shut down because the power rates they

² See Testimony of Ormet Chief Executive Officer, Mike Tanchuk, in Case No. ER09-119-EL-AEC, dated April 23, 2009, pages 5-6. I understand from Mr. Tanchuk that actual 2009 rates were similar. The global average cost of power to smelters was \$29.2/MWH in 2009. Smelters in Africa and smelters in Russia paid \$19.0/MWH and \$13.1/MWH respectively.

would be required to pay are so high that their potential aluminum production would not be competitive on price. As of December 31, 2011, only 15 of those 23 smelters remained in existence, five of which were shut down, leaving only ten currently operating.³

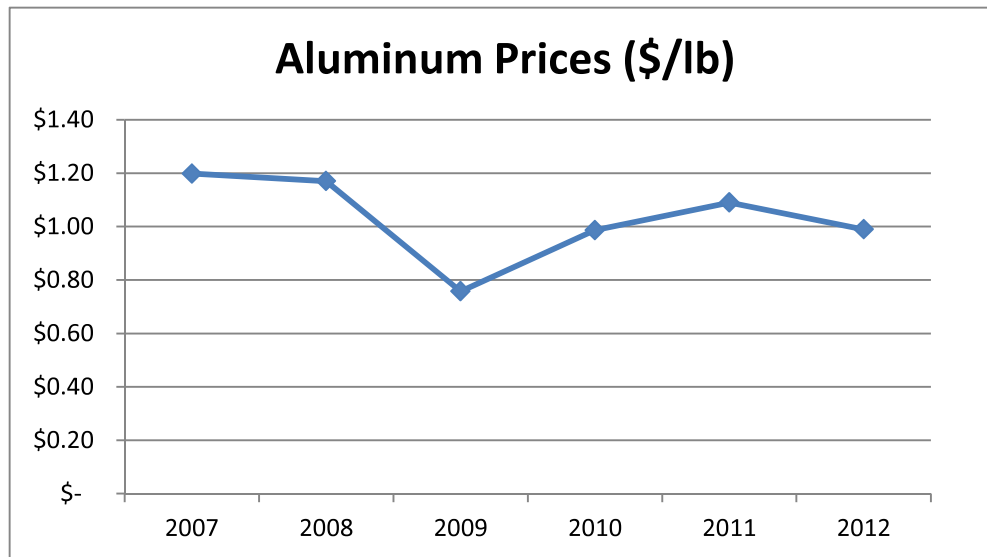
In 1999, the capacity of primary aluminum smelters in the United States was 3,779 thousand metric tons. That capacity declined by more than half to 1,726 thousand metric tons in 2010.⁴

Q. YOU STATED THAT ALUMINUM PRICES HAD DECLINED. WHAT HAS BEEN THE TREND IN ALUMINUM PRICES?

A. Aluminum prices averaged \$1.20/lb in 2007 and \$1.17/lb in 2008 before plummeting to \$0.76/lb in 2009 (when Ormet entered its Special Contract). Since then, aluminum prices recovered only partially to an average of \$0.99/lb in 2010, \$1.09/lb in 2011 and \$0.99/lb in 2012 (through March).

³ See http://www.lightmetallage.com/producers_primary.php

⁴ See <http://minerals.usgs.gov/minerals/pubs/commodity/aluminum/index.html#mcs>



Q. HAS THE COMMISSION TAKEN ANY ACTION TO TRY TO ENSURE ORMET'S ACCESS TO LOWER-PRICED ELECTRICITY?

- A. Yes, in September of 2009, Ormet entered into its present Special Contract, the POWER AGREEMENT between ORMET PRIMARY ALUMINUM CORPORATION and OHIO POWER COMPANY and COLUMBUS SOUTHERN POWER COMPANY ("Special Contract" or "Unique Arrangement"), effective from the filing date of the executed contract through December 31, 2018, subject to Article Three, Early Termination.

The Special Contract was designed to preserve more than 1000 Hannibal-based jobs by helping Ormet bridge the potentially turbulent economic situation over the ensuing few years so that it could stay in business in Ohio over the long term. Ormet had been struggling to balance its power costs since emerging from bankruptcy in 2005. When Ormet filed testimony in April 2009, global aluminum prices had dropped 53% since July 2008 as a result of declining global demand.

Q. PLEASE SUMMARIZE ANY OTHER PROVISIONS OF THE 2009 SPECIAL CONTRACT THAT ARE RELEVANT TO THIS PROCEEDING.

A. Ormet's Special Contract requires Ormet to take from AEP - and to pay AEP for - 100% of Ormet's power requirements. E.g., under Article 2.01, "AEP Ohio agrees to furnish to Ormet, and Ormet agrees to take from AEP Ohio, all of the electric energy of the character specified herein . . . except as otherwise set forth herein."

ESP II WOULD IMPOSE SIGNIFICANT RATE INCREASES ON ORMET

Q. YOU STATED THAT ORMET RECEIVES DISCOUNTS FROM THE GS-4 RATES OF AEP OHIO. WHAT HAS HAPPENED TO GS-4 RATES IN THE LAST FEW YEARS?

A. GS-4 rates have increased 50% from 2007 (when Ormet would have paid \$35.65/MWH had it taken service under the GS-4 tariff) to 2012 (when Ormet expects to pay \$53.31/MWH under the proposed ESP II GS-4 before adjusting downward for discounts provided under its Special Contract).⁵

⁵

The GS-4 rate in 2007 was	\$35.65
Ormet GS-4 (before Special Contract discount) in 2011	\$48.22
Jan-Feb 2012	\$52.49
Under the PUCO Order of Feb 23 rd , 2012	\$49.75
Current Rates April-May 2012-8% increase over 2011	\$51.96
Proposed ESP II, Jun 2012- May 2013	\$53.31

A major factor in the rise of the GS-4 rate has been the FAC component which has increased 60% since 2009 and 22% just since 2011, from

FAC Average Cost in 2009	\$22.09	100%
FAC Average Cost in 2010	\$25.80	117%
FAC average cost in 2011	\$28.94	131%
FAC for Q2 2012 is	\$35.42	160%

Q. IN ADDITION TO THE INCREASE IN GS-4 RATES, HAVE ORMET'S DISCOUNTS OFF THOSE RATES DECLINED AS WELL? IF SO, HOW MUCH AND WHY?

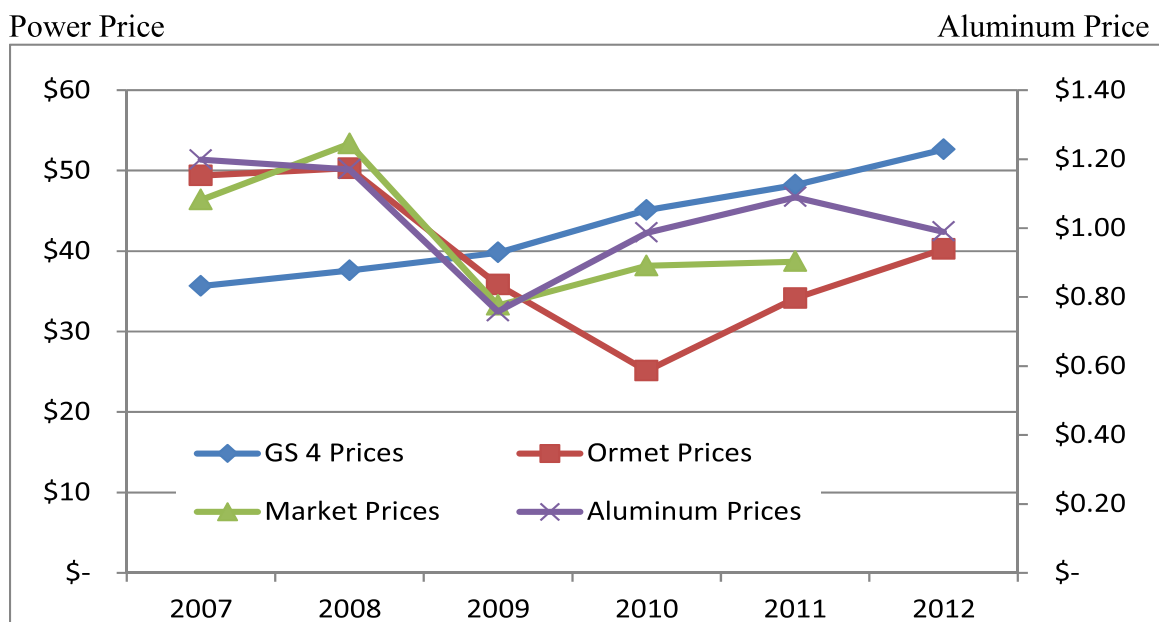
A. Yes. In the 2009 Special Contract, Ormet was granted a discount off the GS-4 rate starting in 2010 that produced a low initial power price. That price was scheduled to ramp up as a result of annually declining discounts from the GS-4 rate. The maximum annual discount reached a level of \$60 million per year in 2010 and 2011 and is scheduled to decline to \$54 million in 2012 and then decline further by \$10 million per year for 2013 through 2018. *See* Article 5.08(b).

Under the proposed ESP II rates, the GS-4 rate applicable to Ormet would increase by approximately 10.5% over the 2011 average GS-4 rate. However, because its Special Contract discount is scheduled to decrease, the rate that Ormet will pay in 2012 under the Special Contract would increase by 18% over the 2011 Special Contract rate. And unless modified by the Commission, the Phase In Recovery Rider ("PIRR") would increase Ormet's actual cost of power by an additional \$632,000 (\$1.742/MWH) per month beginning June 2013.

In total, because of the combined impact of ESP II's increased rates, FAC increased rates and the declining discount under the Special Contract, Ormet

would pay \$30.1 million more in rates in 2012 than it did in 2011, and \$47.1 million more in 2013 than it did in 2011.

The figure below shows the price of aluminum over the period 2007-2012 and its relationship to Ormet's price, the price of GS-4 power and the market price. The price of GS-4 power grew substantially and monotonically since 2007 whereas Ormet's price and the market price declined together before Ormet's price rebounded. Note also how the price of aluminum experienced a bump in 2010 and 2011 before dropping in 2012, causing it to drop while the prices of GS-4 power and Ormet's power continued their rise. This pattern of low or decreasing aluminum prices, coupled with rising GS-4 prices and Ormet's declining discounts, has severely squeezed Ormet's margins.



	Aluminum Price	GS4 Price	Ormet Price⁶	Market Price Average
2007	\$1.20/lb	\$35.65	\$49.39	\$46.37
2008	\$1.17/lb	\$37.58	\$50.30	\$53.33
2009	\$0.76/lb	\$39.78	\$35.83	\$33.27
2010	\$0.99/lb	\$45.08	\$25.12	\$38.16
2011	\$1.09/lb	\$48.22	\$34.14	\$38.70
2012	\$0.99/lb	\$52.62	\$40.25	

In the table above, 2012 numbers for GS-4 power and Ormet's power are projected through 2012 for the whole year which includes multiple rate increases. The AEP Zone Market Price is equal to the AEP-Dayton day-ahead hub plus an AEP Zone adder of \$0.49/MWH.

Also note how the price of market power dropped precipitously after its 2008 spike (related to the spike in world oil prices) and has since remained low.

Nevertheless, AEP retained its ability to raise prices on regulated sales to both Ormet and GS-4 customers in the face of declines in retail and wholesale demand brought on by the Great Recession, increased wholesale competition and the resulting nosedive of prices in wholesale markets. Indeed, AEP has been able to buy low in the wholesale market and sell high in its retail market.

OTHER RATEPAYERS BENEFIT FROM ORMET'S CONTINUATION AS A CUSTOMER OF AEP OHIO

Q. HAVE OTHER CUSTOMERS OF AEP OHIO BENEFITED FROM ORMET'S CONTINUATION AS A CUSTOMER OF AEP OHIO? IF SO, EXPLAIN HOW AND STATE WHETHER THEY WOULD CONTINUE ENJOYING THOSE BENEFITS IN THE FUTURE.

⁶ After accounting for discounts, Ormet's power cost dropped to \$35.83 in 2009 and further in 2010 before rising sharply in 2011 and 2012. These rates do not include the PIRR starting in June 2013, any further FAC rate changes and assumes no changes to other riders.

- A. Yes, other customers have benefited from Ormet's continuation as a customer of AEP and they can expect to continue to enjoy those benefits if Ormet can continue its Ohio operations.

If ESP II is approved, AEP would receive a ratepayer guarantee that its non-fuel generation revenues (along with its Competitive Retail Electric Service ("CRES") Capacity Revenues, Auction Capacity Revenues and Credit for Shopped Load) will equal a Revenue Target of \$929 million. See Exhibit WAA-6. The Revenue Target will be maintained through imposition of the non-bypassable RSR that is discussed *infra* at 16 *et seq.* If Ormet shuts down, other ratepayers will have to make up for the resulting loss of non-fuel generation revenues from Ormet through additional RSR charges.

If Ormet continues to operate and pays rates in excess of the fuel adjustment charge, other ratepayers will be benefited (and be relieved of the increased RSR charges as well as increased fixed transmission and distribution charges). In other words, Ormet will make an important contribution toward the guaranteed level of non-fuel generation revenues if it continues as an AEP Ohio customer.

If Ormet were to shut down all or part of its smelter load, other ratepayers will lose the benefit of Ormet's non-fuel revenues. It is probable that AEP would then seek other markets for the capacity and energy freed up by the shutdown, most likely by making off-system sales of energy and capacity. To the extent AEP diverts to off-system sales the energy freed up by an Ormet shutdown, other ratepayers would not benefit because AEP Ohio has no obligation to credit its

profits on those off-system sales to fuel costs recovered through its Fuel Adjustment Clause.⁷

In summary, AEP Ohio would recover through the RSR from its other ratepayers all of the non-fuel generation revenue that Ormet would cease paying upon its curtailment or shutdown. In addition, AEP would be able to sell the energy and capacity freed up as a result of Ormet's curtailment or shutdown and to retain all profits it earned on the associated off-system sales.

An estimate of the increased costs to other customers caused by a complete Ormet shutdown is shown in the tables below.

Q. WHAT ARE THE DOLLAR AMOUNTS OF THE BENEFIT TO OTHER RATEPAYERS IF ORMET CONTINUES TO OPERATE?

A. Our preliminary estimate indicates that, after taking account of the Special Contract discounts, other ratepayers will benefit in the following amounts from Ormet's contribution to the \$929 million Revenue Target (Ormet's Non-Fuel Gen Payments), Ormet's RSR Payments, Ormet's PIRR Payments and fixed cost of transmission and distribution. Total benefits over the next three years are shown in the following table for each June-May planning year through 2014/2015.

⁷ See the March 18, 2009, Opinion and Order in Case Nos. 08-917-EL-SSO and 08-918-EL-SSO at page 17. The Ohio Supreme Court affirmed the PUCO with respect to excluding profits on off-system sales from the FAC at *In re Application of Columbus S Power Co.*, 128 Ohio St.3d 512, 2011-Ohio-1788 at ¶53-54.

Estimated Benefits to Ratepayers (\$000)	June 2012 May 2013	June 2013 May 2014	June 2014 May 2015
Fixed Costs Benefit	\$ 13,344	\$ 13,344	\$ 13,344
Ratepayer paid Discount	\$ (49,777)	\$ (39,863)	\$ (29,863)
Ormet Non-Fuel Gen Payments	\$ 52,746	\$ 52,746	\$ 52,746
RSR (Ormet RSR Payment)	\$ 7,380	\$ 7,380	\$ 7,380
PIRR Benefit	\$ -	\$ 7,586	\$ 7,586
Annual Benefits to Ratepayers	\$ 23,693	\$ 41,193	\$ 51,193
Cumulative Benefits	\$ 23,693	\$ 64,886	\$ 116,079

These amounts are in addition to those contributed earlier by Ormet. In 2007 and 2008, Ormet contributed an additional \$58.5 million and \$60.5 million, respectively, to AEP Ohio's non-fuel revenues.

Thus, the benefits to other AEP ratepayers of Ormet's continuing its operations are real and substantial. The revenues required from other customers by ESP II would be far greater if Ormet were not to continue operating in Ohio.

PROBLEMS WITH THE RSR

Q. PLEASE DESCRIBE THE PROBLEMS, IF ANY, THAT YOU HAVE IDENTIFIED WITH THE DESIGN OF THE RATE STABILITY RIDER.

A. In short, for several reasons, the RSR is too expensive and is fundamentally flawed in its design.

First, the RSR is designed to guarantee AEP generation revenues at historical levels earned in 2011 as a means of softening the blow associated with the pro-competitive measures and encouragement of shopping that are contained in ESP II. Yet the 2011 generating revenues include at least some revenues earned from the 36% of AEP's connected load which switched to alternative suppliers before the Application was even filed and for reasons unrelated to ESP

II. The Application did not encourage these customers to shop – they were doing so before the Application was filed. And any suggestion that AEP’s proposal played a role in these customers deciding to shop is tenuous at best.

Additionally, the RSR would force ratepayers to guarantee several years of revenues from customers who stop taking service from AEP for reasons wholly unrelated to shopping – i.e., going out of business, leaving the State, conservation efforts, etc.⁸

Q. PLEASE EXPLAIN THE BASIS FOR ORMET'S REQUEST TO BE EXEMPT FROM THE RSR.

A. Ormet seeks relief from the RSR because this charge is driven principally by customer shopping, an option not available to Ormet under its September 16, 2009, Power Agreement, as I have already described. Accordingly, imposing the RSR rider on Ormet violates the regulatory cost-causation principle: that costs should be allocated to and be borne by the customers that cause a utility to incur those costs or that derive a benefit from those costs.⁹

Irrespective of whether the Commission exempts Ormet from RSR charges, any reduction in customer revenues reflected in the RSR should be offset by the associated increase in capacity and energy sales by AEP/AEP Ohio to sister companies under the AEP System Agreement along with any profits on

⁸ AEP did not provide enough information in its application to enable Ormet to meaningfully evaluate the option offered as an alternative to the RSR. Ormet is therefore not in a position to recommend for or against that option. However, Ormet reserves the right to recommend that option when more information is made available about its operation.

⁹ In the alternative, if the Commission is not willing to exempt Ormet from application of the RSR, it should at least allow Ormet to enjoy some of the benefits of that rider by allowing Ormet to take service under Rider IRP-D. Ormet may need some modifications in the curtailment provisions of Rider IRP-D in order to maximize the amount of its curtailable load.

increased off-system sales. It appears that Mr. Allen (in Exhibit WAA-6 and at 13:21-14:1) is capturing some of those offsets in the "\$3/MWh credit for shopped load related to possible energy margins that could be realized by AEP Ohio for reductions in SSO Load."

PROPOSED SOLUTIONS

Q. DO YOU HAVE RECOMMENDED SOLUTIONS THAT WOULD ADDRESS THE PROBLEMS YOU HAVE IDENTIFIED WITH THE PENDING APPLICATION?

A. Yes, at least partially.

Q. PLEASE EXPLAIN YOUR RECOMMENDATION TO REDESIGN THE RSR CHARGE.

A. The RSR should not be charged to customers who cannot enjoy the benefits of shopping. Additionally, revenues that AEP Ohio would lose as a result of customer shopping (or a customer's election to take interruptible service under Rider IRP-D) are recovered under the RSR on a per-kWh basis even though the RSR is intended to recover the loss of fixed cost revenues (demand charges). In the absence of customer shopping, these fixed costs would, in large part, be collected through demand charges imposed on customers that opted to shop (e.g., \$10/kW-month for a GS-4 customer who opted to shop). Under the RSR, the revenues that would otherwise be collected on a charge per kW-month are collected as a charge per kWh, thereby shifting the burden away from low-load-factor customers to high-load-factor customers such as Ormet. The proposed

RSR rate design discriminates against high-load-factor GS-4 customers in that such customers would bear disproportionately high costs - e.g., they would contribute in proportion to their high kWh-per-kW consumption even though costs recovered through the RSR are related to fixed costs that are caused by, and are proportional to, the kW demands of GS-4 customers that elect to shop.

Q. WHAT OTHER CHANGES SHOULD BE MADE TO THE RSR?

- A. The RSR is likely to over collect. The RSR is designed to enable AEP to collect a \$929 million target revenue in all three years of ESP II even though the revenue lost to customer shopping is projected to be much lower in the first year of ESP II. See Allen testimony at 13-14, Exhibit WAA-6 and Exhibit DMR-3. The RSR charge should be reduced in the first year of ESP II in order to reflect actual expectations of revenue loss.

Secondly, the RSR is designed to collect lost revenues associated with AEP Ohio's cost of owning the generating assets. However, those assets will be transferred largely to AEP's affiliate, Genco, on January 1, 2014, where the ownership costs should be much lower (with one unit going to APCO and one to Kentucky Power). After acquiring the now-regulated generating assets from AEP Ohio, it would be customary and to be expected for AEP Genco to lower the fixed capacity costs associated with ownership of the transferred generating assets. That is, Genco can be expected to refinance with a capital structure typical of independent power producers (e.g., 80/20 debt/equity structure as opposed to the 50/50 capital structure usually associated with vertically integrated utilities). However, although it can expect to incur much lower capacity ownership costs

starting on January 1, 2014, Genco intends to continue collecting the higher capacity costs now associated with ownership of the generation by AEP Ohio.

Third, based on its use of a 10.5% rate of equity, AEP requests approval of the RSR which would guarantee \$929 million in annual revenues resulting from retail non-fuel generation revenues, CRES capacity revenues, auction capacity revenues, and credit for shopped load. I understand that another Ormet witness, John Wilson, has testified that AEP's use of a 10.5% rate of equity is too high and that a proper rate of equity would be in the range of 7.94%-8.96%, and certainly not higher than 9%. I continue to believe that the Commission should not approve the RSR at all, and should not apply it to Ormet. However, in the event the Commission approves it, I have re-calculated the RSR to reflect Mr. Wilson's rate of return testimony. If the Commission agrees that the proper ROE is 7.94%, the revenues guaranteed by the RSR should be reduced to \$754 million. If the Commission agrees that the proper ROE is 8.96%, the revenues guaranteed by the RSR should be reduced to \$824 million. If the Commission adopts the mid-point ROE within the range set forth in Mr. Wilson's testimony (8.45%), the revenues guaranteed by the RSR should be reduced to \$789 million. Finally, if the Commission agrees that the proper ROE is 9%, the revenues guaranteed by the RSR should be reduced to \$827 million.

Finally, as I explain above, the RSR seeks to guarantee for AEP generation revenues on the connected load associated with customers who left the Company (or announced the intention to do so) before the Application was even filed and, thus, for reasons unrelated to ESP II. Those customers were not

incented to shop by anything in the Application. The target revenues associated with the RSR should therefore be reduced to reflect the lost revenues associated with AEP Ohio's connected load already committed to leave.

Q. DO YOU HAVE ANY OTHER RECOMMENDATIONS?

A. Yes. Owing to its 98.5% load factor, Ormet consumes a far greater proportion of its energy during off-peak periods than do most customers. However, even though off-peak energy costs are low, Ormet is required to pay the same average FAC energy charge that is imposed on other customers whose energy usage is weighted far more heavily toward high-cost, on-peak periods. This design discriminates against high-load factor customers such as Ormet. Ormet requests that the Commission separate the FAC into two separate charges, one for on-peak periods and the second for off-peak periods.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes, it does.

WHITFIELD A. RUSSELL

Whitfield A. Russell is an electrical engineer, attorney and President of Whitfield A. Russell and Associates, P.C., a corporate Partner of Whitfield Russell Associates. He holds a Bachelor of Science degree in Electrical Engineering from the University of Maine at Orono, a Master of Science in Electrical Engineering from the University of Maryland, and a Juris Doctor degree from Georgetown University Law Center.

Mr. Russell is experienced in electric utility system planning (transmission and generation), ratemaking and bulk power contracts. He has been qualified as an expert witness in 27 states (as well as in the Provinces of Ontario, Alberta and Manitoba and the District of Columbia) and has been accepted as an expert in approximately 150 proceedings before state and federal courts, arbitration panels, public service commissions, the Federal Energy Regulatory Commission and numerous other administrative agencies. Mr. Russell's clients have included public power utilities, state and federal power marketing agencies, investor- owned utilities, independent power producers, and state regulatory bodies and their staffs. He has written and spoken extensively on matters relating to regulated electric utilities.

Mr. Russell founded Whitfield Russell Associates in 1976.¹ Prior to that, from 1972 to 1976, he served as Engineer and eventually Chief Engineer for the Securities and Exchange Commission's Division of Corporate Regulation. That Division, in administering the Public Utility Holding Company Act of 1935, regulated registered public utility holding company systems representing approximately 20% of the gas and electric industries in the United States.

From 1971 to 1972, Mr. Russell was on the staff of the Federal Power Commission. He served as a consultant to staff attorneys in proceedings, and as an expert witness in an administrative proceeding before the Atomic Energy Commission.

From 1969 to 1971, Mr. Russell served as an Associate Engineer in the System Planning Division of the Potomac Electric Power Company. At PEPCO, he conducted system studies of load flows and stability. He was also a member of numerous study groups concerned with planning and operation of the Pennsylvania-New Jersey-Maryland Interconnection.

¹ Whitfield Russell Associates is located at 4232 King Street Alexandria, VA 22302. (703) 894-2200

**PROCEEDINGS IN WHICH
WHITFIELD A. RUSSELL
HAS TESTIFIED**

1. Anaheim v. Kleppe, U.S. District Court, Arizona (Civil No. 74-542 PHX-WEC), concerning the availability of transmission capacity in the Pacific Southwest.
2. In re: Potomac Electric Power Company, before the Maryland Public Service Commission, Case No. 7004, concerning the need for proposed 500 kV transmission lines in the Washington, D.C. area.
3. In re: Baltimore Gas and Electric Company, and Potomac Electric Power Company, before the Maryland Public Service Commission, Case No. 6984, involving the same transmission lines mentioned in the preceding case.
4. Perry v. The City of Monroe, Louisiana (State of Louisiana, Parish of Ouachita, Fourth District Court; Nos. 111145, 111146, 111147) regarding the necessity of Monroe's disposing of its municipal utility system; Filed August 16, 1977.
5. In re: Potomac Electric Power Company, before the District of Columbia Public Service Commission, in Case No. 685, concerning the system planning of the Potomac Electric Power Company and the PJM Pool.
6. In re: Generic Hearings on Rate Structure, before the Colorado Public Utilities Commission, Case No. 5693, regarding the engineering aspects of marginal cost pricing and power pooling in Colorado; Filed October 1980.
7. In re: Pacific Gas and Electric Company, FERC Docket No. ER76-532, regarding the proper level of rates to be charged by PG&E to the Central Valley Project for transmission service; Filed April 1978, revised January 1979.
8. In re: Pacific Power and Light Company, FERC Docket No. E-7796, regarding the Seven Party Agreement and related matters; Filed May 1978.
9. In re: Pacific Gas and Electric Company, FERC Docket No. E-7777 (II), concerning the provisions of numerous bulk power arrangements governing electric utilities in California; Filed October 1978.
10. In re: Potomac Edison Company, before the Maryland Public Service Commission, Case No. 7055, concerning the need for a 230 kV transmission line in Montgomery County, Maryland.
11. In re: Delmarva Power and Light Company, before the Maryland Public Service Commission, Case Nos. 7239F, 7239G, 7239H, 7239I, 7239J, 7239K, 7239L, 7239M and 7239N concerning fuel rate adjustments; Filed June 17, 1980, March 17, 1981, August 19, 1981 and November 20, 1981.

12. In re: Baltimore Gas and Electric Company, before the Maryland Public Service Commission, Case Nos. 7238G, 7238H, 7238I, 7238J, 7238L and combined dockets 7238P, Q, R and S, concerning fuel rates; Filed June 20, 1980, November 2, 1980, April 14, 1981, July 17, 1981 and September 14, 1981.
13. In re: Potomac Electric Power Company, before the Maryland Public Service Commission, Case Nos. 7240A, 7240B, 7240C, 7240D, 7240E, 7240F and 7240G, concerning fuel rate adjustments; Filed October 1980.
14. In re: Florida Power & Light Company, FERC Docket No. E-9574, concerning system planning for the City of Vero Beach, Florida. FP&L withdrew its application to acquire the Vero Beach system.
15. In re: Oklahoma Gas and Electric Company, FERC Docket No. ER77-465, concerning rates for energy banking and transmission services rendered to the Western Farmers Electric Cooperative; Filed October 20, 1978.
16. In re: Idaho Power Company, before the Idaho Public Utility Commission, Case No. U-1006-158, concerning the value of interruptible industrial loads and Idaho Power Companies entitlement to Federal secondary energy; Filed March 1980.
17. In re: Potomac Electric Power Company, before the District of Columbia Public Service Commission, Case No. 737, concerning the Company's construction program; Filed October 27, 1980.
18. In re: Virginia Electric and Power Company, before the Virginia State Corporation Commission, Case No. PUE 800006, concerning construction of transmission lines in the Charlottesville, Virginia area; Filed 1982.
19. In re: Pacific Gas and Electric Company, FERC Project Nos. 2735 and 1988, concerning the Helms Project, a pumped storage generating unit; Filed August 24, 1979.
20. Southeastern Power Administration v. Kentucky Utilities Company, FERC Docket No. EL 80-7, concerning SEPA's attempt to obtain a FERC wheeling order under the Public Utility Regulatory Policies Act of 1978; Filed October 6, 1980.
21. In re: Sierra Pacific Power Company, before the Public Service Commission of Nevada, Docket No. 81-105, concerning construction and transmission planning; Filed June 29, 1981.
22. In re: Virginia Electric and Power Company, before the North Carolina Utilities Commission, Docket No. E-22, Sub 257, concerning production cost simulation and normalized fuel adjustment clause formula; Filed June 9, 1981.
23. In re: the Investigation of the Capital Expansion For Electric Generation, before the New Mexico Public Service Commission, Case No. 1577, concerning construction

programs of the Public Service Company of New Mexico and El Paso Electric Company; Filed July 2, 1981.

24. In re: Potomac Edison Company, before the Maryland Public Service Commission, Case Nos. 7241A, 7241B, 7241C and 7241D, concerning fuel rate adjustments and productivity of generating units; Filed March 13, 1981.
25. In re: Potomac Edison Company, before the Maryland Public Service Commission, Case No. 7528, concerning the method of calculating Potomac Edison's fuel rate.
26. In re: Delmarva Power & Light Company, before the Maryland Public Service Commission, Docket No. 7570, concerning transmission loss allocation methodology; Filed October 30, 1981.
27. In re: Nebraska Public Power District, before the South Dakota Public Utilities Commission, Docket No. F-3371, concerning proposed construction and operation of the 500 kV MANDAN Transmission Facility; Filed September 29, 1981.
28. In re: Sierra Pacific Power Company, before the Public Service Commission of Nevada, Docket No. 81-660, concerning construction and transmission planning; Filed January 4, 1981.
29. In re: Kentucky Utilities Company, FERC Docket Nos. ER-81-341-000 and ER81-267-000, concerning construction planning and the market for short term power; Filed February 26, 1982 and May 7, 1982.
30. In re: Kentucky Power Company et al., before the Kentucky Public Service Commission, Case No. 8566, concerning cogeneration and avoided costs; Filed September 16, 1982.
31. In re: Appalachian Power Company, before the West Virginia Public Service Commission, Case No. 82-162-42T, concerning the wholesale market and short-term power sales; Filed October 19, 1982.
32. In re: Central Maine Power Company, before the Maine Public Utility Commission, Docket No. 82-137, concerning the application of Central Maine Power Company to reorganize in the form of a holding company; Filed October 25, 1982.
33. In re: Houston Lighting & Power Company, before the Public Utility Commission of Texas, Docket No. 4712, concerning rates to be paid to cogenerators and small power producers; Filed February 28, 1983.
34. In re: Dow Chemical Company, before the Public Utility Commission of Texas, Docket Nos. 4802, 5050 and 5062, concerning rates for interruptible service; Filed September 26, 1983.

35. In re: Nevada Power Company, before the Nevada Public Service Commission, Docket No. 83-707, concerning the Reid Gardner No. 4 Participation Agreement, Filed October 11, 1983.
36. Dow Chemical Company vs. Houston Lighting & Power Company, before the District Court of Brazoria County, Texas, 149th Judicial District, No. 79-F-2620, regarding the custom and usage of contract terms in the electric utility industry. Live direct testimony in a jury trial. No transcript available.
37. In re: The Montana Power Company and the Confederated Salish and Kootenai Tribes of the Flathead Reservation, Project Nos. 5-004 and 2776-000, concerning the Tribes' intention and ability to sell its output to one or more entities in the Western states, if obtaining the license to the Kerr Project; Filed July 15, 1983.
38. In re: the Dow Chemical Company vs. Gulf States Utilities Company, before the Louisiana Public Service Commission, Docket No. U-16038, concerning cogeneration and small power production; Filed October 28, 1984.
39. In re: Petition of the Dow Chemical Company, before the Public Utility Commission of Texas, Docket No. 5651, for an order compelling Houston Lighting & Power Company to comply with the Commission Order concerning cogeneration and small power production; Filed December 10, 1984.
40. In re: Oklahoma Gas and Electric Company, before the Oklahoma Corporation Commission, Cause No. 29017, concerning priority for recognition of capacity costs to Qualifying Facilities; Filed January 1985.
41. In re: Kansas City Power & Light Company of Kansas City, Missouri, before the Missouri Public Service Commission, Case Nos. ER-85-128 and EO-85-185, regarding rate design and allocation of production-related costs for the Company's Wolf Creek Generating Station on behalf of the United States Department of Energy; Filed May 3, 1985.
42. In re: Kansas City Power and Light Company, before the State Corporation Commission of the state of Kansas, Docket Nos. 142,099-U and 120,924-U, concerning operating problems caused by excess capacity, mitigation measures and regulatory requirements, on behalf of Johnson County Joint Intervenors; Filed May 6, 1985.
43. In re: Duke Power Company, before the North Carolina Utilities Commission, Docket No. E-7, Sub 391, concerning the Company's use of an Extended Cold Shutdown program to mitigate its excess capacity situation resulting from the Catawba Units, on behalf of the Department of Justice for the State of North Carolina; Filed June 26, 1985.
44. Sierra Pacific Power Company, before the Public Service Commission of the State of Nevada, Docket No. 85-430, on behalf of the State of Nevada Attorney General's

Office of Advocate for Customers of Public Utilities, concerning the effects upon retail rates of placing Valmy Unit No. 2 in service; Filed August 26, 1985.

45. United States of America Department of Energy, before the Bonneville Power Administration, on behalf of the City of Vernon, California, concerning the 1985 Proposed Firm Displacement Power Rate; Filed November 8, 1985.
46. In re: City of Anaheim, et al., v. Southern California Edison, Docket No. 78-0810, on behalf of five partial requirements wholesale customers of Southern California Edison Company, making claims under Federal antitrust laws for access to the Pacific Northwest-Pacific Southwest Intertie.
47. In the Matter of the Application of Sierra Pacific Power Company for Approval of its 1986-2006 Electric Resource Plan, Docket No. 86-701, on behalf of the State of Nevada Attorney General's Office of Advocate for Customers of Public Utilities, concerning efforts of Sierra Pacific Power Company to develop a new interconnection (the SMUD Tie) with the Sacramento Municipal Utility District; Filed September 8, 1986.
48. The Federal Executive Agencies, Complainant v. Public Service Company of Colorado, before the Public Utilities Commission of the State of Colorado, Case No. 6551, on behalf of the Federal Executive Agencies concerning the feasibility of wheeling federal preference power to the Government's facilities at Rocky Flats, the Lowry Air Force Base, the Rocky Flats Technical Center and the Denver Federal Center; Filed December 15, 1986 and February 10, 1987.
49. Commonwealth Edison Company, before the State of Illinois, Illinois Commerce Commission, Docket Nos. 87-0043, 87-0044 and 87-0057 Consolidated, on behalf of Intervenor, Citizen's Utility Board of Illinois, concerning Edison's proposal to form a generating subsidiary.
50. Nevada Power Company, before the Nevada Public Service Commission, Docket No. 87-750, concerning a 345 kV transmission line proposed to connect Nevada Power Company to Utah Power and Light Company; Filed September 28, 1987, October 8, 1987 and October 24, 1987.
51. Utah Power & Light Company, PacifiCorp, PC/UP&L Merging Corporation, FERC Docket No. EC88-2-000, establishing conditions for the proposed merger; also challenging PP&L's/UP&L's assertion that the claimed coordination benefits would not be attainable through power pooling or by contract; Filed February 12, 1988.
52. Rosemount Cogeneration Joint Venture, Biosyn Chemical Corporation and Oxbow Power Corporation vs. Northern States Power Company, before the Minnesota Public Utilities Commission, Docket No. E-002/GG-88-491, on behalf of Petitioners, Rosemount Cogeneration Joint Venture, Biosyn Chemical Corporation and Oxbow Power Corporation, concerning a contract between Northern States Power and Biosyn Chemical Corporation covering the 50 MW output of a yet-to-

be-constructed power plant based on the forecast costs of Sherburne County Unit #3 ("Sherco Unit 3"); Filed October 24, 1988.

