STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the mater of the Application of	)	
THE DETROIT EDISON COMPANY	)	Case No. U-12359
to recover implementation costs for	)	
the period ended December 31, 1999	)	
_____	)	

TESTIMONY AND EXHIBITS OF FRANCIS A. ROBERTS ON BEHALF OF THE ASSOCIATION OF BUSINESSES ADVOCATING TARIFF EQUITY

Financial Times Energy
3333 Walnut Street
Boulder, Colorado 80301

Dated: October 18, 2000

I.

QUALIFICATIONS

Q. Please state your name, occupation, and business address.

A. My name is Francis A. Roberts. I am a Principal of Financial Times Energy ("FTE"), a provider of global energy industry information, including news, data, consulting services, and unbiased analysis. My business address is 3333 Walnut Street, Boulder, Colorado, 80301. We have offices located in Boulder, Colorado; Arlington, Virginia; Houston, Texas; Knoxville, Tennessee; and London, England.

Q. What is your educational background and work experience?

A. I received a Bachelor of Science degree in Mining Engineering from the Colorado School of Mines in 1977, following a Bachelor of Science degree in Forest Management from Oregon State University in 1973. I am the head of FTE's Coal Consulting Practice and have engineering, marketing, and forecasting experience in both coal and non-coal resource industries.

Prior to joining FTE, I was Manager of Market Research at Zeigler Coal Holding Company and was responsible for the preparation and analysis of local and regional coal price forecasts. I also served as a member of the National Coal Association's Economics Committee. I have held the positions of Coal Group Manager at FTE; Manager of Market Analysis at Zeigler Coal Holding Company; Senior Engineer at BP Coal, Old Ben Coal

Company, and Exxon Minerals Company; and Program Manager at Sohio Shale Oil Company. A copy of my resume is included as Exhibit I - _____ (FAR-1).

Q. Please describe your responsibilities and work at FT Energy.

A. I direct the coal forecasting portion of the FT Energy coal consulting practice, in addition to providing consulting support to active projects. The coal consulting practice is principally involved in conducting strategic or marketing studies of coal markets. Coal practice clients include coal companies, electric utilities, transportation companies, and financial institutions. I am also responsible for creating FT Energy's Annual Outlook for Coal, a syndicated study.

Q. In what areas are you presently consulting?

A. My current professional focus is in evaluating coal markets for coal sold into the United States electric utility industry. This usually involves the forecasting of coal demand and coal prices for one, or many, segments of the electric utility industry.

II.

PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. I have been asked by Mr. Christopher Seiple to prepare a delivered coal price and SO_2 content forecast for purposes of supporting a dispatch analysis and a power plant valuation

analysis. In support of these analyses, delivered spot coal prices, delivered contract coal prices, delivered average coal prices, and average SO_2 content have been forecast by power plant and by year for the East Central Area Reliability Council ("ECAR") region for the period 2001 through 2020.

Q. How is the balance of your testimony organized?

A. The balance of my testimony is organized into three sections. Section III contains a description of the model used to forecast coal prices. Section IV includes my reasons for preparing spot, contract, and average delivered coal forecasts. Section V contains my conclusions.

III.

OVERVIEW OF THE MODEL USED TO DETERMINE COAL PRICES TO THE DETROIT EDISON POWER PLANTS

Q. What is the purpose of the coal model you used in your forecast?

A. The model is designed to produce a least-cost, delivered coal solution for all power plants, recognizing known power plant limitations and supply and delivery constraints. We assume profit-driven companies competing in a deregulated market will have the same philosophy.

Q. How, in general, do you determine the future delivered coal prices for Detroit Edison power plants?

A. The delivered coal prices for The Detroit Edison Company ("Detroit Edison") coal-fired power plants were based on the most recent update of the *Outlook for Power*, a study prepared by FTE annually and sold throughout the energy industry. The model used to calculate coal prices is based on forecast unit level coal generation—an output from the Interregional Electric Market Model ("IREMM") used by FTE. After this IREMM-developed generation forecast is converted into Btus, contract coal requirements are scheduled and spot coal requirements are calculated for each power plant.

