

# Oregon

Unlike the vast majority of other States, most of the electricity in Oregon, 87 percent in 1996, was generated at hydroelectric/other plants. The four largest power plants in the State, including John Day, the largest, are hydroelectric plants on the Columbia River in the northern part of the State. The largest utility in Oregon is the United States Army Corps of Engineers (USCE), which operates most of the hydroelectric dams in Oregon. It follows that the average price of electricity, 4.77 cents per kilowatthour, was one of the lowest in the Nation because hydropower is the most inexpensive generator of electricity. Another fact resulting from the large presence of hydropower generation is that Oregon generators were among the lowest emitters of sulfur dioxide, nitrogen oxides, and carbon dioxide.

The nuclear share of total State capability in 1986 was 9.4 percent. Nuclear generation was 14.5 percent but, by 1996, the nuclear shares fell to zero. This was because of the shut-down of the 1,104 megawatt Trojan nuclear plant in November 1992, after it was determined that it would be uneconomical to repair the plant's steam generators. Portland General Electric Company (PGE), the owner of Trojan, decided in January 1993 to shut down the plant permanently, 19 years before the scheduled operating license expiration date of 2011. Through the integrated resource plan process, PGE and the Oregon Public Utility Commission (PUC) established that it would be more economical to phase out the Trojan plant rather than invest an estimated \$200 million to replace the steam generators, which PGE maintained were faulty due to premature corrosion and cracking.<sup>1</sup>

The top five utilities in the State, in terms of operated generating capability within the State—USCE, Portland General Electric Company, Idaho Power Company, PacifiCorp, and the City of Eugene—accounted for 91.9 percent of total Oregon net summer capability. USCE alone accounted for 69.5 percent of utility net summer capability. In 1996, Oregon utilities generated 47.9

billion kilowatthours of electricity, while retail sales amounted to 47.2 billion kilowatthours. From 1986 to 1996, Oregon retail sales in all sectors experienced an annual growth rate of 3.0 percent. The “other” sector of retail sales, which includes sales for public street and highway lighting, other sales to public authorities, sales to railroads and railways, and interdepartmental sales, experienced a rather large growth rate of 6.1 percent. As mentioned earlier, Oregon's average price of electricity was 4.77 cents per kilowatthour, with electric utility average revenue from the residential sector averaging 5.69 cents; from the commercial sector averaging 5.15 cents; from the industrial sector averaging 3.41 cents; and from the other sector averaging 5.74 cents per kilowatthour.<sup>2</sup> The State is an exporter of electricity with a net difference of 0.7 billion kilowatthours between generation and sales.

