

# Zeeland Generating Station

“We continue to show our ability to provide power reliably whenever it’s needed in Michigan.”

“Safety is personal.”

“We take pride in being an active member in the Zeeland community.”

- Zeeland Generating Station Employees

## Safety First

Safety is our top priority — for our employees and our customers. That’s why we’ve made safety an integral part of our vision for all of our generating plants throughout Michigan.

Our employees work safely in the plant to help keep themselves and our communities safe. Here are some key ways we put safety first in everything we do:

- Employees attend regular safety meetings, follow established safety policies and procedures and are provided with and required to wear hard hats, safety glasses, earplugs and other personal protective equipment
- Employees receive regular training on important health, safety and environmental issues that include working in confined spaces and first aid-CPR
- Employees actively participate in stretching and other wellness activities to avoid strains, sprains and other injuries

Employees bring their award-winning safety knowledge and background into numerous volunteer activities in the communities we serve. They volunteer as firefighters, paramedics, auxiliary police, educators, Red Cross helpers, coaches, scouting leaders and more.

## About the Plant

The Zeeland Generating Station is located on a 30-acre site in the city of Zeeland. The first phase of the plant was completed in 2001 and the second phase in 2002. Consumers Energy purchased the facility in 2007, making it the newest addition to the company’s fleet of generating plants.

Zeeland employees and their families contribute to the local economy each year. Contributions are made to schools, recreation centers, libraries, and local nonprofit charities and more. In addition, Consumers Energy pays about \$7.6 million a year in property taxes on the Zeeland Generating Station to local government. Consumers Energy is the largest single taxpayer in the city of Zeeland.

**Location:** In the city of Zeeland

**Employees:** 22

**Safety:** Safety is the top priority for employees. Wellness activities, including stretching, are used to help avoid sprains and strains and help promote overall health and safety of the employees. Safety is personal. Employees believe coming home safely at the end of the day is the best gift they can give their families.

**Plant Site:** A 30-acre site located in an industrial area of the city of Zeeland. [Map](#)

**Electric Generating Capacity:** 930 megawatts, enough to power a community of about 800,000 people.

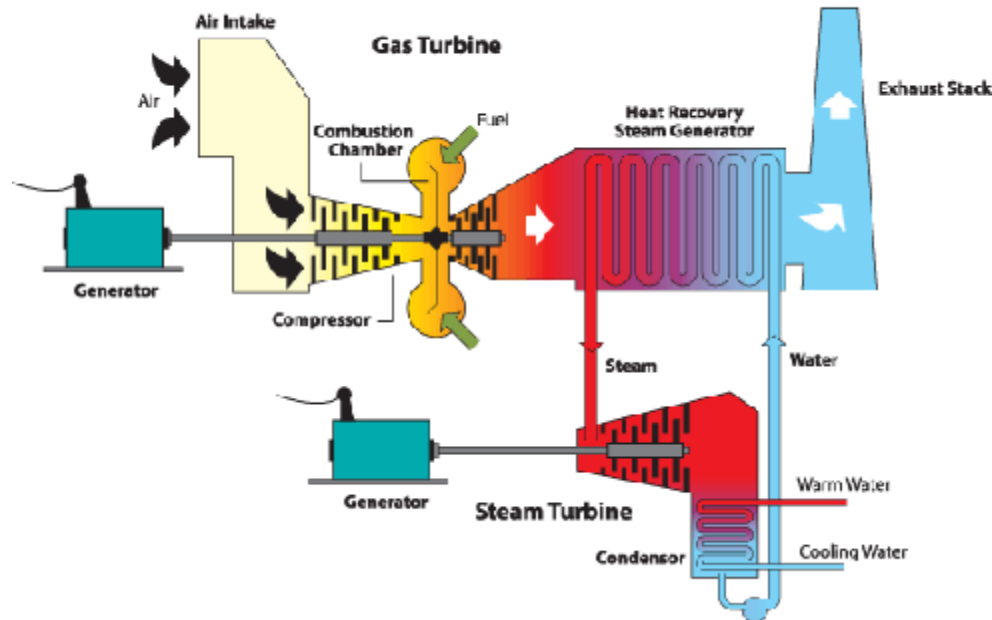


**Fuel:** Natural gas that is transported via 16-inch diameter pipe to the site. The natural gas comes from Louisiana, Oklahoma, and Texas.

**Generating Units:** Two combustion turbines that are capable of producing up to 360 megawatts in 24 minutes. Two combustion turbines with complementary heat recovery steam generators and one steam turbine that can produce up to 575 megawatts.

## How it Works

Natural Gas Combined-cycle Plant Schematic



## Operations

The Zeeland Generating Station began operation in 2001. The site consists of one steam turbine and four combustion turbines, which use natural gas for a fuel source. The site can generate up to 930 megawatts, enough electricity to serve a community of about 800,000 people.

Two of the four combustion turbines are capable of producing up to 360 megawatts in only 24 minutes. These units are considered “peakers,” because they can produce electricity quickly and are used during periods of peak customer demand.

The site also has two combustion turbines with complementary heat recovery steam generators and one steam turbine that can produce up to 575 megawatts. These units are considered “cycling” units, and also are used during periods of high customer demand. They require longer startup times and generally operate for longer periods of time.

The peaking units are simple cycle units, and the cycling units are combined cycle units. The difference is the treatment of the exhaust gas. In a combined cycle unit, hot exhaust gas is used to produce steam through a heat recovery steam generator. In a simple cycle unit, the exhaust gases go directly to the plant’s stack.

Combustion turbines work on the same principle as a jet engine. Large volumes of cool air are brought in to the compressor, which uses rows of blades to compress the air and raise the potential energy. The air then is mixed with fuel in the combustion zone, which provides for high temperature, high-energy airflow. The hot air then passes through turbine blades causing the turbine blades to rotate. In the case of a jet engine, the airflow is used for thrust to move the plane. In a combustion turbine, the airflow is used to turn a turbine that is coupled to a generator to make electricity.