These spot power plant coal purchases are met through allocating those spot purchases to specific coal producing regions on the basis of quality and cost considerations. FTE maintains databases of FOB mine prices and transportation costs to various plants. Price data from these databases are escalated and the appropriate regional data are then averaged and final, Btu-adjusted delivered prices are calculated.

Q. What market area did you model in your analysis?

A. The most recent national forecast formed the basis for this analysis. Key input variables were adjusted to reflect the most current data for the ECAR region. I have chosen to report prices for the Detroit Edison plants, which are part of the ECAR region. I have also supplied Mr. Seiple with plant-specific forecasts for all plants in ECAR, using the same methodology.

Q. What coal supply regions are modeled in your analysis?

A. The model recognizes all coal supply regions in the United States and allows for a generic "imported" coal supply region. The supply regions of most importance to Detroit Edison plants are the Northern Powder River Basin, the Southern Powder River Basin, Central Appalachia, and Northern Appalachia.

Q. What data sources did you use in the preparation of your forecast?

A. FTE's COALdat database was used as a source of historical coal quality and shipment information. This database is based in part on the FERC Form 423s filed by utilities. COALdat, and other FTE-maintained databases, include latest estimates of FOB mine prices by coal quality range, within each coal supply region. They also include estimates of transportation and handling charges from supply regions to plants.

Q. Please describe your methodology in more detail.

A. Coal supply possibilities for each power plant are categorized by supply region and by coal type. Coal types are developed by assigning coal into categories representing specific quality ranges of Btu per pound of coal and pounds of SO_2 per million Btus in the coal. For each coal quality range, specific Btu and sulfur contents are assigned, based, in part, on historical averages.

In the absence of actual contract information from Detroit Edison, FTE's COALdat database is used to determine existing contracts and their expirations. This database contains

historical information about coal quality by contract. Using this information, each plant's total IREMM-determined energy demand is divided into spot coal requirements and contract coal obligations.

The model converts these energy requirements into tons of coal by apportioning existing coal supply from specific coal-producing regions to each coal power plant. In this manner, coal shipments into each plant are completely identified.

The model attaches appropriate escalated transportation costs to each FOB mine price and creates weight-averaged, delivered spot prices. When combined with the prices for contract coal, the model produces a weighted average delivered coal price, by year, for each plant.

At the conclusion of modeling, the final results are always compared with historical information to identify for further investigation any radical departure from the recent past.

Q. How were FOB mine price and coal transportation cost escalations handled in your analysis?

A. FOB mine prices are escalated each year through the forecast period after examination of supply and demand by coal quality, with adjustments for inflation and mine productivity. Similarly, rail rate escalations for eastern and western rail movements are developed. Finally, contract coal prices are assumed to escalate at one percent per year through the life of the contract.

All prices shown in the exhibits are shown in nominal cents per million Btus. In Section V (Conclusions), these prices are discussed as constant (year 2000) cents per million Btus, having been deflated at 2.5% per year from the nominal prices.

Q. Did you calculate the average sulfur content of these coal deliveries?

A. Yes, sulfur contents were calculated in exactly the same manner as above; that is, once contract and spot coal shipments were identified and scheduled, then average sulfur deliveries were calculated using the already-identified heat content and sulfur content of each ton of spot or contract coal.

IV.

REASONS FOR FORECAST PREPARATION

Q. Why was a delivered spot coal price forecast developed?

A. Delivered spot coal prices form the basis upon which power plants will be dispatched. Each increment of new power being produced at a power plant will be produced based upon the cost of incremental, or spot, coal delivered to that plant.

Q. Why was a delivered contract coal price forecast developed?

A. Delivered contract coal prices represent power plant purchase obligations. In this analysis, it was assumed each power plant was obligated to purchase, for the life of the contract, coal

in the same amount as that purchased in 1999 under the contract. These contract coal obligations must be added to the spot coal needs in order to develop an overall coal requirement for each power plant.

Q. Why was an average delivered coal price forecast prepared?

A. This weighted average price represents the actual price the power plant is expected to pay for all of its coal requirements. As such, it is an important figure to use in calculating the actual value of the plant.