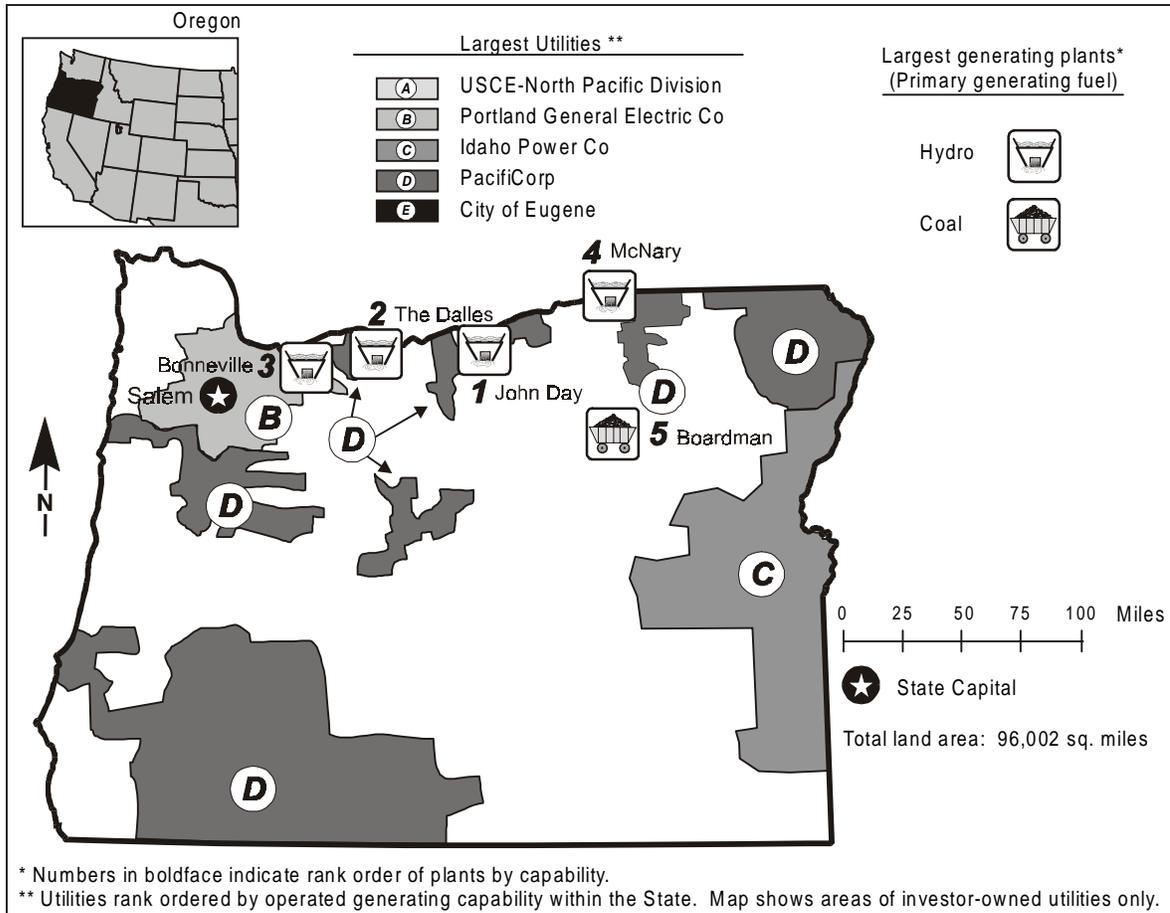
Restructuring activities are proceeding rather slowly in Oregon, probably because of the low price of electricity and the small amount of stranded costs, due mostly to the fact that there are no nuclear plants in the State. A restructuring bill failed to pass the 1997 legislative session, but is expected to be reintroduced in the 1999 session. In July 1998, Pacific Power and Light Company (PPL) filed a proposal with the Oregon PUC for a “portfolio” pilot program for residential and small commercial consumers and direct access for large industrial consumers. The PUC approved a “shopping credit” of 1.98 cents per kilowatthour under an experimental program to introduce supplier choice for electricity customers of PPL.<sup>3</sup> Groups of large-volume and commercial customers (and educational institutions) may contract directly with competitive suppliers, while residential and small commercial customers within an identified target area may choose from a portfolio of pricing options. The shopping credit reflected a recent 12-month average peak power price at the California-Oregon border.<sup>4</sup>

<sup>1</sup> Energy Information Administration, *World Nuclear Capacity and Fuel Cycle Requirements 1993*, DOE/EIA-0436(93) (Washington, DC, November 1993), p. 5.

<sup>2</sup> Energy Information Administration, *Electric Power Annual 1996 Volume II*, DOE/EIA-0348(96)/2 (Washington, DC, December 1997), Table 7.

<sup>3</sup> Energy Information Administration, Status of State Electric Utility Deregulation Activity, [http://www.eia.doe.gov/cneaf/electricity/chg\\_str/tab5rev.html](http://www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html).

<sup>4</sup> *Public Utilities Fortnightly*, News Digest, State PUCs (August 1998), p. 18.