The combustion turbine’s relatively simple technology enables the plant to respond quickly to the daily, weekly and seasonal highs and lows of Michigan’s energy demand. The plant also saves customers money by enabling

Consumers Energy to avoid the expensive spot market when customer demand exceeds the capacity of the company's baseload plants.

## Environmental Commitment

Natural gas combustion and the technology used in two of the combustion turbines allow for significant power production with low nitrogen oxide and sulfur dioxide emissions. Selective catalytic reduction also is utilized on two units to reduce nitrogen oxide levels further.

Employees continually monitor and analyze the air, water and soil at the plant to ensure the plant meets all state and federal requirements.

Zeeland Generating Station employees maintain an active recycling program at the plant to reduce the amount of waste that goes to landfills.

## Community Support

Along with participating in an annual United Way fundraising campaign, plant employees and retirees are active in many organizations in the communities where they live and work.

Zeeland Generating Station employees have adopted a section of Interstate 196 between Zeeland and Hudsonville through the state sponsored Adopt-A-Highway program. The plant also has been a sponsor for the city of Holland Tulip Time Festival since 2002. Schools, recreation centers, libraries, and local charities also are supported by the plant and its employees.

The Consumers Energy Foundation provides Volunteer Investment Program (VIP) grants that may be used to support these worthwhile activities. Since 1992, the foundation has awarded VIP grants totaling \$1.5 million to more than 3,200 organizations on behalf of nearly 4,900 employees and retirees.

To learn more about employee and retiree volunteer efforts, please visit [Consumers Energy Foundation](#).

## Milestones

**2001:** Phase 1 construction is completed. Units 1A and 1B, two combustion turbines in simple cycle operation are placed into service.

**2002:** Phase 2 construction is completed. Units 2A, 2B, and 2C, combustion turbines in combined cycle operation and one steam turbine are placed into service.

**2007:** Consumers Energy purchases the facility to meet the current and future needs of its 1.8 million electric customers.

**2009:** Construction complete on freeze protection enhancement to Units 2A, 2B, and 2C, allowing for improved plant reliability in cold weather.

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### Consumers Coal Fired Power Plant Performance Statistics - 2009

	A	B	C	D	E	F	G	H	I	J
Row	Plant Name	Capacity MW [1]	2009 Generation MWH [2]	Fuel Cost [3] \$	Total Production Expenses [4] \$	Fuel Cost \$/MWH (D/C)	Operating Cost \$/MWH (H - F)	Total Dispatch Cost \$/MWH (E/C)	2009 Capacity Factor ((C/(B*8,760))	2008 Capacity Factor
1	Weadock 7 & 8	312	1,869,429	47,387,978	60,616,880	25.35	7.08	32.43	68%	65%
2	Campbell 3	855	5,892,539	114,917,533	131,565,902	19.50	2.83	22.33	79%	76%
3	Campbell 1 & 2	669	3,303,072	90,188,586	116,111,044	27.30	7.85	35.15	56%	67%
4	Cobb 4 & 5	312	1,733,114	47,168,325	61,812,714	27.22	8.45	35.67	63%	73%
5	Whiting 1 & 2 & 3	345	1,713,405	50,526,162	69,057,881	29.49	10.81	40.30	57%	73%
6	Karn 1 & 2	544	2,743,142	82,571,808	101,826,823	30.10	7.02	37.12	58%	43%

[1] FERC Form 1 Consumers Energy Company 12.31.2009, Pages 402.2, 402.3, 403, & 403.2 Line 5

[2] Ibid, Pages 402.2, 402.3, 403, & 403.2 Line 12

[3] Ibid, Pages 402.2, 402.3, 403, & 403.2 Line 20

[4] Ibid, Pages 402.2, 402.3, 403, & 403.2 Line 34

Name of Respondent Consumers Energy Company		This Report Is: (1) <input checked="" type="checkbox"/> An Original (2) <input type="checkbox"/> A Resubmission		Date of Report (Mo, Da, Yr) 04/16/2010	Year/Period of Report End of 2009/Q4
ELECTRIC ENERGY ACCOUNT					
Report below the information called for concerning the disposition of electric energy generated, purchased, exchanged and wheeled during the year.					
Line No.	Item (a)	MegaWatt Hours (b)	Line No.	Item (a)	MegaWatt Hours (b)
1	SOURCES OF ENERGY		21	DISPOSITION OF ENERGY	
2	Generation (Excluding Station Use):		22	Sales to Ultimate Consumers (Including Interdepartmental Sales)	33,114,933
3	Steam	17,281,094	23	Requirements Sales for Resale (See instruction 4, page 311.)	292,467
4	Nuclear		24	Non-Requirements Sales for Resale (See instruction 4, page 311.)	1,311,852
5	Hydro-Conventional	466,371	25	Energy Furnished Without Charge	
6	Hydro-Pumped Storage	740,323	26	Energy Used by the Company (Electric Dept Only, Excluding Station Use)	13,997
7	Other	553,332	27	Total Energy Losses	2,993,977
8	Less Energy for Pumping	1,053,356	28	TOTAL (Enter Total of Lines 22 Through 27) (MUST EQUAL LINE 20)	37,727,226
9	Net Generation (Enter Total of lines 3 through 8)	17,987,764			
10	Purchases	19,739,462			
11	Power Exchanges:				
12	Received				
13	Delivered				
14	Net Exchanges (Line 12 minus line 13)				
15	Transmission For Other (Wheeling)				
16	Received				
17	Delivered				
18	Net Transmission for Other (Line 16 minus line 17)				
19	Transmission By Others Losses				
20	TOTAL (Enter Total of lines 9, 10, 14, 18 and 19)	37,727,226			