V.

CONCLUSIONS

Q. Please identify the results of your analysis.

A. My work has resulted in the preparation of five exhibits. Exhibit I - _____ (FAR-2) illustrates the forecast of percent of spot coal Btus expected for each plant by coal supply region and by year. Exhibit I - _____ (FAR-3) is a forecast of spot delivered coal prices by plant. Exhibit I - _____ (FAR-4) is a summary of contract prices by plant and by year. Exhibit I - _____ (FAR-5) contains a weighted average (both contract and spot) delivered coal price forecast by plant and by year. Finally, a forecast of the delivered average pounds of SO2 per million Btu of coal can be found in Exhibit I - _____ (FAR-6).

Q. Please summarize the spot coal delivered price forecast from your analysis.

A. Exhibit I - _____ (FAR-3) provides an annual summary of spot coal delivered prices. In the early years of the forecast, real spot coal prices should range from 103 cents per million Btus to 157 cents per million Btu, depending on the plant being examined. By 2020, these real spot prices will have fallen to between 85 and 123 cents per million Btu. These real price declines average between 0.8% and 1.1% per year, depending on the plant.

Real price declines are the natural consequence of a market in which coal supply is largely unlimited and coal demand is flat to slightly increasing. Coal mines have learned to compete in this market through operational improvements resulting in real productivity gains of 3% to 7% per year. It is expected that these trends will continue throughout the forecast period.

Q. Please summarize the contract coal delivered price forecast from your analysis.

A. Exhibit I - _____(FAR-4) provides an annual summary of contract coal delivered prices. Contract coal is usually price protected through the use of price escalation clauses. At Detroit Edison, all existing contracts expire no later than the end of 2005, and contract price escalation was set at 1% per year, a typical escalation rate for current U.S. coal contracts. The near-term, real contract prices range from 98 cents per million Btu to 159 cents per million Btu, depending on the power plant. Lower delivered prices are generally being supplied from producers in the Powder River Basin, while higher prices are generally sourced from Appalachia. Wide variations in average contract price at each plant are

possible from year to year as one or more contracts expire, leaving higher, or lower, priced contracts in effect. By 2005, real contract prices average 153 cents per million Btu, as only higher priced contracts remain in effect. In some cases, contract expirations were unknown. It was assumed in this analysis that the term of these contracts ended in December, 2002.

Q. Please summarize the average delivered coal price forecast from your analysis.

A. In Exhibit I - _____ (FAR-5) note that the average delivered coal price becomes the spot price when contracts are no longer in effect. As each contract expires, it is assumed that coal will be purchased at the spot prices shown in Exhibit I - _____ (FAR-3). By 2006, no coal is being purchased under contract at Detroit Edison, meaning that the average delivered fuel price between 2006 and 2020 is the spot delivered coal price. Until 2006, however, the average delivered fuel price is different from the delivered spot price.

In some plants the average delivered price (which includes contracted coal deliveries) is lower than the spot price. This is usually a result of the contracted coal being supplied from a less expensive region, while the spot coal is supplied from a more expensive region. The average price of delivered coal into some Detroit Edison plants is less than the spot price in the early years of the forecast for exactly this reason.

Average real delivered coal prices into Detroit Edison plants range from 114 cents per million Btu to 157 cents per million Btu in 2001. By the year 2006, all contracts will have expired and new coal will be purchased at market (spot) prices. By 2020, the average real

delivered coal prices into Detroit Edison plants will range from 90 cents per million Btu to 123 cents per million Btu, depending on the plant. This represents a real price decline of between 1.0% and 1.9% per year. Average delivered coal price declines vary from spot coal price declines, owing to the inclusion of contract coal prices in the average price data.

Q. Does this conclude your testimony?

A. Yes.

Francis A. Roberts

AREAS OF QUALIFICATION

Coal market analysis, domestic coal supply, strategic planning, contract valuation, and energy modeling and forecasting.

