Michigan

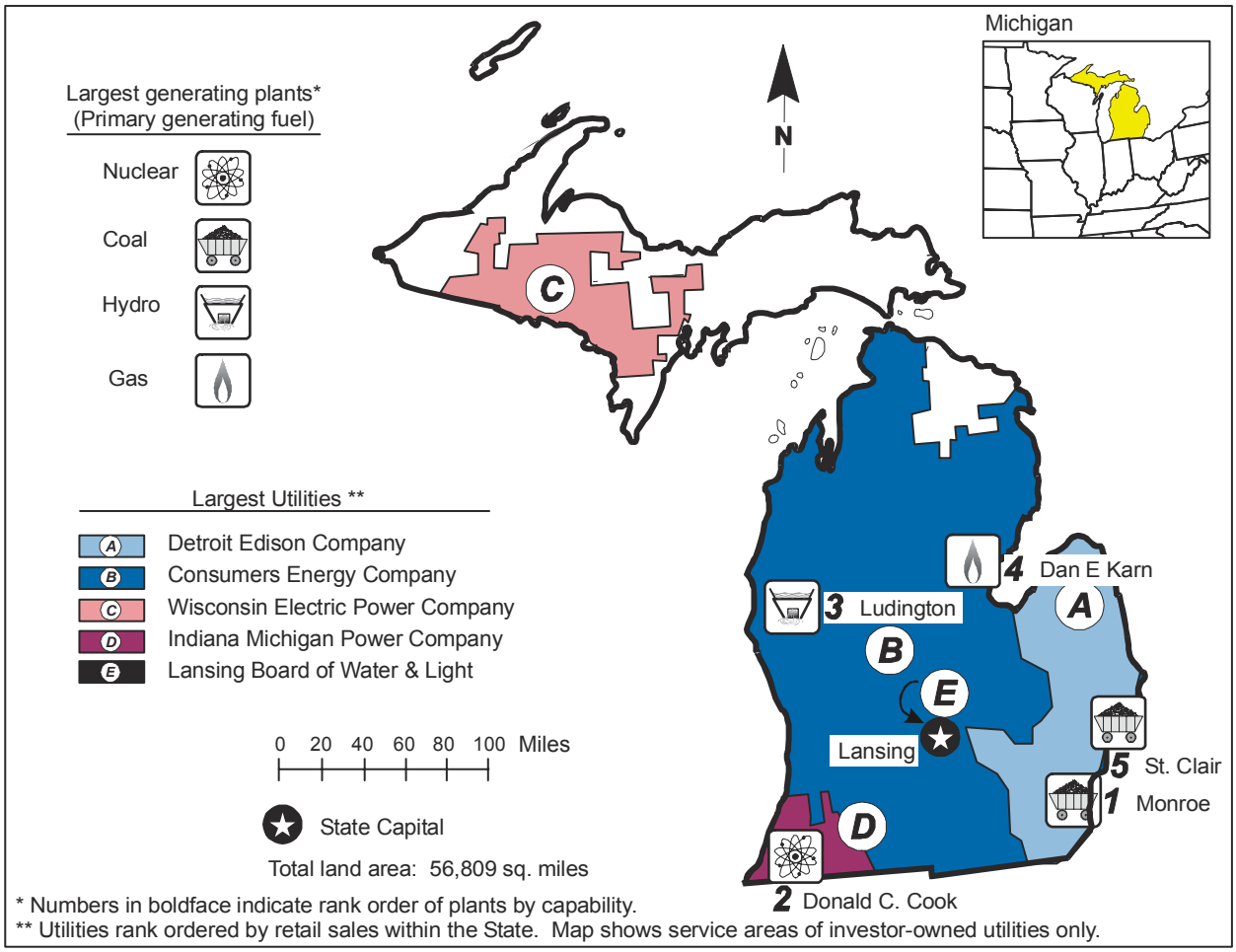
Michigan
Largest generating plants*
(Primary generating fuel)
Nuclear
Coal
Hydro
Gas
N
C
Largest Utilities **
A Detroit Edison Company
B Consumers Energy Company
C Wisconsin Electric Power Company
D Indiana Michigan Power Company
E Lansing Board of Water & Light
0 20 40 60 80 100 Miles
State Capital
Total land area: 56,809 sq. miles
4 Dan E Karn
3 Ludington
A
B
E
Lansing
5 St. Clair
1 Monroe
D
2 Donald C. Cook
* Numbers in boldface indicate rank order of plants by capability.
** Utilities rank ordered by retail sales within the State. Map shows service areas of investor-owned utilities only.