Name of Respondent Consumers Energy Company		This Report Is: (1) <input checked="" type="checkbox"/> An Original (2) <input type="checkbox"/> A Resubmission		Date of Report (Mo, Da, Yr) 04/16/2010	Year/Period of Report End of 2009/Q4	
STEAM-ELECTRIC GENERATING PLANT STATISTICS (Large Plants) (Continued)						
1. Report data for plant in Service only. 2. Large plants are steam plants with installed capacity (name plate rating) of 25,000 Kw or more. Report in this page gas-turbine and internal combustion plants of 10,000 Kw or more, and nuclear plants. 3. Indicate by a footnote any plant leased or operated as a joint facility. 4. If net peak demand for 60 minutes is not available, give data which is available, specifying period. 5. If any employees attend more than one plant, report on line 11 the approximate average number of employees assignable to each plant. 6. If gas is used and purchased on a therm basis report the Btu content of the gas and the quantity of fuel burned converted to Mct. 7. Quantities of fuel burned (Line 38) and average cost per unit of fuel burned (Line 41) must be consistent with charges to expense accounts 501 and 547 (Line 42) as show on Line 20. 8. If more than one fuel is burned in a plant furnish only the composite heat rate for all fuels burned.						
Line No.	Item (a)	Plant Name: Weadock 7 & 8 (b)		Plant Name: Cobb 1 & 3 (c)		
1	Kind of Plant (Internal Comb, Gas Turb, Nuclear)	Steam		Steam		
2	Type of Constr (Conventional, Outdoor, Boiler, etc)	Conventional		Conventional		
3	Year Originally Constructed	1955		1948		
4	Year Last Unit was Installed	1958		1950		
5	Total Installed Cap (Max Gen Name Plate Ratings-MW)	312.50		207.00		
6	Net Peak Demand on Plant - MW (60 minutes)	292		0		
7	Plant Hours Connected to Load	8754		0		
8	Net Continuous Plant Capability (Megawatts)	0		0		
9	When Not Limited by Condenser Water	310		0		
10	When Limited by Condenser Water	310		0		
11	Average Number of Employees	123		0		
12	Net Generation, Exclusive of Plant Use - KWh	1869429000		0		
13	Cost of Plant: Land and Land Rights	144060		0		
14	Structures and Improvements	29174698		593769		
15	Equipment Costs	132550126		24942854		
16	Asset Retirement Costs	0		0		
17	Total Cost	161868884		25536623		
18	Cost per KW of Installed Capacity (line 17/5) Including	517.9804		123.3653		
19	Production Expenses: Oper, Supv, & Engr	1989585		127025		
20	Fuel	47387978		0		
21	Coolants and Water (Nuclear Plants Only)	0		0		
22	Steam Expenses	1718661		389674		
23	Steam From Other Sources	0		0		
24	Steam Transferred (Cr)	0		0		
25	Electric Expenses	1649868		312232		
26	Misc Steam (or Nuclear) Power Expenses	621711		124746		
27	Rents	0		0		
28	Allowances	104790		0		
29	Maintenance Supervision and Engineering	1339915		100280		
30	Maintenance of Structures	1109221		120126		
31	Maintenance of Boiler (or reactor) Plant	3478237		259934		
32	Maintenance of Electric Plant	992064		55338		
33	Maintenance of Misc Steam (or Nuclear) Plant	224850		68255		
34	Total Production Expenses	60616880		1557610		
35	Expenses per Net KWh	0.0324		0.0000		
36	Fuel: Kind (Coal, Gas, Oil, or Nuclear)	Coal	Oil	Gas		
37	Unit (Coal-tons/Oil-barrel/Gas-mcf/Nuclear-indicate)	Tons	Barrels	Mcf		
38	Quantity (Units) of Fuel Burned	934488	3544	121372	0	0
39	Avg Heat Cont - Fuel Burned (btu/indicate if nuclear)	19856561	5770276	1000000	0	0
40	Avg Cost of Fuel/unit, as Delvd f.o.b. during year	48.736	81.119	10.451	0.000	0.000
41	Average Cost of Fuel per Unit Burned	47.609	81.119	10.451	0.000	0.000
42	Average Cost of Fuel Burned per Million BTU	2.398	14.058	10.451	0.000	0.000
43	Average Cost of Fuel Burned per KWh Net Gen	0.024	0.000	0.000	0.000	0.000
44	Average BTU per KWh Net Generation	10002.000	0.000	0.000	0.000	0.000