EMPLOYMENT HISTORY

- Principal – Coal Practice, FT Energy, Boulder [2000-Present]
- Group Manager, Resource Data International, Boulder, CO [1999-2000]
- Manager, Client Services, Resource Data International, Boulder, CO [1997-1999]
- Senior Account Manager, Resource Data International, Boulder, CO [1996-1997]
- Manager-Market Research, Zeigler Coal Holding Company, Fairview Hts, IL [1994-1996]
- Manager-Market Analysis, Zeigler Coal Holding Company, Fairview Hts, IL [1992-1994]
- Senior Market Analyst, Zeigler Coal Holding Company, Fairview Hts, IL [1990-1992]
- Program Manager, British Petroleum, plc (AFT Group), Cleveland, OH [1989-1990]
- Senior Market Analyst, BP Coal, Cleveland, OH [1988-1989]
- Senior Environmental & Safety Engineer, BP Coal, Cleveland, OH [1987-1988]
- Senior Engineering Specialist, British Petroleum, plc, London, England [1985-1987]
- Program Manager, Sohio Shale Oil Company, Salt Lake City, UT [1984-1985]
- Senior Engineer, Sohio Shale Oil Company, Salt Lake City, UT [1983-1984]
- Senior Engineer, Standard Oil Company of Ohio, Cleveland, OH [1982-1983]
- Senior Planning & Scheduling Engineer, Exxon Minerals Company, Rhinelander, WI [1981-1982]
- Senior Planning & Scheduling Engineer, Exxon Minerals Company, Houston, TX [1980-1981]
- Senior Mining Engineer, Exxon Minerals Company, Douglas, WY [1979-1980]
- Senior Mining Engineer, Gulf Minerals Company, Grants, NM [1979-1979]
- Mining Engineer, Exxon Minerals Company, Douglas, WY [1977-1979]

EDUCATION

- Colorado School of Mines, B.S. Mining Engineering [1977]
- Oregon State University, B.S. Forest Management [1972]

PROFESSIONAL EXPERIENCE

Principal-Coal Practice, FT Energy [2000-present]

- Sole author of a report describing the North Dakota lignite markets used to support the acquisition efforts of a western coal company. (2000)

- Sole author of a report describing the northern PRB sub-bituminous coal markets used to support the acquisition efforts of a western coal company. (2000)

- Project manager and primary author of FT Energy's Annual Outlook for Coal – 2000, an annual report detailing a 20-year coal supply, demand, and price forecast by coal supply region and by demand region. (due 2000)

Group Manager, Resource Data International [1999-2000]
Manager, Client Services, Resource Data International [1997-1999]

- Managed product development, service, and research for a complex database product. Provided technical support, training, and service to over 600 database clients. Provided technical expertise in support of the sales function.

Senior Account Manager, Resource Data International [1996-1997]

- Managed approximately 70 database accounts, including electric utilities, coal companies, railroads, consulting firms, and investment banks. Major duties included accounting and administrative oversight, client support in use of RDI's POWERdat, COALdat , and POWERmap software and database systems, and system data analysis.

Manager-Market Research, Zeigler Coal Holding Company [1994-1996]
Manager-Market Analysis, Zeigler Coal Holding Company [1992-1994]
Senior Market Analyst, Zeigler Coal Holding Company [1990-1992]
Senior Market Analyst, BP Coal [1988-1989]

- Managed the Market Research group for the 5th largest U.S. coal company.

- Prepared annual market assessments for two major U.S. coal producers. (1989-1996)

- Participated in, and performed analysis for, coal contract negotiations and performed research for and analysis of all spot coal solicitations for a major U.S. coal producer.

- Prepared in-depth studies of two major U.S. coal-producing regions: including the Powder River Basin, and the Illinois Basin.

- Conducted strategic analysis of domestic competitors and potential acquisition candidates, including Pyro Mining Company (aka Lodestar), and MK Gold.

Program Manager, British Petroleum, plc (AFT Group) [1989-1990]

- Managed a pilot mining and process program for a placer gold deposit in British Columbia, Canada. Prepared process flowsheets, mass balances, and viability assessments.

Senior Environmental & Safety Engineer, BP Coal [1987-1988]

- Analyzed environmental and safety records for all mines for a large U.S. coal company. Monitored compliance with federal, state, and local regulations.