53. In re: Potomac Electric Power Company, before the District of Columbia Public Service Commission, Case No. 869, on behalf of the District of Columbia Office of the People's Counsel, concerning the prudence of off-system purchases; Filed June 6, 1988.
54. In re: Wisconsin Public Power Inc. System, Advance Plan 5, before the Public Service Commission of the state of Wisconsin, on behalf of the Wisconsin Public Power System, Inc., concerning transmission planning in the state of Wisconsin; Filed August 15, 1988.
55. In re: Nevada Power Company, before the Public Service Commission of Nevada, Docket No. 88-701, on behalf of the Attorney General's Office of Advocate for Customers of Public Utilities, concerning NPC's 1988 Resource Plan; Filed August 29, 1988.
56. In re: Commonwealth Edison Company, before the Illinois Commerce Commission, Docket Nos. 87-0427, 87-0169, 88-0189 and 88-0219, on behalf of the Citizens Utility Board, concerning rejection of an unfair, Staff-proposed rate order; Filed September 12, 1988.
57. In re: Dow Chemical Company vs. Houston Lighting & Power Company, before the Texas Public Utilities Commission, Docket No. 8425, 8431, on behalf of The Dow Chemical Company, concerning application of Houston Lighting & Power Company for authority to change rates; Fuel Reconciliation, Revenue Requirements and Rate Design; Filed March 15, 1989.
58. Dow Chemical Company vs. Houston Lighting & Power Company, before the Texas Public Utilities Commission, Docket No. 8555, on behalf of The Dow Chemical Company, concerning rate discrimination, cost to serve and class load characteristics; Filed August 7, 1989.
59. In re: Sierra Pacific Power Company, before the Public Service Commission of Nevada, Docket No. 89-676, on behalf of the Attorney General's Office of Advocate for Customers of Public Utilities, concerning Sierra's system planning; Filed August 18, 1989.
60. In re: Northern California Power Agency vs. Pacific Gas and Electric Company, before the Federal Energy Regulatory Commission, Docket No. EL89-4-000, on behalf of the Northern California Power Agency ("NCPA"), concerning the Interconnection Agreement between Pacific Gas & Electric Company and NCPA; Filed October 3, 1989.
61. In re: M-S-R Public Power Agency vs. Tucson Electric Power Company, before the United States District Court of Arizona, No. CIV-86-521-TUC-ACM, on behalf of M-S-R, concerning TEP's breach of contract.

62. In re: Southern California Edison Company and San Diego Gas & Electric Company, before the Federal Energy Regulatory Commission, Docket No. EC89-5-000, on behalf of the City of Vernon, California concerning expected effects of the proposed merger on competition, system operation and transmission access; Filed January 3, 1990 and March 12, 1990.
63. In re: Farmers Electrical Cooperative Corporation and City Water & Light Plant of the City of Jonesboro, Arkansas, v. Arkansas Power & Light Company, No. LR-C-86-118. Presented deposition testimony on AP&L's liability and assisted in settlement negotiations of treble damage claims for transmission line foreclosure made by plaintiffs, City Water and Light Department of Jonesboro, Arkansas and the Farmers Electric Cooperative.
64. In re: Southern California Edison Company and San Diego Gas & Electric Company, before the California Public Utilities Commission, Docket No. 88-12-035, on behalf of the City of Vernon, California concerning expected effects of the proposed merger on competition, system operation and transmission access; Filed April 1990.
65. In re: Northeast Utilities Service Company and Public Service Company of New Hampshire, before the Federal Energy Regulatory Commission, Docket Nos. EC90-10-000, ER90-143-000, ER90-144-000, ER90-145-000 and EL90-9-000, on behalf of Massachusetts Municipal Wholesale Electric Company, concerning the effect of a proposed merger on competition and transmission access; Filed May 25, 1990.
66. Report to the Public Utilities Board of Manitoba concerning 1990 Manitoba Hydro Capital Projects Review: Generation and Transmission Requirements. Whitfield Russell Associates was appointed to report to The Public Utilities Board on matters regarding the economic consequences to the domestic customers of the Manitoba Hydro capital program; Filed August 28, 1990.
67. In re: Northeast Utilities Service Company, before the Federal Energy Regulatory Commission, Docket Nos. ER90-373-000, et al., on behalf of the Massachusetts Municipal Wholesale Electric Company, evaluating the Preferred Transmission Service Agreement between MMWEC and Northeast Utilities Service Company, for the transmission of MMWEC's power purchase from the New York Power Authority; Filed November 27, 1990.
68. In re: New Hampshire Electric Cooperative Rate Plan Proposal, before the New Hampshire Public Utilities Commission, Docket No. DR90-078, on behalf of the New Hampshire Electric Cooperative, concerning contract valuation; Filed December 11, 1990.
69. Tampa Electric Company v. Zeigler Coal Company. This was an arbitration held in August 1991, concerning provisions of a coal contract in which Mr. Russell offered testimony for Zeigler to the effect that Tampa Electric was not suffering a hardship by measures commonly used in the electric utility industry.

70. In re: The Long Range Forecast of Ohio Power Company, before the Ohio Public Utilities Commission, Docket No. 90-660-EL-FOR (Phase II). Mr. Russell presented and defended testimony on behalf of Ormet Aluminum Corporation concerning Ormet's right to allowances to emit sulfur dioxide from the Kammer Power Plant of Ohio Power Company under the Clean Air Act Amendments of 1990 and the propriety of Ohio Power's Compliance Plan; Filed July 17, 1991.
71. In re: Application of Tex-La Electric Cooperative to Increase Rates. Mr. Russell presented testimony in 1991, demonstrating that Tex-La was prudent in selling its entitlement in a nuclear plant and in settling its 1988 claims against Texas Utilities concerning Texas Utilities' fraud and imprudence in the construction of the Comanche Peak Nuclear Plant; Filed June 1991.
72. In re: Southern California Edison Company, before the Federal Energy Regulatory Commission, Docket No. ER88-83, on behalf of the City of Vernon, California concerning expected effects of Edison's administration of its transmission network on competition, system operation and transmission access; Filed June 1991.
73. In the Matter of the Application of the Public Service Company of New Mexico for Approval to Construct, Own, Operate and Maintain the Ojo Line Extension and for Related Approvals before the New Mexico Public Service Commission, Case No. 2382, on behalf of the United States Department of Energy, concerning transmission line construction programs of the Public Service Company of New Mexico; Filed November 8, 1991.
74. In re: Wisconsin Public Power Inc. System et al., Advance Plan 6, before the Public Service Commission of the state of Wisconsin, Docket No. 05-EP-6, concerning Eastern Wisconsin Utility Joint Transmission System and Interface Study; Filed December 31, 1991.
75. In re: MidAtlantic Energy v. Monongahela Power Company and the Potomac Edison Company, before the Public Service Commission of West Virginia, Case No. 89-783-E-C, on behalf of MidAtlantic Energy, concerning need for capacity and the appropriate avoided cost; Filed January 6, 1992, June 8, 1992 and February 13, 1992..
76. In re: Northeast Utilities Service Company, before the Federal Energy Regulatory Commission, Docket No. EL91-36-000, on behalf of the Massachusetts Municipal Wholesale Electric Company evaluating the tie-line adjustment charge borne by MMWEC that arose under a Transmission Service Agreement between New England Power Company and Northeast Utilities; Filed May 1, 1992 and August 24, 1992.
77. In re: Application of Houston Lighting & Power Company for a Certificate of Convenience and Necessity for the DuPont Project, before the Public Utility Commission of Texas, Docket No. 11000, on behalf of Destec Energy, Inc; Filed September 28, 1992, June 24, 1993 and June 29, 1993.

78. In re: Investigation on the Commission's Own Motion into Barriers to Contracts Between Electric Utilities and Nonutility Cogenerators and Certain Related Policy Issues, before the Public Service Commission of the state of Wisconsin, Docket No. 05-EI-112, on behalf of JOINT PARTIES: DESTEC Energy, Inc., EnerTran Technology Company, LS Power Corporation, The AES Corporation, LG&E Development Corporation, National Independent Energy Producers, and Citizens' Utility Board, concerning appropriate QF contract provision; Filed November 23, 1992.
79. In re: Application of Cap Rock Electric Cooperative, Inc. for a Certificate of Convenience and Necessity, before the Public Utility Commission of Texas, Docket No. 11248, on behalf of Cap Rock Electric Cooperative, Inc., concerning its proposed transmission system improvements; Filed December 30, 1992.
80. In re: Application of Texas Utilities for Authority to Change Rates, before the Public Utility Commission of Texas, Docket No. 11735, on behalf of Cap Rock Electric Cooperative, Inc., concerning standby rates, wholesale rate contracts and terms and conditions of the Power Sales Agreement, Filed May 18, 1993.
81. In re: Determination of Houston Lighting & Power Company's Standard Avoided Cost Calculation for the Purchase of Firm Energy and Capacity from Qualifying Facilities Pursuant to P.U.C. Subst. R. 23.66(H)(3), before the Public Utility Commission of Texas, Docket No. 10832, on behalf of Destec Energy, Inc; Filed August 11, 1993.
82. In re: Complaint of Phibro Refining, Inc. v. HL&P, Docket No. 11989, before the Public Utility Commission of Texas, on behalf of Phibro Energy, USA, Inc., concerning electric service contracts and terms and conditions of HL&P's industrial rate schedule; Filed August 3, 1993.
83. In re: Application of Texas Utilities Electric Company for Authority to Implement Economic Development Service, General Service Competitive Pricing, Wholesale Power Competitive Pricing, and Environmental Technology Service, Docket No. 13100, before the Public Utility Commission of Texas, on behalf of Rayburn Country Electric Cooperative, Inc., concerning TU Electric's so-called "competitive rates."; Filed August 8, 1994
84. In re: Complaint of Kenneth D. Williams v. HL&P, Docket No. 12065, on behalf of Destec before the Public Utility Commission of Texas; Filed January 10, 1995.
85. In re: Rebuttal testimony in a Complaint of Tex-La v. TUEC, Docket No. 12362, on behalf of Rayburn County Electric Coop. before the Public Utilities Commission of Texas; Filed March 6, 1995.
86. In re: Application for Authorization and Approval of Merger Between Wisconsin Electric Power Company, Northern States Power Company (Minnesota), Northern States Power Company (Wisconsin), and Cenergy, Inc., in Docket No. EC-95-16-

- 000, before the Federal Energy Regulatory Commission (on behalf of Certain Intervenor, including Madison Gas & Electric Company, Wisconsin Public Service Corporation, Minnesota Power & Light Company, Otter Tail Power Company and the Lincoln Electric System), in Docket Nos. 6630-UM-100 and 4220-UM-101, before the Wisconsin Public Service Commission and Docket No. 6-2500-10601-2 before the Minnesota Office of Administrative Hearings for the Minnesota Public Utilities Commission (both on behalf of Madison Gas & Electric, Wisconsin Industrial Energy Group, Wisconsin Federation of Cooperatives and the Citizen's Utility Board), concerning the effect upon transmission access of the merger of NSP and WEPCO into Primergy; Filed May 10, 1996.
87. In re: Merger of The Washington Water Power Company and Sierra Pacific Power Company, Docket Nos. EC94-23-000 and ER95-808-000, before the Federal Energy Regulatory Commission, on behalf of Truckee Donner Public Utility District, concerning ancillary services and single system transmission rates; Filed May 22, 1996.
88. In re: Alberta Electric Utilities 1996 Tariff Application before the Alberta Energy And Utilities Board, on behalf of the Industrial Power Consumers Association of Alberta concerning calculation of charges for ancillary services; Filed June 3, 1996.
89. In re: Surrebuttal Testimony in Docket Nos. EC95-16-000, ER95-1357-000 and ER95-1358-000, on behalf of Madison Gas & Electric Company, Citizens Utility Board and Wisconsin Electric Cooperative Association; Filed June 10, 1996.
90. In re: City Public Service Board of San Antonio Filing in Compliance with Subst. Rule 23.67, Docket No. 15613, before the Public Utility Commission of Texas, on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed September 5, 1996.
91. In re: City of Austin Filing in Compliance with Subst. Rule 23.67, Docket No. 15645, before the Public Utility Commission of Texas, on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed September 5, 1996.
92. In re: Central Power and Light and West Texas Utilities Filing in Compliance with Subst. Rule 23.67, Docket No. 15643, before the Public Utility Commission of Texas, on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed September 5, 1996.
93. In re: Texas Utilities Electric Company, Filing in Compliance with Subst. Rule 23.67, Docket No. 15638, before the Public Utility Commission of Texas, on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed September 18, 1996.

94. In re: Docket No. 15840, Regional Transmission Proceeding to Establish Postage Stamp Rate and Statewide Load Flow Pursuant to P.U.C. Subst. Rule. 23.67 on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed August 30, 1996.
95. In re: Application of Wisconsin Energy Corporation, Wisconsin Electric Power Company, Northern States Power Company, and Northern States Power Company-Wisconsin for Approval of a Series of Transactions by Which Northern States Power Company-Wisconsin is merged into Wisconsin Electric Power Company, Northern States Power Company becomes a Subsidiary of Wisconsin Energy Corporation, and Wisconsin Energy Corporation is Renamed Primergy Corporation: Direct Testimony, Rebuttal Testimony and Surrebuttal Testimony on behalf of The Wisconsin Industrial Energy Group ("WIEG"), The Citizens' Utility Board ("CUB"), The Wisconsin Federation of Cooperatives ("WFC") and Madison Gas and Electric ("MG&E") in Docket Nos. 6630-UM-100 and 4220-UM-101 before the Public Service Commission of Wisconsin. The purpose of the direct testimony was to address Certain Intervenors' Transmission System Control Agreement and ISO Bylaws; October 8, 1996. The purpose of the rebuttal testimony was to address Applicants' Unilateral Settlement Offer which was submitted to FERC in their FERC merger proceeding; October 24, 1996. The purpose of the surrebuttal testimony was to address two sets of Rebuttal testimony of Jose Delgado and the Rebuttal Testimonies of Malcolm Bertsch of the Applicants and Don Carlson of Minnesota Power and Light; Filed November 5, 1996.
- 95a. In re: In the Matter of Northern States Power Company's Petition for Approval to Merge with Wisconsin Energy Corporation; OAH Docket No. 6-2500-10601-2: Direct Testimony and Exhibits and Rebuttal Testimony and Exhibits on behalf of Madison Gas and Electric ("MG&E"), The Wisconsin Federation of Cooperatives ("WFC"), and The Citizens' Utility Board ("CUB") in Docket No. E,G-002 and PA-95-500 before the Minnesota Office of Administrative Hearings for the Minnesota Public Utilities Commission. The purpose of the direct testimony is to remedy a Wisconsin Energy Corporation merger, in order to prevent anti-competitive effects with an Independent System Operation which actually operates the transmission system and which is truly independent of the proposed Primergy; October 21, 1996. The purpose of the rebuttal testimony is to address the direct testimony of Dr. Eilon Amit of Minnesota Department of Public Service and Dan Carlson of Minnesota Power and Light; Filed November 8, 1996.
- 95b. In re: Joint Application of WPL Holdings, Inc. and Wisconsin Power & Light Company for all Requisite Approvals in Connection with a Series of Related Transactions by which Interstate Power Company Becomes a Subsidiary of WPL Holdings, Inc., IES Industries, Inc. is Merged into WPL Holdings, Inc. and is Renamed Interstate Power Corporation and for Certain Related Transactions and Matters: Direct Testimony and two Surrebuttal Testimonies on behalf of Badger Cooperative Group ("BCG"), The Citizens' Utility Board ("CUB"), Madison Gas and Electric ("MG&E"), The Wisconsin Federation of Cooperatives ("WFC"),

- Wisconsin Industrial Energy Group ("WIEG") and Municipal Wholesale Power Group ("MWPG") in Docket No. 6680-UM-100 before the Public Service Commission of Wisconsin. The purpose of the direct testimony was to discuss the characteristics of an appropriate ISO and present the ISO recommended by Certain Intervenors; May 7, 1997. The purpose of surrebuttal testimony #1 was to answer the rebuttal testimony of WP&L's witness Rodney Frame, Arnold Kehrli and Scott Wallace; May 30, 1997. The purpose of surrebuttal testimony #2 was to address the rebuttal testimony of WP&L's witness Arnold Kehrli; Filed May 30, 1997.
96. In re: Houston Lighting & Power Company Filing in Compliance with Subst. Rule 23.67, Docket No. 15639, before the Public Utility Commission of Texas, on behalf of Certain Power Marketers and Independent Power Producers, Destec Power Services and Enron Power Marketing, concerning Ancillary Services under the state-wide rate in Texas; Filed September 30, 1996.
97. In re: IES Utilities, Inc., Interstate Power Company, Wisconsin Power & Light Company, South Beloit Water, Gas & Electric Company, Heartland Energy Services, and Industrial Energy Applications, Inc., Docket Nos. EC96-13-000, ER96-1236-000, and ER96-2560-000, before the Federal Energy Regulatory Commission, on behalf of Wisconsin Intervenors ("WI"). Mr. Russell simultaneously filed 2 sets of testimony; the first, sponsored by the intervenors listed above as well as by Wisconsin Public Service Corporation ("Pub Service"), and Dairyland Power Cooperative. ("Dairyland") analyzed engineering and operating problems created by the merger of WP&L, IPW and IES. The second set of testimony discusses how the IEC Independent System Operator ("ISO") fails in general to meet the rigorous and comprehensive ISO standards promulgated by the Wisconsin Public Service Commission (WPSC). Both sets of testimony (Engineering and ISO) were filed before the Federal Energy Commission; Filed March 27, 1997.
98. In re: Joint Application of WPL Holdings, Inc. and Wisconsin Power & Light Company for all Requisite Approvals in Connection with a Series of Related Transactions by which Interstate Power Company Becomes a Subsidiary of WPL Holdings, Inc., IES Industries, Inc. is Merged into WPL Holdings, Inc. and is Renamed Interstate Power Corporation and for Certain Related Transactions and Matters, in Docket No. 6680-UM-100, before the Public Service Commission of Wisconsin; Filed May 7, 1997.
99. In re: City of College Station, FERC Docket No. TX 96-2-000, concerning transmission rates; Filed November 7, 1997.
100. In re: Application for Approval of Restructuring Plan Under Section 2806 of the Public Utility Code, in Docket No. R-00973981 on behalf of Mid-Atlantic Power Supply Association, before the Pennsylvania Public Utility Commission; Filed November 7, 1997.
101. In re: Application for Approval of Restructuring Plan Under Section 2806 of the Public Utility Code, in Docket No. R-00974104 on behalf of Mid-Atlantic Power

Supply Association, before the Pennsylvania Public Utility Commission; Filed November 7, 1997.

102. In re: New England Power Company, FERC Docket No. OA96-74-000, concerning proposed formula rates for Tariffs No. 9 and 4, on behalf of the Massachusetts Municipals; Filed December 12, 1997.
103. In re: Sierra Pacific Power Company before the Federal Energy Regulatory Commission in Docket Nos. ER97-3593-000, ER97-3779-000, ER97-4462-000 on behalf of Truckee Donner Public Utility District, addressing lack of comparable access to transmission systems; Filed February 23, 1998.
104. In re: Application for Approval of Restructuring Plan Under Section 2806 of the Public Utility Code, on behalf of Newmont Gold Company and Barrick Goldstrike Mines, in Docket Nos. 97-11018 and 97-11028, before the Public Service Commission of Nevada; Filed February 1, 1998.
105. In re: Southern California Edison Company before the Federal Energy Regulatory Commission in Docket No. ER97-2355-000 on behalf of Department of Water Resources of the State of California, regarding lower pricing for off-peak transmission services; Filed April 1998.
106. In re: Response to Procedural Order Number Three Load Pockets, on behalf of Newmont Gold Company and Barrick Goldstrike Mines, Docket Number 97-8001, before the Public Utilities Commission of Nevada; Filed May 15, 1998.
107. In re: Supplemental Testimony in an Application for Approval of Restructuring Plan Under Section 2806 of the Public Utility Code, on behalf of Newmont Gold Company and Barrick Goldstrike Mines, Docket Numbers 97-11018 and 97-11028, before the Public Utilities Commission of Nevada, Filed May 22, 1998.
108. In re: Southern California Edison Company, on behalf of The Department of Water Resources of The State of California, Docket No. ER97-2355, before FERC in reference to Transmission Revenue Balancing Account Adjustment ("TRBAA"); Filed November 16, 1998.
109. In re: Ormet Primary Aluminum Corporation, on behalf of Ormet Primary Aluminum Corporation, Arbitration Number 55-199-0051-94, before the American Arbitration Association, concerning the relationship between AEP and other power systems within NERC and ECAR; Filed July 14 1998.
110. In re: Rebuttal Testimony in response to Mr., Walter R. Kelley and Mr. Thomas Kennedy, on behalf of Ormet Primary Aluminum Corporation, Arbitration Number 55-199-0051-94, before the American Arbitration Association; Filed September 2, 1998.
111. In re: Application No. RE95081 – TransAlta Utilities Corp., on behalf of Albchem Industries Ltd., CXY Chemicals and Dow Chemicals Canada Ltd., before the

Alberta Energy & Utilities Board addressing ACD's interest in providing interruptible service; Filed October 1998.

112. In re: Tri-State Generation and Transmission Assoc., Inc., in Arbitration No. 77 Y 181 0023097 before the American Arbitration Association; Filed September 14, 1998.
113. In re: Joint Application for Approval of Merger, Docket No. 98-7023 on behalf of The Staff of the Public Utilities Commission, before the Public Utilities Commission of Nevada; Filed November 9, 1998.
114. In re: Independent System Administrator, Docket No. 97-8001 on behalf of The Staff of the Public Utilities Commission, before the Public Utilities Commission of Nevada; Filed December 11, 1998.
115. In re: Petition for Order Concerning Delineation of Transmission and Local Distribution Facilities, Docket No. 98-0894 on behalf of The City of Chicago, before the Illinois Commission in reference to re-functionalization; Filed April 2, 1999.
116. In re: Consolidated Edison Company, Docket No. EL99-58-000 on behalf of The Village of Freeport, New York, before FERC in reference to remedies for the breach of contract to provide firm service on a non-discriminatory basis; Filed July 22, 1999, August 3, 1999, August 18, 1999 and September 9, 1999.
117. In re: Wisconsin Public Power, Inc. Docket No. 05-EI-119 on behalf of Wisconsin Transmission Customer Group (WTCG"), before the Public Service Commission of Wisconsin to address the concerns of municipally-owned utilities within Wisconsin; Filed March 6, 2000.
118. In re: Joint Application of Utilicorp United Inc. & St. Joseph Light & Power Co., Docket No. EM-2000-292 on behalf of Springfield (MO) City Utilities before the PSC of the State of Missouri to address why the merger between the two is detrimental to the public interest; Filed May 1, 2000.
119. In re: Utilicorp United Inc, and Empire District Electric Co. Docket No. EM-2000-369 on behalf of Springfield (MO) City Utilities before the Public Service Commission of the State of Missouri to explain why the merger between the two is detrimental to the public interest; Filed June 19, 2000.
- 119A. In re: Mobil Oil Corporation vs. Southern California Edison, Oral Testimony in a jury trial before the Superior Court of the State of California for the County of Los Angeles in Docket No. BC 175784, on behalf of Mobil Oil Corporation. The purpose of the testimony was to explain how Southern California Edison's actions contributed to substantial damage to equipment at Mobil's Torrance, California refinery during the cascading blackout on August 10, 1996; Testimony on July 17, 2000.

120. In re: Arrowhead - Westin Transmission Line Project, Docket No. 05-CE-113 on behalf of the Wisconsin Public Service Corporation ("WPSC"), before the Public Service Commission of the State of Wisconsin to provide support for the transmission project as proposed by WPSC and Minnesota Power; Filed November 22, 2000.
121. In re: Kansas Municipal Energy Agency ("KMEA"), Docket No. ER00-2644-000 on behalf of the Kansas Municipal Energy Agency ("Kansas Municipal"), before the Federal Energy Regulatory Commission ("FERC") to review, assess and comment on the actions taken by the Southwest Power Pool in connection with two transmission service requests made by the Kansas Municipal Energy Agency aggregating 39 MW of contract demand; Filed December 8, 2000.
122. In re: Arrowhead - Weston 345 kV Transmission Line, Rebuttal testimony in Docket No. 05-CE-113 on behalf of the Wisconsin Public Service Corporation ("WPSC"), before the Public Service Commission of the State of Wisconsin to address matters set forth in the direct testimony of Dr. Richard A. Rosen on behalf of Save Our Unique Lands ("SOUL"), Mr. David Schoengold on behalf of Wisconsin's Environmental Decade, and Mr. George R. Edgar on behalf of the Citizens' Utility Board ("CUB"); Filed December 18, 2000.
123. In re: Ethyl Corporation verses Gulf States Utilities Company, Civil Docket No. M, live direct testimony in a dispute over direct assignment of substation facilities; Filed April 2001.
124. In re: Joint Application of Entergy Louisiana, Inc. and Entergy Gulf States, Inc., Docket No. U-25533 on behalf of Occidental Chemical Corporation ("OxyChem"), before the Louisiana Public Service Commission for authorization to participate in contracts for the purchase of capacity and electric power for the Summer of 2001; Filed May 3, 2001.
125. In re: Petitioners' Joint Proposal for Merger & Rate Plan, testimony in Case No. 01-M-0075 on behalf of Alliance for Municipal Power before the New York State Public Service Commission. The purpose of this testimony is explain (1) the inappropriateness of Rule 52 in the post merger competitive energy markets; (2) to have stranded transmission cost and distribution costs expunged; and (3) to show how merged Companies exacerbates the incentive to abuse Rule 52 against newly formed municipal utilities; Filed November 5, 2001.
126. In re: Northeast Utilities Service Company Transmission Line Project, direct testimony in Docket No, 217 before the Connecticut Siting Council of the State of Connecticut on behalf of the Attorney General, State of Connecticut for the purpose of (1) Whether there is a need for the 345 f transmission line from Plum-tree to Norwalk; (2) whether the proposed transmission system design is the best option based on current transmission design and (3) whether any approval of the project by the Siting Council should be conditioned upon CL&P and NU's agreement; Filed March 12, 2002.

127. In re: Alliance Companies, et al., Affidavit in Docket Nos. RM01-12-000, RT01-87-000 and RT01-88-000, before the Federal Energy Regulatory Commission on behalf of the Ormet Primary Aluminum Corporation, for the purpose of providing relevant engineering fundamentals related to the proper design of methodology for quantifying transmission losses and for allocating such losses to the customers of regional transmission organizations; Filed March 12, 2002.
128. In re Cannon Power Corporation., Affidavit in Docket No. ER02-2189-000, before the Federal Energy Regulatory Commission on behalf of Whitewater Hill Wind Partners, LLC developing a 66 MW wind power project to be interconnected to Southern California Edison Company; Filed July 29, 2002.
129. In re Cannon Power Corporation., Affidavit in Docket No. ER02-1764, before the Federal Energy Regulatory Commission on behalf of Cabazon Wind Partners, LLC developing a 66 MW wind power project to be interconnected to Southern California Edison Company; Filed August 2, 2002.
130. In re: Response to Pacificorp's Motion: Affidavit in Response to Pacificorp's Daubert Motion Regarding Richard Slaughter and Supplemental Expert Report on behalf of Snake River Valley Electric Association; Filed September 10, 2002.
131. In re: Pacific Gas & Electric Company : Direct Testimony in Docket No. ER01-2998, before the Federal Energy Regulatory Commission on behalf of Northern California Power Agency to explain what level of firmness is required of transmission service under the Stanislaus Commitments; Filed December 20, 2002.
132. In re: American Electric Power Corp.: Affidavit in Docket No. ER03-242, before the Federal Energy Regulatory Commission on behalf of Ormet Primary Aluminum Corp. to respond to AEP's proposed electric transmission rates to be included in the OATT of the PJM Interconnection; Filed December 24, 2002.
133. In re: Application of the CT Light & Power Company: Supplemental Direct Testimony in Docket No. 217, before the State of CT Siting Council on behalf of The Attorney General, State of CT as a follow-up to the direct testimony filed on March 12, 2002 and to address various studies and reports that have been filed since that original testimony; Filed January 14, 2003.
134. In re: Pacific Gas & Electric: Rebuttal Testimony before the Federal Energy Regulatory Commission in Docket No. ER01-2998 on behalf of Northern California Power Agency ("NCPA") to respond to testimony from witnesses Judi K. Mosley, Kevin J. Dasso, Dr. Roy Shanker and Linda Patterson; Filed April 1, 2003.
135. In re: Order Instituting Investigation into implementation of Assembly Bill 970 regarding the identification of electric transmission and distribution constraints, actions to resolve those constraints, and related matters affecting the reliability of electric supply: Direct testimony before the Public Utilities Commission of California on behalf of Oak Creek Energy Systems. The purpose of the testimony is to provide comments on and recommendations with respect to the Tehachapi

Transmission Conceptual Facility Study (“Tehachapi CFS” or “TCFS”), performed by Southern California Edison (“SCE” or “Edison”); Filed April 22, 2003.

136. In re: Order Instituting Investigation into implementation of Assembly Bill 970 regarding the identification of electric transmission and distribution constraints, actions to resolve those constraints, and related matters affecting the reliability of electric supply: Rebuttal testimony before the Public Utilities Commission of California on behalf of Oak Creek Energy Systems. The purpose of the testimony is to rebut the testimony of Mr. Jorge Chacon and Mr. Melvin Stark on behalf of Southern California Edison Company, taking into account the testimony of Mr. Robert Sparks filed on behalf of the California Independent System Operator (“CA ISO” or “ISO”); Filed May 13, 2003.
137. In re: California Independent System Operator Corporation: Direct testimony before the Federal Energy Regulatory Commission in Docket No. ER00-2019 on behalf of State Water Contractors and the Metropolitan Water District of Southern California. The purpose of the testimony is to provide a critical analysis of ISO’s proposed Transmission Access Charge; Filed June 2, 2003.
138. In re: Ameren Services Company, et al.: Affidavit in Docket No. EL03-212-000, before the Federal Energy Regulatory Commission on behalf of Ormet Primary Aluminum Corp. to respond to AEP’s Submission in Response to the Commission’s Section 206 Investigation; Filed September 2, 2003.
139. In re: Pacific Gas and Electric Company: Direct Testimony in Phase I before the Federal Energy Regulatory Commission in Docket Nos. ER00-565-000, ER00-565-003, and ER00-565-007 on behalf of the Northern California Power Agency. The purpose of the testimony is to explain the nature of the costs for which Pacific Gas and Electric Company seeks recovery through its Scheduling Coordinator Service Tariff; Filed September 15, 2003.
140. In re: California Independent System Operator Corporation: Surrebuttal Testimony before the Federal Energy Regulatory Commission in Docket Nos. ER00-2019-006, ER01-819-002, and ER03-608-000 on behalf of State Water Contractors and the Metropolitan Water District of Southern California. The purpose of the testimony is to respond to the Prepared Rebuttal Testimony of Mr. Johannes P. Pfeifenberger on behalf of the ISO; Filed October 20, 2003.
141. In re: Midwest Independent Transmission System Operator, Inc. and Public Utilities With Grandfathered Agreements in the Midwest ISO Region: Prepared Testimony before the Federal Energy Regulatory Commission in Docket Nos. ER04-691-000 and EL04-104-000 on behalf of Marshfield Electric & Water District. The purpose of the testimony is to review Marshfield Electric & Water District’s transmission arrangements in order to respond to the Commission’s May 26, 2004 Order in this proceeding; Filed June 25, 2004.

142. In re: Pacific Gas and Electric Company: Direct Testimony in Phase II before the Federal Energy Regulatory Commission in Docket Nos. ER00-565-000 and ER00-565-003 on behalf of the Northern California Power Agency (“NCPA”). The purpose of the testimony is to discuss PG&E’s propriety in passing through ISO Charge Type costs as Scheduling Coordinator Service charges to NCPA under the terms of the NCPA-PG&E Interconnection Agreement; Filed September 13, 2004.
143. In re: Southern California Edison Company: Prepared Direct Testimony before the Federal Energy Regulatory Commission in Docket No. ER02-2189-003 on behalf of Whitewater Wind Hill Partners. The purpose of the testimony is to provide support for Whitewater’s request that the Commission revise the Interconnection Facilities Agreement (“IFA”) between Whitewater and Southern California Edison Company (“SCE or Edison”); Filed September 14, 2004.
144. In re: Cabazon Wind Partners, LLC Complainant vs. Southern California Edison Company Respondent: Affidavit in Docket No. EL04-137 before the Federal Energy Regulatory Commission on behalf of Cabazon Wind Partners, LLC (“Cabazon”). This Affidavit provides support for Cabazon’s request that Southern California Edison Company (“SCE”) grant Cabazon reimbursement, in the form of a transmission credit or otherwise, for the cost of certain upgrades Cabazon has borne to interconnect its generation to SCE; Filed September 27, 2004.
145. In re: Southern California Edison Company: Cross Answering Testimony before the Federal Energy Regulatory Commission in Docket No. ER02-2189-003 on behalf of Whitewater Hill Wind Partners. The purpose of the testimony is to respond to testimony filed on October 28, 2004, in this proceeding by Commission Staff witnesses, Ms. Tania Martinez Navedo and Mr. Edward W. Mills. As discussed in my prior testimony, the issue in this case involve the designation of disputed upgrades contained in the IFA between Whitewater and Southern California Edison Company; Filed November 22, 2004.
146. In re: Pacific Gas and Electric Company: Direct and Answering Testimony before the Federal Energy Regulatory Commission in Docket No. ER01-1639-006 on behalf of Northern California Power Agency. The purpose of this testimony is to explain 1) PG&E’s failure to justify the pass-through of Reliability Service charges to Western and PG&E’s additional failure to “unbundle the rates in its ETCs and provide a full cost of service analysis supporting the unbundled rates,” 2) PG&E’s attempt to pass-through Scheduling Coordinator Service Charges to Western, and 3) The inappropriateness of PG&E’s imposition of interest charges; Filed November 23, 2004.
147. In re: Petition for a Declaratory Order or Advisory Opinion as to the Applicability of the Commission’s Decision in Docket No. 03-10003, Plant Project in Orange County, California: Affidavit in Docket No. 04-10023, before the Public Utilities Commission of Nevada on behalf of Ridgewood Renewable Power, LLC (“Ridgewood”) with respect to a landfill methane gas powered

electric generating project located at the Olinda/ Alpha landfill in Orange County, California; Filed December 30, 2004.