Name of Respondent Consumers Energy Company		This Report Is: (1) <input checked="" type="checkbox"/> An Original (2) <input type="checkbox"/> A Resubmission		Date of Report (Mo, Da, Yr) 04/16/2010	Year/Period of Report End of 2009/Q4	
STEAM-ELECTRIC GENERATING PLANT STATISTICS (Large Plants) (Continued)						
1. Report data for plant in Service only. 2. Large plants are steam plants with installed capacity (name plate rating) of 25,000 Kw or more. Report in this page gas-turbine and internal combustion plants of 10,000 Kw or more, and nuclear plants. 3. Indicate by a footnote any plant leased or operated as a joint facility. 4. If net peak demand for 60 minutes is not available, give data which is available, specifying period. 5. If any employees attend more than one plant, report on line 11 the approximate average number of employees assignable to each plant. 6. If gas is used and purchased on a term basis report the Btu content or the gas and the quantity of fuel burned converted to Mct. 7. Quantities of fuel burned (Line 38) and average cost per unit of fuel burned (Line 41) must be consistent with charges to expense accounts 501 and 547 (Line 42) as show on Line 20. 8. If more than one fuel is burned in a plant furnish only the composite heat rate for all fuels burned.						
Line No.	Item (a)	Plant Name: Campbell 3 (Total) (b)			Plant Name: Campbell 3 (CECo) (c)	
1	Kind of Plant (Internal Comb, Gas Turb, Nuclear)	Steam			Steam	
2	Type of Constr (Conventional, Outdoor, Boiler, etc)	Conventional			Conventional	
3	Year Originally Constructed	1980			1980	
4	Year Last Unit was Installed	1980			1980	
5	Total Installed Cap (Max Gen Name Plate Ratings-MW)	916.76			855.43	
6	Net Peak Demand on Plant - MW (60 minutes)	842			786	
7	Plant Hours Connected to Load	8204			7655	
8	Net Continuous Plant Capability (Megawatts)	0			0	
9	When Not Limited by Condenser Water	835			779	
10	When Limited by Condenser Water	825			770	
11	Average Number of Employees	146			0	
12	Net Generation, Exclusive of Plant Use - KWh	6334932000			5892538900	
13	Cost of Plant: Land and Land Rights	1748580			1748580	
14	Structures and Improvements	200919118			205292480	
15	Equipment Costs	831246115			841538328	
16	Asset Retirement Costs	0			0	
17	Total Cost	1033913813			1048579388	
18	Cost per KW of Installed Capacity (line 17/5) Including	1127.7911			1225.7922	
19	Production Expenses: Oper, Supv, & Engr	0			2545670	
20	Fuel	0			114817533	
21	Coolants and Water (Nuclear Plants-Only)	0			0	
22	Steam Expenses	0			2064319	
23	Steam From Other Sources	0			0	
24	Steam Transferred (Cr)	0			0	
25	Electric Expenses	0			1377323	
26	Misc Steam (or Nuclear) Power Expenses	0			911730	
27	Rents	0			0	
28	Allowances	0			114289	
29	Maintenance Supervision and Engineering	0			1623036	
30	Maintenance of Structures	0			840244	
31	Maintenance of Boiler (or reactor) Plant	0			5999631	
32	Maintenance of Electric Plant	0			858548	
33	Maintenance of Misc Steam (or Nuclear) Plant	0			313579	
34	Total Production Expenses	0			131565902	
35	Expenses per Net KWh	0.0000			0.0223	
36	Fuel: Kind (Coal, Gas, Oil, or Nuclear)				Coal	Oil
37	Unit (Coal-tons/Oil-barrel/Gas-mcf/Nuclear-indicate)				Tons	Barrels
38	Quantity (Units) of Fuel Burned	0	0	0	3244939	9532
39	Avg Heat Cont - Fuel Burned (btu/indicate if nuclear)	0	0	0	17889157	5838000
40	Avg Cost of Fuel/unit, as Delvd f.o.b. during year	0.000	0.000	0.000	34.362	76.926
41	Average Cost of Fuel per Unit Burned	0.000	0.000	0.000	34.507	76.926
42	Average Cost of Fuel Burned per Million BTU	0.000	0.000	0.000	1.929	13.177
43	Average Cost of Fuel Burned per KWh Net Gen	0.000	0.000	0.000	0.019	0.000
44	Average BTU per KWh Net Generation	0.000	0.000	0.000	9861.000	0.000



Name of Respondent		This Report is:		Date of Report	Year/Period of Report				
Consumers Energy Company		(1) <input checked="" type="checkbox"/> An Original	(2) <input type="checkbox"/> A Resubmission	(Mo, Da, Yr) 04/16/2010	End of 2009/Q4				
<b>STEAM-ELECTRIC GENERATING PLANT STATISTICS (Large Plants)(Continued)</b>									
9. Items under Cost of Plant are based on U. S. of A. Accounts. Production expenses do not include Purchased Power, System Control and Load Dispatching, and Other Expenses Classified as Other Power Supply Expenses. 10. For IC and GT plants, report Operating Expenses, Account Nos. 547 and 549 on Line 25 "Electric Expenses," and Maintenance Account Nos. 553 and 554 on Line 32, "Maintenance of Electric Plant." Indicate plants designed for peak load service. Designate automatically operated plants. 11. For a plant equipped with combinations of fossil fuel steam, nuclear steam, hydro, internal combustion or gas-turbine equipment, report each as a separate plant. However, if a gas-turbine unit functions in a combined cycle operation with a conventional steam unit, include the gas-turbine with the steam plant. 12. If a nuclear power generating plant, briefly explain by footnote (a) accounting method for cost of power generated including any excess costs attributed to research and development; (b) types of cost units used for the various components of fuel cost; and (c) any other informative data concerning plant type fuel used, fuel enrichment type and quantity for the report period and other physical and operating characteristics of plant.									
Plant Name: <i>Whiting</i>		Plant Name: <i>Kam 1 &amp; 2</i>		Plant Name: <i>Kam 3 &amp; 4</i>					
(d)		(e)		(f)					
Steam		Steam		Steam					
Conventional		Conventional		Conventional					
					Line No.				
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					35				
Coal	Oil	Coal	Oil	Gas	Gas	Oil			
Tons	Barrels	Tons	Barrels	Mcf	Mcf	Barrels			
1017083	10311	0	1422816	17983	30092	565213	104982	0	37
18119329	5880000	0	18979733	5796000	1025000	995502	6225204	0	38
50.334	76.852	0.000	57.719	79.330	12.416	11.659	26.853	0.000	39
47.000	76.852	0.000	54.073	79.330	12.416	11.659	46.490	0.000	40
2.594	13.070	0.000	2.849	13.687	12.114	11.712	7.468	0.000	41
0.028	0.000	0.000	0.028	0.000	0.000	0.250	0.185	0.000	42
10791.000	0.000	0.000	9790.000	0.000	0.000	21319.000	24762.000	0.000	43
									44

**Zeeland Generating Station - 575,000 KW Capacity**  
**Combined Cycle Monthly Dispatch 80% CF - 4,000,000 MWH**  
**Column H Bates 408-607 Total Dispatch Cost Only**

