



ENVIRONMENTAL REPORT 2008

The following information is a part of the Environmental Report for 2008 dealing with air emissions, and uses of coal ash.

During the process of generating electricity, sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM) and carbon dioxide (CO₂) pollutants are emitted.

The following report reviews air pollutant emissions during 2008, the previous decade (1999-2008), and 1990 (to be used as the reference year).

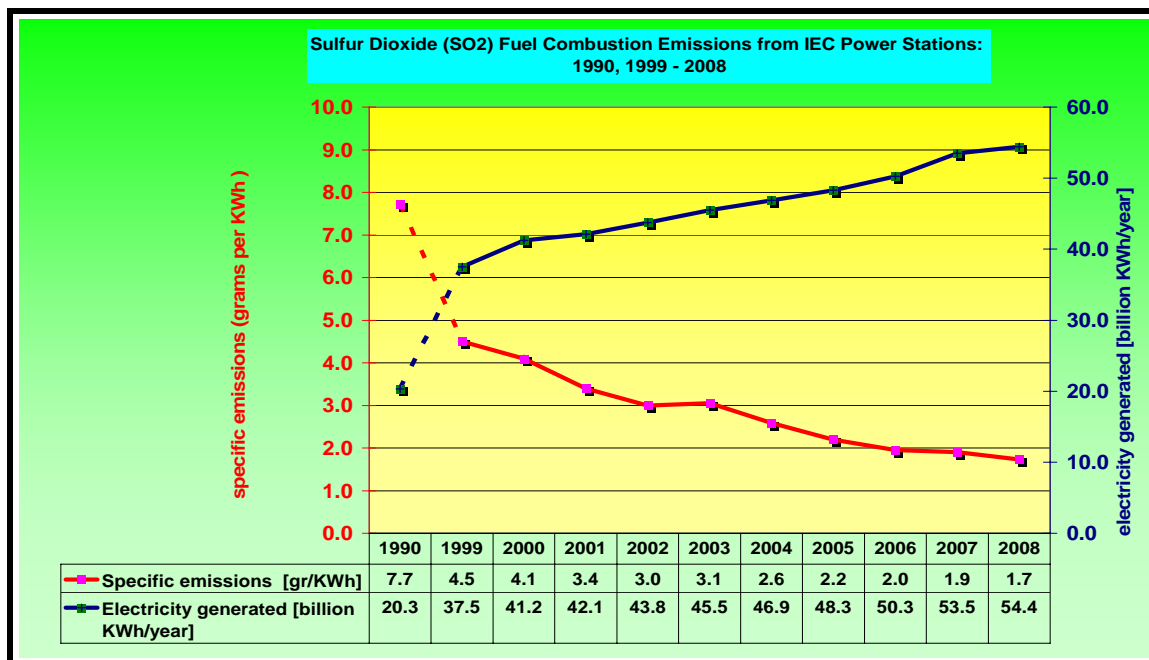
The review represents the specific emissions (grams per KWh generated) of each air pollutant mentioned above.

Sulfur Dioxide (SO₂)