148. In re: Southern California Edison Company and Cabazon Wind Partners, LLC: Prepared Direct Testimony before the Federal Energy Regulatory Commission in Docket No. EL04-137, on behalf of Cabazon Wind Partners, LLC. The purpose of this testimony is to provide support for Cabazon's request that Southern California Edison ("SCE") grant Cabazon reimbursement, in the form of transmission credit or otherwise, for the cost of certain upgrades Cabazon has borne to interconnect generation to SCE; Filed February 4, 2005.
149. In re: Pacific Gas and Electric Company: Phase II Answering Testimony to PG&E's Supplemental Testimony; Cross Answering Testimony; and Errata of Whitfield A. Russell before the Federal Energy Regulatory Commission in Docket No. ER00-565-000, et al and ER04-1233-000, on behalf of Northern California Power Agency. The purpose of this testimony is to respond to Mr. Bray's contention that the SCS Tariff is a formula rate, to respond to aspects of the Prepared Direct and Answering Testimony of Ms. Linda M. Patterson on behalf of the Federal Energy Regulatory Commission Staff and to provide updates to my previously filed testimony, Filed March 8, 2005.
150. In re: Southern California Edison Company: Affidavit before the Federal Energy Regulatory Commission in Docket No. EL05-80-000, on behalf of the California Wind Energy Association ("CalWEA"). The purpose of this affidavit is to explain how and why the proposed Antelope-Tehachapi 230 kV line will be integrated into the regional transmission grid and thereby constitute a network upgrade facility; Filed April 14, 2005.
151. In re: American Electric Power Service Corporation: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER05-751-000, on behalf of Ormet Primary Aluminum Corporation. The purpose of this affidavit is to respond to American Electric Power Corporation's (AEP's) request (a) to increase its annual Network Integration Transmission Service (NTS) revenue requirements to \$486 million per year and (b) to increase the NTS rates; Filed April 29, 2005.
152. In re: Southern California Edison Company and Cabazon Wind Partners, LLC: Prepared Rebuttal Testimony before the Federal Energy Regulatory Commission in Docket No. EL04-137, on behalf of Cabazon Wind Partners, LLC. The purpose of this testimony is to respond to direct testimony filed on March 14, 2005 and cross answering testimony filed on May 3, 2005 by Mr. Daniel J. Allstun, the witness of Southern California Edison and to respond to testimony filed on April 14, 2005 by Commission Staff witness, Ms. Emily White; Filed May 20, 2005.
153. In re: In the Matter of the Arbitrations between PG&E Energy Trading-Power, LP Claimant, Counter-Respondent and Southaven Power, LLC, and Caledonia Generating, LLC, Respondents, Counter-Claimants: Expert Report and litigation before the American Arbitration Association in AAA Nos. 16-198-00206-03 &

- 16-198-00207-03, on behalf of Williams & Connolly LLP (counsel of Southaven Power, LLC) and Bingham McCutchen LLP (counsel for Caledonia Generating, LLC). The purpose of this expert report was to provide my opinion on certain elements of the matters in dispute between PG&E Energy Trading-Power, L.P., on the one hand, and each of Southaven and Caledonia, on the other hand. These disputes have arisen in connection with two similar tolling agreements, each titled "Dependable Capacity and Conversion Services Agreement;" Filed September 8, 2005.
154. In re: Midwest Independent Transmission System Operator, Inc.: Pre-Filed Answering Testimony before the Federal Energy Regulatory Commission in Docket No. ER05-6-001, et al, on behalf of Ormet Primary Aluminum Corporation. The purpose of this testimony is to analyze the proposed SECA rate design as it relates to Ormet; Filed October 24, 2005.
155. In re: Berkshire Power Company, LLC: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER05-1179-001, on behalf of Massachusetts Municipal Wholesale Electric Company, Chicopee Municipal Lighting Plant, and South Hadley Electric Light Department. The purpose of this affidavit is to review the engineering analysis performed by ISO New England in support of its determination of the system reliability for the Springfield, Massachusetts area in Western Massachusetts and, more specifically, the ISO's analysis of the reliability need for two units in that area: (1) the 245 MW Berkshire facility operated by Berkshire Power Company; and (2) the 107 MW West Springfield Unit 3 operated by Consolidated Edison Energy Massachusetts, Inc.; Filed November 7, 2005.
156. In re: Consolidated Edison Energy Massachusetts, Inc.: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER05-903-002, on behalf of Massachusetts Municipal Wholesale Electric Company, Chicopee Municipal Lighting Plant, and South Hadley Electric Light Department. The purpose of this affidavit is to review the engineering analysis performed by ISO New England in support of its determination of the system reliability for the Springfield, Massachusetts area in Western Massachusetts and, more specifically, the ISO's analysis of the reliability need for two units in that area: (1) the 245 MW Berkshire facility operated by Berkshire Power Company; and (2) the 107 MW West Springfield Unit 3 operated by Consolidated Edison Energy Massachusetts, Inc.; Filed November 10, 2005.
157. In re: Pittsfield Generating Company, LP: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER06-262-000, on behalf of Massachusetts Municipal Wholesale Electric Company, Chicopee Municipal Lighting Plant, and South Hadley Electric Light Department. The purpose of this affidavit is to review the engineering analysis performed by ISO New England in support of its evaluation of the system reliability for the Pittsfield, Massachusetts area of Western Massachusetts and, more specifically, the ISO's analysis of the reliability need for the 160 MW facility operated by Pittsfield Generating Company, L.P.; Filed December 21, 2005.

158. In re: Mystic Development LLC: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER06-427-000, on behalf of Massachusetts Municipal Wholesale Electric Company, Wellesley Municipal Light Plant, Reading Municipal Light Department and Concord Municipal Light Plant. The purpose of this affidavit is to (a) respond to portions of the testimony offered by Mystic witnesses Messrs. Theodore Horton, Robert B. Stoddard, and Alan C. Heintz; and (b) review the engineering analysis of the December 7, 2004, "Need for Mystic Units 7, 8 and 9 for System Reliability," performed by ISO New England ("ISO") and included by Mystic in its filing as support for the assertion that Mystic Units 8 and 9 are needed to ensure system reliability in the Northeast Massachusetts/Boston Area load pocket; Filed January 19, 2006.
159. In re: In the Matter of the Application of Ohio Power Company for Approval of a Special Contract Arrangement with Ormet Primary Aluminum Corporation, In the Matter of the Joint Petition of Ohio Power Company and South Central Power Company for Reallocation of Territory, In the Matter of: Ormet Primary Aluminum Corporation and Ormet Primary Mill Products Corporation v. South Central Power Company and Ohio Power Company: Pre-Filed Testimony before the Public Utilities Commission of Ohio in Docket Nos. 96-999-EL-AEC, 96-1000-EL-PEB and 05-1057-EL-CSS, on behalf of Ormet Primary Aluminum Corporation. The purpose of this testimony is to analyze: (a) the effect upon the ratepayers of South Central and Buckeye of requiring South Central to serve Ormet and (b) the effect upon the ratepayers and stockholders of Ohio Power Company ("OPCO") of requiring OPCO to serve Ormet's full requirements under OPCO's retail GS-4 rate schedule; Filed September 8, 2006.
160. In re: Mystic Development, LLC: Direct Testimony before the Federal Energy Regulatory Commission in Docket No. ER06-427-000, on behalf of Massachusetts Municipal Wholesale Electric Company, Reading Municipal Light Department Wellesley Municipal Light Plant and Concord Municipal Light Plant. The purpose of this testimony is to assess whether a cost-of-service ("COS"), Reliability Must-Run ("RMR") Agreement is needed in order to keep Mystic Development LLC's ("Mystic's") Units 8 and 9 available to provide reliability service and if, contrary to my testimony, the Commission finds that a COS RMR agreement is needed to keep Mystic Units 8 and 9 available to provide reliability service, the Commission would be required to determine a just and reasonable COS rate to be imposed on customers under the RMR agreement. I testify regarding adjustments that need to be made to Mystic's proposed COS rates in order to render them just and reasonable; Filed November 9, 2006.
161. In re: Hydroelectric Production Rates and Rate Modification Plan-2007 and 2008 Rate Years: Direct Testimony and Supporting Exhibits before the New York Power Authority, on behalf of the New York Association of Public Power. The purpose of this testimony is to address the understatement of capacity at the Niagara and St. Lawrence Projects of the New York Power Authority ("NYPA") and how that understatement of capacity improperly reduces the amount of capacity made available to preference customers of the Niagara Project and

improperly increases the rates applicable to capacity sold to those customers;
Filed April 9, 2007.

162. In re: ISO New England Inc: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER08-190-000, on behalf of Massachusetts Municipal Wholesale Electric Company (“MMWEC”). The purpose of this testimony is to review the engineering analysis performed by ISO New England Inc. in support of its determination that MMWEC’s Phase II Stony Brook Unit is not qualified to participate in the first Forward Capacity Market auction, scheduled to be held in February 2008; Filed November 21, 2007.
163. In re: Columbus Southern Power Company and Ohio Power Company: Affidavit before the Public Utilities Commission of Ohio in Case Nos. 07-1132-EL-UNC, 07-1191-EL-UNC, 07-1278-EL-UNC, and 07-1156-EL-UNC, on behalf of Ormet Primary Aluminum Company. The purpose of this affidavit is in the matter of the Application of Columbus Southern Power Company and Ohio Power Company for approval of an additional generation service rate increase pursuant to their post-market development period rate stabilization plans and to update each company’s transmission cost recovery rider; Filed February 28, 2008.
164. In re: Niagara Mohawk Power Corporation: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER08-552-000, on behalf of the New York Association of Public Power and several of its members which include Green Island Power Authority, Jamestown Board of Public Utilities, City of Salamanca Board of Public Utilities, City of Sherrill Power & Light and Oneida-Madison Electric Cooperative, Inc. The purpose of this affidavit is review the filing by NMPC for Amendments to its Wholesale Transmission Service Charge for Point-to-Point Transmission service and Network Integration Transmission Service; Filed March 17, 2008.
165. In re: Braintree Electric Light Department, Hingham Municipal Lighting Plant, Hull Municipal Lighting Plant, Mansfield Municipal Electric Department, Middleborough Gas and Electric Department and Taunton Municipal Light Plant v. ISO New England Inc.: Direct Testimony and Exhibits before the Federal Energy Regulatory Commission in Docket No. EL08-48-000, on behalf of the individually municipally-owned power systems serving the Massachusetts communities of Hull, Mansfield, Middleborough, Taunton, Braintree and Hingham. The purpose of this testimony is to provide technical support for the MPS complaint; Filed March 28, 2008.
166. In re: Entergy Nuclear Operations Inc. and Entergy Nuclear Palisades, Inc. (Palisades Nuclear Plant), Entergy Nuclear Operations Inc. and Entergy Nuclear Fitzpatrick, Inc. (James A. Fitzpatrick Nuclear Power Plant), Entergy Nuclear Operations Inc. and Entergy Nuclear Generation Company (Pilgrim Nuclear Power Station), Entergy Nuclear Operations Inc. and Entergy Nuclear Vermont Yankee, Inc. (Vermont Yankee Nuclear Power Station), Entergy Nuclear Operations Inc.; Entergy Nuclear Indian Point 2, LLC; and Entergy Nuclear Indian Point 3, LLC (Indian Point Nuclear Generating Unites Nos. 1, 2, and 3),

- and Entergy Nuclear Operations Inc. and Entergy Nuclear Palisades, LLC. (Big Rock Point): Affidavit before the Nuclear Regulatory Commission in Docket Nos. 50-255-LT and 72-7-LT, 50-333-LT and 72-12-LT, 50-293-LT, 50-271-LT, 50-003-LT, 50-247-LT and 50-286-LT and 50-155-LT and 72-43-LT, on behalf of the Locals 369 and 590, Utility Workers Union of America, AFL-CIO. The purpose of this affidavit is to provide support for the April 15, 2008 Reply of Locals 369 and 590, Utility Workers Union of America, AFL-CIO to Answer of Energy Nuclear Operations, Inc. Opposing Petitions for Leave to Intervene, Request for Hearing, and Related Requests for Relief; Filed April 15, 2008.
167. In re: ISO New England, Inc.: Affidavit before the Federal Energy Regulatory Commission in Docket No. ER08-633-000, on behalf of The Connecticut Department of Public Utility Control. The purpose of this affidavit is to review the reliability analyses performed by the ISONE on the need to retain NRG's Norwalk Harbor Units 1 and 2 as listed Capacity Resources in the Forward Capacity Market for the 2010/2011 Capacity Year; Filed April 17, 2008.
168. In re: In the Matter of the Ontario Energy Board Act, 1998, S.O. 1998, C.15 (Sched. B); In the Matter of an Application by Hydro One Networks Inc. pursuant to section 92 of the Act, for an Order or Orders granting leave to construct a transmission reinforcement project between the Bruce Power Facility and Milton Switching Station, all in the Province of Ontario: Affidavit and Exhibits before the Ontario Energy Board in Docket No. EB-2007-0050, on behalf of the Saugeen Ojibway Nations. The purpose of this affidavit is to review the analyses performed by the Ontario Power Authority, Hydro One and the Independent Electric System Operator of Ontario in support of the application to construct a proposed Bruce-to-Milton double circuit 500 kV transmission line project; Filed April 18, 2008.
169. In re: Braintree Electric Light Department, Hingham Municipal Lighting Plant, Hull Municipal Lighting Plant, Mansfield Municipal Electric Department, Middleborough Gas and Electric Department and Taunton Municipal Light Plant v. ISO New England Inc.: Second Affidavit before the Federal Energy Regulatory Commission in Docket No. EL08-48-000, on behalf of the individually municipally-owned power systems serving the Massachusetts communities of Hull, Mansfield, Middleborough, Taunton, Braintree and Hingham. The purpose of this affidavit is to responds to the testimony of Messrs. Peter Brandien and Gregory Sullivan, which are part of the respective responses to the Complaint submitted by Independent System Operator New England, Inc and NSTAR Energy Company; Filed May 23, 2008.
170. In re: In the Matter of sections 25.30 and 25.31 of the Electricity Act and In the Matter of an Application by Ontario Power Authority for review and approval of its integrated power system plan and approval of its proposed procurement process. Affidavit and Exhibits before the Ontario Energy Board in Docket No. EB-2007-0707, on behalf of the Saugeen Ojibway Nations. The purpose of this affidavit is to review the Integrated Power System Plan ("IPSP") prepared by the

Ontario Power Authority, and discuss that Plan as it relates to the concerns of the Saugeen Ojibway Nations; Filed August 1, 2008.

171. In re: Ashburnham Municipal Light Plant, Boylston Municipal Light Department, Chester Municipal Electric Light Department, Groton Electric Light, Holden Municipal Light Department, Holyoke Gas & Electric Department, Paxton Municipal Light Department, Princeton Municipal Light Department, Shrewsbury Electric Light and Cable, Sterling Municipal Light Department, Templeton Municipal Light, West Boylston Municipal Light Plant, Westfield Gas & Electric, Chicopee Municipal Lighting Plant, Hudson Light & Power Department, South Hadley Electric Light Department and the Massachusetts Municipal Wholesale Electric Company, Complainants, v. Berkshire Power Company, LLC, and ISO New England Inc., Respondents. Affidavit and Exhibits before the Federal Energy Regulatory Commission in Docket No. EL09-3, on behalf of Ashburnham Municipal Light Plant, et al. The purpose of this affidavit is to present the results of an analysis I conducted concerning whether Berkshire Power Company, LLC (“Berkshire”), the operator of the Massachusetts-based Berkshire Plant, is earning sufficient revenues in the market to cover its “facility costs.” The Berkshire Unit is currently operated pursuant to a Reliability Must Run (“RMR”) Agreement between Berkshire and ISO New England Inc; Filed October 8, 2008.
172. In re: Missouri River Energy Services and Midwest Independent Transmission System Operator, Inc. and Missouri River Energy Services and Western Minnesota Municipal Power Agency. Rebuttal Testimony before the Federal Energy Regulatory Commission in Docket No. ER08-370-008 and EL08-22-006, on behalf of Missouri River Energy Services and the Western Minnesota Municipal Power Agency. The main purpose of my testimony is to respond to portions of Mr. Alan Heintz’s Prefiled Answering Testimony, Cross Answering Testimony and Corrections to Testimony on behalf of Otter Tail Power Company (“OTP”) and of Mr. Lotfy N. Sidrak’s Prepared Answering Testimony on behalf of the Commission Staff; Filed October 9, 2009.
173. In re: Southwest Power Pool, Inc. Affidavit before the Federal Energy Regulatory Commission in Docket No. ER10-1069-000 on behalf of Nebraska Public Power District, Omaha Public Power District, City Utilities of Springfield, Missouri, Lincoln Electric System and The Empire District Electric Company. The purpose of this affidavit is respond to Southwest Power Pool, Inc.’s “Submission of Tariff Revisions to Modify Transmission Cost Allocation Methodology,” and, in particular, the Prepared Direct Testimony of Mr. Leslie E. Dillahunty; Filed May 17, 2010.
174. In re: Southwest Power Pool, Inc. Affidavit before the Federal Energy Regulatory Commission in Docket No. ER10-1269-000 on behalf of Nebraska Public Power District. The purpose of this affidavit is to respond to SPP’s Integrated Transmission Plan filing in Docket No. ER10-1269 on May 17, 2010 and the prepared testimony of Mr. Bruce Rew, which summarizes and purports to provide a justification for SPP’s modified transmission planning process, the Integrated Transmission Plan (“ITP”); Filed June 7, 2010.

175. In re: In the Matter of the Application of Rocky Mountain Power for Alternative Cost Recovery for Major Plant Additions of the Populus to Ben Lomond Transmission Line and the Dunlap 1 Wind Project. Testimony before the Public Service Commission of Utah in Docket No. 10-035-89 on behalf of The Utah Industrial Energy Consumers. The purpose of this testimony is to explain Why present method of allocating costs of PacifiCorp's transmission system should be changed to a method that tracks cost causation and is aligned with PacifiCorp's transmission planning; Filed October 26, 2010.
176. In re: The Connecticut Light and Power Company, The Connecticut Transmission Municipal Electric Energy Cooperative. Affidavit before the Federal Energy Regulatory Commission in Docket No. EC11-31 on behalf of the Connecticut Transmission Municipal Electric Energy Cooperative. The purpose of this affidavit is to explain how CTMEEC intends to account for, and recover the transmission revenue requirement associated with, the 345 k V and 115 k V PTF assets that it is acquiring from CL&P; Filed December 15, 2010.
177. In re: Connecticut Transmission Municipal Electric Energy Cooperative. Affidavit before the Federal Energy Regulatory Commission in Docket No. ER11- on behalf of the Connecticut Transmission Municipal Electric Energy Cooperative. The purpose of this affidavit is to file Connecticut Transmission Municipal Electric Energy Cooperative proposed localized costs, revenue requirements and Schedule 21; Filed April 29, 2011.
178. In re: MidAmerican Energy Company. Answering testimony before the Federal Energy Regulatory Commission in Docket No. ER09-823-001 on behalf of Clipper Windpower Development Company, Inc. The purpose of this testimony is to answer and respond to the testimony filed in this proceeding by MidAmerican Energy Company ("MEC") witness Dehn A. Stevens and by Federal Energy Regulatory Commission Staff witnesses Antonio Maceo and Edward R. Gross; Filed May 2, 2011.
179. In re: Duke Energy Corporation and Progress Energy, Inc. Affidavit before the Federal Energy Regulatory Commission in Docket No. EC11-60-000, ER11-3306-000 and ER11-3307-000 on behalf of the Cities of New Bern and Rocky Mount, North Carolina. The purpose of this affidavit it to report on my analyses of several elements of the proposed merger of Duke Energy Corp. and Progress Energy, Inc.; Filed June 3, 2011.
180. In re: New York Power Authority's 2011 Hydroelectric Rate Modification Plan. Affidavit before the Power Authority of the State of New York in I.D. No. PAS-33-11-00001-P on behalf of New York Power Authority. The purpose of this affidavit is to discuss the appropriate rates for bulk power service that the New York Power Authority will render in the 2011-2014 rate years to municipal and cooperative preference customers from NYPA's Niagara and St. Lawrence Projects; Filed October 24, 2011.

181. In re: Duke Energy Corporation and Progress Energy, Inc. Affidavit before the Federal Energy Regulatory Commission in Docket No. EC11-60-004 on behalf of the Cities of New Bern and Rocky Mount, North Carolina. The purpose of this affidavit is to examine the extent to which the four power sales agreements that the Duke Energy Corp. and Progress Energy, Inc. present as “interim mitigation” involve relinquishment of operational control over the electric resources that are represented as being involved in those transactions. Second, to evaluate whether certain of the transmission upgrades that the Applicants propose as “permanent mitigation” are actually foreseeable and reasonably certain changes in the transmission topography of the areas affected by the proposed merger, and therefore not eligible to be considered as mitigation of merger-induced increases in market concentration; Filed April 25, 2012.

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of)	
Columbus Southern Power Company and)	
Ohio Power Company for Authority to)	Case No. 11-346-EL-SSO
Establish a Standard Service Offer)	Case No. 11-348-EL-SSO
Pursuant to §4928.143, Ohio Rev. Code,)	
In the Form of an Electric Security Plan)	
)	
In the Matter of the Application of)	
Columbus Southern Power Company and)	Case No. 11-349-EL-AAM
Ohio Power Company for Approval of)	Case No. 11-350-EL-AAM
Certain Accounting Authority.)	

**DIRECT TESTIMONY OF DR. JOHN W. WILSON
ON BEHALF OF ORMET PRIMARY ALUMINUM CORPORATION**

May 4, 2012

J.W. Wilson & Associates, Inc.

Economic Counsel

1601 North Kent Street • Rosslyn Plaza C • Suite 1104 Arlington, VA 22209

TABLE OF CONTENTS

I. QUALIFICATIONS 1

II. INTRODUCTION 4

III. THE DISCOUNTED CASH FLOW MODEL 8

IV. CAPITAL ASSET PRICING MODEL 15

VI. CAPM COST OF EQUITY ESTIMATES 22

VII. MODEL IMPROVEMENTS..... 23

VIII. RATE OF RETURN ON RATE BASE..... 29

I. QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND ADDRESS.

A. My name is John W. Wilson. I am President of J.W. Wilson & Associates, Inc. Our offices are at 1601 North Kent Street, Suite 1104, Arlington, Virginia, 22209.

Q. PLEASE OUTLINE YOUR EDUCATIONAL BACKGROUND.

A. I hold a B.S. degree with senior honors and a Masters Degree in Economics from the University of Wisconsin. I have also received a Ph.D. in Economics from Cornell University. My major fields of study were industrial organization and public regulation of business, and my doctoral dissertation was a study of utility pricing and regulation. My resume is attached to the end of my testimony.

Q. HOW HAVE YOU BEEN EMPLOYED SINCE THAT TIME?

A. After completing my graduate education I was an assistant professor of economics at the United States Military Academy, West Point, New York. In that capacity, I taught courses in both economics and government. While at West Point, I also served as an economic consultant to the Antitrust Division of the United States Department of Justice.

After leaving West Point, I was employed by the Federal Power

1 Commission ("FPC"), first as a staff economist and then as Chief of FPC's
2 Division of Economic Studies. In that capacity, I was involved in
3 regulatory matters involving most phases of FPC regulation of electric
4 utilities and the natural gas industry. Since 1973 I have been employed as
5 an economic consultant by various clients, including federal, state,
6 provincial and local governments, private enterprise and nonprofit
7 organizations. This work has pertained to a wide range of issues
8 concerning public utility regulation, insurance rate regulation, antitrust
9 matters and economic and financial analysis. In 1975 I formed J.W.
10 Wilson & Associates, Inc., a Washington, D.C. corporation.

11 **Q. WOULD YOU PLEASE DESCRIBE SOME OF YOUR**
12 **ADDITIONAL PROFESSIONAL ACTIVITIES?**

13 A. I have authored a variety of articles and monographs, including a number of
14 studies dealing with utility regulation and economic policy. I have
15 consulted on regulatory, financial and competitive market matters with the
16 Federal Communications Commission, the National Academy of Sciences,
17 the Ford Foundation, the National Regulatory Research Institute, the
18 National Association of Regulatory Utility Commissioners ("NARUC"),
19 the Edison Electric Institute ("EEI"), the Electric Power Research Institute,
20 the U.S. Department of Justice Antitrust Division, the Federal Trade
21 Commission Bureau of Competition, the Commerce Department, the

1 Department of the Interior, the Department of Energy, the Small Business
2 Administration, the Department of Defense, the Tennessee Valley
3 Authority, the Federal Energy Administration, and numerous state and
4 provincial agencies and legislative bodies in the United States and Canada.

5 Previously, I was a member of the Economics Committee of the U.S. Water
6 Resources Council, the FPC Coordinating Representative for the Task
7 Force on Future Financial Requirements for the National Power Survey, the
8 Advisory Committee to the National Association of Insurance
9 Commissioners (“NAIC”) Task Force on Profitability and Investment
10 Income, and the NAIC's Advisory Committee on Nuclear Risks.

11 In addition, I have testified as an expert witness in court proceedings
12 dealing with competition in the electric power industry and on regulatory
13 matters, including the cost of capital and rate of return, before more than 50
14 Federal and State regulatory bodies throughout the United States and
15 Canada. I have also appeared on numerous occasions as an expert witness
16 at the invitation of U.S. Senate and Congressional Committees dealing with
17 antitrust and regulatory legislation. In addition, I have been retained as an
18 expert on regulatory matters by more than 25 State and Federal regulatory
19 agencies. I have also participated as a speaker, panelist, or moderator in
20 many professional conferences and programs dealing with business
21 regulation, financial issues, economic policy and antitrust matters. I am a

1 member of the American Economic Association and an associate member
2 of the American Bar Association and the ABA's Antitrust, Insurance and
3 Regulatory Law Sections.

4 **II. INTRODUCTION**

5 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS**
6 **PROCEEDING?**

7 A. I am presenting testimony in this proceeding on behalf of Ormet Primary
8 Aluminum Corporation.

9 **Q. PLEASE SUMMARIZE YOUR TESTIMONY?**

10 A. My testimony in this case deals with the rate of return and return on equity
11 requested or assumed by the Ohio Power Company ("Ohio Power" or "the
12 Company") in this matter. My understanding, based on Ohio Power's
13 witness testimony and responses to discovery, is that Ohio Power has based
14 its request for a Retail Stability Rider (RSR) in this proceeding on an equity
15 return allowance (also referred to as a return on equity) of 10.5%.¹ It
16 appears that Ohio Power also has assumed a 10.2% equity return allowance

¹ See, e.g., PUCO Case 11-346-EL-SSO; 11-348-EL-SSO- Modified ESP. Testimony of William A. Allen In Support of AEP Ohio's Modified Electric Security Plan ("Allen Test."), p.14, lines 6-11 and Exhibit WAA-6.

1 for other riders.² The 10.2% figure appears to be based on an amount
2 agreed to in a stipulation since rejected by the Commission in a different
3 but related proceeding.³

4 My opinion is that both of these ROEs are excessive, and either amount is
5 not just and reasonable in this case, especially in view of the decline in
6 interest rates and other money costs that has occurred in recent years. The
7 evidence that I present shows that a more reasonable equity return
8 allowance, under present financial circumstances, would be in the range of
9 8.0 to 9.0 percent.

10 My analysis focuses on Ohio Power's rate of return and return on equity. I
11 also address the Company's cost of debt and capital structure. While Ohio
12 Power asserts that it has not filed for an overall rate of return in this
13 proceeding,⁴ it is still important to assess a reasonable rate of return to put
14 into context Ohio Power's requested or assumed returns on equity.

15 I would also note that Ohio Power is clearly not in any financial distress, as
16 its earned return on common equity has been well above the cost of equity
17 capital in recent years. According to the financial results reported in its
18 Form No. 1 Annual Reports, the Company's 2011 net income, after taxes

² See, e.g., Ohio Power Company's Response to Ormet Primary Aluminum Corporation Discovery Requests, PUCO Case 11-346-EL-SSO; 11-348-EL-SSO- Modified ESP, Second Set, Response to Ormet-RDP-2-001 ("Ohio Power Resp. to Second Set of Discovery"); Allen Test. p. 9 lines 20-23.

³ Ohio Power Resp. to Second Set of Discovery, Response to Ormet-RPD-2-001, p. 15.

⁴ *Id.*, Response to Ormet Interrog. 2-006, p.6.

1 and interest, exceeded 10.5 percent of its year-end equity capital. Financial
2 results for Ohio Power and Columbus Southern on a combined basis in
3 earlier years were even higher. In 2010, net income after taxes and interest
4 was 11.68 percent of year-end equity, and in 2009 the result was 12.54
5 percent. The Company's financial results have been more than satisfactory.

6 **Q. WHAT IS RATE OF RETURN?**

7 A. Rate of return is often described as the profit, expressed as a percentage of
8 the utility's invested capital (measured as rate base), that the utility is
9 allowed to include in its rates. From an economist's perspective it is not
10 precisely right to call this allowed "profit" because it includes both the cost
11 of debt capital (interest expense) as well as the allowed return on
12 stockholders' equity investment in the company.

13 For example, if a utility has \$100 million invested in rate base and this is
14 funded with \$50 million of debt, with an average interest of 5%, and \$50
15 million of equity, which the Commission has determined requires a return
16 on equity ("ROE") of 9%, the allowed rate of return ("ROR") would be 7%
17 or \$7 million annually, the average of interest and ROE weighted equally
18 since debt and equity are equal in this example. This amount, along with
19 all expenses and taxes, would be the revenue requirement reflected in the
20 utility's rates.

1 **Q. IS THE DETERMINATION OF A UTILITY’S RETURN ON**
2 **EQUITY ALLOWANCE A CONTROVERSIAL ASPECT IN MOST**
3 **RATE CASES?**

4 A. Yes. Rate of return accounts for a substantial portion of a utility’s rates,
5 and ROE is an important factor in that calculation. While the debt
6 component of rate of return is usually a straightforward reflection of the
7 Company’s actual interest costs as stated on its books, the equity return
8 component is substantially influenced by judgment and is typically hotly
9 contested. Disputes about required ROE allowances in rate cases often
10 center on the use of particular cost of capital estimation models used by the
11 various parties and the ROE resulting from this estimation.

12 **Q. IS STRICT ADHERENCE TO THE RESULTS OF MODELS**
13 **ESSENTIAL TO GETTING THE RATE OF RETURN ON EQUITY**
14 **“RIGHT” IN A REGULATORY PROCEEDING LIKE THIS?**

15 A. No. Models can be either helpful or confusing, and their results are highly
16 dependent on implementation. Ultimately, the “right” ROE determination
17 in this (and any) utility rate case requires a substantial measure of informed
18 judgment. While “experts” may be able to offer the Commission facts,
19 analyses and insights that will help to inform a reasonable range within
20 which that essential judgment can be exercised, it is ultimately a

1 determination that must depend on the Commission's priorities, objectives
2 and exercise of discretion, which no model, set of "expert" calculations, or
3 sworn opinions can replace.

4 **Q. HAVE YOU APPLIED MODELS IN REACHING YOUR ROE**
5 **RECOMMENDATION IN THIS CASE?**

6 **A.** Yes. I have used the same models that were employed by the Utilities
7 Department of the Commission Staff in preparing the Rate of Return
8 sections of the Staff Reports in the recent Columbus and Southern Power
9 Company/Ohio Power Company distribution service rate case before this
10 Commission (Case Numbers 11-0351-EL-AIR. et al. and 11-0352-EL-AIR,
11 et al.) This is the same proceeding on which Ohio Power appears to base at
12 least its 10.2% ROE. *See supra* at 5 n. 3. These models are customarily
13 referred to as Discounted Cash Flow ("DCF") and Capital Asset Pricing
14 ("CAPM") models.

15 **III. THE DISCOUNTED CASH FLOW MODEL**

16 **Q. CAN YOU PROVIDE A GENERAL DESCRIPTION OF THE DCF**
17 **MODEL?**

18 **A.** Yes. Discounted cash flow (or DCF) models are frequently used as a
19 method for measuring the cost or required return on a firm's common equity
20 capital. The DCF model is based upon two fundamental principles. First, it

1 is based on the principle that rational investors evaluate the risks and
2 expected returns of securities in capital markets and establish prices for
3 particular securities which adequately compensate them for the risks they
4 perceive. Second, the model is based on the proposition that the total
5 equity return received by shareholders consists of dividends and capital
6 gains, and these returns are measured in terms of the current dividend yield
7 plus the expected rate of dividend growth. The DCF model, which
8 combines yield and growth information to produce an estimated total return
9 expected by stock investors, is the following:

$$\begin{array}{lclcl} 10 & \text{Total Return} & & \text{Current} & \text{Expected Dividend} \\ & \text{to Investor} & = & \text{Dividend Yield} & + \text{Growth Rate} \\ 11 & T & & & \end{array}$$

12 This model makes no separate provision for capital gains because they are
13 fully accounted for in the dividend growth component. That is, capital
14 gains are a consequence of price appreciation which, in turn, is a
15 consequence of rising dividends and expected dividend growth.

16 Since an individual investor cannot control either the current dividend rate
17 or the dividend growth rate, his or her decision about the adequacy of
18 returns is reflected by the investor's buy, sell, and hold decisions. If the
19 expected return exceeds the required return, the price of common stock will
20 be greater than the stock's book value. If the expected return is lower than

1 investor requirements, the market price will fall below book value. If
2 investor expectations and requirements are the same, the stock will trade at
3 a price equal to book value. Ohio Power is a wholly owned subsidiary of
4 AEP and does not have publicly traded common stock. AEP's stock trades
5 at a market price that exceeds its book value by about 25 percent.

6 **Q. IS THE DCF COST OF COMMON EQUITY CAPITAL ESTIMATE**
7 **DIRECTLY LINKED TO THE MARKET PRICE OF COMMON**
8 **STOCK?**

9 **A.** Yes. The DCF procedure for estimating the cost of equity capital, or
10 required ROE, reflects the fact that the maximum price a logical investor
11 will pay for a security is an amount equal to the present value of the
12 dividends that he or she expects to receive over the years during which the
13 security is held plus its resale price, including capital gains, when the
14 security is sold. Algebraically, this principle can be represented by the
15 following equation:

$$\begin{array}{l} 16 \\ 17 \\ 18 \end{array} \quad P_0 = \frac{D_1}{1 + R} + \frac{D_2}{(1+R)^2} + \dots + \frac{D_t}{(1+R)^t} + \frac{P_t}{(1+R)^t}$$

19 where P_0 is the price of a company's common stock today; $D_1, D_2 \dots D_t$ are
20 expected dividends in subsequent periods; P_t is the expected resale price of
21 the stock at some time in the future; and R is the discount rate or required

1 return (sometimes referred to as the opportunity cost of capital). This
2 algebraic statement becomes an infinite geometric progression in the most
3 common form of the constant growth DCF model (because P_t and all
4 subsequent resale values depend on expected dividends and resale prices at
5 that point in the future, and dividends are assumed to grow at a constant
6 annual rate) which reduces algebraically to the constant growth DCF
7 formula⁵:

8
$$R = D/P + g$$

9 where “g” is the expected annual rate of dividend growth.

10 The market price, “P”, is the present value of all cash flows expected in the
11 future, discounted at a rate equal to the rate of return investors require on
12 the investment. Present value is the current worth of expected future
13 returns – that is, what an investor would be willing to pay today in order to
14 obtain the expected cash flows in the future. Today's price is the present
15 value of these expected cash flows, discounted at a rate that reflects the cost
16 of capital, including the risk perceived by investors that their expectations
17 will not be met.

⁵ In the DCF analysis presented below I provide both constant growth and non-constant growth DCF cost of capital measures. In the distribution proceeding referenced above and by Ohio Power, the Commission's Utilities Department Staff also presented both constant growth and non-constant growth DCF results in their Reports, although they relied on their non-constant growth DCF model in developing their cost of capital estimates.

1 The most controversial aspect of DCF analysis is usually estimating the
2 growth component of the model, rather than the underlying model or
3 theory, itself.

4 **Q. WHAT EXPECTATIONS ARE IMPORTANT IN DCF ANALYSIS?**

5 A. Investors' collective expectations regarding dividend growth are central to
6 the discounted cash flow approach and these dividend growth expectations
7 are the key to estimating the cost of common equity capital. While analysts
8 may opine on what they think investors' dividend growth expectations may
9 be, the only way in which investors reveal their collective expectations is in
10 the market prices that they establish for common stock. Investors establish
11 prices for common stocks on the basis of their collective expectations of
12 future income streams (dividends and capital gains) relative to their return
13 requirements for the level of perceived risk. It is the consensus of investor
14 expectations that establishes the price of common equities, and those
15 expectations are ultimately concerned with investors' expected future
16 income streams (i.e., dividends). This means that it is the expected growth
17 in dividends which is most important in estimating "g" in the DCF
18 calculation.