Senior Engineering Specialist, British Petroleum, plc [1985-1987]

- Prepared mining feasibility and economic evaluations of world-wide mineral and non-mineral ore bodies. Internal consultant to BP Minerals group. Evaluated mining costs for oil shale, tar sand, and tin mines. Evaluated novel mineral processing technologies. Evaluated novel alternative energy extraction methods.

Program Manager, Sohio Shale Oil Company [1984-1985]
Senior Engineer, Sohio Shale Oil Company [1983-1984]
Senior Engineer, Standard Oil Company of Ohio [1982-1983]

- Managed the development of a Utah tar sand deposit from inception through mining feasibility and economic assessment. Conducted orebody assessment program. Evaluated extraction technologies in Canada and the U.S. for suitability to the deposit.
- Provided underground mining expertise in evaluating oil shale deposits in Colorado.
- Performed a functional mining cost analysis for a Colorado oil shale deposit.
- Represented the mining interests of Sohio Shale Oil Company in their partnership in a large scale oil shale test mine in Utah.

Senior Planning & Scheduling Engineer, Exxon Minerals Company [1980-1982]

- Prepared and maintained mine development schedules for a copper mine in Wisconsin and a gold/silver/copper mine in New Mexico.

Senior Mining Engineer, Exxon Minerals Company [1979-1980]
Senior Mining Engineer, Gulf Minerals Company [1979-1979]
Mining Engineer, Exxon Minerals Company [1977-1979]

- Designed, and supervised the construction of, a successfully operated sandfill plant for an underground uranium mine in Wyoming.
- Mine ventilation engineer for an underground uranium mine in Wyoming. Performed fan studies, managed underground air quality, and supervised ventilation construction crew.
- Mine planning engineer for two underground uranium mines (Wyoming and New Mexico).

PRESENTATIONS AND RELATED EXPERIENCE

"Prospectus on Western U.S. Coal Market Demand. Western Coal Council Spring Forum, Denver, CO, May 2000

Work has been quoted in newspapers, including *The Charleston Gazette* and *The Casper Star-Tribune*

"Using Databases To Assist In Coal Price Forecasting". Presentation for the Annual RDI Client Conference, Phoenix, AZ (April, 1997)

PUBLICATIONS

"Is PRB "Super-Growth" Market Expansion Over?" Coal Age, July 2000.

"COALdat Reporter". FTE COALdat Newsletter, April 2000

"COALdat Reporter". FTE COALdat Newsletter, March 2000

"COALdat Reporter". FTE COALdat Newsletter, February 2000

"COALdat Reporter". FTE COALdat Newsletter, January 2000

"COALdat Reporter". FTE COALdat Newsletter, December 1999

"COALdat Reporter". FTE COALdat Newsletter, November 1999s

"Evaluation of Novel Extraction Methods for Alternative Energy Resources". BP Internal Report, 1987 (while on company technical exchange program)

"The Effects of a Fan Shutdown on Radon Concentration in a Positive Pressure Ventilated Mine". US BM (NIOSH) Publication ID Number RI 8738, 1982 (with J.C. Franklin and C. S. Musilin)

FORECAST PERCENT SPOT COAL BY PLANT BY COAL SUPPLY REGION (% OF TOTAL PLANT BTUS)