Table 1. 1999 Summary Statistics

Item	Value	U.S. Rank
NERC Region(s)		ECAR/MAPP/MAIN
Primary Energy Source		Coal
Net Summer Capability (megawatts)	25,461	9
Utility	22,374	8
Nonutility	3,087	12
Net Generation (megawatthours)	103,350,379	13
Utility	87,874,695	15
Nonutility	15,475,684	9
Emissions (thousand short tons)		
Sulfur Dioxide	401	12
Nitrogen Oxide	302	8
Carbon Dioxide	83,764	9
Sulfur Dioxide/sq. mile	7	17
Nitrogen Oxide/sq. mile	5	13
Carbon Dioxide/sq. mile	1,474	17
Electricity Consumption (MWh) (excludes line losses)	107,010,499	10
Utility Retail Electricity Sales (megawatthours)	103,479,677	9
Unregulated Retail Electricity Sales (megawatthours)	501,329	9
Nonutility Retail Sales and Direct Use (megawatthours)	3,029,493	15
Utility Average Retail Price (cents/kWh)	7.14	15

Table 2. Ten Largest Plants by Generating Capability, 1999

Plant	Primary Energy Source(s)	Operating Company	Net Summer Capability (MW)
1. Monroe	Petroleum, Coal	Detroit Edison Co	3,014
2. Donald C Cook	Petroleum, Coal	Indiana Michigan Power Co	2,060
3. Ludington	Hydro	Consumers Energy Co	1,872
4. Dan E Karn	Gas, Petroleum, Coal	Consumers Energy Co	1,791
5. St Clair	Petroleum, Gas, Coal	Detroit Edison Co	1,681
6. Midland Cogeneration	Gas	State St Bank Trust Co	1,666
7. Belle River	Petroleum, Gas, Coal	Detroit Edison Co	1,490
8. J H Campbell	Petroleum, Coal	Consumers Energy Co	1,412
9. Fermi	Petroleum, Nuclear	Detroit Edison Co	1,152
10. Greenwood	Petroleum, Gas	Detroit Edison Co	1,001

Table 3. Five Largest Utilities by Retail Sales within the State, 1999
(Megawatthours)

Utility	Total	Residential	Commercial	Industrial	Other
A. Detroit Edison Company	49,822,240	14,064,096	19,546,640	15,863,779	347,725
B. Consumers Energy Company	35,754,796	11,447,338	10,748,734	13,339,546	219,178
C. Wisconsin Electric Power Co	2,923,501	154,276	137,695	2,629,321	2,209
D. Indiana Michigan Power Co	2,879,769	1,099,219	697,170	1,071,567	11,813
E. Lansing Board of Water & Light	2,307,666	562,630	1,067,140	639,448	38,448
Total	93,687,972	27,327,559	32,197,379	33,543,661	619,373
Percentage of Utility Sales	91	89	92	91	65

Table 4. Electric Power Industry Generating Capability by Primary Energy Source, 1990, 1994, and 1999
(Megawatts)

Plant Type	1990	1994	1999	Average Annual Rate of Growth (Percent)	Percentage Share 1990	Percentage Share 1994	Percentage Share 1999
Total Utility	22,315	22,413	22,374	0.0	88.7	89.0	87.9
Coal	11,931	11,928	11,573	-0.3	47.4	47.3	45.5
Petroleum	3,460	3,235	2,634	-3.0	13.8	12.8	10.3
Gas	713	1,082	2,131	12.9	2.8	4.3	8.4
Nuclear	4,007	3,967	3,921	-0.2	15.9	15.7	15.4
Hydroelectric	2,203	2,201	2,115	-0.5	8.8	8.7	8.3
Other	0	0	1	0.0	0.0	0.0	0.0
Total Nonutility	2,847	2,780	3,087	0.9	11.3	11.0	12.1
Coal	221	628	356	5.4	0.9	2.5	1.4
Petroleum	4	2	7	7.8	0.0	0.0	0.0
Gas	2,145	1,706	2,201	0.3	8.5	6.8	8.6
Petroleum/Gas Combined	143	28	80	-6.2	0.6	0.1	0.3
Hydroelectric	W	W	27	W	W	W	0.1
Other	W	W	416	W	W	W	1.6
Total Industry	25,162	25,193	25,461	0.1	100.0	100.0	100.0
Coal	12,152	12,556	11,929	-0.2	48.3	49.8	46.9
Petroleum	3,464	3,238	2,641	-3.0	13.8	12.9	10.4
Gas	2,858	2,788	4,332	4.7	11.4	11.1	17.0
Petroleum/Gas Combined	143	28	80	-6.2	0.6	0.1	0.3
Nuclear	4,007	3,967	3,921	-0.2	15.9	15.7	15.4
Hydroelectric	W	W	2,141	W	W	W	8.4
Other	307	388	417	3.5	1.2	1.5	1.6

