

Workshop on Environmental and Health Aspects of Coal Ash Utilization

International workshop
23rd – 24th November 2005
Tel-Aviv, Israel

Coal ash in Israel

General background

The coal era began in Israel in 1982 when the first coal-fired electricity production unit, with a capacity of 350 MW, was operated in the Orot Rabin power station, located in Hadera, halfway between Haifa and Tel Aviv. Since that time another nine coal-fired production units have been constructed and operated, in Orot Rabin and in Rutenberg, the other coal-fired power station located south to Ashkelon. These two power stations have an overall capacity of 4,840 MW, which constitute 50% of the national electricity production system. Additional coal-fired units with a capacity of 1200 MW are planned to be constructed in the current decade.

Two of the units being operated in Rutenberg PS include flue gas desulfurization systems (FGD) and low NO_x burners. In the future, FGD will be added to existing coal burning units in Orot Rabin PS.

The production of electricity in Israel in 2004 came to an annual total of 46,989 GWh, from a production system having an overall capacity of 9,870 MW.

The production of electricity from the various kinds of fuel in 2004 was as follows: 78% from coal, 10% from heavy fuel oil, 9% from natural gas and 3% from diesel oil. A conversion of the heavy fuel oil and diesel oil burning units to natural gas is in process.

In 2004 1,330 thousand tons coal ash were produced in Israel from 12.8 million tons coal, of which 1,200 thousand tons fly ash and 130 thousand tons bottom ash. In 2004 550 thousand tons were utilized as a ground cement additive (fly ash) and clinker production raw material (fly and bottom ash) for cement production, 525 thousand tons (fly ash) as a concrete additive, 380 thousand tons (fly and bottom ash) in road construction and land reclamation and 14 thousand tons (bottom ash) in agricultural uses (substrates for plants growing and cowshed padding).

By 2010, after operation of two new units in Rutenberg PS, coal import to Israel will exceed 15 million tons annually, producing 1.6 million tons coal ash.

Coal Ash Production

Year	Fly	Bottom
1982	129	14
1983	199	21
1984	305	40
1985	320	27
1986	329	38
1987	344	33
1988	351	42
1989	368	48
1990	378	47
1991	421	53
1992	462	61
1993	567	69
1994	606	90
1995	668	74
1996	785	87
1997	789	88
1998	806	87
1999	868	95
2000	1,074	120
2001	1,188	132
2002	1,063	118
2003	1232	137
2004	1,199	133
Total	14,451	1,654

Fly Ash Destinations

Year	Cement	Embankment	Sea Dumping	Concrete	Infrastructure
1982	9	123			
1983	109	93			
1984	232	76			
1985	243	80			
1986	242	87			
1987	182	76	83		
1988	218		130		
1989	243		122		
1990	283		92		
1991	321	71	29		
1992	347	88	27		
1993	415	152	0		
1994	470	105	31		
1995	628	7	33		
1996	745		40		
1997	741		37		11
1998	741		13	50	2
1999	690			87	91
2000	576			259	239
2001	577			418	193
2001	414			463	186
2003	482			497	141
2004	538			531	251
Total	9,446	958	637	2,305	1,114

Bottom Ash Destination

Year	Embankment	Sea Dumping	Infrastructure	Agriculture
1982	14			
1983	21			
1984	40			
1985	27			
1986	38			
1987	33			
1988		42		
1989		48		
1990		47		
1991		53		
1992	43	25		
1993	45	21		
1994	60	30		
1995		74		
1996		87		
1997		74	14	
1998		25	62	
1999			95	
2000			115	5
2001			124	8
2001			109	9
2003			140	6
2004			129	14
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