Row	A Month	B Bates 406 Gas Price	C 7,000 BTU/KWH Dispatch Fuel Cost \$/MWH	D Variable Cost \$/MWH	E Fuel and Variable Dispatch \$/MWH (C+D)	F Fixed Cost \$/MWH	G Total Dispatch Cost \$/MWH (E+F)	H Bates 408-607 Total Dispatch Cost \$/MWH	I Cost Whiting \$/MWH 40.30	J Cost Karn 1 & 2 \$/MWH 37.12	K Cost Cobb 4 & 5 \$/MWH 35.67	L Cost Campbell 1 & 2 \$/MWH 35.15	M Cost Campbell 3 \$/MWH 22.33	N Cost Weadock 7-8 \$/MWH 32.43
1	January			2.50		2.16			-	-	-	-	-	-
2	February			2.50		2.16		X	-	-	-	-	-	-
3	March			2.50		2.16		X	X	X	X	-	-	-
4	April			2.50		2.16		X	X	X	X	-	-	-
5	May			2.50		2.16		X	X	X	X	-	-	X
6	June			2.50		2.16		X	X	X	X	-	-	-
7	July			2.50		2.16		X	X	X	X	-	-	X
8	August			2.50		2.16		X	X	X	X	-	-	X
9	September			2.50		2.16		X	X	X	X	-	-	X
10	October			2.50		2.16		X	X	X	X	-	-	-
11	November			2.50		2.16		X	X	X	X	-	-	X
12	December			2.50		2.16		-	-	-	-	-	-	-

Note:  
 X equals a month where Zeeland can dispatch against the corresponding coal plant  
 - equals a month when Zeeland can not dispatch against the corresponding coal plant

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Question:

7. a. Why was the Zeeland generating only dispatched at 7.9% capacity factor in 2009?
- b. What were the average hourly nodal locational marginal prices in 2009 at Zeeland node and the nodes of each of the Company's coal fired generating plants?
- c. In what way(s) are the dispatch criteria for the Zeeland generating plant different from the dispatch criteria at the Company's coal fired generating plants?
- d. Why was Zeeland not dispatched at a higher capacity factor than Whiting and Cobb?
- e. Produce any and all documents related to, or referenced or relied on in answering, the above sub-parts, including electronic versions of spreadsheets with formulas intact.

Response:

- a. Generally the Zeeland generating units were dispatched in a manner that reasonably assured that the variable cost of generation was less than the value of the energy produced. In some cases the units were dispatched by Midwest ISO for reliability. In those situations the Company was made whole for variable expenses that were greater than the value of generation produced.
- b. The 2009 annual average hourly nodal locational marginal prices for the Zeeland node and the nodes for each of the Company's coal fired generating plants is provided as Attachment 1. The hourly values that were used to calculate the annual average are provided as Attachments 2 and 3.
- c. Zeeland Units 1A and 1B are combustion turbines with relatively high variable expense and relatively low startup expense. Zeeland Units 2A, 2B, and 2C (or combined Zeeland Unit 2) constitute the combined cycle unit at Zeeland which, when operated have moderately high variable expense and moderately high startup expense. The Company's coal fired generating plants have relatively low variable expense and relatively high startup expense. Accordingly, the coal fired generating units are generally economic to operate and, when economic, are dispatched at (i) the

675R0717


economic minimum level, (ii) the unit maximum capacity level or (iii) the level in between those two points that maintains marginal variable costs at or below expected locational marginal prices. During periods when locational marginal prices drop below marginal variable costs and the unit is operated a variable cost loss, consideration of the difference in dispatch price to locational marginal price compared to the start-up cost determines if the unit should be removed from service for the duration of the loss period.

For both the combustion turbines and the combined cycle unit, the units are dispatched by the Midwest ISO for reliability or economics. When dispatched for reliability the company is made whole for the difference between its variable costs and the applicable LMP. When dispatched for economics the locational marginal price for the minimum run period exceeds the average variable cost of the applicable generating unit at the economic minimum level (or higher level if the incremental dispatch cost is less than the locational marginal price), plus average no load costs allocated to each unit of production, plus the portion of start-up costs associated with each unit allocated to each unit of production over the minimum run period. For the combined cycle unit start-up costs are generally allocated to a minimum run period of 4 hours. For the combustion turbine units start-up costs are generally allocated to a minimum run period of one hour.

Additionally, the generating units can be committed for ancillary services but not actually operated so as to contribute to a higher capacity factor. For instance in 2009 we observed the Zeeland combined cycle unit being committed for reliability but dispatched at a relatively low level. While the unit was committed to provide reserves to the Midwest ISO system, its capacity factor during that period only reflected the partial operation of the unit.

- d. Zeeland Units 1A, 1B and 2; Cobb Units 4 and 5; and Whiting Units 1, 2, and 3 were dispatched such that the value of the energy produced from each generating unit exceeded the variable cost of generation associated with that unit.
- e. The following documents are provided:
  - 1. Table titled "2009 Annual Average Real Time and Day Ahead Locational Marginal Prices for Selected Nodes".
  - 2. Table titled "2009 Hourly Day Ahead Locational Marginal Prices for Selected Nodes".
  - 3. Table titled "2009 Hourly Real Time Locational Marginal Prices for Selected Nodes".