Figure 1. Industry Generating Capability by Primary Energy Source, 1999

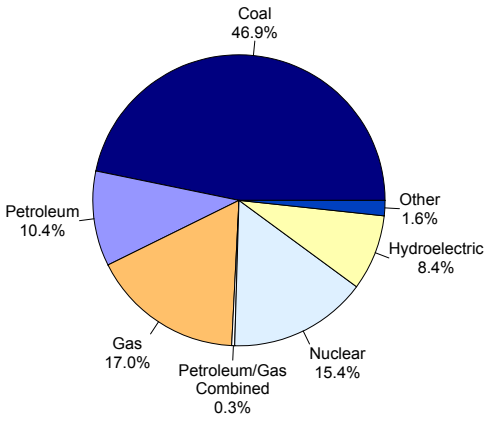

Figure 2. Industry Generation by Energy Source, 1999

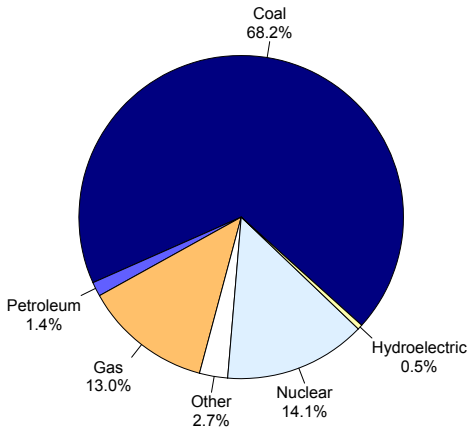

Table 5. Electric Power Industry Generation of Electricity by Energy Source, 1990, 1994, and 1999
(Megawatthours)

Fuel	1990	1994	1999	Average Annual Rate of Change (Percent)	Percentage Share 1990	Percentage Share 1994	Percentage Share 1999
Total Utility	89,058,681	83,720,636	87,874,695	-0.1	87.1	85.1	85.0
Coal	65,295,742	67,538,611	69,118,017	0.6	63.9	68.6	66.9
Petroleum	689,461	655,860	1,282,696	7.1	0.7	0.7	1.2
Gas	665,142	656,757	2,448,449	15.6	0.7	0.7	2.4
Nuclear	21,610,500	14,144,281	14,590,711	-4.3	21.1	14.4	14.1
Hydroelectric	797,836	725,127	434,822	-6.5	0.8	0.7	0.4
Total Nonutility	13,183,848	14,669,921	15,475,684	1.8	12.9	14.9	15.0
Coal	W	W	1,383,306	W	W	W	1.3
Petroleum	178,451	188,501	204,095	1.5	0.2	0.2	0.2
Gas	9,371,276	9,799,739	10,963,368	1.8	9.2	10.0	10.6
Hydroelectric	150,452	142,293	91,037	-5.4	0.1	0.1	0.1
Other	W	W	2,833,877	W	W	W	2.7
Total Industry	102,242,529	98,390,557	103,350,379	0.1	100.0	100.0	100.0
Coal	W	W	70,501,323	W	W	W	68.2
Petroleum	867,912	844,361	1,486,791	6.2	0.8	0.9	1.4
Gas	10,036,418	10,456,496	13,411,817	3.3	9.8	10.6	13.0
Nuclear	21,610,500	14,144,281	14,590,711	-4.3	21.1	14.4	14.1
Hydroelectric	948,288	867,420	525,859	-6.3	0.9	0.9	0.5
Other	W	W	2,833,877	W	W	W	2.7

Table 6. Utility Delivered Fuel Costs and Quality for Coal, Petroleum, and Gas, 1990, 1994, and 1999