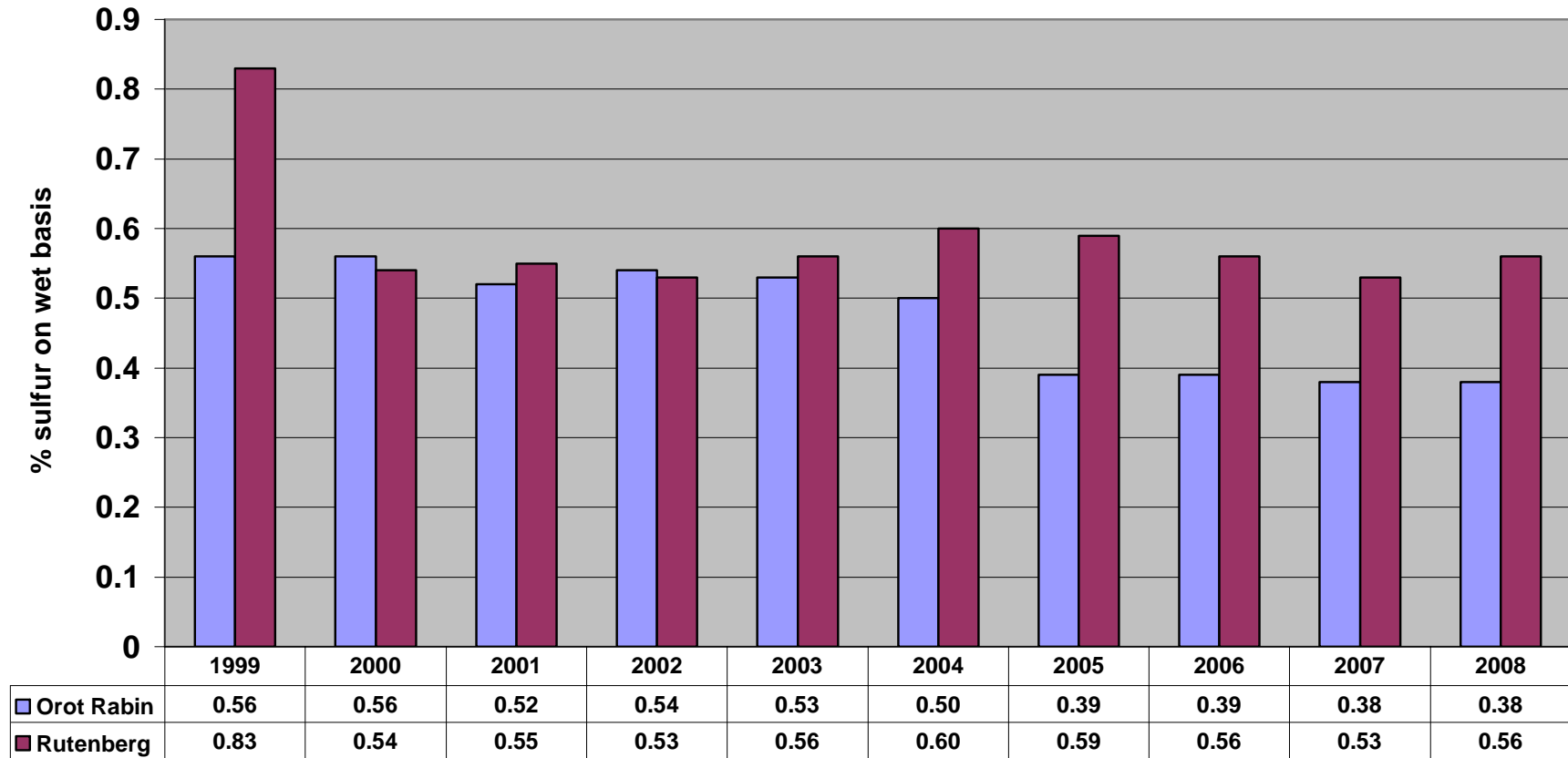
During 2008, a 7% decrease in the specific emission of sulfur dioxide was noted compared to 2007, while electricity generation increased by 2% during the year. As a result, a decrease of 6% in the total emission of sulfur dioxide was noted compared to 2007.

During 1999-2008 electricity generation increased by 45%, while the specific emission of sulfur dioxide decreased by 62% in this period.

In relation to 1990, the specific emission of sulfur dioxide in 2008 decreased by 78% while electricity generation increased by 168% during this period.



**Annual Average Sulfur Content [%] (on wet basis) of Coal Shipments to Rutenberg & Orot Rabin
Power Stations: 1999-2008 ***