1 **Q. HOW IS INVESTORS' EXPECTED DIVIDEND GROWTH**
2 **DETERMINED?**

3 **A.** Although dividend yields are easy to estimate with published data, the
4 expected dividend growth component of the model, “g”, is not as easy.
5 While analysts often publish their earnings expectations, which, overall,
6 tend to be somewhat bullish, there is no published consensus value for the
7 dividend expectations that investors hold. That analysts’ forecasts are
8 somewhat more bullish than investors’ actual expectations is evident from
9 stock market prices, which are typically lower than analysts’ price
10 forecasts. This differential may be consistent with the notion that really
11 valuable analysts are those who know something that the market does not
12 already know. In any event, in estimating an equity cost rate using the DCF
13 model, one must determine what the most reasonable estimate of dividend
14 growth expectations held by investors is at any point in time. If investors
15 accept analysts’ earnings growth forecasts at face value and without any
16 discounting, and if they expect that firms will increase their dividend
17 payouts in lock-step with earnings growth, then analysts’ earnings forecasts
18 may serve as a proxy for the investor dividend growth expectations that are
19 central to the DCF model.

20 In this regard, it is important to emphasize that the task of the rate of return
21 analyst is to determine what dividend growth rate *investors* are expecting,

1 and not simply to forecast a growth rate that analysts expect. Nor does it
2 matter whether investors' expectations turn out to be right or wrong.
3 Today's common stock prices, which enter the DCF calculation through the
4 dividend yield term, depend upon today's expectations for future growth.
5 Of course, expectations and requirements may be different at different
6 times, and, therefore, the cost of common equity is likely to change over
7 time.

8 For example, when interest rates are very high, it is likely that required
9 equity returns are higher than when interest rates are low. Similarly, when
10 expected long-term inflation rates are high, it is likely that the cost of
11 common equity will be higher than when long-term inflation expectations
12 are low. Today, of course, interest rates are extremely low and inflation is
13 well below historic experience. A cost of common equity at one point in
14 time may therefore be quite different from what it was previously, or
15 different than in the future. Also, while tomorrow's hindsight may prove
16 that today's expectations were wrong, that does not and cannot possibly
17 affect today's cost of capital. That is why it is necessary only for the rate of
18 return analyst to estimate, as accurately as possible, what investor
19 expectations actually are, and not whether they are correct.

IV. CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPITAL ASSET PRICING MODEL (“CAPM”).

A. The CAPM is, like the DCF model, one of the most widely used techniques to estimate the cost of equity capital. The fundamental principle underlying the CAPM is that investors require compensation for risk when making an investment – that is, a higher return than is required for a riskless investment. While the DCF model estimates the cost of equity capital directly by examining expected dividend flows and market prices, the CAPM estimates required returns by evaluating the relative risk of alternative investments.

In comparison with the expected return on a risk-free investment, a risky investment must provide investors with a risk premium – an expected return higher than the riskless rate. The most commonly used measure of a risk-free asset is a short term (e.g., 90 day) U.S. Treasury security, which has little or no default or inflation price risk. It should be emphasized that only very short term Treasury debt can be assumed to be risk-free. Long term debt, even long term U.S. Treasury debt, which locks investors into U.S. dollar denominated assets for many years, can be very risky, as

1 inflation or international currency fluctuations can significantly impair
2 investment value.

3 For example, investors who locked their investments into long term
4 treasuries in 2000 saw the purchasing value of their investment decline
5 substantially in terms of buying power in relation to other world currencies.
6 Likewise, long term bond values fell dramatically during periods of high
7 inflation in the 1980s. Only very short term treasury debt is substantially
8 free of these currency and inflation risks. Just as these risks caused the real
9 asset value of long term Treasury bonds to decline in the past, they could
10 do so again in the next decade. Utility equity investments, on the other
11 hand, are far more protected from these risks by the regulatory process
12 itself, which adjusts allowed returns as money costs change.

13 **Q. HOW DOES THE CAPM MODEL WORK?**

14 A. CAPM separates the total risk of an investment into two parts: systematic
15 risk and unsystematic risk. Systematic risk is unavoidable; it affects all
16 assets to a greater or lesser degree. For example, a sharp rise in inflation
17 would affect all stocks to a greater or lesser degree. The size of the risk
18 premium for each stock is determined in proportion to the stock's co-
19 movement with the market for all stocks. A stock that is twice as volatile
20 as the average requires a risk premium that is double the average risk

1 premium. A stock that is half as volatile as the average requires a risk
2 premium that is half the average, etc. All systematic risk is rewarded with a
3 risk premium that is above the risk-free rate of return, and the risk premium
4 varies in direct proportion to the stock's relative volatility. The relative risk
5 of each stock is measured by a value known as beta ("B"), which is a
6 measure of the stock's relative volatility in comparison with the volatility
7 of the entire market. In contrast, unsystematic risk is that portion of total
8 risk that can be avoided by diversifying. Unsystematic risk is not rewarded
9 with a risk premium.

10 The CAPM defines the cost of equity for each company's stock as equaling
11 the riskless rate plus an increment equal to the amount of systematic risk
12 that goes with the investment:

13
$$K_n = R_f + B_n (R_m - R_f)$$

14 where,

15 K_n = the cost of equity for company n

16 R_f = the riskless rate of return

17 B_n = the beta for the stock of company n

18 $R_m - R_f$ = the expected market risk premium (i.e., the average
19 difference between the expected returns for the diversified market

1 portfolio and the riskless return).

2 **V. DCF COST OF EQUITY ESTIMATES**

3 **Q. DO YOU AGREE WITH THE DCF CALCULATIONS PRESENTED**
4 **IN THE STAFF REPORTS IN CASE NUMBERS 11-0351-EL-AIR,**
5 **ET AL. AND 11-0352-EL-AIR. ET AL.?**

6 **A.** First, I recognize that at least one of the returns on equity requested or
7 assumed by Ohio Power for its riders in this matter appears to be derived
8 from a separate but related proceeding, Case Nos. 11-0351-EL-AIR and 11-
9 0352-EL-AIR. *See* fn. 3. Thus, even though this is a different case, it is
10 Ohio Power that references the earlier proceeding. Further, it is instructive
11 to review how the Commission's Utilities Department Staff reached a
12 reasonable return on equity in their Reports in the earlier proceeding.
13 Indeed, my focus is not on what the parties or Commission ultimately
14 decided in settlement (since rejected) in the earlier case but rather on the
15 methodology that the Utilities Department Staff used in calculating a
16 reasonable return on equity, as I base my opinion in this matter on the same
17 methodology.

18 The DCF calculations presented in these Staff Reports are representative of
19 DCF calculations presented in most public utility rate cases. While, as
20 explained below, I am not in full agreement with the use of historic GNP

1 growth as a proxy for investors' long term dividend growth expectations in
2 the non-constant growth model, in the analysis presented below I provide
3 updated DCF calculations for Ohio Power in conformance with those in the
4 Staff Reports in order to estimate a reasonable ROE in this matter.

5 **Q. PLEASE DESCRIBE YOUR DCF COST OF EQUITY ESTIMATES.**

6 A. My DCF cost of common equity estimates are based on the same group of
7 utilities that were considered by the Utilities Department Staff to be
8 representative of Ohio Power for the purpose of cost of equity estimation.
9 This group consists of companies that are publicly traded on the New York
10 Stock Exchange, and are categorized as electric utility companies by Value
11 Line. These companies each have total capitalizations greater than \$5
12 billion. They also have Financial Strength Value Line ratings of B++ and
13 are not currently involved in major merger activity. As in the Staff's
14 analysis, my cost of equity estimate for this comparable group of
15 companies is the average of their CAPM and DCF cost of common equity
16 estimates.

17 In calculating updated DCF cost of common equity estimates for each
18 comparable company, I followed the method employed by the Utilities
19 Department Staff, using the annual average stock price, the sum of the last
20 four quarterly dividends, analyst estimates of the expected rate of growth of

1 earnings per share and Staff's estimate of generic issuance costs related to
2 external financing. The stock price that I employed is the average daily
3 closing price for the period from April 26, 2011 through April 24, 2012
4 (Staff had used the earlier period from April 19, 2010 through April 15,
5 2011). Staff's DCF model assumes that earnings growth and dividend
6 growth are the same. Following the Staff procedure, I averaged earnings
7 per share estimates from Yahoo, MSN, Reuters and Value Line to get DCF
8 growth estimates for each of the comparable companies. Also following
9 the Staff methodology, the Value Line average incorporates both what Staff
10 refers to as the "explicit" long-range earnings estimate shown in the "box"
11 on each Value Line sheet and the "implicit" continuous growth rate
12 calculated from the Value Line estimates of future annual earnings per
13 share.

14 Following the Staff's method, I determined the DCF cost of equity using a
15 calculated non-constant DCF growth rate. That is, I followed the Staff
16 method of assuming dividends grow at a rate derived from the average of
17 financial analysts' growth estimates for the first five years, and, from the
18 twenty-fifth year on, the annual growth rate was assumed to be equal to
19 historic growth rate in GNP as obtained from the U.S. Labor Department
20 for the period 1929 through 2011. (Staff used the period 1929 through
21 2010). For the sixth through the twenty-fourth years, as in the Staff's

1 analysis, I assumed dividend growth to vary linearly between the rate in the
2 fifth year and the rate in the twenty-fifth year. Using this Staff method, I
3 calculated an estimated stream of annual dividends. The internal rate of
4 return derived from this dividend stream and the stock price was used, as in
5 the Staff's September 15, 2011 Report, to calculate an updated non-
6 constant growth DCF cost of equity estimate.

7 The updated comparable group non-constant DCF cost of equity estimates
8 average 9.85%. When averaged with the 6.80 CAPM estimate, the result is
9 8.32%. This compares with 8.96% in the September, 2011 Staff Report,
10 which was based on data from a year earlier. Using the Staff's one hundred
11 basis point range of uncertainty, the resulting cost of equity estimate is
12 7.82% to 8.82%. The Staff methodology then adds an "issuance cost"
13 allowance to this estimate. The updated issuance cost factor, following the
14 Staff methodology is 1.01506. Applying this factor to the estimated cost of
15 common equity range results in an adjusted return on equity range of 7.94%
16 to 8.96%. These results, as shown Schedule JW-1.1a (which corresponds
17 with Staff Schedule D-1.1), are somewhat lower than the Staff's ranges of
18 8.58% to 9.59% for Columbus Southern and 8.59% to 9.60% for Ohio
19 Power, as money costs have declined since the time of the Staff's earlier
20 analysis.

VI. CAPM COST OF EQUITY ESTIMATES

Q. DO YOU AGREE WITH THE CAPM CALCULATIONS PRESENTED IN THE STAFF REPORTS IN CASE NUMBERS 11-0351-EL-AIR, ET AL. AND 11-0352-EL-AIR. ET AL.?

A. Again, my reason for reviewing the Staff calculations was not to assess the reasonableness of the rates they calculated in a separate but related proceeding, but rather to assess how Staff reached their conclusions, since this is instructive to other matters before the Commission, such as the present case. Indeed, as in the case of the Staff's DCF calculations, the CAPM calculations presented in these Reports are representative of CAPM calculations presented in most public utility rate cases. While I believe that very short term Treasury interest rates are a better measure of risk free capital cost than the rates on long term bonds, in the analysis below I provide updated CAPM calculations for Ohio Power calculated in conformance with the methodology used in the Staff Reports.

Q. PLEASE DESCRIBE YOUR CAPM CALCULATIONS.

A. In order to update and replicate the Staff's analysis, in calculating the CAPM cost of common equity estimate, I employed the average of the Value Line betas (which is 0.686) and the Ibbotson-derived spread of arithmetic mean total returns between large company stocks and long term

1 government bonds (i.e., what the Staff refers to as “risk free” return). As in
2 the Staff’s analysis, I used these values in the CAPM formulation with the
3 weighted average of the 10 year and 30 year daily closing Treasury yields
4 for the period from April 26, 2011 through April 24, 2012 (Staff’s earlier
5 analysis had used the period from April 19, 2010 through April 15, 2011).
6 In my updated analysis, the averaged 10 year yield is 2.119 and the
7 averaged 30 year yield is 3.244. The average of the 10 and 30 year yield
8 values is 2.6817, and this was added to the average product of the beta
9 (.686) and the 6.0% spread. This resulted in an updated CAPM cost of
10 equity estimate, using the Staff’s methodology, of 6.796 percent. The
11 derivation of this result is shown in Schedule JW-1.3, which is an update of
12 Staff Schedule D-1.3. My CAPM estimate is somewhat lower than the
13 Staff’s corresponding estimate (7.858%) which was based on data from a
14 year earlier, as money costs fell significantly over the year.

15 **VII. MODEL IMPROVEMENTS**

16 **Q. ARE THERE IMPROVEMENTS THAT COULD BE MADE IN**
17 **APPLYING THESE MODELS?**

18 **A.** Yes. First, in applying the non-constant DCF model, it would be better to
19 use a growth estimate tied to *per share* growth rather than historic GNP
20 growth, which is not a per share growth measure, but a measure of total

1 economic growth. Per share growth and total economic growth are
2 substantially different because a large part of total economic growth reflects
3 growth in the number of shares, not just growth per share. Thus, if a
4 company's earnings and dividends double over 10 years, and the number of
5 shares outstanding remains the same, the value of each share doubles.
6 However, if growth in the company's earnings and dividends is financed by
7 selling additional shares, the resulting per share growth value is less than
8 double. Likewise, if GNP or total corporate earnings double over 10 years,
9 and this reflects the development and growth of new businesses as well as
10 the growth in the number of shares issued by existing businesses, then total
11 growth is spread over more shares, and growth per share is less than
12 double.

13 **Q. PLEASE EXPLAIN WHY THAT IS SO.**

14 A. Whether in terms of earnings or other measures, the economy grows over
15 time for two distinct reasons:

16 1) Individual business enterprises grow, and

17 2) The number of business enterprises grows.

18 When individual business enterprises grow:

19 1) New equity capital is raised from new equity issues, and

1 2) Existing equity investments grow over time due to retained earnings
2 and other accumulations to existing shares.

3 Earnings growth per share will be the same as total earnings growth only if
4 all growth is attributable to existing shares -- i.e. if there are no new firms
5 and existing firms issue no new shares of stock.

6 If a company's earnings and the market value of its equity capital doubles
7 over ten years, and it still has the same number of shares outstanding, the
8 value of each share doubles, reflecting a 7.18% annual rate of growth over
9 the ten years:

$$(1.0718)^{10} = 2.0$$

11 If, on the other hand, a company's earnings and market value double, but
12 this growth is financed by selling additional shares, the resulting per share
13 value is less than double and the annual per share growth rate is less than
14 7.18%:

15 Likewise, if GNP or total corporate earnings double over 10 years, and this
16 reflects growth in the number of corporations as well as growth in the
17 number of shares issued by each corporation, growth per share is less than
18 double.

19 In short, total growth measures -- like growth in GNP, GDP, total
20 corporate earnings or total dividends over a long period of time -- will not

1 provide a good proxy for earnings or dividend growth *per share*. Over any
2 long period of time there will also be substantial growth in population,
3 households, number of investors, number of corporations, and corporate
4 shares outstanding.

5 **Q. ARE THERE ADDITIONAL REASONS FOR QUESTIONING**
6 **HISTORIC GNP GROWTH AS A MEASURE OF PER SHARE**
7 **EARNINGS GROWTH IN A MULTI-STAGE OR NON-CONSTANT**
8 **DCF CALCULATION?**

9 A. Yes. The historic GNP growth percentage for the period 1929 through
10 2011 as shown in Schedule JW-1.9 (which corresponds with Staff Schedule
11 D-1.9) exceeds the Congressional Budget Office's ("CBO") official long
12 term GDP growth forecast by a wide margin⁶. This alone makes a DCF
13 analysis based on historic GNP or GDP growth suspect. Whereas Staff's
14 non-constant DCF analysis uses 6.56% as projected GNP growth, the
15 CBO's published long term GDP forecast (beyond 2018) is for 2.5% real
16 growth and 4.5% nominal growth annually. Had Staff used the CBO
17 forecast rather than the 6.56% figure, their estimated DCF cost of equity
18 estimate would have been substantially lower.

⁶ GDP (Gross Domestic Product) and GNP (Gross National Product) are very closely related. For example, if Schedule JW-1.9 were done on the basis of GDP instead of GNP the end result would be 6.51% instead of 6.52%.

1 **Q. WHAT PER SHARE LONG TERM GROWTH ESTIMATE WOULD**
2 **YOU RECOMMEND AS A BETTER ALTERNATIVE THAN**
3 **HISTORIC GNP FOR USE IN THE NON-CONSTANT DCF**
4 **MODEL?**

5 A. A sustainable long term growth estimate can be calculated directly from
6 retained earnings. Because retained earnings provide for growth in equity
7 and growth in equity provides for business growth, the rate of earnings
8 plow-back (i.e., those earnings not paid out in dividends) serves as a basis
9 for estimating future dividend growth. If the funds that are retained and
10 reinvested earn the allowed return and the allowed return is equal to the
11 cost of capital, retained earnings provide a good estimate of future growth.

12 For example, if a company with a stock price and book value of \$50 per
13 share earns \$4.00 (8%) and pays out a dividend of \$2.00, its dividend yield
14 is 4% (i.e., $2.00/50$). Expected growth will also be 4% because, if the 8%
15 earnings rate is maintained, the \$2.00 that is retained will permit earnings to
16 increase by that amount (i.e., $\$2.00 \times 8\% = \0.16 , which is 4% of \$4.00).
17 Likewise, the retention of \$2.00 of earnings within the corporation will
18 cause the book value of its stock to increase by 4% (i.e., \$2.00 is 4% of
19 \$50.00). In this case, the dividend yield of 4% plus expected growth of 4%
20 equals 8%, which is the cost of equity capital.

1 **Q. ARE THERE OTHER TECHNICAL IMPROVEMENTS THAT**
2 **COULD BE MADE TO THE MODELS?**

3 A. Yes. As I noted above, the CAPM model is premised on the principle that
4 equity investments are not risk-free, and therefore the return required by
5 equity investors is equal to the risk-free return plus a risk premium
6 associated with equity investment risk. The Staff CAPM computation,
7 which I have followed in updating the cost of equity analysis, uses long
8 term Treasury bond rates (10 year and 30 year) as the risk-free rate. In fact,
9 long term bonds are not risk-free because there is substantial financial risk
10 of being locked into a fixed return if money costs rise over time or of being
11 locked into a dollar denominated asset if the relative value of the dollar
12 falls. For this reason, it is generally recognized that only very short term
13 rates (i.e., 30 or 90 day T-bills) are really risk-free. At the present time,
14 riskless treasury bills are yielding less than 1%, and they have been at that
15 level for some time as Federal Reserve monetary policy has been aimed at
16 keeping these rates very low.

17 Among the people who have studied the equity premium closely, most
18 think it is probably in the range of 3 to 5 percentage points above treasury
19 bills. On the other hand, recent surveys have shown that rank-and-file
20 finance professors peg the long-term premium at about 6 percent.

1 The author of the most well-known surveys on risk premium, Ivo Welch of
2 Yale University, agrees with the 3-5 percent range. According to his
3 analysis, a 3% geometric equity premium estimate and a 5% arithmetic
4 estimate are more accurate than the 6% consensus of the profession. (See
5 Ivo Welch, "Views of Financial Economists on the Equity Premium and on
6 Professional Controversies" (University of California, Los Angeles and
7 Yale University, 2001)). Welch's more recent surveys indicate that, as of
8 2007-2008, finance professors estimated equity premiums in a slightly
9 lower 4% to 6% range, centering around 5%. (See Ivo Welsh, "The
10 Consensus Estimate for the Equity Premium by Academic Financial
11 Economists", National Bureau of Economic Research, January 18, 2008
12 and Pablo Fernandez, "Market Risk Premium Used in 2008", IESE
13 Business School, 2009). CAPM calculations based on short term Treasury
14 rates rather than long term rates would produce lower cost of equity
15 estimates.

16 **VIII. RATE OF RETURN ON RATE BASE**

17 **Q. HAVE YOU CALCULATED THE OVERALL RATE OF RETURN**
18 **AND ROE THAT YOU CONSIDER REASONABLE AND JUST IN**
19 **THIS CASE?**

20 **A.** Yes. Following the same procedure used by the Staff in a prior related

1 proceeding cited by Ohio Power, I calculated a required overall return on
2 rate base in the range of 6.75 to 7.28 percent. This result, which is shown
3 in Schedule JW-1a, reflects the updated DCF and CAPM results following
4 the Staff methods as described above and the Company's capital structure
5 and embedded cost of debt at 12/31/2011 as reported in its most recent
6 Form No. 1 Annual Report on a consolidated, post-merger basis.

7 I also conclude that a ROE would be in the range of 7.94% to 8.96% and
8 should not exceed 9%. The details of this capital structure and overall
9 return calculations are shown in Schedule JW-1a, which corresponds with
10 Schedule D-1 in the Staff Report.

11 A cost of capital finding in this range would be appropriate in this case if
12 the Commission does not want to adopt the suggested model changes that I
13 discussed above at this time. Somewhat lower ranges for overall rate of
14 return (6.39% - 6.92%) and ROE (7.25%-8.26%) are shown in Schedule
15 JW-1b. These lower rates of return reflect a constant DCF cost of capital
16 estimate based on an extension of analysts' forecasts rather than the Staff's
17 two-stage approach reflecting historic GNP growth.

18 I therefore do not consider a return of equity for riders in this case in the
19 range of 10.2% or 10.5% to be reasonable and just. Rather, the return on
20 equity should not exceed 9% and could reasonably be less.

1 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

2 **A. Yes, it does.**

Dr. John W. Wilson

EDUCATION

B.S.	(Senior Honors)	-	University of Wisconsin
M.S.	(Economics)	-	University of Wisconsin
Ph.D.	(Economics)	-	Cornell University

EMPLOYMENT

1975 - Present	-	President, J.W. Wilson & Associates, Inc.
1973 - 1974	-	Independent Economic Consultant
1972 - 1973	-	Chief, Division of Economic Studies Federal Power Commission
1971 - 1972	-	Economist, Federal Power Commission
1969 - 1971	-	Assistant Professor of Economics (and Captain, U.S. Army); United States Military Academy; West Point, New York. Also varsity debate coach, USMA; and antitrust consultant, U.S. Department of Justice.
1966 - 1969	-	Teaching Assistant, Cornell University
1965 - 1966	-	Research Assistant, University of Wisconsin
1961 - 1965	-	Independent Insurance Agent (Licensed in the State of Wisconsin)

PUBLICATIONS

“Private Passenger Automobile Insurance Profitability in Massachusetts,” Massachusetts Attorney General, September, 2002.

“Actuarial Report Regarding the California Earthquake Authority’s 2002 Proposed Rate Application,” California Earthquake Authority, October, 2002.

“Private Passenger Automobile Insurance Profitability in Massachusetts,” Massachusetts Attorney General, September, 2001.

“Merger Policy Guidelines for the Electric Power Industry,” (January 1996) The Electricity Journal.

"Incremental Transmission Pricing, the Comparability Standard, and an Alternative to the FERC's 'Higher of' Policy," with D.F. Greer and R.A. Sinclair (December 1994) The Electricity Journal.

"New Market Pricing Proposals for Telephone Exchange Services: A Critical Appraisal" in James H. Alleman and Richard D. Emerson, Perspectives on the Telephone Industry, Harper & Rowe, 1989.

Who Pays for Sunk Costs? The National Regulatory Research Institute, Ohio State University, Columbus, Ohio, 1988.

Medical Malpractice Insurance in New York State, Alliance For Consumers Rights, New York, N.Y., 1988.

Incorporating the Direct Recognition of Investment Income in the Rate Review and Approval Process, District of Columbia Insurance Administration, Washington, D.C., 1986.

Profitability of West Virginia Medical Malpractice Insurers, Attorney General of West Virginia, August, 1986.

Insurance in California: Profitability Competition and Equity in Selling and Pricing of Private Passenger Automobile Insurance and The Crisis in Day Care and Municipal Liability Insurance, with J. Robert Hunter, National Insurance Consumer Organization, October, 1986.

"Telephone Access Costs and Rates" in Public Utilities Fortnightly, September 15, 1983.

Insurance Ratemaking: Investment Income and Profitability in Property/Casualty Insurance Ratemaking; with J. Robert Hunter, National Association of Insurance Commissioners, 1983.

A Study of Jurisdictional Separations to Compare AT&T's Interstate Settlements Information System With the Separations Manual and Division of Revenue Process; Federal Communications Commission, Washington, D.C., 1980.

The Nuclear Fuel Reprocessing Industry: An Analysis of Industry Development and Industrial Organization, National Science Foundation, Washington, D.C., 1976.

"Comments on Pricing and Allocation in the Natural Gas Industry," in Harry M. Trebing, New Dimensions in Public Utility Pricing, Michigan State University Press, East Lansing, Michigan, 1976.

"Inverted Electric Utility Rate Structures: An Empirical Analysis," with Robert G. Uhler in Ibid.

"How to Design Marginal Cost Rates for Electric Utilities," in Proceedings of the Need for Power Conference, Ohio Power Siting Commission, Columbus, Ohio, 1976.

Projected Electric Power Demands for the Potomac Electric Power Company, Maryland, Power Plant Siting Program, Maryland Department of State Planning, Annapolis, Maryland, July 1975.

"Adam Smith Abandoned: Big Oil is Big Coal is Big Natural Gas," in Business and Society Review, Spring, 1974; also in Skeptic: The Forum for Contemporary History, Special Issue No. 5, January 1975; also in Robert Heilbroner and Paul London, Corporate Social Policy, Addison-Wesley, 1975.

"Market Structure and Interfirm Integration in the Petroleum Industry," presented at the annual meeting of the Association for Evolutionary Economics, San Francisco, December, 1974; also published in the Journal of Economic Issues, June 1975.

"Competitive Market Structure and Performance in the Energy Resource Industries," Public Administration and Policy in an Era of Energy Scarcity, (Walter Scheffer, ed.), University of Oklahoma, 1975.

The Burmah-Signal Merger, published as a Special Report together with dissenting views, Special Subcommittee on Integrated Oil Operations, Committee on Interior and Insular Affairs, U.S. Senate, 1974.

"Competition in the Petroleum Industry," presented at the Southern Economic Association Conference, Atlanta, Georgia, 1974.

"Electricity Consumption: Supply Requirements, Demand Elasticity and Rate Design," presented at the annual meeting of the American Economic Association, December, 1973; published in the American Journal of Agricultural Economics, May, 1974.

"The Computerized Rate Case: Rate of Return", presented at the Regulatory Information Systems Conference, Missouri Public Service Commission, October, 1973; published in Proceedings.

"Rate of Return Regulation Under Changing Economic Conditions," Public Utilities Fortnightly, July, 1972.

"An Economic Analysis of Combination Utilities," The Antitrust Bulletin, Spring, 1972 (co-author).

"Residential Demand for Electricity," Quarterly Review of Economics and Business, Spring, 1971.

"Managerial Efficiency and Interutility Cost Variations," Proceedings of the Iowa State University Conference on Public Utility Management, 1969.

"Government Intervention in a Failing Competitive Market: A Case for Public Action in the Interest of Conservation," Cornell Plantations Magazine, Winter Research Issue, 1967-68.

"The Use of Public Mass Transportation in the Major Metropolitan Areas of the United States," Land Economics, August 1967 (co-author).

The Port of Milwaukee: An Economic Review, University of Wisconsin Press, 1967 (collaborator).

Residential and Industrial Demand for Electricity: An Empirical Analysis, (Ph.D. dissertation, Cornell University, 1969).

EXPERT TESTIMONY:

Before the U.S. House of Representatives -

Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power; expert testimony concerning the effects of regulation in the natural gas industry, May 1977.

Committee on the Budget, Task Force on Distributive Impacts of Budget and Economic Policies; expert testimony on natural gas matters, 1977.

Committee on the Judiciary, Subcommittee on Monopolies & Commercial Law; expert economic testimony dealing with anticompetitive problems in the U.S. petroleum industry, February 25, 1976.

Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power; expert testimony pertaining to the deregulation of the field price of natural gas, January 30, 1976.

Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power; expert testimony concerning natural gas producer regulation, March 1975.

Committee on Interstate and Foreign Commerce, Subcommittee on Telecommunications, Finance and Consumer Protection; expert testimony pertaining to current structure of the telecommunications industry, June 1980.

Committee on the Judiciary, Subcommittee on Monopolies and Commercial Law Oversight Hearings on Mergers and Acquisitions; expert testimony concerning merger policy and antitrust enforcement, December 1981.

Committee on Energy and Commerce, Subcommittee on Energy Generation and Power; expert testimony concerning competition in the electric power industry and the importance of public preference on hydroelectric relicensing in that regard, 1986.

Committee on the Judiciary, Subcommittee on Monopolies and Commercial Law, September 13, 1984; expert testimony concerning competition in the insurance industry.

Before the United States Senate -

Joint Economic Committee, Subcommittee on Energy; expert testimony concerning antitrust problems related to the development of an integrated fuels industry in the United States; November 1975.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly; expert testimony dealing with integration between the oil, coal, and nuclear industry, June 1975.

Committee on the Judiciary, Joint Hearing before the Subcommittee on Antitrust and Monopoly and the Subcommittee on Administrative Practice and Procedure; expert testimony dealing with natural gas reserves in the United States, October 1973.

Committee on Commerce; expert testimony on market conditions in the natural gas producing industry and field price regulation, October 1973.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, expert testimony dealing with competition in the petroleum industry, June 1973.

Committee on the Judiciary, Subcommittee on Antitrust and Monopoly; expert testimony on matters pertaining to S.403, A Bill to Prohibit Certain Combinations and Control Between Electric and Gas Utilities, May 1971.

Committee on Government Operations; expert testimony pertaining to S.607, A Bill to Establish an Office of Utility Consumers' Counsel, 1970.

Committee on the Judiciary; expert testimony concerning the proposed settlement of the AT&T antitrust lawsuit, March 1982.

Committee on Energy and Natural Resources, Subcommittee on Water and Power; expert testimony concerning competition in electric power industry and the importance of public preference in hydroelectric relicensing, 1986.

Before the American Arbitration Association -

Commercial Arbitration, Dallas Division, No. 71 198 00323 01, Report regarding control, ownership and operation of Cleburne generating plant, competition between Brazos and Enron and Enron's status as an electric utility on behalf of Claimant, Brazos Electric Power Cooperative, Inc., March 12, 2003.

Before the California State Legislature -

Expert testimony on matters dealing with natural gas supply in the State of California.

Assembly Committee on Natural Resources and Energy of the California Assembly. A Report to the California State Assembly, March 1983.

Expert testimony on matters pertaining to profitability, competition and discrimination in California property/ casualty insurance markets before the California State Assembly, 1986.

Before the New York State Legislature -

Expert testimony on matters dealing with natural gas supply in the State of New York.

Expert testimony concerning medical malpractice insurance rates and profits in New York, February, 1988.

Before the Texas State Legislature -

Expert testimony before the Texas State Legislature concerning insurance rate regulation and industry data reporting to the State Insurance Board, 1989.

Before the Virginia State Legislature -

Expert testimony before the Virginia House of Delegates on behalf of the Attorney General concerning the need for improved regulation of rates charged by property/casualty insurance companies in the State of Virginia (various dates 1987-1989).

Expert testimony before the Virginia Senate on behalf of the Attorney General in support of legislation strengthening the regulation of property/casualty insurance companies rates for commercial liability insurance by the Virginia Corporate Commission (various dates 1987-1989).

Before the Federal Communications Commission -

Affidavit dealing with the economic structure and performance of competitive markets in connection with implementation of wide area paging systems.

Expert witness concerning AT&T's migration strategy.

Expert witness in CC Docket No. 80-286; testimony on cost methods.

Before the Federal Energy Regulatory Commission (formerly Federal Power Commission) -

Expert witness in Docket ER76-205, Southern California Edison Company; testimony concerning rate of return and other related financial issues.

Expert witness in Docket ER77-175, Florida Power & Light Company; testimony concerning transmission service rate and related antitrust issues.

Expert witness in Docket ER76-304, New England Power Company; testimony concerning rate of return.

Expert witness in Docket No. ER76-495, Carolina Power & Light Company; testimony concerning rate of return and related financial issues.

Expert witness in Docket No. ER76-45, Consumers Power Company; testimony concerning antitrust and bulk power supply issues.

Expert witness in Docket No. RP76-57-1, Plant City Natural Gas Case; testimony concerning special exemptions for natural gas curtailments.

Expert witness in Docket No. CP74-192, Florida Gas Transmission Company; testimony concerning natural gas supply, and pipeline abandonment and conversion to oil products line.

Expert witness in Docket No. E-9147, Virginia Electric & Power Company; testimony concerning rate of return.

Expert witness in Docket No. E-8884, Carolina Power & Light Company; testimony concerning rate of return, managerial efficiency, and cost of service.

Expert witness in Docket No. E-8570, Southern California Edison Company; testimony concerning rate of return, economic efficiency, cost of service, fuel adjustment clause, and anticompetitive price discrimination.

Expert witness in Docket No. E-8176, Southern California Edison Company; testimony concerning rate of return.

Expert witness in Docket No. RP74-50-5, Florida Hydrocarbons Company and Florida Gas Transmission Company; testimony concerning natural gas curtailment exemptions for liquefied petroleum gas production.

Expert witness in Docket No. E-8881, Carolina Power & Light Company; testimony concerning rate of return and related economic matters.

Expert Economic Policy Witness in Docket No. CI73-501, Louisiana Land and Exploration Company; testimony concerning prices and competition.

Expert Rate of Return Witness in Docket No. E-7738, Boston Edison Company.

Expert Economic Policy Witness in Docket No. CI73-293, et al., Belco Petroleum Corporation, et al.; testimony concerning prices and competition.

Expert Economic Policy Witness in Docket No. E-7679, Florida Power Corporation; testimony concerning rate of return, rate structure design and antitrust matters.

Expert Economic Policy Witness in Docket No. CI72-301, et al., Northern Michigan Exploration Company, et al.; testimony concerning prices and competition.

Expert Witness on matters pertaining to competition in Docket No. E-7618, Southern California Edison Company.

Expert Rate of Return Witness in Docket No. E-7645, Public Service Company of Indiana.

Expert Rate of Return Witness in Docket No. E-7602, Central Telephone & Utility Corporation.

Expert witness for City of Anaheim, California in Docket No. ER76-205, Southern California Edison Company; testimony dealing with rate of return issues.

Expert witness in Docket Nos. ER78-19, ER78-81, Florida Power & Light Company; testimony concerning prices and competition.

Expert witness in Docket No. ER76-714, Indiana & Michigan Electric Company; testimony concerning rate of return.

Expert witness for the Municipal Wholesale Power Group in Docket No. ER77-347, Wisconsin Power & Light Company; testimony concerning price squeeze issues.

Expert witness in Docket Nos. EL78-15 and ER78-339, Public Service of New Hampshire; concerning the inclusion of construction work in progress in rate base.

Expert witness in Docket No. ER78-379, et al., Indiana & Michigan Electric Company; testimony concerning rate of return and capital structure.

Expert witness in Docket No. OR78-1, Trans-Alaska Pipeline; testimony concerning rate of return, rate base, and capital structure.

Expert witness in Docket No. OR79-1, Williams Pipe Line Company; testimony concerning rate base valuation and related regulatory issues.

Expert witness in Docket No. ER78-522, Virginia Electric & Power Company; testimony concerning price squeeze issues.

Expert witness in Docket ER78-360, Connecticut Yankee Atomic Power Company; testimony concerning rate of return and related issues.

Expert witness in Docket No. RP83-11, Transcontinental Gas Pipeline Company; testimony concerning rate of return and sales volumes.

Expert witness in Docket No. ER82-427-000, Southern California Edison Company; testimony concerning fuel procurement practices and nuclear plant operating efficiency.

Expert witness in Docket No. ER82-483-000, Middle South Utilities Company; testimony concerning equalization of costs.

Expert witness in Docket No. ER76-205-003, Southern California Edison Company; testimony concerning price squeeze issues related to wholesale rates.

Expert witness, Docket No. ER82-545-000, Public Service Company of Oklahoma, analyzed competitive issues related to rates, terms and conditions for transmission tariffs filed,

Expert witness in Docket No. ER83-609, Southwestern Electric Power Company; testimony concerning cost of capital and rate of return.

Expert witness in Docket No. ER85-204-000, South Carolina Generating Company, Inc.; testimony concerning corporate reorganization and the application for initial rate schedule.

Expert witness in Docket Nos. ER85-646-005 and ER85-647-003 (Phase II), New England Power Company; testimony concerning the issue of the proper regulatory treatment of abandoned plant costs.