**Table 1. 1996 Summary Statistics**

Item	Value	U.S. Rank	Item	Value	U.S. Rank
NERC Region(s)		WSCC	<b>Utility</b>		
Net Exporter or Importer		Importer	Capability (MWe)	10,526	26
State Primary Generating Fuel		Hydro	Generation (MWh)	47,883,913	23
Population (as of 7/96)	3,196,313	29	Average Age of Coal Plants	16 years	
Average Revenue (cents/kWh)	4.77	<sup>a</sup> 6	Average Age of Oil-fired Plants	23 years	
<b>Industry</b>			Average Age of Gas-fired Plants	13 years	
Capability (MWe)	11,429	<sup>b</sup> 24	Average Age of Nuclear Plants	--	
Generation (MWh)	51,044,645	<sup>b</sup> 22	Average Age of Hydroelectric Plants	33 years	
Capability/person (KWe/person)	3.58	14	Average Age of Other Plants	26 years	
Generation/person (MWh/person)	15.97	14	<b>Nonutility<sup>c</sup></b>		
Sulfur Dioxide Emissions (Thousand Short Tons)	7	47	Capability (MWe)	903	16
Nitrogen Oxide Emissions (Thousand Short Tons)	16	44	Percentage Share of Capability	7.9	20
Carbon Dioxide Emissions (Thousand Short Tons)	4,681	45	Generation (MWh)	3,160,732	26
Sulfur Dioxide/sq. mile (Tons)	0.07	49	Percentage Share of Generation	6.2	24
Nitrogen Oxides/sq. mile (Tons)	0.17	48			
Carbon Dioxide/sq. mile (Tons)	48.76	48			

-- = Not applicable.

**Table 2. Five Largest Utility Plants, 1996**

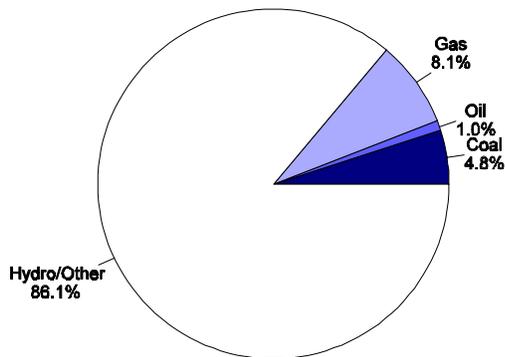
Plant Name	Type	Operating Utility	Net Capability (MWe)
1. John Day .....	Hydro	USCE-North Pacific Division	2,484
2. The Dalles .....	Hydro	USCE-North Pacific Division	1,961
3. Bonneville .....	Hydro	USCE-North Pacific Division	1,212
4. McNary .....	Hydro	USCE-North Pacific Division	1,127
5. Boardman .....	Coal	Portland General Electric Co	508

**Table 3. Top Five Utilities with Largest Generating Capability, and Type, Within the State, 1996**  
(Megawatts Electric)

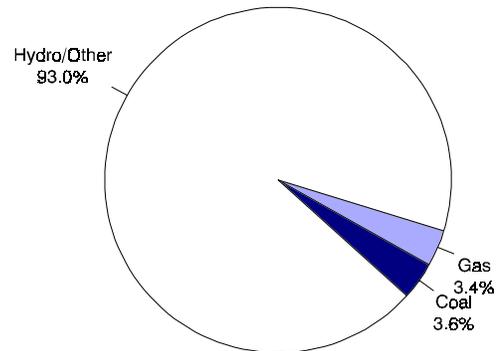
Utility	Net Summer Capability	Net Coal Capability	Net Oil Capability	Net Gas Capability	Net Nuclear Capability	Net Hydro/Other Capability
A. USCE-North Pacific Division .....	7,302	--	--	--	--	7,302
B. Portland General Electric Co .....	2,127	508	103	849	--	667
C. Idaho Power Co .....	581	--	--	--	--	581
D. PacifiCorp .....	339	--	--	--	--	339
E. City of Eugene .....	151	--	--	--	--	151
Total .....	10,500	508	103	849	--	9,040
Percentage of Industry Capability	91.9	--	--	--	--	--

-- = Not applicable.