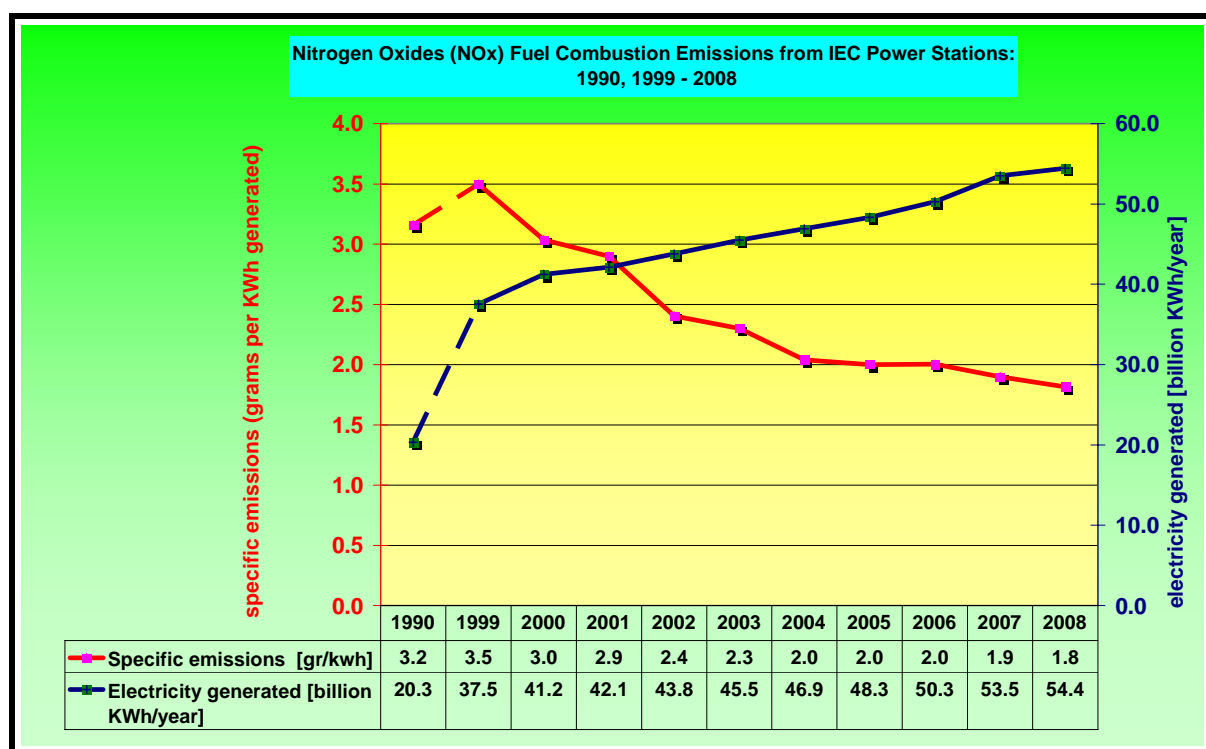
* The FGD system installation in "Rutenberg B" power units absorb more than 90% of sulfur oxides from the flue gases

Nitrogen Oxides (NO_x)

During 2008, a 7% decrease in the specific emission of nitrogen oxides was noted compared to 2007, while electricity generation increased by 2% during the year. As a result, a decrease of 5% in the total emission of nitrogen oxides was noted compared to 2007.

During 1999-2008, electricity generation increased by 45%, while the specific emission of nitrogen oxides decreased by 48% in this period.

In relation to 1990, the specific emission of nitrogen oxides in 2008 decreased by 43% while electricity generation increased by 168% during this period.