Fuel	1990	1994	1999	Average Annual Rate of Change (Percent)
Coal (cents per million Btu) (1999 dollars)	193.8	164.4	130.6	-4.3
Average heat value (Btu per pound)	11131	10925	10487	-0.7
Average sulfur Content (percent)	0.7	0.7	0.6	-1.4
Petroleum (cents per million Btu) (1999 dollars)	388.2	322.7	289.2	-3.2
Average heat value (Btu per gallon)	146014	146577	149118	0.2
Average sulfur Content (percent)	0.8	0.8	1.0	1.5
Gas (cents per million Btu) (1999 dollars)	255.2	262.2	252.3	-0.1
Average heat value (Btu per cubic foot)	224	403	608	11.8

Table 7. Electric Power Industry Emissions Estimates by Fuel, 1990, 1994, and 1999
(Thousand Short Tons)

Emission Type	1990	1994	1999	Average Annual Rate of Change (Percent)
Sulfur Dioxide				
Coal	365	393	395	0.9
Petroleum	3	4	6	7.1
Other	0	0	0	0.0
Total	368	397	401	0.9
Nitrogen Oxide				
Coal	283	298	280	-0.1
Petroleum	1	1	3	11.0
Gas	4	11	15	15.8
Other	0	3	5	0.0
Total	288	313	303	0.5
Carbon Dioxide				
Coal	66,616	73,111	73,524	1.1
Petroleum	752	933	1,640	9.0
Gas	710	5,766	7,771	30.5
Other	0	688	829	0.0
Total	68,078	80,498	83,764	2.3

Figure 3. Industry Generation of Electricity by Primary Energy Source, 1990-1999

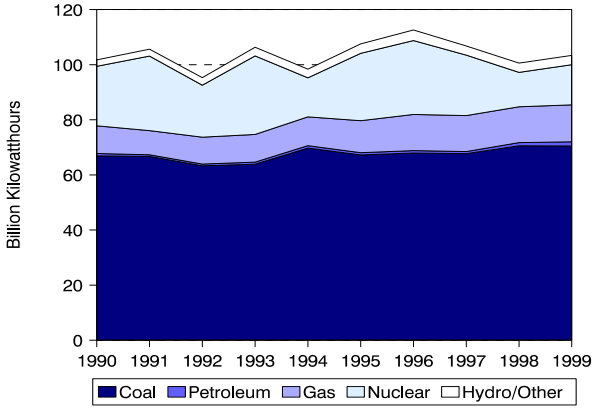

Figure 4. Utility Delivered Fuel Prices for Coal, Petroleum, and Gas, 1990-1999 (1999 Dollars)