(Note: Attached are numbered documents: 675R0720 through



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David F. Ronk, Jr.  
November 18, 2010

Transaction and Resource Planning Department

CONSUMERS ENERGY COMPANY

**2009 Annual Average Real Time and Day Ahead Locational Marginal Prices for  
Selected Nodes**

Generating Node	Day Ahead (\$/MWh)	Real Time (\$/MWh)
1 Campbell 1	30.16	29.69
2 Campbell 2	30.26	29.79
3 Campbell 3	30.19	29.74
4 Cobb 4	30.99	30.46
5 Cobb 5	30.85	30.24
6 Karn 1	30.71	30.21
7 Karn 2	30.64	30.14
8 Weadock 7	30.87	30.39
9 Weadock 8	30.88	30.37
10 Whiting 1	30.23	29.58
11 Whiting 2	30.23	29.58
12 Whiting 3	30.30	29.64
13 Zeeland CC	30.50	29.91

Zeeland Generating Station - 575,000 KW Capacity  
 Combined Cycle Monthly Dispatch 80% CF - 4,000,000 MWH  
 Column G Total Dispatch Cost Only

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Month	Bates 406 Gas Price	7,000 BTU/KWH Dispatch Fuel Cost \$/MWH	Variable Cost \$/MWH	Fuel and Variable Dispatch \$/MWH (C+D)	Fixed Cost \$/MWH	Total Dispatch Cost \$/MWH (E+F)	Bates 408-607 Total Dispatch Cost \$/MWH	Cost Whiting \$/MWH 40.30	Cost Karn 1 & 2 \$/MWH 37.12	Cost Cobb 4 & 5 \$/MWH 35.67	Cost Campbell 1 & 2 \$/MWH 35.15	Cost Campbell 3 \$/MWH 22.33	Cost Weadock 7-8 \$/MWH 32.43
1	January			2.50		2.16			-	-	-	-	-	-
2	February			2.50		2.16			-	-	-	-	-	-
3	March			2.50		2.16			X	X	-	-	-	-
4	April			2.50		2.16			X	X	-	-	-	-
5	May			2.50		2.16			X	X	X	X	-	-
6	June			2.50		2.16			X	X	X	-	-	-
7	July			2.50		2.16			X	X	X	X	-	-
8	August			2.50		2.16			X	X	X	X	-	X
9	September			2.50		2.16			X	X	X	X	-	X
10	October			2.50		2.16			X	-	-	-	-	-
11	November			2.50		2.16			X	X	X	X	-	-
12	December			2.50		2.16			-	-	-	-	-	-

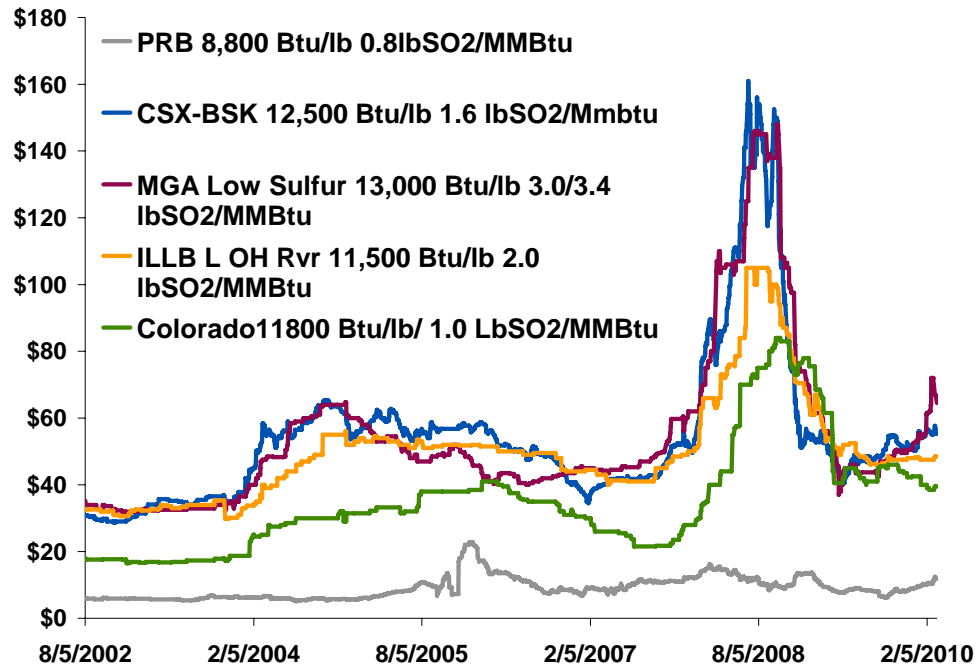
Note:  
 X equals a month where Zeeland can dispatch against the corresponding coal plant  
 - equals a month when Zeeland can not dispatch against the corresponding coal plant

**Zeeland Generating Station - 575,000 KW Capacity**  
**Combined Cycle Monthly Dispatch-80% CF - 4,000,000 MWH**  
**Column C Fuel Cost Dispatch Only**

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Month	Bates 406 Gas Price	7,000 BTU/KWH Dispatch Fuel Cost \$/MWH	Variable Cost \$/MWH	Fuel and Variable Dispatch \$/MWH (C+D)	Fixed Cost \$/MWH	Total Dispatch Cost \$/MWH (E+F)	Bates 408-607 Total Dispatch Cost \$/MWH	Fuel Cost Whiting \$/MWH 29.49	Fuel Cost Karn 1 & 2 \$/MWH 30.10	Fuel Cost Cobb 4 & 5 \$/MWH 27.22	Fuel Cost Campbell 1 & 2 \$/MWH 27.30	Fuel Cost Campbell 3 \$/MWH 19.50	Fuel Cost Weadock 7-8 \$/MWH 25.35
1	January			2.50		2.16			-	-	-	-	-	-
2	February			2.50		2.16			-	-	-	-	-	-
3	March			2.50		2.16			-	-	-	-	-	-
4	April			2.50		2.16			-	-	-	-	-	-
5	May			2.50		2.16			-	X	-	-	-	-
6	June			2.50		2.16			-	-	-	-	-	-
7	July			2.50		2.16			X	X	-	-	-	-
8	August			2.50		2.16			X	X	X	X	-	-
9	September			2.50		2.16			X	X	X	X	-	X
10	October			2.50		2.16			-	-	-	-	-	-
11	November			2.50		2.16			-	X	-	-	-	-
12	December			2.50		2.16			-	-	-	-	-	-

Note:  
 X equals a month where Zeeland can dispatch against the corresponding coal plant  
 - equals a month when Zeeland can not dispatch against the corresponding coal plant

Figure 4-11  
**Over-the-Counter FOB Coal Prices (Nominal \$/Ton)**



SOURCE: Ventyx Velocity Suite and ICAP.