UTILITY	PLANT	ORIGIN	BTU CAT	Sulf Cat	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Detroit Edison C	Harbor Beach	CAPP	>= 12500	<= 1.2	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
Detroit Edison C	Harbor Beach	CAPP	>= 12500	1.21 - 1.	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Detroit Edison C	Marysville	CAPP	>= 12500	<= 1.2	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Detroit Edison C	Marysville	CAPP	>= 12500	1.21 - 1.	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Detroit Edison C	Monroe (MI)	CAPP	>= 12500	1.71 - 2.	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Detroit Edison C	Monroe (MI)	NEAPP	>= 12750	1.21 - 2.	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Detroit Edison C	Monroe (MI)	SPRB	>= 8600	<= 1.2	41%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Detroit Edison C	River Rouge	CAPP	>= 12500	1.21 - 1.	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%
Detroit Edison C	River Rouge	NEAPP	>= 12750	1.21 - 2.	16%	16%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%
Detroit Edison C	St. Clair	NEAPP	>= 12750	> 2.5	14%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Detroit Edison C	St. Clair	NPRB	>= 8800	<= 1.2	21%	22%	15%	16%	65%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
Detroit Edison C	Trenton Channel	CAPP	>= 12500	1.21 - 1.	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Detroit Edison C	Trenton Channel	NEAPP	>= 12750	1.21 - 2.	45%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%
Detroit Edison C	Trenton Channel	SPRB	>= 8600	<= 1.2	44%	49%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Detroit Edison C	Belle River	NPRB	>= 8800	<= 1.2	17%	15%	13%	13%	56%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Detroit Edison C	Belle River	SPRB	>= 8600	<= 1.2	24%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Detroit Edison C	River Rouge	SPRB	>= 8600	<= 1.2	24%	43%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%	44%

FORECAST SPOT DELIVERED COAL PRICE BY PLANT

CONSTANT CENTS PER MMBTU (YEAR 2000)

Utility	Plant	Plant No.	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Detroit Edison	Harbor Beach	1731	156.85	154.89	153.04	151.07	149.16	147.39	145.27	143.25	141.37	139.42	137.72	135.98	134.02	132.24	130.57	128.91	127.28
Detroit Edison	Marysville	1732	156.74	154.74	152.87	150.89	148.98	147.20	145.07	143.05	141.17	139.20	137.50	135.77	133.80	132.02	130.35	128.70	127.07
Detroit Edison	Monroe	1733	115.19	114.16	113.34	112.37	111.46	110.08	108.36	106.75	105.26	103.72	102.38	101.01	99.43	98.02	96.71	95.42	94.14
Detroit Edison	River Rouge	1740	124.11	120.52	119.77	118.67	117.63	116.19	114.41	112.74	111.20	109.59	108.20	106.79	105.15	103.69	102.32	100.98	99.65
Detroit Edison	St. Clair	1743	103.47	100.27	96.74	95.44	100.83	100.61	99.26	97.97	96.86	95.54	94.64	93.69	92.43	91.39	90.44	89.50	88.58
Detroit Edison	Trenton Channel	1745	118.92	117.69	116.78	115.76	114.82	113.40	111.64	109.98	108.46	106.86	105.49	104.10	102.48	101.04	99.70	98.37	97.07
Detroit Edison	Belle River	6034	107.26	106.38	106.04	105.66	106.53	105.79	104.41	103.15	102.06	100.86	99.93	98.95	97.65	96.58	95.63	94.68	93.74

Utility	Plant	Plant No.	2018	2019	2020
Detroit Edison	Harbor Beach	1731	125.67	124.09	122.52
Detroit Edison	Marysville	1732	125.46	123.87	122.30
Detroit Edison	Monroe	1733	92.88	91.65	90.43
Detroit Edison	River Rouge	1740	98.34	97.05	95.78
Detroit Edison	St. Clair	1743	87.66	86.76	85.87
Detroit Edison	Trenton Channel	1745	95.78	94.52	93.27
Detroit Edison	Belle River	6034	92.81	91.90	90.99

FORECAST CONTRACT DELIVERED PRICE BY PLANT

CONSTANT CENTS PER MMBTU (YEAR 2000)

Utility	Plant	Plant No.	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Detroit Edison	Harbor Beach	1731	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Detroit Edison	Marysville	1732	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Detroit Edison	Monroe	1733	97.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Detroit Edison	River Rouge	1740	108.85	128.17	-	-	-	-	-	-	-	-	-	-	-	-	-
Detroit Edison	St. Clair	1743	158.84	159.94	157.59	155.29	153.02	-	-	-	-	-	-	-	-	-	-
Detroit Edison	Trenton Channel	1745	99.17	99.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Detroit Edison	Belle River	6034	158.80	159.93	157.58	155.28	153.01	-	-	-	-	-	-	-	-	-	-