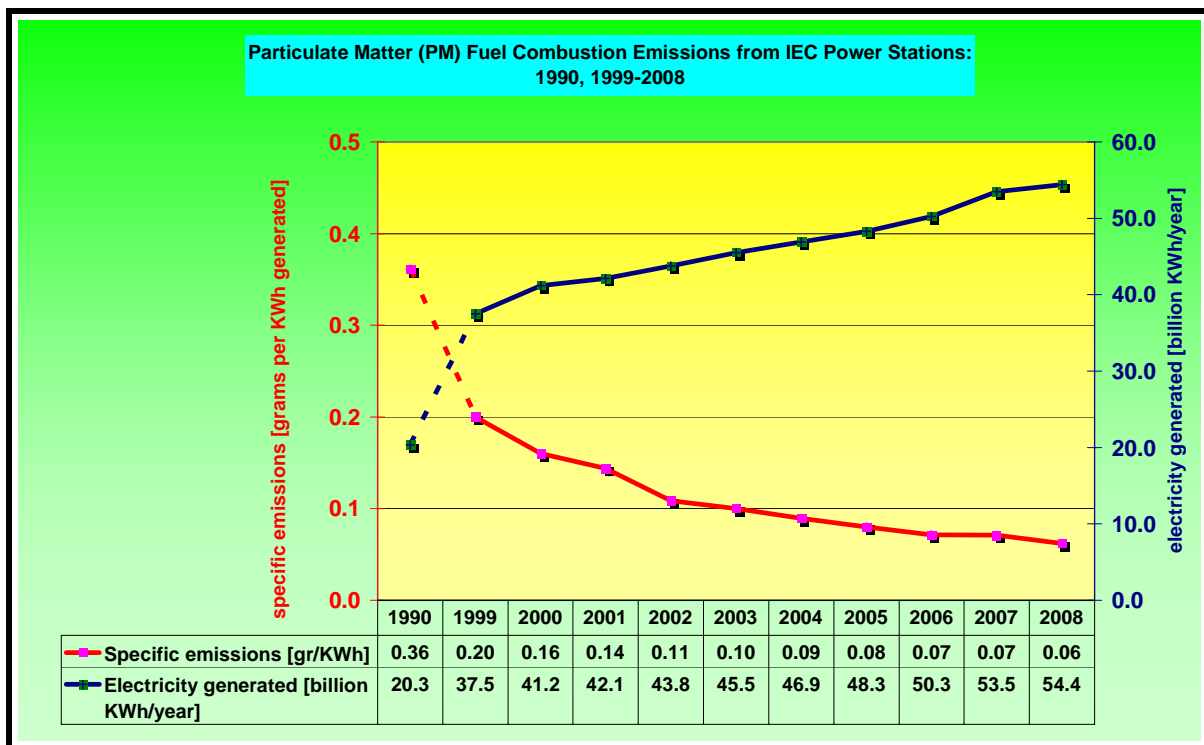


Particulate Matter (PM)

During 2008, a 13% decrease in the specific emission of particulate matter was noted compared to 2007, while electricity generation increased by 2% during the year. As a result, a decrease of 11% in the total emission of particulate matter was noted compared to 2007.

During 1999-2008, electricity generation increased by 45%, while the specific emission of particulate matter decreased by 69% in this period.

In relation to 1990, the specific emission of particulate matter in 2008 decreased by 83% while electricity generation increased by 168% during this period.