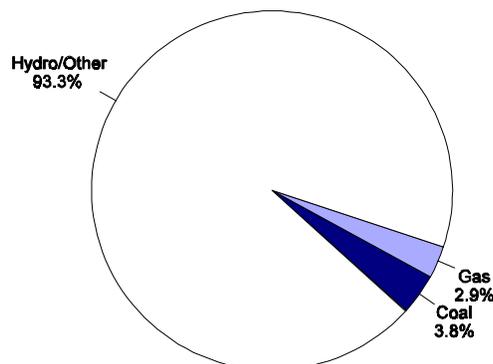
**Figure 1. Utility Generating Capability by Primary Energy Source, 1996**



**Figure 2. Utility Generation by Primary Energy Source, 1996**



**Figure 3. Energy Consumed at Electric Utilities by Primary Energy Source, 1996**



**Table 4. Electric Power Industry Generating Capability by Primary Energy Source, 1986, 1991, and 1996**  
(Megawatts Electric)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	530	530	508	4.6	4.6	4.4
Oil	109	109	103	1.0	0.9	0.9
Gas	493	493	852	4.3	4.3	7.5
Nuclear	1,080	1,104	--	9.4	9.6	--
Hydro/Other	8,979	9,000	9,063	78.5	78.3	79.3
Total Utility	11,191	11,236	10,526	97.9	97.7	92.1
Total Nonutility	245	262	903	2.1	2.3	7.9
Industry	11,436	11,498	11,429	100.0	100.0	100.0

-- = Not applicable.

**Table 5. Electric Power Industry Generation of Electricity by Primary Energy Source, 1986, 1991, and 1996**  
(Thousand Kilowatthours)

Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	-38,799	2,814,199	1,727,583	-0.1	5.9	3.4
Oil	-5,478	9,648	6,631	(s)	(s)	(s)
Gas	10	1,164,413	1,636,828	(s)	2.5	3.2
Nuclear	7,081,231	1,465,368	--	14.5	3.1	--
Hydro/Other	40,743,146	40,844,393	44,512,871	83.5	86.3	87.2
Total Utility	47,780,110	46,298,021	47,883,913	97.9	97.8	93.8
Total Nonutility	1,017,418	1,043,616	3,160,732	2.1	2.2	6.2
Industry	48,797,528	47,341,637	51,044,645	100.0	100.0	100.0

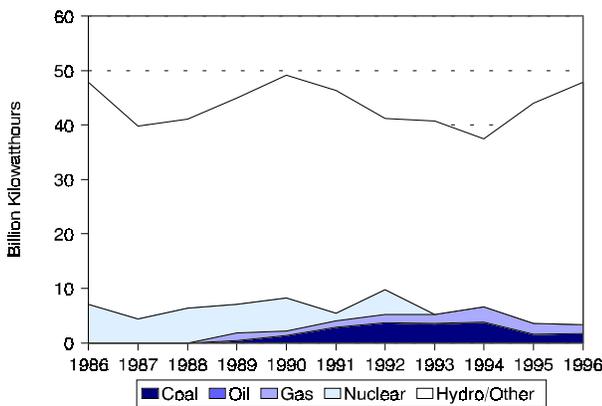
-- = Not applicable. (s) = Nonzero percentage less than 0.05 if value is positive and greater than -0.05 if value is negative.