Expert witness in Docket No. ER84-571 (Phase I), Utah Power and Light; on behalf of the Western Area Power Administration (WAPA) and other parties concerning Utah Power and Light's application to overturn fixed price contracts.

Expert witness in Docket Nos. ER86-76 and ER86-230, Commonwealth Edison Company; testimony concerning Commonwealth Edison's proposed "marginal cost-based" tariffs for wheeling services.

Expert witness in Docket No. ER85-785-001, Wisconsin Electric Power Company; testimony concerning proposed "value of service" rates for transmission services.

Expert witness in Docket No. RP86-119-000, Tennessee Gas Pipeline Company; testimony concerning the proper regulatory treatment of gas supply contract reformation costs and excess take or pay costs.

Expert witness in Docket No. RP86-126-000; Transwestern Pipeline Company; testimony concerning the proper regulatory treatment of gas supply contract reformation costs and excess take or pay costs.

Expert witness in Docket No. RM85-17 on behalf of the American Public Power Association concerning proposed rules and regulations pertaining to the implementation of new economic pricing techniques for wholesale electric utility services and ratemaking, and the competitive implications of risk sharing between buyers and sellers of wholesale services.

Expert witness in Docket No. ER-84-31-000, Central and South West Services, Inc.; testimony concerning competition in the electric utility industry and the potential competitive impact of the proposed Central and Southwest pool.

Expert witness in Docket No. RP87-103-000, Panhandle Eastern Pipeline Company; testimony concerning regulatory and economic principles that are violated by proposal of Indiana Gas company regarding recovery of gas supply costs.

Expert witness in Docket No. 88-68, Transcontinental Gas Pipeline Corporation; testimony concerning proposal of "Indicated Shippers" regarding recovery of gas supply costs and violation of regulatory and economic principles.

Expert witness in Docket Nos. ER89-256-000, ER90-333- 000, EC89-10-000, Palisades Generating Company; testimony concerning certain aspects of proposed "Purchase Power Agreement" and other related agreements.

Expert witness in Docket Nos. EC90-10-000, ER90-143-000, ER90-144-000, ER90-145-000, and EL90-9-000, Northeast Utilities Service Company (re Public Service Company of New Hampshire); testimony concerning economic aspects of a proposed utility acquisition as well as related regulatory policies and competitive issues.

Expert witness in Docket Nos. ER90-374-000, ER90-373-000, ER90-390-000, ER90-373-001, ER90-090-00, Northeast Utilities Service Company; testimony on concerns expressed by the Commission in its Orders of August 28, 1990 and October 31, 1990 regarding the "opportunity cost" provisions in Northeast Utilities transmission agreements and to respond to its expressed views in this regard.

Expert witness in Docket Nos. EC90-10-007 and ER93-294-000; affidavit concerning arguments expressed by Northeast Utilities Service Company with respect to "opportunity cost" rates.

Expert witness in Docket No. ER92-331-000 and ER92-332-000; testimony concerning economic issues related to "open access" transmission service Consumers Power Company claims to offer in its proposed tariff and the non-firm transmission service offered in its proposed coordinated operating agreement between CPCo, the Michigan Public Power Agency, and Wolverine.

Expert witness in Docket Nos. ER92-595-000, ER92-596-000 and ER92-626-000; Pacific Gas & Electric Company, Southern California Edison, et al., testimony

concerning anticompetitive effects of the unreasonable restrictions and limitations that would be imposed on TANC and its Members by the rate and service schedules filed by the Companies.

Expert witness in Docket No. ER93-465-000, Florida Power & Light; affidavit concerning the discriminatory and anticompetitive practices of FPL and imposed costs on Florida cities.

Expert witness in Docket No. RP92-166-000, Panhandle Eastern Pipe Line Company; rebuttal testimony concerning FERC staff witness' recommended common equity return allowance.

Expert witness in Docket No. RP93-109-000, Williams Natural Gas Company; testimony concerning the appropriate rate of return allowance in addition, to determine whether WNG's proposed rates are discriminatory, preferential or anticompetitive.

Expert witness in Docket Nos. TX93-4-000 and EL93-51-000; Florida Power & Light Company; affidavit dealing with the amount of network transmission service that FPL would require Florida Municipal Power Agency to buy in order to receive service and FPL's proposed restrictions on FMPA's access to transmission interconnections with other utilities.

Expert witness in Docket Nos. ER93-465-000, et al., Florida Power & Light Company; testimony regarding competitive issues concerning "open access" transmission service and appropriate rate of return for wholesale rates.

Provide advice and comments on behalf of Pennsylvania Boroughs in Docket Nos. RM95-8-000 & RM95-7-000 regarding NOPRs proposed treatment of stranded costs.

Expert witness in Docket No. ER95-112-000; Entergy Services, Inc; testimony regarding the Comparability of Entergy open-access tariffs.

Expert witness in Docket No. EC96-10-000, Baltimore Gas and Electric Company, Potomac Electric Power Company; testimony filed on behalf of the DC Office of People's Counsel on competition and merger related market power issues.

Expert witness in Docket No. EC96-13-000, et al., The Wisconsin Intervenors; examination of economic issues relating to proposed merger with a focus on market power issues.

Expert witness in Docket No. EC96-13-000, et al., Badger Cooperative Group, et al.; testimony on Remedies.

Expert witness in Docket No. EC97-5-000, Ohio Edison Company, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, Toledo Edison Company; affidavit submitted on behalf of the Boroughs of Ellwood City, Grove City and Zelienopole, Pennsylvania concerning Applicant's "Order Compliance Filing" in response to the Commission's July 16, 1997 Order regarding the competitive impact of the merger.

Expert witness in Docket Nos. EC97-5-000, Ohio Edison, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company; affidavit submitted on behalf of Industrial Energy Users-Ohio, regarding economic issues pertaining to Applicant's Compliance Filing in response to Commission's July 16, 1997 Order.

Expert witness in Docket No. EC97-5-000, Ohio Edison Company, Pennsylvania Power Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company; affidavit filed on behalf of the City of Cleveland regarding its protest and the impact of merger on competition in electric power markets.

Expert witness in Docket No. EC97-56-000, Western Resources and Kansas City Power & Light Company; affidavit filed on behalf of The Kansas City Board of Public Utilities regarding merger related market power issues.

Expert witness in Docket Nos. EC98-1-000 & ER98-6-0000, New England Power Company, The Narragansett Electric Company, U.S. Gen New England, Inc., Application for Required Approvals Under Sections 203 & 205 of the Federal Power Act for Divestiture of Generating Business & Related Matters; affidavit filed on behalf of the Town of Norwood, Massachusetts concerning economic issues resulting from NEP's sale of all its non-nuclear generation assets to U.S. Generating.

Expert witness in Docket No. EC98-40-000, American Electric Power Company, Inc., Central & South West Corporation; affidavit filed on behalf of American Electric Group Intervenors concerning merger related market power issues as a result of the merger between AEP & CSW.

Expert witness in Docket No. RP95-364-005, Williston Basin Interstate Pipeline Company; testimony filed on behalf of the Public Utilities Commission of South Dakota and the Montana Consumer Counsel concerning investors' long term growth expectation component of the discounted cash flow (DCF) model, November, 1999.

Expert witness in Docket Nos. ER99-28-001, ER99-28-003, EL99-38-002 and ER99-945-002, Sierra Pacific Power Company; testimony filed on behalf of the Transmission Agency of Northern California concerning the interconnection of the Alturas Intertie Project with the Pacific Northwest-Southwest AC Intertie, January, 2000.

Expert witness in Docket Nos. EC00-55-000 & ER00-1520-001, CP&L Holdings, Inc. and Florida Progress Corporation, affidavit filed on behalf of The Florida Cities concerning market power issues as a result of the proposed merger of CP&L and FPC, April 2000.

Expert witness in Docket No. EC00-63-000, Sierra Pacific Power, Nevada Power Company and Portland General Electric Company, affidavit filed on behalf of The Transmission Agency of Northern California concerning merger related market power issues and the potential for anticompetitive exploitation by applicants, May 2000.

Expert witness in Docket No. EC01-33-000, FPL Group and Entergy Corporation, affidavit filed on behalf of Seminole Electric Cooperative and Florida Municipal Power Agency concerning competitive market and ratepayer protection issues as a result of proposed merger between FPL and Entergy, January 2001.

Expert witness in Docket No. EL01-80-000, National Grid USA, affidavit concerning competitive market issues as a result of National Grid's Petition for a Declaratory Order, declaring they not be deemed a "market participant" as defined by Commission regulations with respect to region served by the Alliance RTO, June 2001.

Expert witness in Docket No. ER01-1639-000, Pacific Gas & Electric Company, testimony filed on behalf of the Northern California Power Agency concerning economic arguments of PG&E proposed amendment to Contract 2948A with Western Area Power Administration, September 2001.

Expert witness in Docket Nos. EC01-156-000 and ER01-3254-000, Alliant Energy Corporate Services, Inc., MidAmerican Energy Company, Xcel Energy Services, Inc., TRANSLink Transmission Company, affidavit filed on behalf of IAMU, CMMPA, and MMUA concerning economic, cost of capital and competitive market issues, November 2001.

Expert advice and analysis in Docket No. RM01-12-000, Remedying Undue Discrimination Through Open Access Transmission Service and Standard Electricity Market Design; comments filed on behalf of Montana Consumer Counsel concerning FERC SMD Proposal, November, 2002.

Expert witness in Docket No. EL03-37-000, Town of Norwood, Massachusetts v. New England Power Company; testimony filed on behalf of Town of Norwood concerning complaint against National Grid, USA for imposing unlawful and excessive rates and charges, December, 2002.

Expert witness in Docket Nos. EL00-95-000, et al., San Diego Gas & Electric Company, et al.; testimony on behalf of interveners City of Burbank, City of Glendale, Imperial Irrigation District and Turlock Irrigation District concerning alleged market manipulation, February, 2003.

Expert advice and analysis in Docket Nos. EL01-118-000 and EL01-118-001 on behalf of Montana Consumer Counsel, comments on proposed revisions to market-based rate tariffs and authorizations, July 2003.

Expert witness in Docket Nos. ER00-2019-006, et al., California Independent System Operator Corp.; testimony filed on behalf of the California Department of Water Resources State Water Project concerning transmission cost allocations, economic efficiency and rate structure design, September 2, 2003.

Expert witness in Docket Nos. EL03-180-000, et al., Enron Power Marketing Inc., et al.; testimony filed on behalf of City of Glendale responding to allegations reflected in Commission's *Order to Show Cause Concerning Gaming and/or Anomalous Market Behavior Through the Use of Partnerships, Alliances or Other Arrangements and Directing Submission of Information*, September, 2003.

Expert witness in Docket No. ER03-1223-000, Montana Megawatts I, LLC, affidavit filed on behalf of the Montana Consumer Counsel concerning NWE/MMI proposed power sales rate formula in support of their request that the Commission accept their "cost based" Power Purchase Agreement as an initial rate filing, October 2003.

Expert witness in Docket Nos. ER04-157-000, Bangor Hydro, et al.; testimony filed on behalf of the New England Consumer Owned Entities (NECOE), concerning Joint Return on Equity filing by the New England Transmission owners made in connection with the proposed formation of a Regional Transmission Organization for New England, December 2003.

Expert advice and analysis in Docket Nos. ER 93-465-033, ER 93-417-002, ER 96-1375-003, OA 96-39-010 and OA 97-245-003, Florida Power & Light Company; Affidavit regarding anticompetitive transmission cost discrimination, June 2004.

Expert witness in Docket Nos. ER-03-563-030, Devon Power, LLC, et al testimony on the design of a locational installed capacity ("LICAP") market in New England.

Expert witness on behalf of Wellesley Municipal Light Plant, Reading Municipal Light Department, and Concord Municipal Light Plant in Docket Nos. ER-03-563-030 Devon Power, LLC et al.; testimony regarding LICA pricing and demand curve parameters. November 2004.

Expert Witness in the matter of PPL Montana, LLC, Docket No. ER 99-3491-003, ER-00-2184-001 and ER00-2185-001. Affidavit dealing with PPL Montana's Market Power Analysis. January 2005.

Affidavit in the matter of PPL Montana, LLC, Dockets No. ER 99-3491-003, ER-00-2184-001, ER00-2185-001, EL05-124-000 and Delivery Price Test dealing with PPL Montana's Market Power Analysis. November 2005.

Expert witness in the matter of Market-Based Rates for wholesale Sales of Electric Energy Capacity and Ancillary Services by Public Utilities. Docket No. RM04-7-000. August 2006.

Expert Witness in the matter of Mystic Development, LLC, on Behalf of Wellesley Municipal Light Plant, Reading Municipal Light Plant, Concord Municipal Light Plant, And Massachusetts Municipal Wholesale Electric Company Docket No. 06-427-000. November 9, 2006.

Expert witness in Docket No. EL03-37-000, Town of Norwood, Massachusetts v. National Grid USA, New England Electric System, New England Power Company, Massachusetts Electric Co. and Narragansett Electric Company; Affidavit filed on behalf of Town of Norwood. May 2007.

Expert Witness in Docket ER08-552-000, Niagara Mohawk Power Corporation Affidavit on behalf of the New York Association of Public Power ("NYAPP) and several of its members (Green Island Power Authority, the Jamestown Board of Public Utilities, the City of Salamanca, the City of Sherrill, the Village of Solvay and Oneida Madison). March 17, 2008.

Expert witness in the matter of ISO New England, Inc. March 17, 2008.

Expert advice in the matter of New York Regional Interconnect, Inc. Docket No. ER08-39-000. June 2008.

Before the International Trade Commission -

Expert witness on the profitability of AT&T's Small Business Telephone Systems and Subassemblies, Inv. Nos. 731-TA-426-428(F).

Before the Nuclear Regulatory Commission -

Affidavit dealing with proposed licensing conditions pertaining to a new nuclear power plant to be constructed by the Florida Power & Light Company, April 1976.

Affidavit dealing with proposed licensing conditions pertaining to a proposed Nuclear Power Plant License Renewal, Docket No. 90-16500, October 1990.

Before the Securities & Exchange Commission -

Expert economic witness for the U.S. Justice Department on the matter of American Electric Power Company, Inc., SEC File No. 70-4596 (proposed merger with Columbus & Southern Ohio Electric Company), February-March, 1971.

Before the Surface Transportation Board -

Verified Statement on Behalf of The Western Coal Traffic League, American Public Power Association, Edison Electric Institute, National Association of Regulatory Utility Commissioners and National Rural Electric Cooperative Association. STB Finance Docket No. 35506. November 2011.

Before the United States Department of Energy -

Dealing with gas supplies and natural gas pipeline service to Florida.

Before the Federal Maritime Commission -

Expert witness in Docket No. 85-3, Matson Navigation Company, Inc.; testimony concerning proposed overall rate increase.

Before the U.S. Court of Federal Claims -

Expert witness in Brazos Electric Power Cooperative, Inc. v. The United States, No. 98-837C, affidavit filed on behalf of Brazos concerning economic damages suffered as a result of the Government's breach of contract, October 2001.

Before the U.S. District Court for the -

Northern District of New York, Expert witness in 79-CV-163, Town of Massena, New York v. Niagara-Mohawk Power Corporation; testimony concerning antitrust issues pertaining to Massena, New York's establishment of a municipal electric distribution system.

District of Connecticut, expert witness in antitrust liability and damage phases of Jury Trial in Civil Action B-75-319, Northeastern Telephone Company v. American Telephone & Telegraph Company, et al.

District Court of Maryland, expert witness in Civil Action No. K83-2990, City of Hagerstown, Town of Thurmont and Town of Williamsport, Maryland v. The Potomac Edison Company, Allegheny Service Corporation; testimony concerning the price elasticity of demand for electric power.

District Court of Wyoming, expert witness in Civil Action No. C82-0443; testimony concerning the motivations and consequences of Burlington Northern Railroad's alleged monopolization of coal supplies from the Powder River Basin in Wyoming.

District Court of Wyoming, expert witness in Civil Action No. C-86-0172, January, 1988, concerning natural gas markets in the Rocky Mountain area.

District Court of Massachusetts, expert witness in Civil Action No. 87-1881-C concerning antitrust liability issues and economic damages sustained by the Towns of Concord and Wellesley, Massachusetts, 1989.

Eastern District of Missouri, Southeastern Division, expert witness in Civil Action No. S83-288c concerning economic damages sustained by the Town of Malden, Missouri, resulting from alleged antitrust violation by Union Electric Company.

District of New Mexico, expert witness in Civil Action No. CV84-1430-JB concerning the carbon dioxide market in the Bravo Dome area of Northeastern New Mexico.

District of Alabama, expert witness in Civil Action concerning the constitutionality of "tort reform" legislation limiting punitive damages. Testimony concerned the profitability of the property/casualty insurance industry in the State of Alabama, 1989.

Eastern District of Missouri, Civil Action No. 83-2756(c), expert testimony quantifying the damages resulting from alleged anticompetitive practices by the Union Electric Company.

Southern District of Texas, Houston Division, Civil Action No. H-91-627, expert witness regarding anticompetitive practices and quantifying the damages resulting from the alleged anticompetitive practices by Baker Hughes Inc., Hughes Tool Company, Reed Tool Company, Camco International Inc., and Smith International, Inc.

Middle District Court of Alabama, Northern Division; Civil Action No. 89-H-519N; expert witness evaluating private agreements between the defendants meet the purpose of the "active supervision" test for state action immunity.

U.S. District Court for the District of Kansas, Case No. 85-2349, expert witness concerning competitive markets in the natural gas industry and the quantification of damages resulting from the alleged anticompetitive conspiracy of Amoco and affiliates with Cities Service Gas Company, its parent corporation, and affiliates.

Northern District of Alabama, Southern Division, Civil Action No. CV-91-PT-00445-S, affidavit concerning the impact on competition in the relevant market caused by various actions of Southern Natural Gas Company and Alabama Gas Corporation.

District of Minnesota, Third Division, Civil Action No. CV-3-90-240; affidavit concerning anticompetitive practices and resulting damages caused by of Fujitsu Systems of America, Inc.

Northern District of Illinois, Eastern Division, Civil Action No. 87 C 3839; report on Ecolchem's lost profits due to Arrowhead's alleged patent infringement.

Middle District of Florida, Orlando Division, Case No. 92-35-CIV-Orl-18; affidavit concerning Florida Power & Light Company's position and conduct for purposes of determining their competitive implications in light of Section 2 of the Sherman Act.

Western District of Oklahoma, Civil Action Nos. 89 1186 T and 89 822 T; affidavit concerning workers compensation rates in Oklahoma and anticompetitive conspiracy between the defendants and anticompetitive pricing.

District of New Mexico, No. CIV 93-0397 SC/WWD, report concerning damages sustained by New Mexico insurance agencies as a result of adverse actions taken by CIGNA in connection with COMPAR program in which agencies were participants.

District of Minnesota, Fourth Division, expert witness in Civil File No. 4-93 Civil 577, affidavit concerning the effect of reinsurance costs in setting premiums and the reasonable rate of return in workers compensation insurance.

District of Colorado, report prepared to evaluate economic damages in Civil Action No. 94-K-728, June, 1996.

District of New Mexico, report prepared to review and analyze pricing and royalty payments in order to assess economic damages in Civil Action, No. 95-12 JC/WWD, February, 1997.

District of Ohio, expert witness in Civil No. CV96-0308-E-BLW, Snake River Valley Electric Association v. PacifiCorp; affidavit filed on behalf of SRVEA regarding the competitive structure of electric utility markets in which PacifiCorp and SRVEA operate, September, 1997.

District of Massachusetts, Expert witness in Case No. 97-CV10818-PBS, Town of Norwood Massachusetts v. New England Power Company; affidavit filed on behalf of the Town of Norwood, September, 1997.

Southern District of Iowa, Central Division, expert witness in Case No. 4-97-CV-80782, North Star Steel Company v. Mid American Energy Holdings Company and Mid American Energy Company; declaration filed on behalf of NSSC regarding economic issues relating to regulation, antitrust and competition in the electric utility industry, February, 1998.

Eastern District of Michigan, expert witness in Docket No. 97-10366, Indeck Energy Services v. Consumers Energy Company; affidavit filed on behalf of Indeck concerning competition February, 1998.

Eastern District of Texas, expert witness in Civil Action No. H-97-3994, North Star Steel Texas Inc. V Entergy Gulf States, Inc.; declaration filed on behalf of North Star regarding market structure and competition, March, 1998.

Middle Pennsylvania, expert witness in Civil Action No. 4:CV-96-2176, AVCO v. Superior Air Parts, Inc.; report filed on behalf of AVCO concerning economic damages suffered as a result of alleged actions by defendants.

District of Colorado, expert witness in Case No. 96-Z-2451, United States Government and CO₂ Claims Coalition, LLC v. Shell Oil Company, Shell Western E&P, Inc., Mobil Producing Texas and New Mexico, Inc. and Cortez Pipeline Company; report submitted on behalf of Plaintiffs' concerning Defendants' pricing and royalty payment practices for carbon dioxide gas produced from the McElmo Dome CO₂ gas unit in Colorado, August, 1998.

District of Nebraska, expert advice and analysis in Civil Action No. 8:97CV-346. Report filed on behalf of Nebraska Public Power District concerning NPPD's Nuclear Decommissioning Trust Fund Investments, April 1999.

Middle District of Pennsylvania, expert witness in Case No. 3:CV-01-2308, Borough of Olyphant, Pennsylvania v. PP&L, Inc., PP&L Corporation, and PP&L Generation, L.L.C.; affidavit concerning competitive structure of electric utility markets in which PP&L and Olyphant operate, PP&L market power and anticompetitive injury suffered by Olyphant as consequence of PP&L conduct, December, 2002.

District of Montana, Billings Division, Expert witness in CV-03-129-BLG-RWA, Upper Missouri Generation & Transmission Electric Cooperative, Inc. v. Western Plains Electric Cooperative, Inc.; Damages Report, March 2004.

Southern District of Texas, affidavit in the matter of Gary R. Shannahan, Daniel L. Mortland, And Kathryn M. Scott Individually And For Others Similarly Situated Dynegy, Inc., Dynegy Inc. Benefit Plans Committee, Louis Dorey, Robert D. Doty, Jr., Alec G. Dreyer, Andrea Lang, Michael Mott, Milton L. Scott, And R. Blake Young. Civil Action No. 4:06-cv-00160 (September 15, 2006).

District of Columbia, Expert Witness in Case No. 1:04cv-00940-RWR, City of Moundridge, et al v. Exxon-Mobil Corporation et al. May 2008.

Before the Circuit Court of the Second Judicial Circuit, State of Florida -

Expert witness in Florida Excess Profits Statute Enforcement; testimony concerning excess profit levels in the private passenger automobile insurance industry in the state of Florida.

Expert testimony on behalf of the State of Florida Insurance Department concerning the constitutionality of and technical need for the recent strengthening of the State's insurance regulatory law as it is applied to commercial liability insurance rates. (1986)

Before the Missouri Circuit Court of Callaway County -

Expert witness in Case No. CV 587-4; testimony concerning rates to be charged for electric transmission services; 1989.

Before the Superior Court of New Jersey, Law Division, Cumberland County -

Expert witness in Docket No CUM-L-001206-00, Atlantic City Electric Company; on behalf of The City of Vineland, New Jersey. Report on The Fair Market Value of Property to be Acquired by The City of Vineland, New Jersey from the Atlantic City Electric Company, July 2000.

Before the Superior Court Division of North Carolina, Wake County -

Affidavit concerning North Carolina workers compensation insurance regulatory framework and the effect of residual market service carrier fees on employers costs of workers compensation insurance and the extent to which the fees are subject to regulatory scrutiny and control.

Before the St. Lawrence County (New York) Court Commissioners of Appraisal -

Expert testimony, Index 59244 concerning the condemnation value to be established for Niagara Mohawk's distribution property being acquired by the Town of Massena, New York to establish a municipal system.

Prepared for the St. Lawrence County (New York) -

Preliminary report for the Towns and Villages of Canton and Potsdam, New York; feasibility and legal considerations for the establishment of a municipal electric system, August 1996.

Before the Maine Superior Court of Kennebec County -

Expert witness in Docket No. CV-85-459, NCCI v. Superintendent of Insurance, witness for the State of Maine concerning the reasonableness of Maine's workers compensation insurance regulatory law.

Before the Arizona Superior Court, Coconino County -

Expert testimony in Case No. 39780 on behalf of the City of Page, Arizona, concerning the condemnation value of electric utility properties being taken by the City of Page to establish its own municipally-owned electric utility system.

Before the Arizona Superior Court, Maricopa County -

Expert witness in Civil Action No. 87-36278 concerning the condemnation value of electric utility properties being taken by the City of Gilbert to establish its own municipally owned electric utility system, 1989.

Before the California Superior Court for San Francisco -

Expert testimony in Case No. 843144 concerning the anticompetitive nature of anti-rebate laws applicable to the California property/casualty insurance industry.

Before the California Superior Court, Sacramento County -

Expert advice and analysis in Case No. 98AS052270 on behalf of California consumers of diesel fuel concerning anticompetitive pricing among certain oil companies doing business in the State of California, July, 1999.

In the Court of Common Pleas, State of South Carolina, County of Greenville

Affidavit providing a description of the overall framework of the South Carolina workers compensation insurance regulatory scheme with a focus on residual market servicing carrier fees; Case No. 93-CP-23-2428, October 1996.

Report filed in Case No. 94-CP-23-2428 on economic liability and anticompetitive damages for workers' compensation insurance buyers in South Carolina, May, 1998.

In the Circuit Court for Bullock County, Alabama

Affidavit quantifying the direct economic value of proposed settlement to workers compensation purchaser in Alabama; Civil Action No. CV-94-82.80, October 1996.

In the Circuit Court of the 11th Judicial Circuit in and for Miami-Dade County, Florida

Expert witness in Case No. 99-17626 CA 23, Violeta Sobrado Rothe, et al. v. Amedex Insurance Company; testimony concerning the usage and importance of the terms "class" and "block" in the insurance industry, June 2001.

In the Circuit Court of the 15th Judicial Circuit in and for Beach County, Florida

Expert witness in Case No. CL94-3275 AD, National Council on Compensation Insurance, Inc. et al., vs. Uniforce Temporary Personnel, Inc. et al. Retained by Uniforce to testify as to damages suffered as a result of NCCI's alleged improper determination of its Experience Modifier between 1988 and 1992, May, 1997.

In the District Court of Travis County, Texas, 53rd District & 250th Judicial District Court

Expert witness in Consolidated Action Nos. 97-08264 and 95-15470; report filed on behalf of Plaintiffs, on class certification issues regarding economic conspiracy and damages, January, 1998.

In the District Court of Harris County, Texas, 269th Judicial District Court

Expert advice and analysis in Cause No. 96-016613, Cities of Wharton, Pasadena and Galveston v. Houston Lighting & Power Company. Expert Report filed on behalf of Cities concerning municipal franchise fees, October, 1999.

In the Circuit Court of Coahoma County, Mississippi

Expert witness in Civil Action No. 14CI-97-0006, Mississippi Valley Gas Company vs. City of Clarksdale Public Utilities Commission; testimony on behalf of City of Clarksdale concerning allegations and evidence relating to antitrust liability and damages, August 1998.

In the District Court of Johnson County, Texas, 249th Judicial District Court

Affidavit in Cause No. C-2002-00267; Brazos Electric Power Cooperative, Inc. v. Ponderosa Pine Energy, L.L.C., et al., on behalf of Brazos Electric Power Cooperative, Inc. regarding control, ownership and operation of Cleburne generating plant, competition between Brazos and Enron, and Enron's Status as an electric utility, August 4, 2003.

Before the Alabama Public Service Commission -

Expert witness in Docket No. 17667, Alabama Power Company; testimony concerning rate base and cost of service issues.

Expert witness in Case No. 18548, South Central Bell Telephone Company; testimony concerning the restructuring of WATS rates.

Expert witness in Docket No. 1882, South Central Bell Telephone Company; testimony dealing with the Company's proposed levels of revenue, expenses, rate of return and rate base.

Before the Governor of Alabama's Special Commission on Insurance Regulation and Tort

Expert testimony on profitability in the property/casualty insurance industry and the underlying causes of the liability insurance crisis, 1986.

Before the Alaska Pipeline Commission -

Expert witness in Docket P-78-5, Northpole Refinery; testimony on cost allocation and rate design issues.

Before the Arizona Corporation Commission -

Expert witness for Honeywell Information Systems, Inc. in Docket No. U-1345, Arizona Public Service Company; testimony concerning cost of service and marginal cost pricing.

Expert witness in Docket No. 9981-E-1051-83, Mountain States Telephone and Telegraph Company; testimony concerning financial condition, cost of capital and rate of return.

Expert witness in Docket No. U-1345-83-155, Arizona Public Service Company; testimony concerning financial condition, earnings level, cash flow and incentive regulation.

Expert witness in Docket No. 9981-E-1051-83-286, Mountain States Telephone and Telegraph Company; testimony dealing with post-divestiture cost estimates.

Expert witness in Docket Nos. E-1032-86-020, E-1656-86-020, E-2276-86-020, and E-2334-86-020, Citizens Utilities Company; testimony addressing issues of fair rate of return, capital structure, and prudent utility operations.

Expert witness in Docket No. U-1345-85-156, Arizona Public Service Company; testimony concerning fair rate of return and capital structure, the effects of diversification on APS, APS affiliate relations and tax issues.

Expert witness in Docket No. E-1032-86-020, et al; Citizens Utilities Company; testimony concerning the revenue requirements, operating and accounting practices of Citizens Utilities Water, Wastewater, Electric and Gas Operations in Arizona.

Expert witness in Docket No. E-1032-85-204 et al; Citizens Utilities Rural Company, Inc.; testimony concerning the rate of return and revenue requirements for Citizens Utilities telephone utility operations in Arizona.

Expert witness in Docket No. U-1933-92-101, Tucson Electric Power Company; testimony concerning TEP's requested authorization for restructuring of agreements and the appropriate regulatory policy the Commission should follow as it deals with TEP's continuing restructuring process and the ratemaking impact of that process.

Expert witness in Docket No. U-1933-93-006, Tucson Electric Power Company; testimony concerning TEP's cost of capital and fair rate of return that should be allowed for the purpose of setting electric utility rates and TEP's proposed cost allocation methodology and related rate design proposals.

Before the Arkansas Public Service Commission -

Expert witness in Docket No. 81-144-U, Arkansas Power & Light Company; testimony concerning proposals by AP&L and Commission staff to retroactively allocate to Reynolds Metals a customer-specific charge for unrecovered revenue balance.

Expert witness in Docket No. U-2748, Southwestern Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. U-2896, Generic Hearing; testimony concerning competition in the telecommunications industry.

Expert witness in Docket No. 82-314-0, Arkansas Power & Light Company; testimony concerning cost of service issues.

Expert witness in Docket No. 83-064-U, Southwestern Electric Power Company; testimony concerning rate of return, CWIP and cash working capital issues.

Expert witness in Case No. 84-249-U, Arkansas Power & Light Company; testimony discussing the extent to which the cost of Middle South Utilities Grand Gulf Unit 1 should be included in Arkansas Power & Light Company's rates.

Before the Canadian Radio Television and Telecommunications Commission -

Expert testimony concerning the competitive implications of Canadian Pacific Telecommunication's application for access to the Bell Canada network.

Expert testimony concerning cost methods in Docket No. 1981-41.

Expert testimony concerning the Commission's Revenue Settlement Plan and the cost methodologies presented by Bell Canada and others; the testimony presents a fully distributed cost methodology for application to the major telephone utilities in Canada.

Expert testimony concerning the resale of telecommunication services and the interconnection of competitive long distance carriers to the local networks of telephone companies.

Newfoundland and Labrador Board of Commissioners of Public Utilities - Canada

Expert witness in the matter of Newfoundland and Labrador Hydro, testimony and report filed on behalf of Board of Commissioners concerning cost of service methodology, rate design and proposed rates, July 2001.

Expert witness In The Matter of an Amended Application by Petition of Newfoundland Light & Power Co. Limited; testimony on behalf of the Board of Commissioners concerning NL&P cost allocations and proposed rate design, July, 1996.

Report to The Board of Commissioners of Public Utilities of Newfoundland and Labrador concerning Newfoundland Power Company's Study of Rate Designs Based on Marginal Costs.

Report to The Board of Commissioners of Public Utilities of Newfoundland and Labrador, *Regulation of Electric Utility Capital Expenditures: A Summary of North American Jurisdictions*, January 2004.

The California Earthquake Authority -

Report to the California Earthquake Authority, *Actuarial Report Regarding the California Earthquake Authority's 2002 Proposed Rate Application*, October 2002.

Before the California State Insurance Commissioner -

Expert testimony in File No. REB-1002 (Consolidated); testimony in the Matter of Various Rate Increase Applications and With Respect to Certain Issues Related to the Control, Review and Approval of Insurance Rates Pursuant to Insurance Code Sections 1861.01(a), 1861.05, and Related Laws, March 1990.

Expert testimony in the matter of determination of rate of return, leverage factor, and projected yield for 1989 rate calculations, File No. RCD-2 (Continued Hearings) 1991.

Report to the California Insurance Department -

Using Industry Loss Trends to Project Individual Insurer Loss Trends, July 1991.

Before the California Public Utilities Commission -

Expert witness in Application No. 55723, Pacific Telephone & Telegraph Company; testimony concerning the basis and economic implications of cost allocation rate levels, and rate design for various types of telephone equipment and service classifications.

Expert witness in Centrex 10191, Investigation into Rates, Tariffs, and Costs of Centrex Service; testimony concerning service and equipment costs, tariff structures, and competition in the telecommunications industry.

Expert witness in Case No. OII 83 06 01, Western Union; testimony concerning "natural" monopolies and regulatory restrictions in telecommunications systems.

California Office of the Attorney General -

Preliminary Report on 1996 Gasoline and Diesel Fuel Retail Price Increases in California, August, 1996.

Before the Colorado Public Utilities Commission -

Expert witness in Docket No. 1154, 1133, Case No. 5748, Mountain States Telephone & Telegraph Company; testimony concerning Dimension PBX and

Com Key tariffs as well as Western Electric pricing practices and impacts on competitors in the interconnect industry.

Expert witness in Docket No. 1067, Case No. 5703, Mountain States Telephone & Telegraph Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in Docket No. 1425, Public Service Company of Colorado; testimony concerning service extension charges.

Expert witness in Docket No. 34444, Public Service Company of Colorado; testimony concerning service extension charges.

Before the Connecticut Department of Public Utility Control -

Expert witness in Docket No. 94-12-13, Investigation Into the Restructuring of the Electric Utility Industry.

Expert witness in the application of the Connecticut Light and Power Company for approval of amended rate schedules, Docket No. 90-12-03.

Expert witness in Docket No. 92-11-11, Connecticut Light & Power Company; testimony concerning CL&P's proposed implementation of "average and excessive" cost allocation methodology and proposed rates.

Expert witness in Docket No. 95-07-05, DPUC Investigation of a Fully Tracking Energy Adjustment Clause for Electric Companies; testimony on behalf of the Office of Consumer Counsel concerning the adoption of an EAC to replace the FAC and GUAC to protect the interests of Connecticut ratepayers and ensure economy and efficiency in energy production and purchasing.

Expert witness in Docket No. 96-01-28, DPUC Review of the Purchased Gas Adjustment Clause; testimony on behalf of the Office of Consumer Counsel to determine whether elimination of adjustment clauses would better achieve regulatory policy goals in the natural gas industry, June, 1996.

Expert witness in Docket No. 99-07-20, Joint Application of Energy East Corp. and Connecticut Energy Corporation for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of Connecticut Energy Corporation by Energy East Corporation, September, 1999.

Expert witness in Docket No. 99-08-02, Joint Application of Northeast Utilities and Yankee Energy System for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of Yankee Energy System by Northeast Utilities, October, 1999.

Expert witness in Docket No. 99-08-09, Joint Application of Energy East Corporation and CTG Resources for Approval of a Change of Control; testimony filed on behalf of Connecticut Office of Consumer Counsel concerning competitive market issues pertaining to the proposed acquisition of CTG by Energy East, October, 1999.

Before the Delaware Public Service Commission -

Expert witness in Docket No. 80-9, Delmarva Power & Light Company; testimony concerning class revenue requirements, review of the Company's proposed rates, and incentives in the design of the fuel adjustment tariff.