Figure 4-11 depicts how OTC prices reacted more dramatically both to the supply crunch in 2008 as well as the subsequent implosion of demand. OTC prices were driven up by the ability of many mines in CAPP to sell their coal into either the metallurgical or thermal markets. Since the demand for metallurgical coal on the international market was extremely high during the run up of 2008, more coal was pulled out of the CAPP thermal market and drove prices there higher than in other areas. This also had a knock-on effect on prices from all U.S. coal producing regions. As of the first quarter of 2010, U.S. coal demand has recovered somewhat as have coal prices. High international metallurgical coal prices continue to attract high-grade steam coal from the Eastern United States into the metallurgical coal market, as seen in the metallurgical coal export numbers above.

PRB OTC prices responded differently to the 2008 supply shortage, primarily because PRB cannot replace Eastern coal in the short-run. Capital-intensive coal handling and boiler modifications are almost always required to maintain power generation capacity. OTC prices crashed in late 2008 as the banking crisis unfolded and the recession began to take hold and demand dried up in both the domestic and international markets and continued to decline into late 2009. Since the fourth quarter of 2009, PRB prices have also recovered as a relatively cold winter led to increased winter burn.

#### **Delivered Coal Price Trends**

Figure 4-12 depicts average delivered coal prices, as reported by U.S. generators—which include both commodity and transportation costs—climbed 29 percent from 2004 to 2008 in real dollar terms and have increased another 6 percent in 2009 driven by

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UNIT FUEL COST COMPARISON  
 ¢/MMBtu

Line No.	FUEL TYPE	2009 ACTUAL ¢/MMBtu	2009 PSCR PLAN ¢/MMBtu	PERCENTAGE DIFFERENCE ACTUAL PLAN
1				
2				
3				
4				
5	COAL	182.9	219.2	-16.6%
6				
7	No.2 OIL	1504.6	2573.2	-41.5%
8				
9	No.6 OIL	585.5	1191.0	-50.8%
10				
11	NATURAL GAS	597.5	893.1	-33.1%
12				
13	COKE OVEN GAS	187.2	255.0	-26.6%
14				
15	OTHER	1384.1	N/A	N/A
16				
17	TOTAL SYSTEM - FOSSIL	189.3	230.8	-18.0%
18				
19	NUCLEAR	47.5	46.3	2.6%
20				
21	TOTAL SYSTEM	166.8	197.7	-15.6%
22				
23	Note: Unit fuel costs represent total Electric Department fuel expense including industrial steam.			

15675R-MEC-CE-40

Question:

5. Reference Foster direct testimony, page 2 line 18, and Exhibit A-3 in Case No. U-15677-R:
- a. Describe in detail each and every fact, reason, or cause that the Company believes may account for or contribute to Consumers Energy's actual delivered cost for coal being 33% higher than Detroit Edison's in 2009 (specifically, \$2.436/MMBtu compared to \$1.89/MMBtu).
  - b. Include in your description of each fact, reason, or cause the amount of the difference you believe it accounts for.
  - c. Produce any and all documents related to, or referenced or relied on in answering, the sub-part a.

Response:

- (a) The Company believes the following items contribute to the 2009 coal cost differential between Consumers Energy Company ("CE") and Detroit Edison ("DE"):
1. DE had a legacy transportation contract with BNSF Railway which provided DE with rail transportation rates which were significantly below the market.
  2. Third party revenues and equity received from Midwest Energy Resources (a DE subsidiary) contribute a significant reduction in DE coal expense.
  3. The majority of coal consumed by CE during 2009 was burned at plants where only one rail carrier provided delivery, a condition the industry refers to as "captive" shipment. The majority of coal consumed by DE was burned at plants where more than one transportation option exists. Generally speaking, "captive" plants experience higher transportation rates than non-captive plants.
- (b) The Company has no access to DE transportation rates and therefore is unable to specifically quantify the amounts requested.
- (c) Please reference Hoffman direct testimony in Case No. U-16434 pages 9 and 10 and Good direct testimony in Case No. U-15677-R, page 9 lines 14 through 18.

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Steven C Foster

Steven C. Foster  
November 12, 2010

Electric & Gas Supply Department

675R0679

**MPSC Case No.:** U-15677-R  
**Respondent:** J. D. Good  
**Requestor:** MEC  
**Question No.:** MECDE-1.1d/34  
**Page:** 1 of 1

**Question:** Reference J. D. Good testimony, page 6, line 3

(d) Describe in detail how transportation expenses for 2009 compared to transportation expenses in 2006, 2007, and 2008.

**Answer:** The Detroit Edison Company objects to providing any and all documents addressing the causes of the decreases in transportation expense relied on in answering this question for the years 2006, 2007 and 2008 for the reason that the request is overly broad, seeks excessive detail, seeks information that is not relevant and otherwise is not reasonably calculated to lead to the discovery of admissible evidence.

However, without waiving and subject to the above objections the testimony referenced referred to “decreases in transportation expenses”. This was in comparison to the 2009 forecast (see J.D. Good testimony, page 6, lines 1-3 for context), not to previous years, and the reasons for the decreases were discussed in Question MECDE-1.1a/31.

The estimated transportation expenses for 2009 for coal were \$302,863,371 for 20,799,158 tons. The estimated transportation expenses for 2008 for coal were \$343,894,077 for 21,460,094 tons. The estimated transportation expenses for 2007 for coal were \$280,351,805 for 21,764,091 tons. The estimated transportation expenses for 2006 were \$274,955,602 for 21,232,779 tons.