**Table 6. Electric Power Industry Consumption by Primary Energy Source, 1986, 1991, and 1996**  
(Quadrillion Btu)

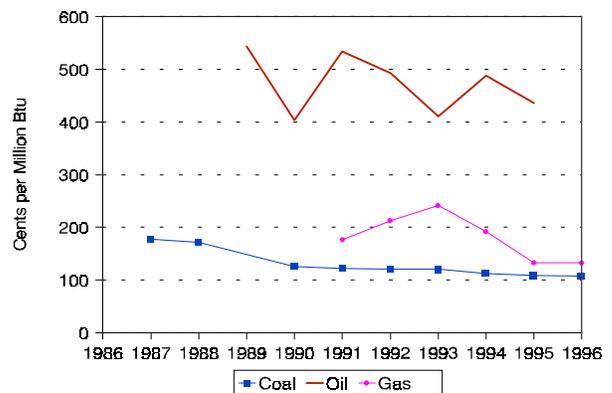
Fuel	1986	1991	1996	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Coal	(s)	0.031	0.019	--	6.0	3.5
Oil	(s)	(s)	(s)	--	--	--
Gas	(s)	0.011	0.014	--	2.1	2.7
Nuclear	0.076	0.016	--	15.1	3.1	--
Hydro/Other	0.426	0.423	0.459	84.0	81.9	86.2
Total Utility	0.502	0.481	0.491	99.1	93.1	92.4
Total Nonutility	0.004	0.035	0.040	0.9	6.9	7.6
Industry	0.507	0.516	0.532	100.0	100.0	100.0

-- = Not applicable. (s) = Nonzero value less than 0.0005.

**Figure 4. Utility Generation of Electricity by Primary Energy Source, 1986-1996**



**Figure 5. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986-1996**  
(1996 Dollars)



**Table 7. Utility Delivered Fuel Prices for Coal, Oil, and Gas, 1986, 1991, and 1996**  
(Cents per Million Btu, 1996 Dollars)

Fuel	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Coal . . . . .	--	121.9	107.1	--
Oil . . . . .	418.5	534.3	--	--
Gas . . . . .	--	176.5	132.2	--

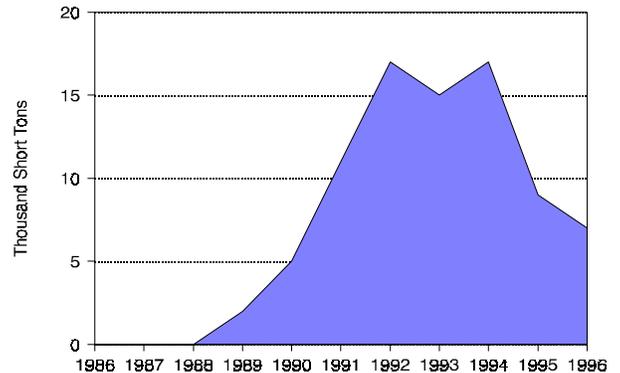
-- = Not applicable.

**Table 8. Electric Power Industry Emissions Estimates, 1986, 1991, and 1996**  
(Thousand Short Tons)

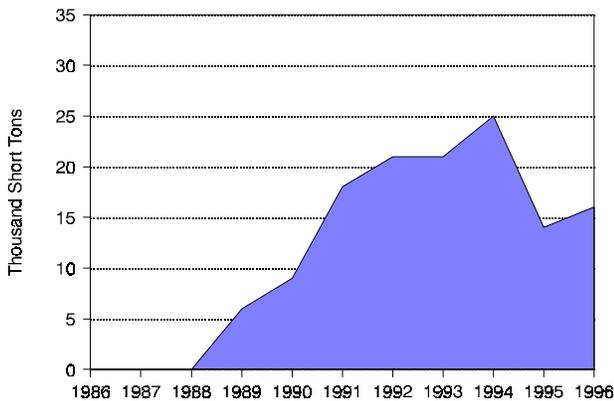
Emission Type	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)
Sulfur Dioxide . . . .	(s)	11	7	86.6
Nitrogen Oxides <sup>d</sup> . .	(s)	18	16	120.2
Carbon Dioxide <sup>d</sup> . . .	2	5,532	4,681	114.9

(s) = Nonzero value less than 0.05.