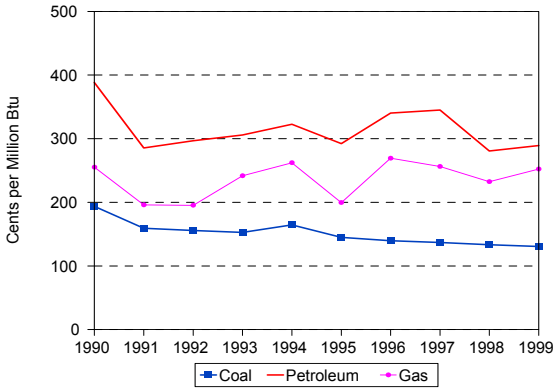

Figure 5. Estimated Sulfur Dioxide Emissions, 1990-1999

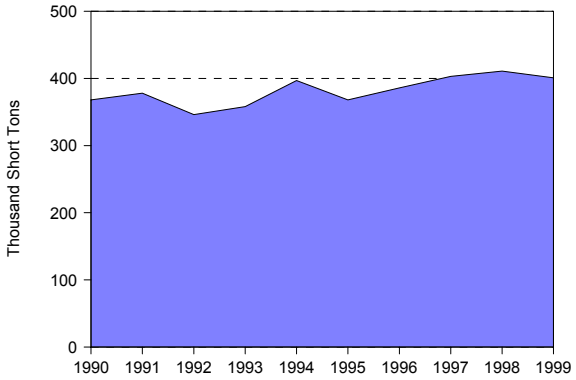

Figure 6. Estimated Nitrogen Oxide Emissions, 1990-1999

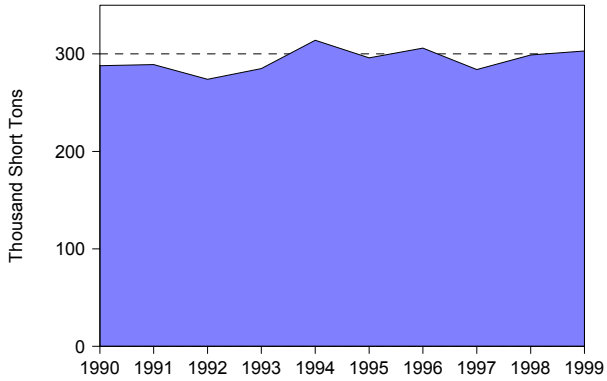

Figure 7. Estimated Carbon Dioxide Emissions, 1990-1999

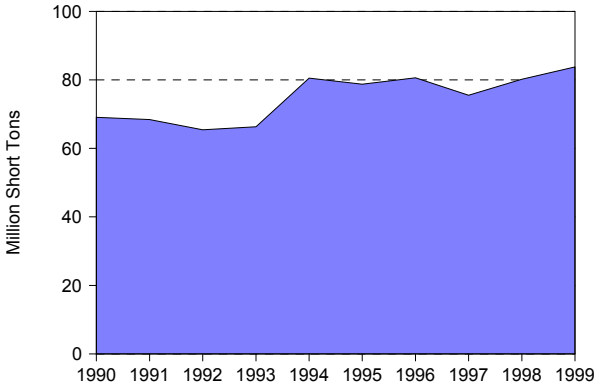

Figure 8. Nuclear Power Capacity Factor Comparison, 1990-1999

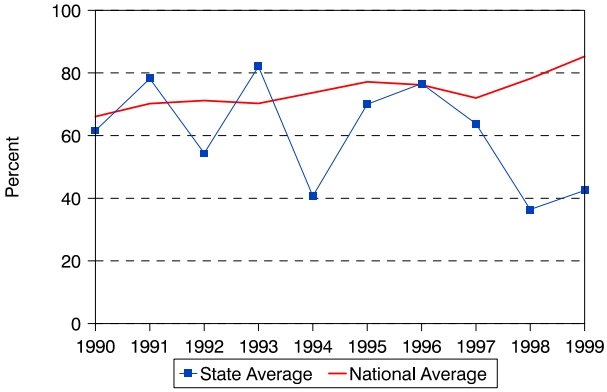

Table 8. Utility Retail Sales, Revenue, and Average Revenue per Kilowatthour, by Sector 1990, 1994, and 1999

	1990	1994	1999	Average Annual Rate of Change (Percent)	Percentage Share 1990	Percentage Share 1994	Percentage Share 1999
Utility Retail Sales							
(thousand megawatthours)							
Residential	25,319	27,174	30,661	2.1	30.7	29.8	29.6
Commercial	20,610	30,412	35,062	6.1	25.0	33.4	33.9
Industrial	35,062	32,717	36,808	0.5	42.6	35.9	35.6
Other	1,376	857	948	-4.1	1.7	0.9	0.9
Total	82,367	91,160	103,480	2.6	100.0	100.0	100.0
Retail Sales Revenue							
(million 1999 dollars)							
Residential	2,401	2,454	2,676	1.2	33.9	34.8	36.2
Commercial	2,033	2,631	2,755	3.4	28.7	37.3	37.3
Industrial	2,484	1,873	1,860	-3.2	35.1	26.5	25.2
Other	166	99	96	-5.9	2.3	1.4	1.3
Total	7,084	7,056	7,387	0.5	100.0	100.0	100.0
Average Revenue per Kilowatthour							
(cents/kWh) (1999 dollars)							
Residential	9.48	9.03	8.73	NA	NA	NA	NA
Commercial	9.86	8.65	7.86	NA	NA	NA	NA
Industrial	7.09	5.72	5.05	NA	NA	NA	NA
Other	12.08	11.50	10.17	NA	NA	NA	NA
Total	8.60	7.74	7.14	NA	NA	NA	NA

Table 9. Utility Retail Sales, Revenue, and Number of Customers by Type of Utility, 1999

Item	Investor-Owned	Public	Federal	Cooperative	Total
Number of Utilities	9	41	0	10	60
Number of Retail Customers	3,994,111	288,243	0	251,877	4,534,231
Retail Sales (thousand megawatthours)	93,529	7,543	0	2,407	103,480
Percentage of Retail Sales	90.4	7.3	0.0	2.3	100.0
Revenue from Retail Sales (million dollars)	6,704	478	0	205	7,387
Percentage of Revenue	90.8	6.5	0.0	2.8	100.0
Average Revenue per Kilowatthour (cents/kWh)	7.17	6.34	0.00	8.54	7.14