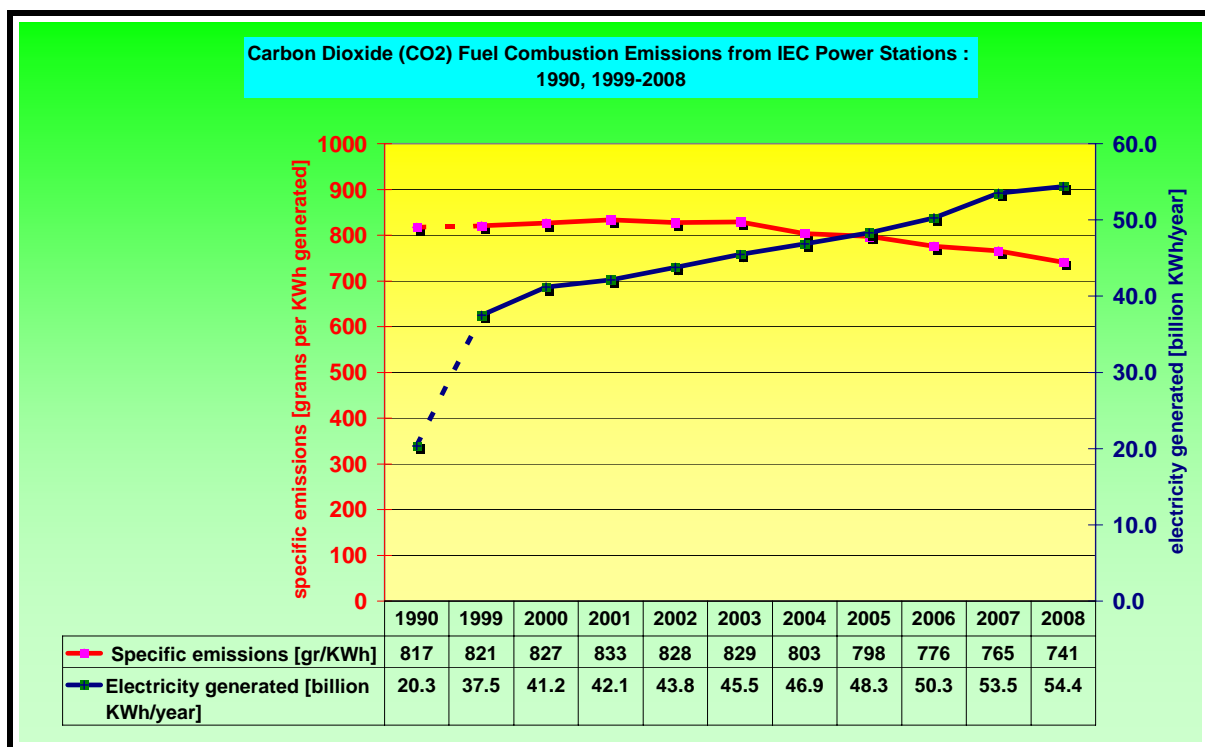


Carbon Dioxide (CO₂)

During 2008, a moderate decrease of 3% in the specific emission of carbon dioxide was noted compared to 2007, while electricity generation increased by 2% during the year. As a result, a moderate decrease of 2% in the total emission of carbon dioxide was noted compared to 2007.

Since the introduction of natural gas in 2004, a considerable decrease of 11% in the specific emission of carbon dioxide was noted.

As a result, although electricity generation increased by 20% since the introduction of natural gas, an increase of only 7% in the total emission of carbon dioxide was noted in that period.



The following tables represent a summary of air pollutant emissions from fuel combustion in IEC power stations during 2002– 2008: absolute emissions [thousand metric tons per year] and specific emissions [grams per KWh generated].