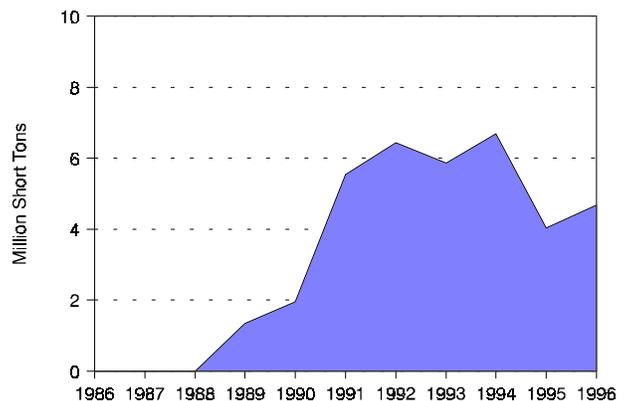
**Figure 6. Estimated Sulfur Dioxide Emissions, 1986-1996**



**Figure 7. Estimated Nitrogen Oxide Emissions, 1986-1996**



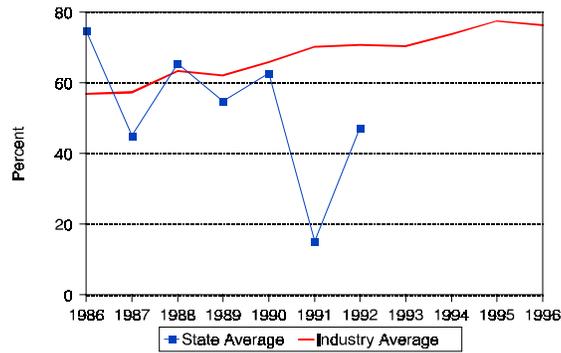
**Figure 8. Estimated Carbon Dioxide Emissions, 1986-1996**



**Table 9. Utility Retail Sales by Sector, 1986, 1991, and 1996**  
(Megawatthours)

Sector	1986	1991	1996	Annual Growth Rate 1986-1996 (Percent)	Percentage Share 1986	Percentage Share 1991	Percentage Share 1996
Residential . .	13,722,045	15,949,119	17,284,645	2.3	39.1	36.5	36.6
Commercial	9,959,862	11,614,083	13,387,964	3.0	28.4	26.6	28.4
Industrial . . .	10,993,905	15,296,762	15,804,189	3.7	31.4	35.0	33.5
Other . . . . .	390,479	790,787	708,114	6.1	1.1	1.8	1.5
Total . . . . .	35,066,288	43,650,751	47,184,912	3.0	100.0	100.0	100.0

**Figure 9. Nuclear Power Capacity Factor Comparison, 1986-1996**



**Table 10. Utility Retail Sales Statistics, 1986, 1991, and 1996**

Item	Investor-Owned Utility	Public	Federal	Cooperative	Total
	1986				
Number of Utilities	4	17	1	18	40
Number of Retail Customers	965,790	194,949	8	109,405	1,270,152
Retail Sales (MWh)	24,927,135	6,730,593	832,777	2,575,783	35,066,288
Percentage of Retail Sales	71.1	19.2	2.4	7.4	100.0
Revenue from Retail Sales (thousand 1996 \$) <sup>e</sup>	1,588,998	263,617	16,796	148,735	2,023,033
Percentage of Revenue	78.6	13.0	1.1	7.4	100.0
	1991				
Number of Utilities	3	17	1	19	40
Number of Retail Customers	1,033,092	208,126	8	146,522	1,387,748
Retail Sales (MWh)	28,549,384	7,619,357	3,908,728	3,573,282	43,650,751
Percentage of Retail Sales	65.4	17.5	9.0	8.2	100.0
Revenue from Retail Sales (thousand 1996 \$) <sup>e</sup>	1,497,300	300,917	83,588	192,160	2,084,330
Percentage of Revenue	71.8	14.4	4.5	9.2	100.0
	1996				
Number of Utilities	3	17	2	19	41
Number of Retail Customers	1,140,092	229,517	9	164,540	1,534,158
Retail Sales (MWh)	31,512,250	8,260,073	3,451,035	3,961,554	47,184,912
Percentage of Retail Sales	66.8	17.5	7.3	8.4	100.0
Revenue from Retail Sales (thousand 1996 \$) <sup>e</sup>	1,627,386	332,503	80,999	211,971	2,252,859
Percentage of Revenue	72.2	14.8	3.6	9.4	100.0