Expert witness in Docket No. 81-8, Diamond State Telephone Company; testimony concerning affiliated relationship and terminal equipment.

Expert witness in Docket No. 83-12, Diamond State Telephone Company; testimony concerning Company's financial condition and rate of return.

Before the D.C. Public Service Commission -

Expert witness in Formal Case No. 686, Washington Gas Light Company; testimony dealing with cost allocation and rate design issues.

Expert witness in Case No. 729, The C&P Telephone Company; testimony concerning regulatory and economic treatment of tax expenses in establishing revenue requirements.

Expert witness in Case No. 748, Potomac Electric Power Company; testimony pertaining to requested rate increase.

Expert witness in Formal Case No. 768, Washington Gas Light Company; testimony concerning the financial condition of the Washington Gas Light Company.

Expert witness in Formal Case No. 777, Chesapeake & Potomac Telephone Company; testimony dealing with Financial Condition, depreciation and Capital Recovery, and Cost Methods.

Expert witness in Formal Case No. 712, Attrition; testimony dealing with Attrition.

Expert witness in Formal Case No. 785, Potomac Electric Power Company; testimony dealing with company request for rate increase.

Expert witness in Formal Case No. 787, Washington Gas Light Company; testimony concerning WGL's financial condition and revenue increase requirements.

Expert witness in Formal Case No. 869, Potomac Electric Power Company; testimony concerning revenue requirement and rate design issues.

Expert witness in Formal Case No. 951, Office of the Peoples Counsel; testimony examining rates, costs, and competitive issues.

Advice and Comments in Formal Case No. 945, Investigation into Electric Services, Market Competition and Regulatory Practices; on behalf of D.C. Office of People's Counsel, January, 1997.

Expert witness in Formal Case No. 922, Application of Washington Gas Light Company District of Columbia Division for Authority to Increase Existing Rates and Charges for Gas Services; testimony on behalf of the Office of People's Counsel concerning reasonableness of financial assumptions underlying the WGL filing in support of its proposed phase-in of post retirement benefits expense under FAS 106, June, 1997.

Report to the D.C. Office of the People's Counsel on Bell Atlantic's Merger Commitments to the Federal Communications Commission, August, 1997.

Report to the D.C. Office of the People's Counsel; Alternatives to the PEPCO/BG&E Merger.

Expert witness in Formal Case No. 1057, Verizon Washington, DC Inc.,s Competitive Under Price Cap Plan 2007 for the Provision of Local Telecommunications's Services in the District of Columbia on behalf of the D.C. Office of the People's Counsel. January 31, 2008.

Before the Florida Department of Insurance -

Expert testimony concerning the underwriting return allowable in establishing workers compensation insurance rates (1984).

Expert witness in the 1986 Workers Compensation Insurance Rate Case; testimony concerning the appropriate rate of return for workers compensation insurers in the State of Florida.

Expert testimony concerning the underwriting return and profit rate that should be established in setting rates for workers compensation insurance in Florida (1985).

Expert witness in 1987 workers' compensation insurance rate case; testimony concerning return and underwriting profit that should be established in setting rates for workers compensation insurance in Florida.

Expert witness in 1988 workers' compensation insurance rate case; testimony concerning rate of return for establishing workers' compensation insurance rates in Florida.

Expert witness in 1989 workers' compensation insurance rate case; testimony concerning rate of return for establishing workers' compensation insurance rates in Florida.

Expert witness in an Application of National Counsel on Compensation Insurance for Revision of Workers Compensation Insurance Rates, October 1989.

Expert Witness in the Application of National Counsel on Compensation Insurance for Revision of Workers Compensation Insurance Rates, October 1991.

Before the Florida Public Service Commission -

Expert witness in Docket No. 810035TP, Southern Bell Telephone & Telegraph Company; testimony concerning revenue adjustment to achieve the full normalization of deferred tax expenses and the associated current tax costs.

Expert witness in Docket No. 810095-TP, General Telephone Company; testimony dealing with tax normalization issues.

Expert witness in Docket No. 810235-TP, Central Telephone Company of Florida; testimony dealing with deregulation of telephone terminal equipment.

Expert witness in Docket No. 900202-EU, City Electric System of the Utility Board of the City of Key West, Florida; testimony concerning the critical economic importance of coordination in the electric utility industry.

Expert witness in Docket No. 020233-EI, Review of GridFlorida Regional Transmission Organization (RTO) Proposal; testimony concerning prudence of GridFlorida market design principles, October, 2002.

Before the Public Service Commission of Georgia -

Expert witness in Docket No. 3231-U, Southern Bell Telephone & Telegraph Company; testimony concerning its relationship with AT&T with respect to general services and licenses, and the proper treatment of the costs involved.

Expert witness for the Commission's Advisory Staff in Docket No. 18300-U, Georgia Power Company's 2004 Rate Case, testimony on cost of service methodology and rate design, October 2004.

Before the Georgia Department of Insurance -

Report to the Department of Insurance on NCCI's 1992 rate filing regarding appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Expert witness in Case No. 93C-147, National Council on Compensation Insurance, audit report of NCCI's 1993 voluntary and residual market workers

compensation insurance rate filings and recommendation on appropriate rate of return and required underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Before the Hawaii Public Utility Commission -

Expert witness in Docket No. 4125, Citizens Electric Company - Kauai Electric Division; testimony concerning rate of return, capital structure and related issues.

Expert witness in Docket No. 4156, Maui Electric Company, Ltd.; testimony concerning rate of return and related issues.

Expert witness in Docket No. 4306, Hawaii Telephone & Telegraph Company; testimony on overall financial health and revenue requirements.

Expert witness in Docket No. 4588, Hawaiian Telephone Company; testimony on cost-based telephone utility rates and flat customer access charges.

Expert witness in Docket No. 5114, Hawaiian Telephone Company; testimony concerning interstate rate increases and revised rate schedules.

Expert witness in Docket No. 6801, GTE Hawaiian Telephone Company; testimony concerning cost of capital impacts of GTE Corporation and HTC reorganization.

Before the Idaho Public Utilities Commission -

Expert witness in Case U-1000-37, Mountain States Telephone & Telegraph Company; testimony concerning rate of return, capital structure and related issues.

Before the Illinois Commerce Commission -

Expert witness in Docket No. 77-0511, Illinois Bell Telephone Company; testimony concerning proposed trunk rates and regulations.

Expert witness in Docket No. 85-0079, Continental Telephone Company of Illinois; testimony concerning proposed general increases in telephone rates.

Expert witness in Docket Nos. 83-0573 and 84-0555, Commonwealth Edison Company; testimony on behalf of the Attorney General of the State of Illinois concerning a phase-in of new rates for Commonwealth Edison.

Expert witness in Docket No. 84-0111, Illinois Bell Telephone Company; testimony concerning the proposed restructuring of Centrex services applicable in all exchanges.

Expert witness in Docket No. 87-0427, Commonwealth Edison Company; testimony concerning cost of capital and rate of return issues for the purpose of setting electric utility rates.

Expert witness in Docket No. 90-0169, Commonwealth Edison Company; testimony concerning cost of capital and rate of return issues for the purpose of setting electric utility rates.

Before the Indiana Public Service Commission -

Expert witness in Cause No. 35214, Public Service of Indiana, Inc.; testimony concerning cost allocation, rate design issues and the economic implications of electric utility rates.

Expert witness, Cause No. 35214, Public Service Company of Indiana; testimony concerning rate structure design and cost allocation issues.

Expert witness in Cause No. 37558, Indiana Bell Telephone Company, Inc.; testimony concerning the authority to make adjustments in the existing Centrex exchange and network services rates, for approval of new schedules, rates, and rules and regulation.

Before the Iowa State Commerce Commission -

Expert witness in Docket No. RPU-84-7, Northwestern Bell Telephone Company; testimony concerning the adjustment of intrastate rates and charges.

Expert witness in Docket No. RPU-84-40 (RF-84-305), Iowa-Illinois Gas and Electric Company; testimony on behalf of North Star Steel concerning the appropriateness of the proposed revision to Rider 4 for interruptible service.

Expert witness in Docket No. RPU-86-8, Interstate Power Company; testimony concerning the implementation of management efficiency standards in the regulatory process.

Before the Iowa Utilities Board -

Expert witness for the Office of Consumer Advocate in Docket No. RPU-05-2-TF-05-143 and TF-05-144; Aquila, Inc. d/b/a Aquila Networks regarding the Management Performance of Aquila, Incorporated and the potential of this performance on Iowa gas utility ratepayers. August 2005.

Expert witness for the Office of Consumer Advocate in Docket RPU-08-3; Black Hills/Iowa Gas Utility Company, LLC d/b/a Black Hills Energy (f/k/a Aquila, Inc, d/b/a Aquila Networks. December 3, 2008.

Expert witness for the Office of Consumer Advocate in Docket No. RPU-2010-0001, Interstate Power and Light Company. Testimony - July 2010.

Idaho Tax Commission -

Expert advice and analysis in valuing Electric Utility Property. Report Valuing Electric Utility Property prepared and presented to the Idaho State Tax Commission, and testimony in property tax proceedings for Idaho Power Company and PacifiCorp. June 2005.

Before the State Corporation Commission of the State of Kansas-

Expert witness in Docket Nos. 105, 712-U, Southwestern Bell Telephone Company; testimony dealing with service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. 97-WSRE-676-MER, Joint Application of Western Resources, Inc. and Kansas City Power and Light Company for Approval of Merger and Other Related Relief; testimony filed on behalf of Kansas City Board of Public Utilities regarding merger related market power issues, February, 1999.

Before the District Court of Montgomery County, Kansas –

Expert witness in Case No. 09 CV 691, Coffeyville Resources Nitrogen Fertilizers, LLC vs. City of Coffeyville, Kansas. August 2010

Before the Utility Regulatory Commission of Kentucky -

Expert witness in Case No. 7669, General Telephone Company of Kentucky; testimony concerning an adjustment in rates.

Expert witness in Case No. 9160, South Central Bell Telephone Company; testimony concerning an increase in rates and the approval of tariff changes for telecommunications service.

Expert witness in Case No. 8847, South Central Bell Telephone Company; testimony concerning financial condition, rate base and rate of return.

Before the Louisiana Insurance Rating Commission -

Expert witness in the Matter of Workers Compensation Insurance Rates 1986; testimony concerning loss development, expense trending and financial matters pertaining to the specification of an appropriate rate level for workers compensation insurance in Louisiana.

Before the Louisiana Public Service Commission -

Expert witness in Docket No. U-14495, Gulf States Utilities Company; testimony concerning price elasticity of demand for electric utility service.

Before the Maine Public Utilities Commission -

Expert testimony in F.C. #2168, Central Maine Power Company; testimony concerning electric utility rate structure design.

Expert witness in Docket No. F.C. 2332, Central Maine Power Company; testimony dealing with rate design issues and the economic implications of electric utility rates.

Expert witness in Docket No. 80-142, New England Telephone & Telegraph Company; testimony concerning proposed increase in rates.

Expert witness in Docket No. 80-108, Bangor Hydro-Electric Company; testimony concerning cost of serving an interruptible customer.

Expert witness in Docket No. 80-66, Central Maine Power Company; testimony concerning cost of service and rate design issues.

Before the Maine Bureau of Insurance -

Expert witness in the Matter of Workers Compensation Insurance Rates; testimony concerning loss development, expense trending, investment income and other matters pertaining to the appropriate level of workers compensation insurance rates in Maine.

Expert witness in Docket No. INS-88-2, National Counsel on Compensation Insurance; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in Maine.

Expert witness in Docket No. INS-91-66; testimony concerning appropriate profit and contingency component for inclusion in the servicing carrier allowance for workers compensation rates.

Before the Maryland Public Service Commission -

Expert testimony in Case No. 6807, Future Adequacy of Service; testimony concerning electric power demand modeling and forecasting.

Expert witness in Case No. 7338, Phase III, Potomac Edison Company; testimony concerning electric utility rate design pertinent to the Public Utility Regulatory Policies Act of 1978.

Expert witness in Case No. 7408, Baltimore Gas & Electric Company; testimony concerning BG&E's Gas Service Tariff provisions regarding the costs to be paid by new customers for gas main extensions and service line extensions in excess of 50 feet.

Expert witness in Case No. 7435, Chesapeake & Potomac Telephone Company; testimony concerning capital cost issues.

Expert witness in Case No. 7450, Chesapeake & Potomac Telephone Company; testimony concerning issues related to the divestiture by AT&T.

Expert witness in Case No. 7450 Phase II/7735, Chesapeake & Potomac Telephone Company; testimony concerning cost of service and subscriber access costs.

Expert witness in Case No. 7851, Chesapeake & Potomac Telephone Company; testimony concerning the application for authority to restructure schedule of rates and charges.

Expert witness in Case No. 7467, The Chesapeake & Potomac Telephone Company; testimony concerning the regulatory and economic treatment of deferred tax expenses and credits in establishing revenue requirements.

Expert witness in Case No. 7591, Chesapeake & Potomac Telephone Company; testimony dealing with cost methods.

Expert witness in Case No. 7661, Chesapeake & Potomac Telephone Company; testimony concerning the development of cost of service methodologies.

Before the Utilities Commission of St. Michaels, MD -

Expert witness in annual rent arbitration; testimony concerning fair and reasonable revised annual rent for period 10/15/91 to 10/15/96 to be paid by Delmarva Power & Light Company under its 1981 lease of the St. Michaels service territory.

Before the Massachusetts Public Utility Commission -

Expert witness in D.P.U. 19139, Investigation of Rates and Charges for Dimension 400 PBX Service; testimony concerning service and equipment costs; tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. D.P.U. 84-25, Western Massachusetts Electric Company; testimony concerning CWIP in rate base, cash flow and phase-in issues.

Before the Commonwealth of Massachusetts Division of Insurance -

Expert witness in Docket No. 2001-29, Automobile Insurance Bureau of Massachusetts, testimony filed on behalf of the Massachusetts Attorney General concerning cost of capital and rate of return, September 2001.

Expert witness in Docket No. 2000-10, Automobile Insurance Bureau of Massachusetts, testimony filed on behalf of The Massachusetts Attorney General concerning private passenger automobile insurance rates and underwriting profit, August 2000.

Expert witness in Application of Automobile Insurance Bureau of Massachusetts, 2000 Massachusetts Private Passenger Automobile Underwriting Profit Filing; testimony filed on behalf of Massachusetts Attorney General concerning rate of return and cost of capital, September, 1999.

Before the Michigan Public Service Commission -

Expert witness for the State of Michigan, Department of Attorney General in Case Nos. U-5365 and U-5322, Michigan Consolidated Gas Company; testimony concerning rate of return and cost of service issues.

Expert witness in Case No. U-5502, Detroit Edison Company; testimony concerning rate of return.

Expert witness of the State of Michigan, Department of Attorney General in Case No. U-5608, Indiana & Michigan Electric Company; testimony concerning rate of return.

Expert witness for the State of Michigan Office of Attorney General in Case No. U-5669, Upper Peninsula Power Company; testimony concerning rate of return and cost of service issues.

Expert witness in Case U-5955, Michigan Consolidated Gas Company; testimony concerning rate of return and capital structure issues.

Expert witness in Case U-6002, Michigan Bell Telephone Company; testimony concerning capital structure and rate of return issues.

Expert witness in Case U-5979, Consumer's Power Company; testimony concerning rate of return issues.

Expert witness in Cases U-5197, U-5752, U-5753 and U-5754, Michigan Bell Telephone Company; testimony concerning cost of service and antitrust issues.

Expert witness in Docket No. U-6103, Detroit Edison Company; testimony concerning cost of service and steam heat rates.

Expert witness in Cause No. U-7660, Detroit Edison Company; testimony concerning financial conditions, revenue requirements and cash flow issues.

Expert witness in Cause No. U-7830, Consumers Power Company; testimony concerning capital structure and rate of return as well as revenue requirement issues pertaining to the Midland plant.

Expert witness in Case No. U-8789, The Detroit Edison Company; testimony concerning costs of excess capacity in setting utility rates in regard to proper ratemaking treatment for the FERMI 2 plant.

Expert witness in Case No. U-10127 and U-8871, Consumers Power Company; testimony concerning the merits of CPCo's proposed settlement agreement to resolve Midland Cogeneration Venture Limited Partnership cost recovery issues.

Before the Michigan Department of Commerce, Insurance Bureau -

Expert witness in Case No. 91-11806-BC, Blue Cross Blue Shield of Michigan; testimony concerning required rate levels for BCBSM.

Before the Minnesota Commerce Commission -

Expert witness in O.A.H. Docket No. 9-1004-3412-2, St. Paul Fire & Marine Insurance Company; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting rate change that should be implemented in establishing St. Paul's rates for physicians and surgeons medical malpractice liability insurance in Minnesota.

Before the Minnesota Public Service Commission -

Expert cost of service and rate design witness in Docket No. E-002/GR-77-611, Northern States Power Company; testimony concerning cost responsibility, cost allocation, and principles of rate structure design.

Expert cost of service and rate design witness in Docket No. E002/GR-76-934, Northern States Power Company; testimony concerning cost responsibility and cost allocation issues and principles of rate structure design.

Expert rate design witness in Docket No. ER-2-1, Northern States Power Company; testimony involved analysis of rate design issues including time-of-day pricing, marginal cost responsibility, and load factor analysis.

Expert witness in Docket No. G-008/GR-77-1237, Minnesota Gas Company; testimony concerning cost allocation and rate of return issues.

Before the Mississippi Public Service Commission -

Expert witness in Docket No. U-3929, Mississippi Power Company; testimony concerning proposed increase in rates, and recommendations to a fair rate of return in electric utility rates.

Before the Missouri Public Service Commission -

Expert witness in Docket No. TR82-1998, Southwestern Bell Telephone Company; testimony concerning rate of return requirements.

Expert witness in Case No. TR-83-253, Southwestern Bell Telephone Company; testimony concerning cost of service and subscriber access costs.

Expert witness in Case No. EM-96-149, Application of Union Electric Company for an Order Authorizing (1) Certain Merger Transactions Involving Union Electric Company; (2) the Transfer of Certain Assets, Real Estate, Leased Property, Easements and Contractual Agreements to Central Illinois Public Service Company; and (3) in Connection therewith, Certain Other Related Transactions; testimony filed on behalf of the PSC concerning merger related market power issues, November, 1996.

Before the Missouri Department of Insurance -

Expert witness in Case No. 93-06-09-0621, Modern American Life Insurance Company; affidavit concerning MAL's proposed reorganization and its effect on policyholders.

Before the Montana Public Service Commission -

Expert witness for the Commission Staff in Docket No. 6279, Montana Power Company; testimony concerning rate structure design, cost of service issues, and rate of return.

Expert witness for the Commission Staff in Docket No. 6277, Montana-Dakota Utilities Company; testimony concerning rate of return, rate structure design, and cost of service issues.

Expert witness for the Commission Staff in Docket No. 6441, Montana-Dakota Utilities Company; testimony concerning rate of return issues.

Expert witness for the Consumer Counsel in Docket No. 6454, Montana Power Company; testimony concerning rate of return.

Expert witness for the Consumer Counsel in Docket No. 6496, Mountain States Telephone and Telegraph Company; testimony concerning rate of return and cost of capital.

Expert witness for the Consumer Counsel in Docket No. 6494 and 6495, Butte Water Company; testimony dealing with rate of return and cost of service issues.

Expert witness in Docket Nos. 6545 and 6546, Montana Power Company Water Rates; testimony concerning proposed water rate increases. (Rate of return and cost of service issues.)

Expert witness for the Consumer Counsel in Docket No. 6567, Montana-Dakota Utilities Company; testimony concerning rate of return, cost allocation, and rate design issues.

Expert witness in Docket No. 6618, Phase I and Phase II, Montana Power Company; testimony concerning rate of return, capital structure, and gas utility rate structure design issues.

Expert witness for the Consumers' Counsel in Docket No. 6701, Great Falls Gas Company; testimony concerning cost of service, cost allocation, and rate design issues.

Expert witness for the Consumer's Counsel in Docket No. 6695, Montana-Dakota Utilities Company; testimony concerning gas and electric rate design and testimony concerning the profits earned by an affiliated coal company.

Expert witness in Docket No. 80.4.2, Montana Power Company; testimony concerning cost of capital and rate of return.

Expert witness in Docket No. 80.7.52, Montana-Dakota Utilities Company; testimony concerning revenue adjustment and the associated current tax costs, and recommendations concerning gas utility rate design.

Expert witness in Docket No. 80.10.79, Mountain States Telephone & Telegraph Company; testimony concerning pro-posed rate changes and rate structure recommendations.

Expert witness in Docket No. 80.12.100, Mountain States Telephone & Telegraph Company; testimony concerning revenue adjustment and the associated current tax costs, and treatment of affiliate relationship costs.

Expert witness in Docket No. 81.1.2, Montana-Dakota Utilities Company; testimony concerning revenue adjustment and the associated current tax costs, the profits earned by an affiliated coal company, and electric rate structure design.

Expert witness in Docket No. 81.8.70, Pacific Power & Light Company; testimony on rate design and excess coal profits.

Expert witness in Docket No. 82.2.8, Mountain States Telephone Company; testimony dealing with financial conditions and rate of return.

Expert witness in Docket No. 82.4.28, Pacific Power and Light Company; testimony concerning the issues of coal profit levels and an "attrition" adjustment.

Expert witness on Docket No. 82.8.54, Montana Power Company; testimony dealing with utility captive coal profits and revenue increase needs.

Expert witness in Docket No. 83.3.18, Mountain States Telephone & Telegraph Company; testimony concerning cost of service and access charge matters.

Expert witness in Docket No. 83.3.18, Mountain States Telephone & Telegraph Company; testimony concerning cost of capital, rate of return, and cost of service issues.

Reply Comments on Telephone Access Costs and Rates in Docket No. 83.6.47.

Expert witness in Docket No. 83.5.36, Pacific Power and Light Company; testimony concerning coal profit levels.

Expert witness in Docket No. 83.9.67, Montana Power Company; testimony concerning coal profit levels and cost allocation and rate design issues.

Expert witness in Docket No. 83.9.68, Montana-Dakota Utilities Company; testimony concerning coal purchases and operations.

Expert witness in Docket No. 83.11.80, AT&T Communications of the Mountain States, Inc.; testimony concerning the Company's financial circumstances, its forecasted budgeted test year, access charges, and the rate of return to be included in the rate for intrastate toll services.

Expert witness in Utility Division Docket No. 84.10.64, in the matter of the Commission's Investigation of Electric Avoided Cost. Testimony presented on behalf of the Montana Consumer Counsel concerning a range of alternative methods of determining the avoided cost of Montana jurisdictional utilities that should be applied in setting rates payable to cogenerators and qualifying facilities.

Expert witness in Case No. 84.4.19, Mountain States Telephone and Telegraph Company; testimony deals with the Company's financial circumstances, its forecasted budgeted test year, directory revenues and expenses, productivity, official services, cash working capital and the rate of return which should be included in the telephone service rates.

Expert witness in Docket No. 87.12.77, The Montana-Dakota Utilities Company; testimony concerning as utility rate design.

Expert witness in Docket No. 88.1.2, Mountain States Telephone & Telegraph Company; testimony concerning rate of return to support MBT's telephone utility service in Montana.

Expert advice and analysis in the matter of the application for approval of (A) the general filing of Pacific Power and Light Company in demonstration of one test year as a merged company and (B) proposed new tariff, Schedule No. 47T, on the PP&L Champion International Inc. Electric Service Contract, Utility Division Docket No. 90.11.78.

Advice and analysis in the matter of the application of U S West Communications Inc. for approval of an alternative form of regulation, et al., Docket Nos. 90.12.86, 89.8.28, 89.8.29, 89.9.29, 90.5.32.

Expert witness in Docket No. 91.3.12, GTE Northwest, Inc.; testimony concerning required rate of return allowance to support GTE-NW's jurisdictional telephone utility service.

Expert witness in Docket No. 92.7.32, PTI Communications; testimony concerning rate of return allowance that PTIC requires to support its jurisdictional telephone utility service rate base.

Expert witness in Docket No. 93.3.10, Order No. 5701a; testimony concerning a Commission investigation of standards of the Energy Policy Act of 1992 and whether adoption of standards would carry out the purpose of Title I of the Public Utility Regulatory Policies Act of 1978.

Expert witness in Docket No. 93.6.24, Montana Power Company; testimony concerning rate requirements, regulatory policy issues, and restrictions on profits in dealings with affiliates.

Expert witness in Docket No. 93.7.29, Montana Power Company; testimony concerning cost allocation and rate design.

Expert witness in Docket No. D2001.10.144, Montana Power Company; testimony concerning MPC's electric default supply portfolio filing and proposed tariffs and rate changes, January, 2002.

Expert advice and analysis in Docket No. D2002.7.93; comments concerning Commission's Inquiry into Necessary and Reasonable Rates for Default Electric Supply Service, August, 2002.

Expert advice and analysis in Docket No. D2003.8.109 concerning Investigation of NorthWestern Energy's Financial and Related Transactions with NorthWestern Corporation, its Affiliates and Creditors that May Impair its Financial Solvency and Public Utility Service Obligations, August 2003.

Expert witness for the Montana Consumer Counsel in Docket No. D2004.3.45; the Application of North Western Energy for Approval of Agreement for Sale and Purchase of Capacity and Energy between North Western Energy and Basin Creek Equity Partners, LLC, June 2004.

Direct Testimony in Docket No. D2003.6.77 and D2004.6.90 Utility Division, Northwestern Energy's Electric Default Supply Tracker Filings for the periods of July 1, 2002 through June 30, 2003 and July 1, 2003 through June 30, 2004 and for the Forecasted Period July 1, 2004 through June 30, 2005. December 13, 2004

Direct Testimony on behalf of the Montana Consumer Counsel In the Matter of the Joint Application of NorthWestern Corporation and Babcock & Brown Infrastructure Limited, BBI US Holdings Pty Ltd., BBI US Holdings II Corp., and BBI Glacier Corp. For Approval on the Sale and Transfer of NorthWestern Corporation Pursuant to a Merger Agreement. Docket No. D2006.6.82 December 15, 2006.

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of NorthWestern Energy's Electric Default Supply Tracker Filings for the Periods July 1, 2005 through June 30, 2006 and July 1, 2006 through June 30, 2007 and for the Forecasted Period July 1, 2007 through June 30, 2008. Docket Nos. D2006.5.66 and D2007.5.46. October 5, 2007.

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of Montana-Dakota Utilities Co., Application for Authority to Establish Increased Rates for Electric Service. Docket No. D2007.7.79. October 22, 2007.

Expert witness for the Montana Consumer Counsel. Testimony In the Matter of NorthWestern Energy's Application for Authority to Establish Increased Natural Gas and Electric Service Rates. Docket No. D2007.7.82. November 9, 2007

Expert witness for the Montana Consumer Counsel. Direct Testimony In the Matter of An Investigation of NorthWestern Corporation Compliance with Order 6505e. Docket No. D2008.4.36. May 20, 2008.

Expert witness for the Montana Consumer Counsel. Testimony In the Matter of NorthWestern Energy's Application for Authority to Establish Increased Natural Gas and Electric Service Rates. Phase II. Docket No. D2007.7.82. July 18, 2008.

Direct Testimony In the Matter of the Application of NorthWestern Energy for Approval to Construct and Operate the Mill Creek Generating Station to Supply Regulation Service for NorthWestern Energy's Montana Electric Operations and Montana Transmission Control Area Docket No. D2008.8.95. November 20, 2008.

Direct Testimony on behalf of the Montana Consumer Counsel In the Matter of the Petition of Energy West Incorporated for an Order Approving Its Corporate Reorganization to Create a Holding Company Structure; Docket No. D2008.5.57; January 29, 2009.

Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Energy West Incorporated for Approval of its Acquisition of And Transfer of Stock of Brainard Gas Corporation, Great Plains Natural Gas Company, Lightning Pipeline Company, Inc. and Membership Interest in Great Plains Land Development Co., Ltd. Docket No. D2008.11.132, April 17, 2009.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of NorthWestern Energy's Electric Supply Tracker Filings for the Periods July 1, 2007 through June 30, 2008 and July 1, 2008 through June 30, 2009 and for the Forecasted Period July 1, 2009 through June 30, 2010. Docket Nos. D2008.5.45 and D2009.5.62.

Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Mountain Water Company for Authority to Increase Rates and Charges for Water Service to its Missoula, Montana Customers. Docket No. D2010.4.41, Order No. 7088, October 15, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of NorthWestern Energy's Application for Approval of Avoided Cost Tariff For New Qualifying Facilities. Docket No. D2010.7.77, November 10, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc. for Authority to Establish Increased Rates for Electric Service. Docket No. D2010.8.82, December 23, 2010.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Energy West Montana to Establish Increased Service Rates in the Great Falls, Cascade and West Yellowstone Service Areas. Docket No. D2010.9.90, April 12, 2011.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Consolidated Petition by Mountain Water Company for Declaratory Rulings and Application for Approval of Sale and Transfer of Stock in Park Water Company. Docket No. D2011.1.8, July 29, 2011.

Compliance Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of Northwestern Energy for Approval to Construct and Operate the Mill Creek Generating Station to Supply Regulation Service for Northwestern Energy's Montana Electric Operations and Montana Transmission Control Area. Docket No. D2008.8.95, August 12, 2011.

Direct Testimony on behalf of the Montana Consumer Counsel In the matter of the Application of NorthWestern Energy for Approval to Purchase and Operate the Spion Kop Wind Project, for Certification of the Spion Kop Wind Project as an Eligible Renewable Resource, and for Related Relief. Docket No. D2011.5.41, September 22, 2011.

Before the State of Montana Tax Appeal Board –

Expert witness in the matter of PPL Montana, LLC v. Montana Department of Revenue. Cause No. DV-STP-2002-4 (Report – April 2004).

Expert witness in Case No. SPT-2006- NorthWestern Corporation v. State of Montana, Department of Revenue. Economic Critique of the Shaw Stone & Webster Appraisal. December 2006.

Expert witness in the matter of PacifiCorp v. State of Montana Department of Revenue. Cause No. CT-2005-3.

Expert witness. The Value of Puget Sound Energy, Inc.'s Electric and Gas Property An Economic Critique of the Davis Appraisal And the Cornia/Walters Obsolescence Analysis. April 2008.

Before the Montana Thirteenth Judicial District Court -

Expert witness in Cause No.: DV-10-1312, Bresnan Communications, LLC vs. State of Montana Department of Revenue. Report dated July 2011, Affidavit September 1, 2011.

Before the Nebraska Public Service Commission -

Expert witness in Docket No. C-227, Northwestern Bell Telephone Company; testimony concerning rate of return and capital structure issues.

Before the Nevada Public Service Commission -

Expert witness in Docket No. 83-707, Nevada Power Company; testimony concerning cost of common equity and rate of return.

Before the New Hampshire Public Utilities Commission -

Expert witness in Docket No. DG 10-017, EnergyNorth Natural Gas; testimony concerning cost of common equity and rate of return. October 22, 2010.

Direct Testimony on behalf of the Commission Staff in Docket No. DG 10-055 Unitil Energy Systems, Incorporated; testimony concerning rate of return and cost of common equity. November 5, 2010.

Before the New Jersey Department of Public Utilities -

Expert witness in PUC Docket Number 7512-1314, New Jersey Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Docket No. 8312-1126, Western Union; testimony concerning competition in intrastate telecommunications.

Expert testimony concerning whether the provision of telecommunications service is a "natural monopoly," whether regulatory restrictions should be imposed in

order to maintain monopoly conditions, and the extent to which monopolized interexchange service permits subsidies to local exchange service.

Before the New Jersey Insurance Department -

Expert witness in Rate Counsel File No. 83-PPA-6, Keystone Insurance Company; testimony concerning the underwriting return on private passenger automobile insurance rates and loss/expense projections.

Expert witness in File No. 83-30, Reliance Insurance Company; testimony concerning the underwriting return on private passenger automobile insurance rates and loss/expense projections.

MIC Insurance Company; expert testimony concerning the underwriting return that should be allowed in establishing MIC's private passenger automobile insurance rates in New Jersey.

Expert witness in Department of Insurance Filing Nos. 86-847 and 86-1964, Prudential Property and Casualty Insurance Company; testimony concerning the appropriate underwriting margins for Prudential's automobile liability and physical damage coverage in New Jersey.

Expert witness in DOI Filing No. 87-1725, State Farm Mutual Automobile Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates in New Jersey.

Expert witness in DOI Filing No. 87-1845, The Prudential Property and Casualty Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Prudential in New Jersey.

Expert witness in DOI Filing No. 88-188, Liberty Mutual Fire Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Liberty Mutual in New Jersey.

Expert witness in DOI Filing No. 88-211, Colonial Penn Insurance Company; testimony concerning earnings rate, expense level and underwriting return for establishing private passenger automobile insurance rates for Colonial Penn in New Jersey.

Expert witness in DOI File No. 88-1736, The Prudential Property and Casualty Insurance Company; testimony concerning earnings rate, expense level and the underwriting return for establishing private passenger automobile insurance rates for Prudential in New Jersey.

Before the New Mexico Corporation Commission -

Expert witness in Docket No. 1002, Mountain States Telephone & Telegraph Company; testimony concerning cost of service allocation issues.

Before the New York Public Service Commission -

Expert witness for Suffolk County in Case No. 27136, Long Island Lighting Company; testimony dealing with rate of return and cost of service issues.

Presentation regarding telephone customer access line charges and bypass before an en banc meeting of the Public Service Commission, March 1984.

Expert witness in Case No. 27006, New York Telephone Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in Cases 26943, 26944, 26945, Niagara Mohawk Power Corporation; testimony concerning electric utility costs and rate structure design.

Expert witness in Cases 27374 and 27375, Long Island Lighting Company; testimony concerning electric and gas rate issues.

Expert witness in Docket No. 27774, Long Island Lighting Company; testimony concerning electric utility rate structure design.

Expert witness in Case 27469, New York Bell Telephone Company; testimony concerning terminal equipment rates. Affidavit dealing with the legality of tariffs filed by the Rochester Telephone Corporation.

Expert witness in Case No. 28954, Consolidated Edison Company of New York; testimony concerning claimed revenue requirements regarding capital structure.

Expert witness in Case No. 28978, New York Telephone; testimony presents the theoretical foundations for an appropriate Centrex rate structure and rates.

Expert witness in Case Nos. 90-E-1185 and 90-G-0112, Long Island Lighting Company; testimony addressing ratemaking issues concerning LILCO's proposed "sales adjustment mechanism, insurance costs, advertising expenditures, and Edison Electric Institute (EEI) dues." (May 1991)

Expert witness in Case No. 96-E-0132, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations for Long Island Lighting Company for Electric Service to Determine if Opportunities Exist to Reduce Electric Prices; testimony filed on behalf of LIPA concerning LILCO's required rate of return on rate base, August, 1996.

Before the North Carolina Utility Commission -

Expert witness for the Commission Staff in Docket No. E-22, Sub 224, Virginia Electric & Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. E-7, Sub 237, Duke Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. P-55, Sub 816, Southern Bell Telephone Company; testimony concerning rate of return and capital structure issues.

Expert witness in Docket No. P100, Sub 65, on behalf of the North Carolina Department of Justice, testimony concerning telephone access charges.

Expert witness in Docket No. E-7, Sub 373, Duke Power Company; testimony concerning rate base and cost of service issues.

Expert witness in Docket No. E-7, Sub 391, Duke Power Company; testimony concerns required rate of return and cost of capital.

Expert witness in Docket No. P55, Sub 834, Southern Bell Telephone and Telegraph Company; testimony concerning attrition adjustment, rate of return, and divestiture related revenue requirement issues.

Expert witness in Docket No. E-2, Sub 503, Carolina Power & Light Company; testimony pertains to application for authority to adjust and increase electric rates.

Expert witness in Docket Nos. E-2, Sub 391; E-2, Sub 416; E-2, Sub 402; E-2, Sub 411; E-2, Sub 446, Carolina Power & Light Company; testimony presents an independent analysis of the appropriateness of the fuel factors employed by Carolina Power & Light Company.

Expert witness to Docket No. E-2, Sub 481, Carolina Power & Light Company; testimony concerns the amounts of CWIP included in CP&L's rate base.