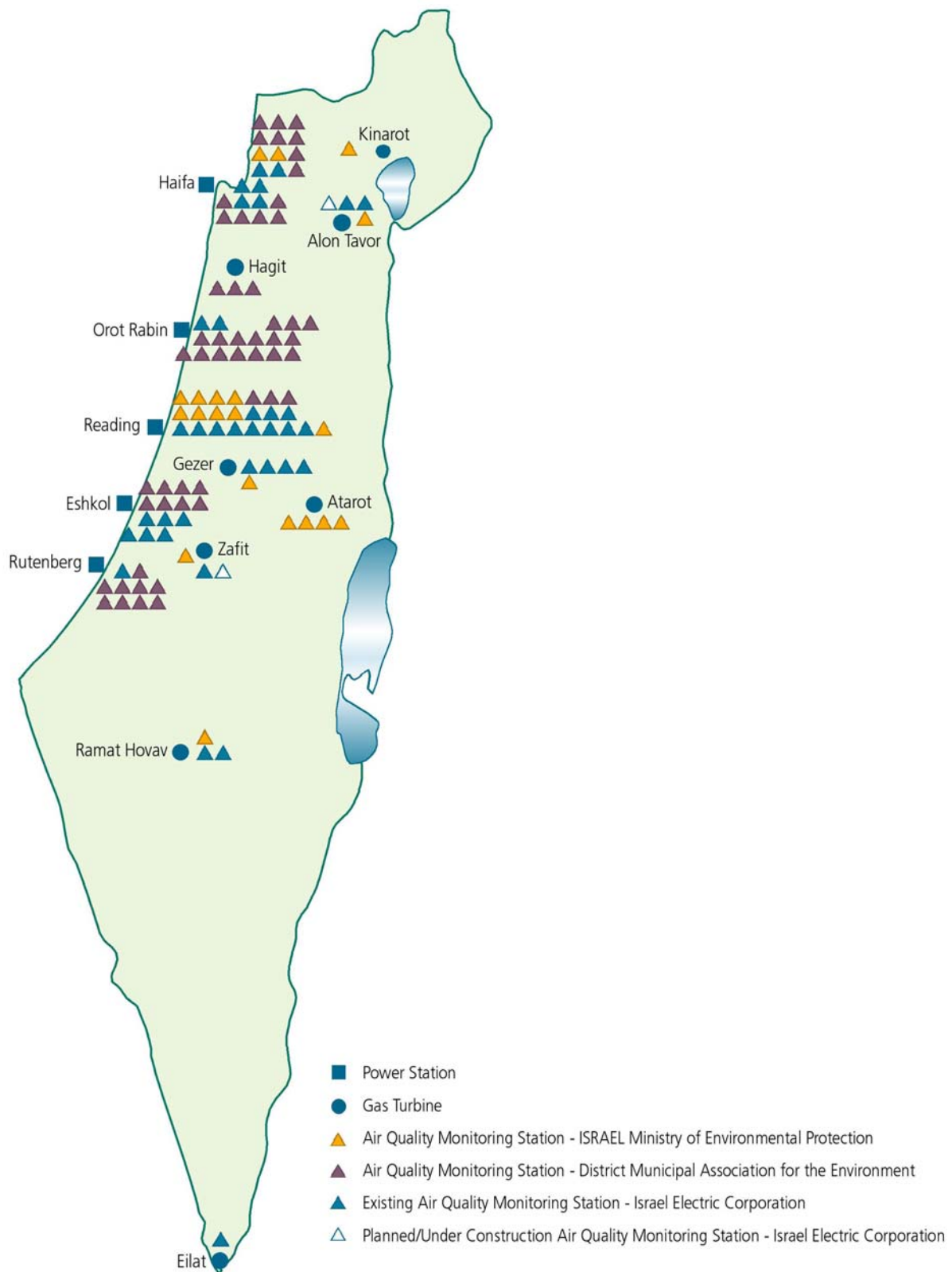
Fuel Combustion Emissions from IEC Power Stations: Thousand Metric Tons							
Fuel	2002	2003	2004	2005	2006	2007	2008
Sulfur Dioxide							
natural gas	---	---	0.2	0.1	0.3	0.2	0.3
fuel oil	27.1	26.8	12.9	8.5	6.5	4.0	3.8
coal	103.5	110.4	107.1	93.9	88.9	92.1	87.2
gas oil in combined cycle units	0.7	1.2	0.9	1.3	1.5	2.2	2.0
gas oil in gas turbine units (open cycle)	0.9	0.5	0.4	1.1	0.9	1.3	0.8
TOTAL	132.2	138.9	121.4	104.9	98.1	99.8	94.0
Nitrogen Oxides							
natural gas	---	---	2.5	3.7	4.7	5.8	7.1
fuel oil	14.3	10.3	6.2	4.9	3.5	2.3	2.1
coal	87.7	90.7	84.9	85.4	88.4	92.0	85.9
gas oil in combined cycle units	0.8	1.5	1.1	1.4	1.9	2.4	2.1
gas oil in gas turbine units (open cycle)	2.4	1.3	0.9	2.9	2.1	1.9	1.3
TOTAL	105.1	103.7	95.6	98.3	100.7	104.3	98.6
Particulate Matter							
natural gas	---	---	0.05	0.06	0.09	0.11	0.16
fuel oil	1.40	1.34	0.85	0.62	0.46	0.26	0.24
coal	3.19	3.20	3.13	2.90	2.75	3.02	2.71
gas oil in combined cycle units	0.06	0.13	0.11	0.15	0.19	0.32	0.21
gas oil in gas turbine units (open cycle)	0.10	0.07	0.05	0.14	0.10	0.10	0.06
TOTAL	4.76	4.74	4.20	3.87	3.60	3.81	3.37
Carbon Dioxide							
natural gas	---	---	2,245	3,105	4,165	5,027	6,601
fuel oil	5,185	5,509	3,455	2,666	2,022	1,265	1,189
coal	29,757	30,871	30,928	30,873	30,856	31,887	30,245
gas oil in combined cycle units	525	917	739	997	1,192	1,837	1,587
gas oil in gas turbine units (open cycle)	735	398	285	859	745	933	613
TOTAL	36,202	37,694	37,653	38,501	38,980	40,950	40,235
*	an estimate based on stack emission control and fuel sulfur content.						
**	Up to 2006 - the calculation of carbon dioxide emissions takes into account the fuel carbon content oxidation factor and its conversion into carbon dioxide.						
***	Since 2007 - the calculation of carbon dioxide emissions takes into account the fuel caloric value and the fuel carbon content (according to the CDM methodology).						