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**Respondent:** J. D. Good/Legal  
**Requestor:** MEC  
**Question No.:** MECDE-1.2c/37  
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**Question:** Reference J. D. Good testimony, page 9, lines 14 – 18

(c) Produce any and all documents referenced or relied on in answering each sub-part of this question.

**Answer:** The Detroit Edison Company objects to providing “the before” coal costs for Detroit Edison, the total third party revenues, and the “after” coal cost for 2006, 2007, and 2008 for the reason that the request is overly broad, seeks excessive detail, seeks information that is not relevant and otherwise is not reasonably calculated to lead to the discovery of admissible evidence.

However, without waiving and subject to the above objections Attachment MECDE-1.2c/37 are the MERC Consolidated Operating Income Statements for 2006, 2007, 2008, and 2009 to see the credit to Detroit Edison fuel expense (net 3<sup>rd</sup> party revenue) and to see total 3<sup>rd</sup> party revenue. Attachment MECDE-1.2c/37 also includes the Power Plant Performance Management Fuel Workbook for 2006, 2007, 2008, and 2009 to see the total “after” Detroit Edison coal expense.

**MPSC Case No.:** U-15677-R  
**Respondent:** J. D. Good/Legal  
**Requestor:** MEC  
**Question No.:** MECDE-1.2b/36  
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**Question:** Reference J. D. Good testimony, page 9, lines 14 – 18

(b) Provide the “before” coal costs for Detroit Edison, the total third party revenues, and the “after” coal costs for 2006, 2007, 2008, and 2009.

**Answer:** The Detroit Edison Company objects to providing “the before” coal costs for Detroit Edison, the total third party revenues, and the “after” coal cost for 2006, 2007, and 2008 for the reason that the request is overly broad, seeks excessive detail, seeks information that is not relevant and otherwise is not reasonably calculated to lead to the discovery of admissible evidence.

However, without waiving and subject to the above objections, the testimony referenced states “third party revenues contributed to a significant reduction in Detroit Edison fuel expense”. The reduction in fuel expense was due to the “net” revenues that were earned from 3<sup>rd</sup> party business (after subtracting expenses) and not the “total” revenues for 3<sup>rd</sup> party business. The net and totals for the years requested are:

2006:  
“Before” coal costs \$650,876,000  
“Net” 3<sup>rd</sup> party revenue \$ 21,326,000  
“After” coal costs \$629,550,000  
“Total” 3<sup>rd</sup> party revenue \$ 45,743,000

2007:  
“Before” coal costs \$701,973,000  
“Net” 3<sup>rd</sup> party revenue \$ 21,640,000  
“After” coal costs \$680,333,000  
“Total” 3<sup>rd</sup> party revenue \$ 48,028,000

2008:  
“Before” coal costs \$801,603,000  
“Net” 3<sup>rd</sup> party revenue \$ 27,415,000  
“After” coal costs \$774,188,000  
“Total” 3<sup>rd</sup> party revenue \$ 55,396,000

2009:  
“Before” coal costs \$783,407,000  
“Net” 3<sup>rd</sup> party revenue \$ 26,634,000  
“After” coal costs \$756,773,000  
“Total” 3<sup>rd</sup> party revenue \$ 51,229,000

**MPSC Case No.:** U-15677-R  
**Respondent:** J. D. Good  
**Requestor:** MEC  
**Question No.:** MECDE-2.12c/62  
**Page:** 1 of 1

**Question:** Reference Exhibit A-3:

- c. Provide a breakdown by amount and origin (Eastern, including by Appalachian region, Western), of the coals burned in each coal-burning unit owned by the Company.

**Answer:** See Attachment MECDE-2.12c/62 for a listing of the amount and origin of the coals burned in the coal-burning units owned by the Company.

**Coal Consumption in Detroit Edison Plants/Units in 2009**

<u>Plant</u>	<u>Unit</u>	<u>Coal Type</u>	<u>Region</u>	<u>Tons Consumed</u>
Harbor Beach	1	Eastern	Central Appalachian	56,721
	1	Western	Powder River Basin	12,507
Belle River	1	Western	Powder River Basin	2,125,209
	2	Western	Powder River Basin	2,214,736
St. Clair	1	Eastern	Northern Appalachian	4,745
	1	Western	Powder River Basin	427,729
	2	Eastern	Northern Appalachian	9,333
	2	Western	Powder River Basin	431,857
	3	Eastern	Northern Appalachian	9,158
	3	Western	Powder River Basin	464,162
	4	Eastern	Northern Appalachian	9,332
	4	Western	Powder River Basin	441,214
	6	Eastern	Northern Appalachian	126,581
	6	Western	Powder River Basin	640,152
River Rouge	7	Eastern	Northern Appalachian	184,410
	7	Western	Powder River Basin	1,003,095
Trenton Channel	2	Eastern	Central Appalachian	247,289
	2	Western	Powder River Basin	612,735
	3	Eastern	Central Appalachian	250,370
	3	Western	Powder River Basin	608,949
Monroe	HP	Eastern	Central Appalachian	249,404
	HP	Eastern	Northern Appalachian	3,703
	HP	Western	Powder River Basin	317,143
	9	Eastern	Central Appalachian	486,676
	9	Eastern	Northern Appalachian	7,226
	9	Western	Powder River Basin	948,306
Monroe	1-4	Eastern	Central Appalachian	3,003,436
	1-4	Western	Powder River Basin	6,258,306
	1	Combined Eastern & Western		2,162,395
	2	Combined Eastern & Western		2,360,876
3	Combined Eastern & Western		2,250,822	
4	Combined Eastern & Western		2,487,653	

Note: HP consists of boilers 16,17,18, and 19

Note: Data is not available for the tons by type for individual units at Monroe