Expert witness in Docket E-100, Sub 41A, testimony addressing the biennial determination of rates for sale and purchase of electricity between utilities and qualifying facilities.

Expert witness in Docket No. E-2, Sub 481, Carolina Power & Light Company; testimony addresses the necessity for the requested rate relief.

Expert witness in Docket No. E-7, Sub 408; Duke Power Company; testimony concerning the expense, rate base and rate of return issues pertaining to Duke's request for an increase in retail electric rates.

Before the North Carolina Insurance Commission -

Expert witness on behalf of the North Carolina Insurance Department in Docket No. 361, concerning private passenger automobile insurance rates filed by the North Carolina Insurance Service office.

Expert witness pertaining to the earnings rate that should be allowed in establishing private passenger automobile insurance rates.

Expert witness pertaining to the underwriting return that should be allowed in establishing farmowners multiple peril insurance rates.

Expert witness in Docket No. 474; testimony concerning the appropriate rate of return and underwriting margin for automobile insurers in North Carolina.

Expert witness before the Commissioner of Insurance; testimony concerning the allowable underwriting return in farmowners multiple peril insurance rates.

Expert witness in 1987 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in 1987 workers' compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance in North Carolina.

Expert witness in 1988 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in 1989 private passenger automobile insurance rate case; testimony concerning earnings rate and underwriting return for establishing private passenger automobile insurance rates in North Carolina.

Expert witness in Docket No. 478; testimony concerning dividends, deviations, accounting principles, and premium-to-surplus ratios are appropriate in determining rates.

Expert witness in Docket No. 535, North Carolina Rate Bureau; testimony regarding a revision of Private Passenger Automobile Insurance Rates, October 1989.

Expert witness, North Carolina Rate Bureau 1992 filing, testimony concerning appropriate rate of return on the underwriting profit and contingency factor that should be allowed in establishing workers compensation rates.

Expert witness concerning the appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing private passenger automobile insurance rates.

Expert witness in Docket Nos. 670 & 671; North Carolina Rate Bureau 1993 filing, testimony concerning appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing homeowners and dwelling fire and extended coverage insurance rates.

Expert witness in Docket No. 689, North Carolina Rate Bureau 1994 filing; testimony concerning appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing private passenger automobile insurance rates.

Before the Public Utilities Commission of Ohio -

Expert witness in Case No. 99-1212-EL-ETP, First Energy Corporation; testimony filed on behalf of Shell Energy Services Company concerning “stranded” costs and competitive market rates.

Expert witness in Case Nos. 99-1729-EL-ETP & 99-1730-EL-ETP, American Electric Power electric restructuring proceeding; testimony filed on behalf of Shell Energy Services Company, concerning stranded costs and competitive market rates.

Expert witness in Case No. 76-26-TP-CCS, Ohio Bell Telephone Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Case No. 78-676-EL-AIR, Ohio Power Company; testimony concerning rate of return and capital structure issues.

Expert witness in Case No. 79-1184-TP-AIR, Ohio Bell Telephone Company; testimony concerning proper ratemaking treatment of costs and adjustments for demand curtailment and stimulation.

Expert witness in Case Nos. 80-260-EL-AIR, and 80-429-EL-ATA, Cincinnati Gas & Electric Company; testimony concerning rate structure design, calculation of tariffs and revenue responsibilities.

Expert witness in Case No. 81-782-EL-AIR, Ohio Power & Light Company; testimony on company's request for rate increase.

Expert witness in Case No. 80-1155-GA-AIR et al., Columbia Gas of Ohio; testimony dealing with rate of return.

Expert witness in Docket No. 83-464-TP-COI, Ohio Bell Telephone Company; testimony concerning intrastate access charges.

Before the Oklahoma Corporation Commission -

Expert witness in Case No. 28002, Southwestern Bell Telephone Company; testimony concerning financial condition, cost of capital, rate of return and cost of service issues.

Expert witness in Cause No. 28123, Oklahoma Gas and Electric Company; testimony concerning rate of return, CWIP, and cash working capital issues.

Expert witness in Cause Nos. 28331 and 28875, Public Service Company of Oklahoma; testimony analyzing request for rate relief; presents a cost of capital study and addresses the allocations and determination of Transok's cost of service.

Expert witness in Cause No. 28309, testimony addressing the development of intrastate access charges.

Expert witness in Cause No. 29321, Southwestern Bell Telephone Company; testimony analyzing Southwestern Bell's request for interim intrastate rate relief; pursuant to intrastate rates, charges, services and practices necessary to achieve an increase in rate of return; and, intrastate access charges and tariffs.

Before the Oklahoma State Board of Property and Casualty Rates -

Expert testimony pertains to the earnings rate and the underwriting return allowed in establishing worker's compensation insurance rates.

Expert witness File No. 92-1566C; testimony concerning appropriate rate of return on the underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Before the Ontario Energy Board -

Expert witness in Case No. OEB-HR-17; Ontario Hydro; testimony concerning cost allocation and rate design issues and nuclear decommissioning cost matters and parallel generation.

Expert witness in Case No. E.B.R.O. 410-III and E.B.R.O. 414-II, The Consumers Gas Company, Ltd.; testimony concerning gas utility cost allocation and rate design.

Before the Ontario Legislative Assembly -

Ontario Hydro Select Committee; expert testimony on economic principles of electric utility rate structure design; March 9, 1976.

Before the Pennsylvania Insurance Commissioner -

Expert testimony concerning rate of return issues in determining private passenger automobile insurance rates.

Expert witness regarding rate of return in determining private passenger automobile insurance rates.

Expert witness to present testimony on the rate of return that should be allowed in establishing workers compensation insurance rates in Pennsylvania.

Expert witness to present testimony on the appropriate rate of return and on the underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates that are not inadequate, excessive or unreasonably discriminatory, November, 1991.

Before the Pennsylvania Insurance Department -

Expert advice and analysis regarding the effect of market structure on Pennsylvania Blues' surplus position, November 2003.

Before the Pennsylvania Public Utility Commission -

Expert witness in Docket No. I-8400381, Philadelphia Electric Company; testimony pertains to Company's load forecast and the question of instituting regulatory incentives designed to improve performance and reduce electric utility costs.

Expert witness in Docket No. R-842651, Pennsylvania Power & Light Company; testimony concerning the impact of electric power rate increases on the local economy, the terms and conditions for the measurement of billing demands, the feasibility of deferred return ratemaking.

Expert witness in Docket No. 850152, Philadelphia Electric Company; testimony to assess the merits of adopting operating performance standards for PECO's nuclear power plants.

Expert witness in the Commission's 1984 Generic proceeding on the establishment of new cogeneration rates.

Expert witness in Docket No. A-2010-2176733, Joint Application For Approval Under Chapter 11 of the Pennsylvania Public Utility Code of the Change of Control of Qwest Communications Company, LLC and For All Other Approvals Required Under the Public Utility Code. Testimony in regard to issues pertaining to the proposed merger of CenturyLink and Qwest. July 2010.

Expert witness in Docket No. A-2010-2176520/A-2010-2176732, Joint Application of West Penn Power Company d/b/a Allegheny Power, Trans-

Allegheny Interstate Line Company and FirsEnergy Corp, Testimony concerning the effect of the merger on competition. August 2010

Before the Rhode Island Public Utilities Commission -

Expert witness for the Commission Staff in Docket No. 1170, New England Telephone and Telegraph Company; testimony concerning rate of return, working capital allowance, tax issues and earnings erosion.

Expert witness for the Commission Staff in Docket No. 1167, Bristol County Water Company; testimony dealing with rate of return and the financial implications of leveraged capitalization within a multi-tier holding company structure.

Expert witness for the Commission Staff in Docket No. 1185, Blackstone Valley Electric Company; testimony concerning the principles of electric utility rate structure design.

Expert witness for the Commission Staff in Docket No. 1189, Providence Gas Company; testimony concerning rate of return for a gas utility.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1268, Newport Electric Corporation; testimony concerning rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1251, New England Telephone & Telegraph Company; testimony concerning rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1256, Wakefield Water Company; testimony regarding rate of return.

Expert witness for the Division of Public Utilities and Carriers in Docket No. 1258, Providence Gas Company; testimony regarding rate of return and cost of service.

Expert witness in Docket No. 1262, Blackstone Valley Electric Company; testimony presenting and summarizing the results of the Rhode Island Demonstration Project. Expert witness for the Division of Public Utilities and Carriers in Docket No. 1311, Newport Electric Corporation; testimony concerning inverted rates and lifeline rates.

Expert witness in Docket No. 1468, Narragansett Electric Company; testimony consists of a critique of the rate of return testimony presented by the Applicants' witness, and of an analysis of the cost of senior securities and common equity capital.

Expert financial and cost of service witness in Docket No. 1502, Bristol County Water Company; testimony concerning proposed rate increase.

Expert witness in Docket No. 1560, New England Telephone & Telegraph Company; testimony concerning rate of return, affiliated relationships, license contract, migration and related issues.

Expert witness in Docket No. 2320; Rhode Island Department of the Attorney General; testimony addressing various economic issues relating to electric utility restructuring. (A Plan for Restructuring the Electric Utility Industry was also prepared for the Rhode Island Department of the Attorney General.)

Before the Rhode Island Department of Business Regulation, Insurance Division -

Expert witness, National Council on Compensation Insurance, testimony concerning the appropriate rate of return and underwriting profit and contingency factor that should be allowed in establishing workers compensation insurance rates.

Before the South Carolina Department of Insurance -

Expert witness in Docket No. 82-053, Insurance Company of North America; testimony concerning the underwriting return for private passenger automobile insurance rates.

Expert witness in Docket No. 83-001, Rate Filing for Private Passenger Automobile Liability and Physical Damage Insurance Rate; testimony concerning rate level requirements for private passenger automobile insurance.

Expert witness in Docket No. 84-046, State Farm Mutual Automobile Insurance Company; testimony addresses the underwriting return that should be allowed in establishing private passenger automobile insurance rates (1984).

Expert witness, State Farm Mutual Automobile Insurance Company; testimony concerning the earnings rate and the underwriting return that should be allowed in establishing private passenger automobile insurance rates (1985).

Expert witness in Docket No. 84-023 concerning rates to be charged by South Carolina for fire insurance on dwellings.

Expert witness in 1987 workers compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in South Carolina.

Expert witness in 1988 Mark Four insurance rate case, Blue Cross and Blue Shield of South Carolina; testimony concerning earnings rate and underwriting return for establishing Mark Four insurance rates for Blue Cross in South Carolina.

Expert witness in 1989 workers' compensation insurance rate case; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in South Carolina.

Before the South Carolina Public Service Commission -

Expert witness in Docket No. 80-69-E, Carolina Power & Light Company; testimony concerning rate design issues and the economic implications of electric utility rates and focusing on the PURPA cost of service standard.

Expert witness in Docket No. 82-328-E, Carolina Power & Light Company; testimony concerning rate of return issues.

Expert witness in Docket Nos. 84-388-E and 84-389-EIG, South Carolina Electric & Gas Company; testimony reviews the application pertaining to the restructure of SCE&G's corporate organization.

Before the South Dakota Public Utilities Commission -

Expert witness for the Commission Staff in Docket No. F-3112, Black Hills Power & Light Company; testimony dealing with rate of return, rate structure design, and subsidiary operations.

Expert witness for the Commission Staff in Docket No. F-3053, Montana-Dakota Utilities Company; testimony dealing with rate of return, rate structure design, and subsidiary operations.

Expert witness for the Commission Staff in Docket No. F-3054, Northern States Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3055, Northwestern Public Service Company; testimony concerning rate of return.

Expert witness for the Commission staff in Docket No. F-3052, Otter Tail Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3126, Montana Dakota Utilities Company; testimony dealing with electric utility rate of return.

Expert witness for the Commission Staff in Docket No. F-3159, Montana-Dakota Utilities Company; testimony dealing with gas utility rate of return.

Expert witness for the Commission Staff in Docket No. F-3153, Northwestern Public Service Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3164, Otter Tail Power Company; testimony concerning rate of return.

Expert witness for the Commission Staff in Docket No. F-3174, Black Hills Power & Light Company; testimony concerning rate of return issues.

Expert witness for the Commission Staff in Docket No. F-3188, Northern States Power Company; testimony concerning rate of return.

Expert witness in Dockets F-3240 and F-3241, Montana-Dakota Utilities Company; testimony concerning rate of return, cost of capital, rate structure design and coal subsidiary profits.

Expert witness in Docket No. F-3262, Black Hills Power & Light Company; testimony concerning rate of return, cost of capital, rate structure design and coal subsidiary profits.

Expert witness in Docket No. F-3367, Northwestern Public Service Company; testimony concerning rate of return and other ratemaking issues.

Expert witness in Docket No. F-3371, Nebraska Public Power District; testimony on proposed MANDAN Nominal 560KV Transmission Facility.

Expert witness in Docket No. F-3370, Montana-Dakota Utilities Company; testimony dealing with rate design.

Expert witness in Docket No. F-3382, Northern States Power Company; testimony on rate of return.

Expert witness in Docket No. F-3384, Montana-Dakota, Utilities Company; testimony on rate of return.

Expert witness in Docket No. F-3389, Black Hills Power & Light Company; testimony on rate of return and cost of service.

Expert witness in Docket No. F-3508, Northwestern Public Service Company; testimony examined electric rate requirements giving particular attention to cost of capital and rate of return.

Expert witness in Docket No. F-3391, Northwestern Public Service Company; testimony presents a cost of capital study and recommends a fair rate of return.

Before the Tennessee Public Service Commission -

Expert witness in Docket No. U-6285, South Central Bell Telephone Company; testimony pertaining to Western Electric's cost allocations and anticompetitive implications of South Central Bell's rate levels and rate design for telephone services.

Before the Texas Public Utility Commission -

Expert witness in Docket No. 78, Southwestern Bell Telephone Company; testimony concerning telephone equipment, telephone service costs, rate of design, and the economic implications thereof.

Expert witness in Docket No. 3094, General Telephone Company of the Southwest; testimony concerning the application for an adjustment in rates for intrastate telephone service.

Expert witness in Docket 2672, Southwestern Bell Telephone Company; testimony concerning telephone answering service rates proposed by Southwestern Bell.

Expert witness in Docket No. 5640, Texas Utilities Electric Company; testimony pertaining to rate of return and the inclusion of CWIP in rate base.

Expert witness in Docket No. 9300, Texas Utilities Electric Company; testimony concerning cost of capital, rate of return, revenue requirement, and "pure prudent investment rule" issues.

Expert Witness in Docket Nos. PUC 14980 and SOAH 473-95-1708, Office of Public Utility Counsel; testimony addressing various competitive market issues.

Expert witness in PUC Docket No. 15560, SOAH Docket 493-96-0897, Application of Texas-New Mexico Power Company for Approval of its Community Choice Transition Plan; testimony on behalf of the Texas Office of Public Utility Counsel concerning economic issues relating to TNP's application for approval of its "Community Choice Transition Plan", November, 1996.

Report to the Office of Public Utility Counsel on the Criteria for the Sale of Generation Assets by ERCOT Generation-Owning Utilities; Criteria for Electric Generation Divestiture in ERCOT, October, 1998.

Expert witness in PUC Docket No. 25395, SOAH Docket No. 473-02-3457, Application of Central Power and Light for a Declaratory Order; testimony on behalf of Citgo Refining and Chemicals, L.P., responding to issues specified in the Commission's Preliminary Order of March 27, 2003, May 30, 2003.

Before the Texas Railroad Commission -

Expert witness for the City of San Antonio in Docket No. GUD-500, Lo-Vaca Gas Gathering Company; analysis of the economic impact upon purchased gas costs of certain extraordinary transactions.

Before the Texas Railroad Commission -Gas Services Division

Expert witness in Gas Utilities Docket No. 8664; Aligned Cities; testimony examining rate issues and related economic matters with an emphasis on corporate reorganization.

Before the Texas State Board of Insurance -

Expert witness in the Matter of Workers Compensation and Employer Liability Insurance Rates 1986; testimony concerning loss development, expense trending, investment income and other matters pertaining to the establishment of appropriate rate levels for workers compensation insurance in Texas.

Expert witness in the Matter of Private Passenger Automobile Insurance Rates (1986); affidavit concerning the appropriate underwriting margin for automobile liability and physical damage insurance rates in Texas.

Expert witness in Docket Nos. 1675 and 1678 concerning workers compensation insurance rates in the State of Texas; 1989.

Before the Public Service Commission of Utah -

Expert witness in Case No. 76-049-01, Mountain States Telephone & Telegraph Company; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Expert witness in Case No. 82-049-08, Mountain States Telephone & Telegraph Company; testimony concerning cost of service allocations between service categories and rate of return requirements and capital structure.

Expert witness in Case No. 83-049-05, Mountain States Telephone & Telegraph Company; testimony concerning the need for interim rate relief.

Expert witness in Case No. 84-049-01, Mountain States Telephone & Telegraph Company; testimony concerning post-divestiture cost estimates.

Expert witness in Case No. 84-035-02, Utah Power & Light Company; testimony addresses UP&L's application to form a wholly-owned subsidiary to carry out unregulated business enterprises.

Before the Vermont Public Service Board -

Expert witness in Docket 4299, Central Vermont Power Company; testimony concerning condemnation value and antitrust issues pertaining to the establishment of a municipal electric system in Springfield, Vermont.

Before the Virginia Corporation Commission -

Expert witness in PUE Case No. 790012; testimony concerning rate structure design, analysis of cost structure, revenue responsibilities, time-of-use rates, and customer responses.

Expert witness in Case No. PUE860031, Commonwealth Gas Services, Inc.; testimony concerning cost allocation, revenue requirements and rate design for Commonwealth Gas.

Expert witness in Case No. Ins. 860156; testimony concerning the appropriate underwriting margin for workers compensation insurers in the State of Virginia.

Expert witness in Case No. INS 870235; testimony concerning earnings rate and underwriting return for establishing workers' compensation rates in Virginia.

Expert testimony in Case No. INS 880340; testimony concerning earnings rate and underwriting return for establishing workers' compensation insurance rates in Virginia.

Expert witness in Case No. INS 890253, The Virginia Insurance Reciprocal; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting change that should be implemented in establishing rates for lawyers professional liability insurance in Virginia; 1989.

Report on behalf of the Virginia Trial Lawyers Association, in Case No. INS870060, concerning whether lawyers' professional liability insurance is available in Virginia at reasonable prices and whether competition is an adequate regulator of rates; 1987.

Expert witness in Case No. PUE880053, Northern Virginia Gas; testimony concerning rate for interruptible transportation service proposed by NVNG; 1988.

Expert witness on behalf of the Attorney General in Case No. INS890313, St. Paul Fire & Marine Insurance Company and St. Paul Mercury Insurance Company; testimony concerning required return, profit and contingency factor, expense level, loss ratio and resulting change for establishing St. Paul's rates for physicians and surgeons medical malpractice liability insurance in Virginia; 1989.

Expert witness on behalf of the Attorney General in Case No. INS890416; concerning the identification of "troubled lines" of property/casualty insurance in the State of Virginia; 1989.

Expert witness on behalf of the Attorney General in Case No. INS 900256; concerning the determination of competition as an effective regulator of rates.

Expert witness on behalf of the Attorney General in Case No. INS 910224; testimony concerning rate of return that should be allowed in establishing workers compensation rates.

Expert witness on behalf of the Attorney General in Case No. INS 920241; testimony concerning competition as an effective regulator of rates pursuant to Virginia Code 38.2-1905.1.E.

Before the Virginia District Court (Eastern District) -

Expert witness of Civil Action No. 90-488-A, The Progressive Corporation v. Integon P & C Corporation; testimony concerning issues of competition and profitability in non-standard automobile insurance lines in Virginia.

The Virginia Trial Lawyers Association -

Report to the Virginia Trial Lawyers Association, *Report on Medical Malpractice Insurance in the Commonwealth of Virginia*, July 2003.

Prepared for the Virgin Islands Director of Banking and Insurance -

A Life and Health Insurance Examination and a Property and Casualty Examination for prospective insurance agents, along with a Training Manual for Insurance Agents, Brokers and Adjusters. (October, 1991)

Before the Washington State Utilities and Transportation Commission -

Expert witness in Case No. U-79-66, Pacific Northwest Bell Telephone Company; testimony concerning rate of return, cost of capital, and rate design.

Expert witness in Case No. U-82-19, Pacific Northwest Bell Telephone Company; testimony concerning rate of return and cost allocation issues.

Expert witness in Docket No. TO-011472, Olympic Pipe Line Company; testimony concerning cost of capital and rate of return, May 2002.

Expert witness for the Commission Staff in Docket Nos. UG-040640 and UE-040641 (consolidated) Puget Sound Energy, Inc.; testimony regarding cost of capital and rate of return, September 2004.

Before the Superior Court of Washington for Clark County -

Affidavit in No. 91 2 01840 9 in response to Plaintiff's Motion for Partial Summary Judgment concerning methods used to value utility property.

Before the West Virginia Public Service Commission -

Expert witness in PSC Case Nos. 8500, 8750, and 8879; Chesapeake & Potomac Telephone Company of West Virginia; testimony concerning service and equipment costs, tariff structures and competition in the telecommunications industry.

Before the West Virginia Insurance Commissioner -

Expert witness in the matter of Medical Malpractice Insurance Rates in the State of West Virginia, September, 1986; testimony concerning the appropriate underwriting margin and need for rate increases for medical malpractice underwriters.

Before the Public Service Commission of Wisconsin -

Expert witness in File Number 6720-TR-10, Wisconsin Telephone Company; testimony concerning service and equipment costs, tariff structure and competition in the telecommunications industry.

Expert witness in I-AC-15, WPSC Internal Wiring Proceeding; testimony concerning pricing standards for the sale of inside wiring.

Expert witness in Docket No. 6720-TR-34B, Wisconsin Telephone Company; testimony concerning Optional Local Measured Service.

Expert witness in Docket No. 6630-UR-100, Wisconsin Electric Power Company; testimony concerning the capital structure and fair rate of return for Wisconsin Electric Power.

Expert witness in Docket No. 6680-UM-100, merger of WPL Holdings, Inc. and Wisconsin Power & Light Company and all related transactions; testimony filed on behalf of The Wisconsin Intervenors relating to market power and merger induced efficiencies, evergreen contracts and merger remedies, May 1997.

**Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.**

Schedule JW-1a

Rate of Return Summary

Capital Structure as of December 31, 2011

(\$000)

Non-Constant DCF

	Amount (\$)	% of Total	% Cost	Weighted Cost %
Long Term Debt	\$4,062,325	47.93%	5.46%	2.62%
Preferred Stock	\$0	0.00%	0.00%	0.00%
Company Equity	<u>\$4,413,669</u>	<u>52.07%</u>	7.94% - 8.96%	<u>4.14% - 4.66%</u>
Total Capital	\$8,475,994	100.00%		6.75% - 7.28%

**Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.**

**Equity Issuance Cost Adjustment
December 31, 2011**

Schedule JW-1.1a

Non-Constant DCF

(1) Retained Earnings ¹	\$ 2,580,395,020
(2) Total Common Equity ¹	\$ 4,413,669,464
(3) Ratio of (1) to (2)	0.58464
(4) Generic Issuance Cost, f	3.50%
(5) External Equity Ratio, w [1.0 - (3)]	0.41536
(6) Net Adjustment Factor, $(w/(1 - f)) + (1 - w)$	1.01506
(7) Low End Equity Cost [8.32% x (6)]	7.94%
(8) High End Equity Cost [8.32% x (6)]	8.96%

Source:

¹ 2011 FERC FORM 1

**Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.**

Schedule JW-1b

Rate of Return Summary

Capital Structure as of December 31, 2011
(\$000)

Constant DCF

	Amount (\$)	% of Total	% Cost	Weighted Cost %
Long Term Debt	\$4,062,325	47.93%	5.46%	2.62%
Preferred Stock	\$0	0.00%	0.00%	0.00%
Company Equity	<u>\$4,413,669</u>	<u>52.07%</u>	7.25% - 8.26%	<u>3.77% - 4.30%</u>
Total Capital	\$8,475,994	100.00%		6.39% - 6.92%

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

Equity Issuance Cost Adjustment
December 31, 2011

Schedule JW-1.1b

Constant DCF

(1) Retained Earnings ¹	\$ 2,580,395,020
(2) Total Common Equity ¹	\$ 4,413,669,464
(3) Ratio of (1) to (2)	0.58464
(4) Generic Issuance Cost, f	3.50%
(5) External Equity Ratio, w [1.0 - (3)]	0.41536
(6) Net Adjustment Factor, (w/(1 - f)) + (1 - w)	1.01506
(7) Low End Equity Cost [8.32% x (6)]	7.25%
(8) High End Equity Cost [8.32% x (6)]	8.26%

Source:

¹ 2011 FERC FORM 1

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 1 of 6

<u>Date</u>	<u>Close 10 Yr Yld (%)</u>	<u>Close 30 Yr Yld (%)</u>
4/26/2011	3.32	4.40
4/27/2011	3.37	4.46
4/28/2011	3.31	4.42
4/29/2011	3.30	4.41
5/2/2011	3.29	4.39
5/3/2011	3.26	4.36
5/4/2011	3.22	4.33
5/5/2011	3.17	4.28
5/6/2011	3.16	4.30
5/9/2011	3.14	4.30
5/10/2011	3.19	4.33
5/11/2011	3.16	4.30
5/12/2011	3.23	4.35
5/13/2011	3.19	4.33
5/16/2011	3.15	4.28
5/17/2011	3.12	4.23
5/18/2011	3.17	4.29
5/19/2011	3.17	4.30
5/20/2011	3.15	4.30
5/23/2011	3.13	4.27
5/24/2011	3.12	4.26
5/25/2011	3.13	4.28
5/26/2011	3.06	4.22
5/27/2011	3.06	4.24
5/31/2011	3.05	4.22
6/1/2011	2.97	4.15
6/2/2011	3.03	4.25
6/3/2011	3.00	4.23
6/6/2011	3.00	4.26
6/7/2011	3.01	4.26
6/8/2011	2.96	4.21
6/9/2011	3.00	4.22
6/10/2011	2.97	4.18
6/13/2011	2.99	4.20
6/14/2011	3.10	4.30
6/15/2011	2.97	4.20
6/16/2011	2.91	4.16
6/17/2011	2.94	4.20
6/20/2011	2.96	4.20
6/21/2011	2.98	4.22
6/22/2011	2.99	4.22
6/23/2011	2.91	4.16
6/24/2011	2.87	4.17
6/27/2011	2.93	4.28
6/28/2011	3.05	4.33
6/29/2011	3.11	4.37
6/30/2011	3.16	4.38

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 2 of 6

<u>Date</u>	<u>Close 10 Yr Yld (%)</u>	<u>Close 30 Yr Yld (%)</u>
7/1/2011	3.20	4.40
7/5/2011	3.14	4.39
7/6/2011	3.10	4.35
7/7/2011	3.15	4.37
7/8/2011	3.02	4.28
7/11/2011	2.92	4.20
7/12/2011	2.91	4.19
7/13/2011	2.89	4.18
7/14/2011	2.94	4.24
7/15/2011	2.91	4.25
7/18/2011	2.91	4.29
7/19/2011	2.89	4.20
7/20/2011	2.93	4.26
7/21/2011	3.01	4.32
7/22/2011	2.96	4.26
7/25/2011	3.00	4.32
7/26/2011	2.95	4.28
7/27/2011	2.98	4.28
7/28/2011	2.95	4.26
7/29/2011	2.81	4.13
8/1/2011	2.74	4.07
8/2/2011	2.62	3.92
8/3/2011	2.60	3.87
8/4/2011	2.46	3.72
8/5/2011	2.56	3.82
8/8/2011	2.34	3.66
8/9/2011	2.18	3.57
8/10/2011	2.14	3.54
8/11/2011	2.34	3.79
8/12/2011	2.24	3.70
8/15/2011	2.29	3.75
8/16/2011	2.21	3.65
8/17/2011	2.16	3.57
8/18/2011	2.08	3.44
8/19/2011	2.07	3.39
8/22/2011	2.09	3.40
8/23/2011	2.14	3.48
8/24/2011	2.26	3.61
8/25/2011	2.22	3.59
8/26/2011	2.19	3.53
8/29/2011	2.27	3.62
8/30/2011	2.18	3.51
8/31/2011	2.22	3.59
9/1/2011	2.15	3.51
9/2/2011	2.00	3.31
9/6/2011	1.98	3.26
9/7/2011	2.04	3.35

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 3 of 6

<u>Date</u>	<u>Close 10 Yr Yld (%)</u>	<u>Close 30 Yr Yld (%)</u>
9/8/2011	1.99	3.31
9/9/2011	1.91	3.25
9/12/2011	1.93	3.24
9/13/2011	1.99	3.32
9/14/2011	2.01	3.31
9/15/2011	2.09	3.35
9/16/2011	2.08	3.34
9/19/2011	1.94	3.19
9/20/2011	1.95	3.21
9/21/2011	1.88	3.04
9/22/2011	1.72	2.79
9/23/2011	1.81	2.87
9/26/2011	1.90	3.00
9/27/2011	2.02	3.12
9/28/2011	2.00	3.09
9/29/2011	1.96	3.00
9/30/2011	1.92	2.92
10/3/2011	1.78	2.76
10/4/2011	1.78	2.76
10/5/2011	1.90	2.88
10/6/2011	1.99	2.95
10/7/2011	2.07	3.02
10/10/2011	2.08	3.02
10/11/2011	2.16	3.11
10/12/2011	2.23	3.21
10/13/2011	2.17	3.14
10/14/2011	2.23	3.21
10/17/2011	2.15	3.14
10/18/2011	2.15	3.16
10/19/2011	2.16	3.17
10/20/2011	2.18	3.20
10/21/2011	2.20	3.25
10/24/2011	2.23	3.28
10/25/2011	2.13	3.14
10/26/2011	2.20	3.22
10/27/2011	2.39	3.45
10/28/2011	2.31	3.35
10/31/2011	2.17	3.20
11/1/2011	2.00	3.01
11/2/2011	2.01	3.04
11/3/2011	2.07	3.12
11/4/2011	2.05	3.10
11/7/2011	1.99	3.04
11/8/2011	2.07	3.12
11/9/2011	1.96	3.02
11/10/2011	2.06	3.11
11/11/2011	2.06	3.11

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 4 of 6

<u>Date</u>	<u>Close 10 Yr Yld (%)</u>	<u>Close 30 Yr Yld (%)</u>
11/14/2011	2.04	3.09
11/15/2011	2.06	3.10
11/16/2011	2.02	3.06
11/17/2011	1.96	2.97
11/18/2011	2.01	3.00
11/21/2011	1.96	2.94
11/22/2011	1.94	2.91
11/23/2011	1.88	2.82
11/25/2011	1.97	2.92
11/28/2011	1.96	2.91
11/29/2011	2.00	2.96
11/30/2011	2.07	3.06
12/1/2011	2.12	3.13
12/2/2011	2.04	3.04
12/5/2011	2.05	3.04
12/6/2011	2.09	3.11
12/7/2011	2.02	3.04
12/8/2011	1.97	3.00
12/9/2011	2.05	3.10
12/12/2011	2.01	3.05
12/13/2011	1.96	3.00
12/14/2011	1.90	2.90
12/15/2011	1.91	2.93
12/16/2011	1.85	2.86
12/19/2011	1.81	2.80
12/20/2011	1.92	2.93
12/21/2011	1.97	3.00
12/22/2011	1.95	2.98
12/23/2011	2.03	3.06
12/27/2011	2.01	3.04
12/28/2011	1.91	2.90
12/29/2011	1.90	2.91
12/30/2011	1.87	2.89
1/3/2012	1.96	2.99
1/4/2012	2.00	3.04
1/5/2012	1.99	3.06
1/6/2012	1.96	3.02
1/9/2012	1.96	3.03
1/10/2012	1.97	3.03
1/11/2012	1.90	2.96
1/12/2012	1.93	2.98
1/13/2012	1.85	2.90
1/17/2012	1.85	2.89
1/18/2012	1.90	2.95
1/19/2012	1.97	3.04
1/20/2012	2.03	3.10
1/23/2012	2.07	3.15

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 5 of 6

<u>Date</u>	<u>Close 10 Yr Yld (%)</u>	<u>Close 30 Yr Yld (%)</u>
1/24/2012	2.06	3.16
1/25/2012	2.01	3.15
1/26/2012	1.93	3.09
1/27/2012	1.90	3.06
1/30/2012	1.84	2.98
1/31/2012	1.80	2.93
2/1/2012	1.85	3.02
2/2/2012	1.83	3.01
2/3/2012	1.95	3.15
2/6/2012	1.90	3.09
2/7/2012	1.97	3.14
2/8/2012	1.98	3.14
2/9/2012	2.05	3.19
2/10/2012	1.97	3.12
2/13/2012	1.99	3.14
2/14/2012	1.92	3.07
2/15/2012	1.93	3.09
2/16/2012	1.99	3.15
2/17/2012	2.01	3.16
2/21/2012	2.05	3.19
2/22/2012	2.01	3.15
2/23/2012	1.98	3.12
2/24/2012	1.98	3.10
2/27/2012	1.92	3.04
2/28/2012	1.93	3.06
2/29/2012	1.98	3.09
3/1/2012	2.04	3.16
3/2/2012	1.99	3.11
3/5/2012	2.01	3.14
3/6/2012	1.94	3.08
3/7/2012	1.97	3.12
3/8/2012	2.01	3.17
3/9/2012	2.04	3.19
3/12/2012	2.03	3.17
3/13/2012	2.11	3.25
3/14/2012	2.27	3.41
3/15/2012	2.28	3.41
3/16/2012	2.30	3.41
3/19/2012	2.38	3.48
3/20/2012	2.37	3.46
3/21/2012	2.29	3.38
3/22/2012	2.28	3.36
3/23/2012	2.24	3.31
3/26/2012	2.24	3.33
3/27/2012	2.19	3.30
3/28/2012	2.20	3.30
3/29/2012	2.16	3.27

CAMP Cost of Equity Estimate

Schedule JW-1.3

Page 6 of 6

Date	Close 10 Yr Yld (%)	Close 30 Yr Yld (%)
3/30/2012	2.22	3.35
4/2/2012	2.19	3.34
4/3/2012	2.28	3.41
4/4/2012	2.24	3.38
4/5/2012	2.17	3.32
4/9/2012	2.04	3.18
4/10/2012	1.99	3.14
4/11/2012	2.03	3.18
4/12/2012	2.05	3.21
4/13/2012	2.00	3.15
4/16/2012	1.97	3.11
4/17/2012	2.01	3.15
4/18/2012	1.98	3.13
4/19/2012	1.95	3.11
4/20/2012	1.97	3.13
4/23/2012	1.93	3.08
4/24/2012	1.96	3.11

<i>Averages</i>		
Last 64 Days	2.0477	3.1856
Last 127 Days	2.0276	3.1105
Last 190 Days	2.0794	3.2084
Last 252 Days	2.3230	3.4713
	2.1194	3.2440
	2.6817	

	Beta
AEE	0.80
D	0.70
EIX	0.80
PCG	0.55
PPL	0.65
WEC	0.65
XEL	0.65
Average	0.686

CAPM Cost of Equity Estimate : 6.7960

CAPM - risk free return + β * (large company total return - risk free return)

Spread of arithmetic mean total returns between large company stocks
and long term government bonds = 6.00%