Fuel Combustion Emissions from IEC Power Stations: Grams per KWh Generated							
Fuel	2002	2003	2004	2005	2006	2007	2008
Sulfur Dioxide							
natural gas	---	---	0.04	0.02	0.03	0.02	0.02
fuel oil	3.8	3.6	2.7	2.4	2.4	2.3	2.3
coal	3.0	3.1	2.9	2.6	2.5	2.5	2.5
gas oil in combined cycle units	0.8	0.8	0.8	0.8	0.8	0.8	0.8
gas oil in gas turbine units (open cycle)	1.2	1.2	1.2	1.2	1.2	1.1	1.2
TOTAL	3.0	3.1	2.6	2.2	2.0	1.9	1.7
Nitrogen Oxides							
natural gas	---	---	0.6	0.6	0.5	0.5	0.5
fuel oil	2.0	1.4	1.3	1.4	1.3	1.3	1.3
coal	2.5	2.5	2.3	2.4	2.5	2.5	2.4
gas oil in combined cycle units	1.0	1.0	0.9	0.8	1.0	0.9	0.8
gas oil in gas turbine units (open cycle)	3.0	3.1	3.0	3.2	2.6	1.6	1.9
TOTAL	2.4	2.3	2.0	2.0	2.0	1.9	1.8
Particulate Matter							
natural gas	---	---	0.01	0.01	0.01	0.01	0.01
fuel oil	0.20	0.18	0.18	0.17	0.17	0.15	0.15
coal	0.09	0.09	0.09	0.08	0.08	0.08	0.08
gas oil in combined cycle units	0.08	0.09	0.09	0.09	0.10	0.12	0.08
gas oil in gas turbine units (open cycle)	0.13	0.16	0.17	0.15	0.13	0.09	0.09
TOTAL	0.11	0.10	0.09	0.08	0.07	0.07	0.06
Carbon Dioxide							
natural gas	---	---	532	519	459	476	469
fuel oil	732	730	733	742	747	736	735
coal	848	856	848	855	863	856	855
gas oil in combined cycle units	643	611	614	604	621	621	612
gas oil in gas turbine units (open cycle)	934	960	965	944	915	930	948
TOTAL	828	829	803	798	776	765	741

Low Sulfur Fuel Consumption in Haifa, Reading and Eshkol Power Stations
Thousand Metric Tons at Fuel Oil and Natural Gas Power Stations (expressed as fuel oil equivalent)

Power Stations	2002	2003	2004	2005	2006	2007	2008
Natural Gas (expressed as fuel oil equivalent)							
Haifa	0	0	0	0	0	0	0
Reading	0	0	0	0	292.2	573.0	642.1
Eshkol	0	0	1,011.5	1,381.3	1,564.0	1,633.3	1,811.8
TOTAL	0	0	1,011.5	1,381.3	1,856.3	2,206.3	2,453.9
Very Low Sulfur Fuel Oil				(Sulfur 0.5%)			
Haifa	81.1	133.8	347.1	343.5	418.4	363.1	350.3
Reading	371.1	448.3	407.3	391.5	111.8	0	0
Eshkol	159.6	266.7	169.2	115.6	117.1	38.1	26.7
TOTAL	611.8	848.8	923.6	850.6	647.4	401.2	376.9
Low Sulfur Fuel Oil				(Sulfur 1.0%)			
Haifa	320.5	297.3	22.3	0.0	0.0	0.0	0.0
Reading	0	0	0	0	0	0	0
Eshkol	732.8	615.7	156.6	0.0	0.0	0.0	0.0
TOTAL	1,053.3	913.0	178.9	0.0	0.0	0.0	0.0