Utility	Plant	Plant No.	2016	2017	2018	2019	2020
Detroit Edison	Harbor Beach	1731	-	-	-	-	-
Detroit Edison	Marysville	1732	-	-	-	-	-
Detroit Edison	Monroe	1733	-	-	-	-	-
Detroit Edison	River Rouge	1740	-	-	-	-	-
Detroit Edison	St. Clair	1743	-	-	-	-	-
Detroit Edison	Trenton Channel	1745	-	-	-	-	-
Detroit Edison	Belle River	6034	-	-	-	-	-

FORECAST AVERAGE DELIVERED PRICE BY PLANT

CONSTANT CENTS PER MMBTU (YEAR 2000)

Utility	Plant	Plant No.	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Detroit Edison	Harbor Beach	1731	156.85	154.89	153.04	151.07	149.16	147.39	145.27	143.25	141.37	139.42	137.72	135.98	134.02	132.24	130.57
Detroit Edison	Marysville	1732	156.74	154.74	152.87	150.89	148.98	147.20	145.07	143.05	141.17	139.20	137.50	135.77	133.80	132.02	130.35
Detroit Edison	Monroe	1733	113.65	114.16	113.34	112.37	111.46	110.08	108.36	106.75	105.26	103.72	102.38	101.01	99.43	98.02	96.71
Detroit Edison	River Rouge	1740	120.09	121.05	119.77	118.67	117.63	116.19	114.41	112.74	111.20	109.59	108.20	106.79	105.15	103.69	102.32
Detroit Edison	St. Clair	1743	139.28	134.73	136.29	133.93	108.72	100.61	99.26	97.97	96.86	95.54	94.64	93.69	92.43	91.39	90.44
Detroit Edison	Trenton Channel	1745	117.86	117.60	116.78	115.76	114.82	113.40	111.64	109.98	108.46	106.86	105.49	104.10	102.48	101.04	99.70
Detroit Edison	Belle River	6034	137.76	135.33	135.21	133.87	113.03	105.79	104.41	103.15	102.06	100.86	99.93	98.95	97.65	96.58	95.63

Utility	Plant	Plant No.	2016	2017	2018	2019	2020
Detroit Edison	Harbor Beach	1731	128.91	127.28	125.67	124.09	122.52
Detroit Edison	Marysville	1732	128.70	127.07	125.46	123.87	122.30
Detroit Edison	Monroe	1733	95.42	94.14	92.88	91.65	90.43
Detroit Edison	River Rouge	1740	100.98	99.65	98.34	97.05	95.78
Detroit Edison	St. Clair	1743	89.50	88.58	87.66	86.76	85.87
Detroit Edison	Trenton Channel	1745	98.37	97.07	95.78	94.52	93.27
Detroit Edison	Belle River	6034	94.68	93.74	92.81	91.90	90.99

FORECAST DELIVERED COAL LB SO2/MMBTU BY PLANT, CONTRACT AND SPOT COMBINED

Utility	Plant	Plant No.	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Detroit Edison	Harbor Beach	1731	0.65	0.63	0.62	0.62	0.70	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Detroit Edison	Marysville	1732	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
Detroit Edison	Monroe	1733	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Detroit Edison	River Rouge	1740	1.32	1.34	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Detroit Edison	St. Clair	1743	1.38	1.64	1.60	1.60	1.72	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Detroit Edison	Trenton Channel	1745	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53	1.53
Detroit Edison	Belle River	6034	0.68	0.67	0.67	0.67	0.70	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71

Utility	Plant	Plant No.	2017	2018	2019	2020
Detroit Edison	Harbor Beach	1731	0.71	0.71	0.71	0.71
Detroit Edison	Marysville	1732	1.13	1.13	1.13	1.13
Detroit Edison	Monroe	1733	1.48	1.48	1.48	1.48
Detroit Edison	River Rouge	1740	1.33	1.33	1.33	1.33
Detroit Edison	St. Clair	1743	1.74	1.74	1.74	1.74
Detroit Edison	Trenton Channel	1745	1.53	1.53	1.53	1.53
Detroit Edison	Belle River	6034	0.71	0.71	0.71	0.71