Source: Yahoo.com

DCF Cost of Equity Estimate

Schedule JW-1.4
Page 1 of 6

Stock Prices (\$) ¹	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
4/26/2011	27.44	43.93	37.54	44.05	25.82	29.58	23.18
4/27/2011	27.47	44.23	37.96	44.25	26.04	29.79	23.28
4/28/2011	27.79	44.49	38.21	44.30	26.10	30.02	23.35
4/29/2011	27.84	44.58	38.03	44.13	26.10	30.17	23.36
5/2/2011	28.06	44.69	38.01	44.11	26.14	30.14	23.43
5/3/2011	28.08	44.87	38.05	44.15	26.13	30.56	23.47
5/4/2011	27.75	45.15	37.79	43.62	26.22	30.65	23.50
5/5/2011	27.43	44.69	37.55	43.97	26.06	30.38	23.29
5/6/2011	27.63	45.06	38.24	43.83	26.20	30.09	23.33
5/9/2011	27.75	45.14	37.81	43.74	26.03	30.28	23.34
5/10/2011	28.31	45.75	38.62	44.27	26.42	30.58	23.64
5/11/2011	28.06	45.76	38.56	44.08	26.44	30.60	23.50
5/12/2011	28.31	46.24	38.33	44.55	26.67	30.90	23.84
5/13/2011	28.20	46.08	38.30	44.07	26.58	30.75	23.96
5/16/2011	28.41	45.97	38.30	43.66	26.40	30.77	24.02
5/17/2011	28.32	46.41	38.34	43.86	26.82	30.85	24.23
5/18/2011	28.10	46.06	38.05	43.45	26.79	30.82	24.18
5/19/2011	28.22	46.29	37.81	43.18	26.82	30.86	24.24
5/20/2011	28.51	46.36	38.46	42.89	26.91	30.69	24.26
5/23/2011	27.98	46.04	38.27	41.35	26.69	30.38	23.92
5/24/2011	27.99	46.01	37.92	41.15	26.46	30.34	23.84
5/25/2011	28.05	45.78	38.22	40.91	26.40	30.40	23.71
5/26/2011	28.13	45.93	38.12	41.08	26.40	30.29	23.71
5/27/2011	28.20	45.83	38.07	41.28	26.51	30.32	23.60
5/31/2011	28.22	46.30	38.11	41.55	26.82	30.48	23.76
6/1/2011	27.76	45.72	37.87	41.30	26.60	30.23	23.57
6/2/2011	27.82	45.86	37.56	40.96	26.52	30.21	23.49
6/3/2011	27.61	45.75	37.68	40.56	26.42	30.01	23.36
6/6/2011	27.58	45.51	37.29	40.44	26.21	29.81	23.24
6/7/2011	27.67	45.99	37.53	40.28	26.29	30.05	23.28
6/8/2011	27.61	46.27	37.63	40.15	26.14	30.26	23.24
6/9/2011	27.44	46.55	37.80	40.19	26.14	30.08	23.21
6/10/2011	27.30	46.12	37.76	39.79	25.97	29.88	23.08
6/13/2011	27.40	46.41	37.88	39.95	26.15	30.05	23.22
6/14/2011	27.39	46.27	37.88	40.18	26.26	30.17	23.28
6/15/2011	27.01	45.70	37.48	39.71	25.97	29.85	23.15
6/16/2011	27.06	45.85	37.85	40.12	26.21	30.05	23.36
6/17/2011	27.33	46.24	38.00	40.40	26.10	30.42	23.59
6/20/2011	27.71	46.73	38.00	40.56	26.22	30.52	23.62
6/21/2011	27.79	46.80	37.93	40.42	26.45	30.46	23.68
6/22/2011	27.42	46.34	37.77	40.16	26.18	30.23	23.46
6/23/2011	26.96	45.74	37.15	39.74	26.11	29.94	23.21
6/24/2011	27.20	45.84	37.47	40.04	26.10	29.90	23.31
6/27/2011	27.45	46.28	37.67	39.89	26.33	30.18	23.50
6/28/2011	27.50	46.38	37.76	40.08	26.68	30.41	23.66
6/29/2011	27.62	46.67	37.84	40.20	26.87	30.44	23.66
6/30/2011	27.76	46.83	37.83	40.70	26.82	30.56	23.59
7/1/2011	28.12	47.53	37.95	41.31	27.00	31.02	23.93
7/5/2011	27.95	47.16	37.76	40.80	26.87	30.82	23.80
7/6/2011	27.92	47.45	37.88	41.26	26.94	30.78	23.89

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

JWW-1.4

DCF Cost of Equity Estimate

Schedule JW-1.4

Page 2 of 6

	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
7/7/2011	28.06	47.50	37.87	41.18	27.07	30.96	23.92
7/8/2011	27.95	47.18	38.13	41.09	27.00	30.83	23.77
7/11/2011	27.48	46.68	37.53	40.83	26.77	30.42	23.47
7/12/2011	27.79	46.92	37.90	41.19	26.95	30.69	23.59
7/13/2011	27.81	46.84	37.61	41.09	26.86	30.57	23.51
7/14/2011	27.73	46.74	37.54	40.66	26.68	30.35	23.32
7/15/2011	27.73	47.02	37.66	40.84	26.77	30.52	23.32
7/18/2011	27.30	46.57	37.03	40.32	26.54	30.28	23.06
7/19/2011	27.62	47.24	37.15	40.58	26.57	30.58	23.28
7/20/2011	27.70	47.80	37.40	41.06	26.67	30.73	23.53
7/21/2011	28.36	48.51	38.21	41.92	27.01	31.10	23.92
7/22/2011	28.25	48.30	38.30	41.40	26.99	30.94	23.82
7/25/2011	28.80	48.10	38.26	41.60	27.36	30.83	23.79
7/26/2011	28.66	47.83	37.95	41.15	27.47	30.51	23.77
7/27/2011	28.66	47.59	37.93	40.79	27.59	30.48	23.77
7/28/2011	28.25	47.53	37.69	40.71	27.42	30.19	23.54
7/29/2011	27.74	47.01	37.17	40.12	26.89	29.87	23.29
8/1/2011	27.89	47.14	37.04	40.19	27.00	29.87	23.33
8/2/2011	27.27	46.67	36.15	38.96	26.50	29.43	22.85
8/3/2011	27.48	47.21	36.01	39.20	26.59	29.25	22.76
8/4/2011	25.98	46.35	34.22	39.36	25.57	28.40	22.14
8/5/2011	26.59	47.14	34.22	40.63	25.60	28.86	22.55
8/8/2011	25.00	44.57	32.50	38.38	24.41	27.23	21.30
8/9/2011	26.16	45.38	33.80	38.65	25.43	28.06	21.64
8/10/2011	25.45	44.98	33.08	37.97	24.69	28.01	21.18
8/11/2011	26.73	46.60	34.31	38.73	25.26	29.41	22.18
8/12/2011	26.38	46.29	33.96	38.60	25.06	29.23	22.22
8/15/2011	27.29	48.20	35.39	39.48	25.68	30.12	22.85
8/16/2011	27.48	48.21	35.50	39.31	25.99	29.96	22.77
8/17/2011	27.86	48.63	35.62	39.94	26.40	30.30	22.95
8/18/2011	27.43	47.62	35.05	39.99	26.30	29.98	22.70
8/19/2011	27.34	46.56	35.01	39.88	26.31	29.66	22.62
8/22/2011	27.14	46.82	34.25	39.70	26.18	29.74	22.77
8/23/2011	27.80	47.64	34.85	40.26	26.61	30.51	23.35
8/24/2011	28.39	48.59	35.46	40.99	27.07	30.97	23.68
8/25/2011	28.16	47.97	35.23	40.15	26.81	30.31	23.39
8/26/2011	28.11	47.50	35.13	39.79	26.79	30.46	23.31
8/29/2011	28.82	48.00	36.08	40.81	27.45	30.96	23.65
8/30/2011	28.70	47.78	36.02	40.60	27.39	30.95	23.71
8/31/2011	29.13	47.77	36.31	41.01	27.83	31.12	23.94
9/1/2011	28.72	47.62	36.03	40.76	27.68	30.89	23.74
9/2/2011	28.44	47.03	35.33	40.03	27.51	30.50	23.50
9/6/2011	28.26	46.94	34.83	39.33	27.62	30.29	23.34
9/7/2011	28.66	47.24	35.48	40.08	27.62	30.89	23.61
9/8/2011	28.79	47.19	35.22	40.34	27.64	30.74	23.53
9/9/2011	28.22	46.25	34.52	39.37	27.27	29.96	23.07
9/12/2011	28.48	46.53	35.01	39.28	27.30	30.23	23.26
9/13/2011	28.73	46.83	35.24	39.29	27.30	30.51	23.75
9/14/2011	28.81	47.57	35.68	39.58	27.50	30.67	23.99
9/15/2011	29.26	48.48	36.38	40.21	27.77	31.08	24.28
9/16/2011	29.67	48.85	36.87	41.20	28.10	31.20	24.53
9/19/2011	29.69	48.75	36.76	40.87	27.98	31.11	24.45
9/20/2011	30.16	49.59	37.11	41.60	28.56	31.37	24.76

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

JWW-1.4

DCF Cost of Equity Estimate

Schedule JW-1.4

Page 3 of 6

	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
9/21/2011	29.68	48.90	36.45	41.07	28.27	30.82	24.38
9/22/2011	29.01	48.33	35.73	41.15	27.79	30.11	24.03
9/23/2011	29.48	49.00	36.23	41.69	27.80	30.70	24.21
9/26/2011	29.63	49.77	36.97	41.79	28.12	30.65	24.36
9/27/2011	29.61	49.92	36.88	41.95	28.18	30.70	24.35
9/28/2011	29.34	49.42	36.81	41.11	27.99	30.44	24.14
9/29/2011	29.52	50.23	37.67	41.86	28.15	31.05	24.43
9/30/2011	29.03	49.76	37.66	41.40	27.85	30.78	24.21
10/3/2011	28.29	48.85	36.54	40.53	27.09	30.58	23.83
10/4/2011	27.93	48.20	35.74	40.53	26.98	29.87	23.48
10/5/2011	28.12	48.52	35.72	40.51	26.78	30.13	23.67
10/6/2011	28.55	49.01	36.89	42.08	27.25	30.96	24.18
10/7/2011	28.53	49.27	37.16	42.06	27.42	30.97	24.14
10/10/2011	29.28	50.18	38.16	42.32	27.94	31.46	24.45
10/11/2011	29.02	49.57	38.00	41.36	27.85	31.03	24.15
10/12/2011	29.03	49.17	37.25	40.93	27.64	30.97	24.21
10/13/2011	29.19	49.04	37.35	41.37	27.73	31.11	24.21
10/14/2011	29.94	49.49	37.66	41.60	27.83	31.32	24.40
10/17/2011	29.71	49.02	37.33	41.39	27.80	31.14	24.30
10/18/2011	30.01	49.47	38.00	42.10	28.00	31.47	24.60
10/19/2011	29.87	49.95	37.93	41.44	28.11	31.79	24.68
10/20/2011	30.10	50.02	38.11	41.72	28.21	31.84	24.94
10/21/2011	30.98	51.03	38.95	42.09	28.70	32.36	25.20
10/24/2011	31.12	50.38	38.95	41.67	28.46	32.69	25.04
10/25/2011	30.71	49.69	38.93	41.32	28.10	31.94	24.80
10/26/2011	30.60	50.13	39.37	41.41	28.52	31.95	24.99
10/27/2011	31.47	50.98	40.67	42.24	28.69	32.85	25.69
10/28/2011	31.41	50.35	40.10	42.03	28.98	32.30	25.41
10/31/2011	31.09	50.56	39.98	41.99	28.65	31.90	25.35
11/1/2011	30.12	49.40	39.39	40.89	28.31	31.05	24.72
11/2/2011	30.90	50.21	39.41	41.45	28.70	31.80	25.33
11/3/2011	31.16	50.67	40.50	39.99	29.27	32.22	25.69
11/4/2011	31.49	50.53	40.14	39.99	28.95	32.18	25.56
11/7/2011	32.04	51.41	40.39	39.47	29.12	32.35	25.68
11/8/2011	32.52	51.59	40.51	39.67	29.38	32.62	25.83
11/9/2011	32.07	50.26	39.38	39.16	29.05	31.84	25.22
11/10/2011	31.83	50.33	39.85	39.24	29.17	32.28	25.49
11/11/2011	32.18	51.02	40.15	39.48	29.50	32.86	25.80
11/14/2011	31.65	50.70	39.88	39.17	29.13	32.31	25.44
11/15/2011	31.83	50.53	40.00	39.06	29.14	32.62	25.68
11/16/2011	31.40	50.00	39.12	38.08	28.71	32.33	25.33
11/17/2011	31.19	49.83	38.92	37.91	28.49	32.06	25.11
11/18/2011	31.49	50.02	39.00	38.17	28.81	32.35	25.42
11/21/2011	31.15	49.65	38.52	37.43	28.59	31.90	25.16
11/22/2011	31.00	49.04	37.84	36.72	28.37	31.53	24.77
11/23/2011	30.61	48.33	37.19	36.08	27.72	31.23	24.46
11/25/2011	30.73	48.52	37.27	36.42	27.87	31.63	24.71
11/28/2011	31.04	49.11	37.54	37.24	28.37	31.72	24.88
11/29/2011	31.70	49.84	37.62	37.20	28.52	32.07	25.21
11/30/2011	32.98	51.09	38.71	38.02	29.29	32.89	25.78
12/1/2011	32.87	50.82	38.53	37.70	29.05	32.97	25.68
12/2/2011	31.67	50.04	37.87	37.22	28.96	32.68	25.34
12/5/2011	31.41	49.98	38.68	37.78	29.06	32.76	25.49

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

JWW-1.4

DCF Cost of Equity Estimate

Schedule JW-1.4

Page 4 of 6

	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
12/6/2011	31.91	49.82	38.97	37.79	29.05	32.80	25.59
12/7/2011	31.72	49.98	38.70	37.55	28.89	32.66	25.56
12/8/2011	31.36	49.62	37.91	37.10	28.53	32.21	25.16
12/9/2011	31.92	50.25	38.45	37.43	28.70	32.78	25.48
12/12/2011	31.49	49.79	38.37	37.29	28.47	32.42	25.41
12/13/2011	31.78	49.96	38.65	37.72	28.48	32.64	25.46
12/14/2011	31.27	49.66	38.22	37.79	28.27	32.20	25.37
12/15/2011	31.59	50.26	38.60	38.72	28.64	32.97	25.91
12/16/2011	31.31	50.13	38.70	39.13	28.37	33.15	25.90
12/19/2011	31.10	49.84	38.38	38.60	28.00	33.41	25.81
12/20/2011	31.69	51.58	39.34	39.51	28.34	33.85	26.59
12/21/2011	32.19	52.25	40.05	40.19	29.04	34.25	26.91
12/22/2011	32.31	52.18	40.08	40.08	29.16	34.21	26.73
12/23/2011	32.42	52.40	40.56	40.22	29.27	34.46	26.93
12/27/2011	32.81	52.88	40.76	40.83	29.42	34.87	27.35
12/28/2011	32.65	52.53	40.83	40.42	29.31	34.72	27.19
12/29/2011	33.17	52.98	41.21	41.02	29.37	34.98	27.44
12/30/2011	32.71	52.53	41.09	40.79	29.05	34.66	27.37
1/3/2012	32.35	51.96	41.05	40.40	28.45	34.25	27.07
1/4/2012	32.34	51.53	40.71	40.42	28.36	34.15	26.89
1/5/2012	32.32	51.42	40.23	40.62	28.40	34.34	27.01
1/6/2012	31.69	50.90	40.09	40.63	28.16	34.19	26.93
1/9/2012	31.68	50.83	40.07	40.62	28.41	34.20	26.95
1/10/2012	31.89	50.76	40.19	40.70	28.38	34.21	27.17
1/11/2012	31.94	50.64	40.33	41.22	27.85	33.93	26.82
1/12/2012	31.93	50.41	40.24	41.47	27.64	34.04	26.43
1/13/2012	31.92	50.08	40.27	40.85	27.73	33.91	26.48
1/17/2012	31.97	50.28	40.18	41.31	27.57	34.00	26.44
1/18/2012	31.71	49.91	40.14	41.01	27.73	33.84	26.55
1/19/2012	31.16	49.78	39.68	40.77	27.45	33.81	26.33
1/20/2012	31.24	50.05	40.19	39.94	27.15	33.81	26.34
1/23/2012	31.43	49.96	40.01	40.22	27.47	33.95	26.34
1/24/2012	30.87	49.79	39.82	39.74	27.29	33.63	26.26
1/25/2012	31.52	50.58	40.60	40.66	27.87	34.26	26.81
1/26/2012	31.52	50.33	41.07	40.83	27.84	34.48	27.14
1/27/2012	31.21	49.05	40.75	40.41	27.45	33.95	26.71
1/30/2012	31.08	48.83	40.41	39.98	27.24	33.71	26.29
1/31/2012	31.24	49.52	40.73	40.24	27.44	33.71	26.34
2/1/2012	31.30	49.90	40.62	40.73	27.50	33.90	26.34
2/2/2012	31.18	49.99	40.37	40.64	27.21	34.11	26.09
2/3/2012	31.37	49.86	40.77	40.98	27.19	34.36	26.26
2/6/2012	31.14	49.75	40.62	40.72	27.14	34.37	26.15
2/7/2012	31.35	49.90	40.78	40.84	27.37	34.63	26.30
2/8/2012	31.25	49.68	40.70	41.30	27.43	34.32	26.32
2/9/2012	31.14	49.35	40.78	40.84	27.36	34.41	26.31
2/10/2012	30.92	49.40	40.78	40.81	28.09	34.26	26.24
2/13/2012	30.81	49.42	40.35	40.90	27.56	34.28	26.18
2/14/2012	30.80	49.71	40.49	41.11	27.50	34.32	26.14
2/15/2012	30.70	49.56	40.28	41.02	27.59	34.31	25.96
2/16/2012	31.22	49.90	41.01	41.86	28.01	34.42	26.09
2/17/2012	31.50	50.05	40.85	41.90	28.11	34.38	26.10
2/21/2012	31.33	49.62	41.37	41.86	27.92	34.22	26.17
2/22/2012	31.44	49.95	41.41	41.47	28.19	34.29	26.22

DCF Cost of Equity Estimate

Schedule JW-1.4

Page 5 of 6

	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
2/23/2012	31.72	50.42	41.59	41.23	28.25	34.39	26.22
2/24/2012	31.84	50.79	41.91	41.32	28.48	34.37	26.22
2/27/2012	31.57	50.88	41.98	41.17	28.36	34.27	26.27
2/28/2012	31.53	50.72	41.67	41.24	28.31	34.16	26.15
2/29/2012	31.67	50.47	41.56	41.25	28.19	34.08	26.23
3/1/2012	31.74	50.41	42.46	41.51	28.21	34.17	26.13
3/2/2012	31.57	50.52	42.49	41.64	28.10	34.22	26.06
3/5/2012	31.84	50.82	42.78	41.51	28.20	34.18	26.18
3/6/2012	31.61	50.52	42.70	41.41	27.89	34.10	25.99
3/7/2012	31.48	50.49	42.66	41.56	27.95	34.42	26.09
3/8/2012	31.51	50.60	42.37	41.83	28.08	34.66	26.25
3/9/2012	31.52	50.76	42.50	42.39	28.26	34.85	26.43
3/12/2012	32.19	51.33	43.28	42.81	28.51	35.18	26.77
3/13/2012	32.20	51.36	43.48	43.06	28.38	35.27	26.86
3/14/2012	31.63	50.55	42.81	42.64	28.10	34.73	26.36
3/15/2012	31.64	50.48	42.68	42.80	28.18	34.60	26.13
3/16/2012	31.46	50.32	42.32	42.84	28.31	34.53	26.14
3/19/2012	31.24	50.26	41.92	42.70	28.09	34.37	25.97
3/20/2012	31.61	50.64	42.02	43.24	27.81	34.45	26.31
3/21/2012	31.72	50.46	42.28	43.17	27.71	34.44	26.27
3/22/2012	31.77	50.42	42.37	42.88	27.67	34.49	26.26
3/23/2012	31.77	50.28	42.35	42.94	27.67	34.50	26.18
3/26/2012	32.18	50.71	42.48	43.15	27.74	35.06	26.37
3/27/2012	32.47	51.01	42.97	43.27	28.16	35.23	26.47
3/28/2012	31.99	50.69	42.42	42.86	27.92	34.92	26.29
3/29/2012	32.14	50.78	42.50	42.99	28.01	35.04	26.38
3/30/2012	32.58	51.21	42.51	43.41	28.26	35.18	26.47
4/2/2012	32.50	51.50	42.79	43.49	28.20	35.39	26.58
4/3/2012	32.41	51.54	42.65	43.19	28.17	35.37	26.76
4/4/2012	32.32	51.59	42.82	43.28	27.89	35.17	26.63
4/5/2012	32.09	51.38	42.79	42.88	27.63	35.05	26.48
4/9/2012	31.92	50.90	42.77	42.55	27.66	35.06	26.39
4/10/2012	31.39	50.20	41.94	42.04	27.06	34.59	26.06
4/11/2012	31.47	50.17	41.66	42.19	27.07	34.69	26.00
4/12/2012	31.56	50.30	41.71	42.65	27.10	34.99	26.15
4/13/2012	31.47	50.28	41.57	42.26	26.77	34.85	26.02
4/16/2012	31.64	50.74	42.44	43.01	26.93	35.34	26.39
4/17/2012	31.86	50.99	42.95	43.08	27.09	35.58	26.51
4/18/2012	31.49	50.62	42.86	42.90	26.90	35.56	26.37
4/19/2012	31.29	50.54	42.52	42.79	26.90	35.43	26.31
4/20/2012	31.68	51.02	42.89	43.20	27.15	35.88	26.76
4/23/2012	31.43	50.85	42.38	43.09	27.06	35.63	26.50
4/24/2012	31.93	50.81	43.10	43.48	27.27	35.84	26.71
AVERAGE (\$)	29.8761	48.7985	38.8420	40.9130	27.4896	32.1179	24.8438
QUARTERLY DIV. (\$) ²	0.4000	0.5280	0.3250	0.4550	0.3600	0.3000	0.26
	0.4000	0.4930	0.3250	0.4550	0.3500	0.2600	0.26
	0.3850	0.4930	0.3200	0.4550	0.3500	0.2600	0.26
	0.3850	0.4930	0.3200	0.4550	0.3500	0.2600	0.26
ANNUAL DIVIDEND (\$)	1.5700	2.0070	1.2900	1.8200	1.4100	1.0800	1.0400

DCF Cost of Equity Estimate

Schedule JW-1.4
Page 6 of 6

	<u>AEE</u>	<u>D</u>	<u>EIX</u>	<u>PCG</u>	<u>PPL</u>	<u>WEC</u>	<u>XEL</u>
YIELD	5.26%	4.11%	3.32%	4.45%	5.13%	3.36%	4.19%
REUTERS ³	-5.20%	5.07%	1.93%	3.39%	2.87%	6.96%	5.04%
MSN ⁴	4.00%	5.50%	5.00%	4.30%	5.00%	6.60%	5.10%
YAHOO ⁵	-3.90%	4.60%	-1.80%	1.03%	4.60%	6.63%	5.24%
DCF GROWTH FACTOR	-1.70%	5.06%	1.71%	2.91%	4.16%	6.73%	5.13%
VALUE LINE ⁶							
'11 EARNINGS (\$)	2.44	2.76	3.35	2.82	2.61	2.18	1.56
'16 EARNINGS (\$)	2.75	4.00	3.50	4.00	2.75	2.75	2.00
	2.42%	7.70%	0.88%	7.24%	1.05%	4.76%	5.09%
VALUE LINE "BOXED"	-0.50%	5.00%	0.50%	5.00%	5.00%	6.50%	5.00%
VALUE LINE	0.96%	6.35%	0.69%	6.12%	3.03%	5.63%	5.05%
DCF GROWTH ESTIMATE	-1.03%	5.38%	1.45%	3.71%	3.87%	6.45%	5.11%
DCF COST OF EQUITY ESTIMATE	8.91%	10.41%	8.47%	10.04%	10.70%	10.08%	10.37%
DCF AVERAGE				9.85%			
CAPM COST OF EQUITY ESTIMATE				6.80%			
COST OF EQUITY ESTIMATE				8.32%			
 <u>Constant DCF</u> ⁷							
DCF COST OF EQUITY ESTIMATE	7.74%	9.49%	5.86%	8.16%	9.00%	9.82%	9.29%
DCF AVERAGE				8.48%			
CAPM COST OF EQUITY ESTIMATE				6.80%			
COST OF EQUITY ESTIMATE				7.64%			

Sources:

¹ finance.yahoo.com

² finance.yahoo.com

³ reuters.com/finace

⁴ money.msn.com

⁵ finance.yahoo.com

⁶ Value Line Investment Guide

⁷ Constant DCF Cost of Equity uses average of only positive growth estimates.

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

AEE Non-Constant DCF Calculation

Schedule JW-1.5

Page 1 of 7

$g = -1.03\%$ $D = \$1.57$	non const $dcf = 8.91\%$ $P = -\$29.88$	const $dcf = 7.74\%$ $g(e) = 6.52\%$
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Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	-1.03%	1.55
2	-1.03%	1.54
3	-1.03%	1.52
4	-1.03%	1.51
5	-1.03%	1.49
6	-0.66%	1.48
7	-0.28%	1.48
8	0.10%	1.48
9	0.48%	1.48
10	0.85%	1.50
11	1.23%	1.52
12	1.61%	1.54
13	1.99%	1.57
14	2.36%	1.61
15	2.74%	1.65
16	3.12%	1.70
17	3.50%	1.76
18	3.88%	1.83
19	4.25%	1.91
20	4.63%	2.00
21	5.01%	2.10
22	5.39%	2.21
23	5.76%	2.34
24	6.14%	2.48
25	6.52%	2.64
26	6.52%	2.82
27	6.52%	3.00
28	6.52%	3.20
29	6.52%	3.40
30	6.52%	3.63

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

D Non-Constant DCF Calculation

Schedule JW-1.5

Page 2 of 7

$g = 5.38\%$ $D = \$2.01$	non const $dcf = 10.41\%$ $P = -\$48.80$	const $dcf = 9.49\%$ $g(e) = 6.52\%$
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Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	5.38%	2.11
2	5.38%	2.23
3	5.38%	2.35
4	5.38%	2.48
5	5.38%	2.61
6	5.44%	2.75
7	5.49%	2.90
8	5.55%	3.06
9	5.61%	3.23
10	5.67%	3.42
11	5.72%	3.61
12	5.78%	3.82
13	5.84%	4.04
14	5.89%	4.28
15	5.95%	4.54
16	6.01%	4.81
17	6.06%	5.10
18	6.12%	5.41
19	6.18%	5.75
20	6.24%	6.11
21	6.29%	6.49
22	6.35%	6.90
23	6.41%	7.35
24	6.46%	7.82
25	6.52%	8.33
26	6.52%	8.87
27	6.52%	9.45
28	6.52%	10.07
29	6.52%	10.73
30	6.52%	11.42

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

EIX Non-Constant DCF Calculation

Schedule JW-1.5

Page 3 of 7

		non const		const	
g =	1.45%	dcf =	8.47%	dcf =	5.86%
D =	\$1.29				
		P =	-\$38.84	g(e) =	6.52%

Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	1.45%	1.31
2	1.45%	1.33
3	1.45%	1.35
4	1.45%	1.37
5	1.45%	1.39
6	1.71%	1.41
7	1.96%	1.44
8	2.21%	1.47
9	2.47%	1.51
10	2.72%	1.55
11	2.97%	1.59
12	3.23%	1.64
13	3.48%	1.70
14	3.73%	1.77
15	3.99%	1.84
16	4.24%	1.91
17	4.49%	2.00
18	4.75%	2.09
19	5.00%	2.20
20	5.25%	2.31
21	5.51%	2.44
22	5.76%	2.58
23	6.01%	2.74
24	6.27%	2.91
25	6.52%	3.10
26	6.52%	3.30
27	6.52%	3.52
28	6.52%	3.75
29	6.52%	3.99
30	6.52%	4.25

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

PCG Non-Constant DCF Calculation

Schedule JW-1.5

Page 4 of 7

$g = 3.71\%$ $D = \$1.82$	non const $dcf = 10.04\%$ $P = -\$40.91$	const $dcf = 8.16\%$ $g(e) = 6.52\%$
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Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	3.71%	1.89
2	3.71%	1.96
3	3.71%	2.03
4	3.71%	2.11
5	3.71%	2.18
6	3.85%	2.27
7	3.99%	2.36
8	4.13%	2.46
9	4.27%	2.56
10	4.41%	2.67
11	4.55%	2.80
12	4.69%	2.93
13	4.83%	3.07
14	4.97%	3.22
15	5.12%	3.39
16	5.26%	3.56
17	5.40%	3.76
18	5.54%	3.96
19	5.68%	4.19
20	5.82%	4.43
21	5.96%	4.70
22	6.10%	4.98
23	6.24%	5.29
24	6.38%	5.63
25	6.52%	6.00
26	6.52%	6.39
27	6.52%	6.81
28	6.52%	7.25
29	6.52%	7.72
30	6.52%	8.23

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

PPL Non-Constant DCF Calculation

Schedule JW-1.5

Page 5 of 7

$g = 3.87\%$ $D = \$1.41$	non const $dcf = 10.70\%$ $P = -\$27.49$	const $dcf = 9.00\%$ $g(e) = 6.52\%$
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Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	3.87%	1.46
2	3.87%	1.52
3	3.87%	1.58
4	3.87%	1.64
5	3.87%	1.71
6	4.01%	1.77
7	4.14%	1.85
8	4.27%	1.93
9	4.40%	2.01
10	4.54%	2.10
11	4.67%	2.20
12	4.80%	2.31
13	4.93%	2.42
14	5.06%	2.54
15	5.20%	2.67
16	5.33%	2.82
17	5.46%	2.97
18	5.59%	3.14
19	5.73%	3.32
20	5.86%	3.51
21	5.99%	3.72
22	6.12%	3.95
23	6.26%	4.19
24	6.39%	4.46
25	6.52%	4.75
26	6.52%	5.06
27	6.52%	5.39
28	6.52%	5.75
29	6.52%	6.12
30	6.52%	6.52

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

**Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.**

WEC Non-Constant DCF Calculation

Schedule JW-1.5

Page 6 of 7

		non const		const	
g =	6.45%		dcf =	10.08%	dcf =
D =	\$1.08				9.82%
			P =	-\$32.12	g(e) =
					6.52%

Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	6.45%	1.15
2	6.45%	1.22
3	6.45%	1.30
4	6.45%	1.39
5	6.45%	1.48
6	6.46%	1.57
7	6.46%	1.67
8	6.46%	1.78
9	6.47%	1.90
10	6.47%	2.02
11	6.47%	2.15
12	6.48%	2.29
13	6.48%	2.44
14	6.48%	2.60
15	6.49%	2.76
16	6.49%	2.94
17	6.49%	3.14
18	6.50%	3.34
19	6.50%	3.56
20	6.50%	3.79
21	6.51%	4.03
22	6.51%	4.30
23	6.51%	4.58
24	6.52%	4.87
25	6.52%	5.19
26	6.52%	5.53
27	6.52%	5.89
28	6.52%	6.28
29	6.52%	6.68
30	6.52%	7.12

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

XEL Non-Constant DCF Calculation

Schedule JW-1.5

Page 7 of 7

$g = 5.11\%$ $D = \$1.04$	non const $dcf = 10.37\%$ $P = -\$24.84$	const $dcf = 9.29\%$ $g(e) = 6.52\%$
------------------------------	--	--

Year	<u>GROWTH RATE</u>	<u>DIVIDEND</u>
1	5.11%	1.09
2	5.11%	1.15
3	5.11%	1.21
4	5.11%	1.27
5	5.11%	1.33
6	5.18%	1.40
7	5.25%	1.48
8	5.32%	1.56
9	5.39%	1.64
10	5.46%	1.73
11	5.53%	1.82
12	5.60%	1.93
13	5.67%	2.04
14	5.74%	2.15
15	5.81%	2.28
16	5.88%	2.41
17	5.95%	2.56
18	6.03%	2.71
19	6.10%	2.87
20	6.17%	3.05
21	6.24%	3.24
22	6.31%	3.45
23	6.38%	3.67
24	6.45%	3.90
25	6.52%	4.16
26	6.52%	4.43
27	6.52%	4.72
28	6.52%	5.03
29	6.52%	5.35
30	6.52%	5.70

This schedule is truncated; the calculation extends to 400 years to ensure the stability of the calculation.

g, D, P are from Schedule JW-1.4
g(e) is from Schedule JW-1.9

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

Growth in U.S. Gross National Product, 1929 to 2011

Schedule JW-1.9

Page 1 of 2

Year	GNP (\$billion)	Change (\$billion)	Growth (%)
1929	104.4		
1930	91.9	-12.5	-11.97%
1931	77	-14.9	-16.21%
1932	59.1	-17.9	-23.25%
1933	56.7	-2.4	-4.06%
1934	66.3	9.6	16.93%
1935	73.6	7.3	11.01%
1936	84	10.4	14.13%
1937	92.2	8.2	9.76%
1938	86.5	-5.7	-6.18%
1939	92.5	6	6.94%
1940	101.7	9.2	9.95%
1941	127.2	25.5	25.07%
1942	162.3	35.1	27.59%
1943	198.9	36.6	22.55%
1944	220.1	21.2	10.66%
1945	223.3	3.2	1.45%
1946	222.9	-0.4	-0.18%
1947	245.2	22.3	10.00%
1948	270.6	25.4	10.36%
1949	268.5	-2.1	-0.78%
1950	295.2	26.7	9.94%
1951	341.2	46	15.58%
1952	360.3	19.1	5.60%
1953	381.2	20.9	5.80%
1954	382.4	1.2	0.31%
1955	417.2	34.8	9.10%
1956	440.2	23	5.51%
1957	464.1	23.9	5.43%
1958	469.8	5.7	1.23%
1959	509.4	39.6	8.43%
1960	529.6	20.2	3.97%
1961	548.3	18.7	3.53%
1962	589.7	41.4	7.55%
1963	622.2	32.5	5.51%
1964	668.6	46.4	7.46%
1965	724.4	55.8	8.35%
1966	792.8	68.4	9.44%
1967	837.8	45	5.68%
1968	915.9	78.1	9.32%
1969	990.5	74.6	8.14%
1970	1044.7	54.2	5.47%
1971	1134.4	89.7	8.59%
1972	1246.4	112	9.87%
1973	1394.9	148.5	11.91%
1974	1515	120.1	8.61%

Ohio Power Company
CASE NO. 11-346-EL-SSO, et al.

Growth in U.S. Gross National Product, 1929 to 2011

Schedule JW-1.9

Page 2 of 2

Year	GNP (\$billion)	Change (\$billion)	Growth (%)
1975	1650.7	135.7	8.96%
1976	1841.4	190.7	11.55%
1977	2050.4	209	11.35%
1978	2315.3	264.9	12.92%
1979	2594.2	278.9	12.05%
1980	2822.3	228.1	8.79%
1981	3159.8	337.5	11.96%
1982	3289.7	129.9	4.11%
1983	3571.7	282	8.57%
1984	3967.2	395.5	11.07%
1985	4244	276.8	6.98%
1986	4477.7	233.7	5.51%
1987	4754	276.3	6.17%
1988	5123.8	369.8	7.78%
1989	5508.1	384.3	7.50%
1990	5835	326.9	5.93%
1991	6022	187	3.20%
1992	6371.4	349.4	5.80%
1993	6698.5	327.1	5.13%
1994	7109.2	410.7	6.13%
1995	7444.3	335.1	4.71%
1996	7870.1	425.8	5.72%
1997	8355.8	485.7	6.17%
1998	8810.8	455	5.45%
1999	9381.3	570.5	6.48%
2000	9989.2	607.9	6.48%
2001	10338.1	348.9	3.49%
2002	10691.4	353.3	3.42%
2003	11210.9	519.5	4.86%
2004	11944.5	733.6	6.54%
2005	12720.1	775.6	6.49%
2006	13449.6	729.5	5.74%
2007	14151.9	702.3	5.22%
2008	14460.7	308.8	2.18%
2009	14091.2	-369.5	-2.56%
2010	14715.9	624.7	4.43%
2011	15339.5	623.6	4.24%
Average			6.52%

Source: National Income and Product Accounts (NIPA) from the U.S. Bureau of Economic Analysis Table 1.7.5. Relation of Gross Domestic Product, Gross National Product, Net National Product, National Income, and Personal Income

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing *Testimony on Behalf of Ormet Primary Aluminum Corporation* of James Burnes Riley, Paul A. Coomes, Whitfield A. Russell, and John W. Wilson, as well as the foregoing supporting documentation was served this 4th day of May, 2012, via e-mail upon the parties with email addresses listed below and to each party listed below via U.S. Mail.

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Summary: Testimony Testimony of James Burns Riley, Paul Coomes, Whitfield A. Russell and Dr. John W. Wilson electronically filed by Ms. Emma F Hand on behalf of Ormet Primary Aluminum Corporation