Air Quality Monitoring Stations – 2008



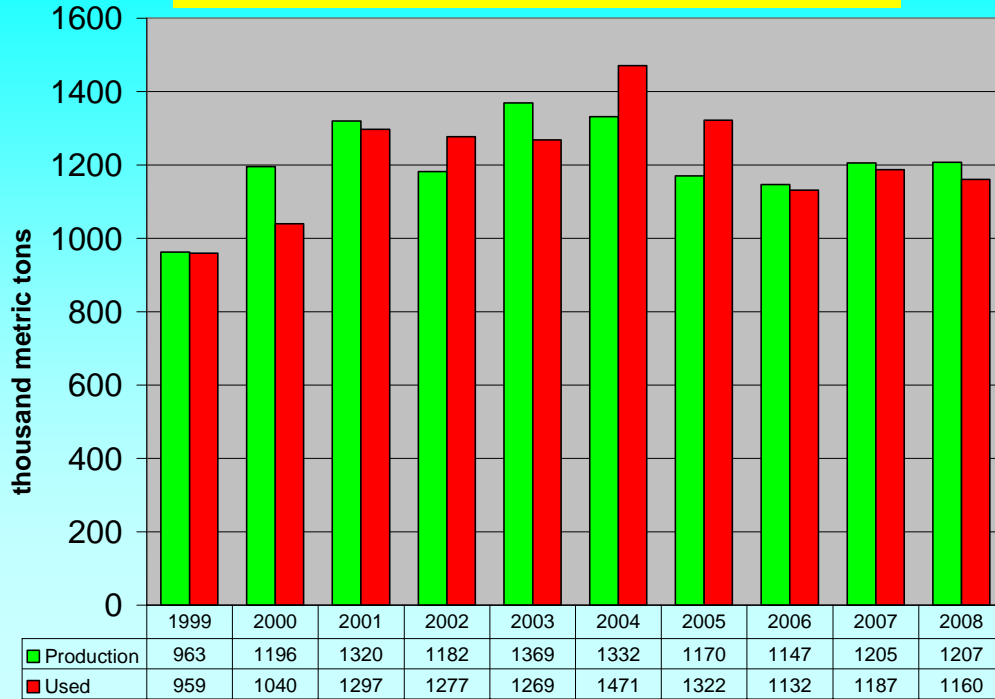
Uses of Coal Ash Produced by IEC

Coal ash is a by-product of coal combustion produced at the IEC "Orot Rabin" Power Station in Hadera and "Rutenberg" Power Station in Ashkelon. On average, 1.2 million tons of coal ash were produced at these power stations annually during the period 2004 to 2008. About 90% of this amount is fly ash, which is composed of the fine particles collected by the electro-static precipitators, and 10% is bottom ash, which is composed of coarser particles collected from the bottom of the boiler.

From 1998, the entire quantity of coal ash produced by the IEC was used by various sectors in the economy. The majority of the ash was used in the building industry to manufacture cement and concrete. Large quantities of coal ash were also used as structural fill material for the construction of roads and other infrastructures. Since 2000, some of the bottom ash was used in agriculture as bedding material for cowsheds (fine fraction) and as a growing medium for horticultural plants (coarse fraction).

From 2007, as the result of the increasing demand for fly ash by the cement and concrete industries, almost all the fly ash was used in this sector and only minor amounts were used for infrastructure construction. The addition of fly ash is known to improve concrete properties (e.g. strength, resistance to corrosion, insulation). Coal ash is used in industry and infrastructures as a substitute for natural raw materials, such as limestone and sand. This its use decreases the damage caused to the environment and natural landscape by the quarrying of these materials. Another advantage of fly ash usage in the building industry is the indirect reduction of CO₂ emissions in the country, due to the decreased consumption of clinker by the local cement industry. In 2008, we estimated that the use of fly ash in the cement and concrete industries prevented emissions of approximately 360,000 tons of CO₂.

Production and Use of Coal Ash during 1999 - 2008



Distribution of the Main Uses of Coal Ash during 1999 - 2008

