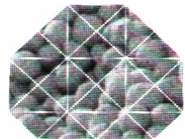
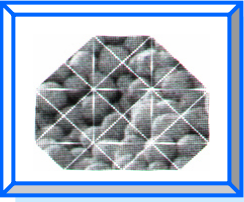


**National Coal Ash Board**

# Israeli National Coal Ash Board



**NCAB**



**National Coal Ash Board**

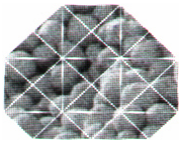
# **Coal Ash in Israel**

## **General Background**

**Environmental and Health Aspects of Coal Ash Utilization**

**Tel-aviv, Israel**

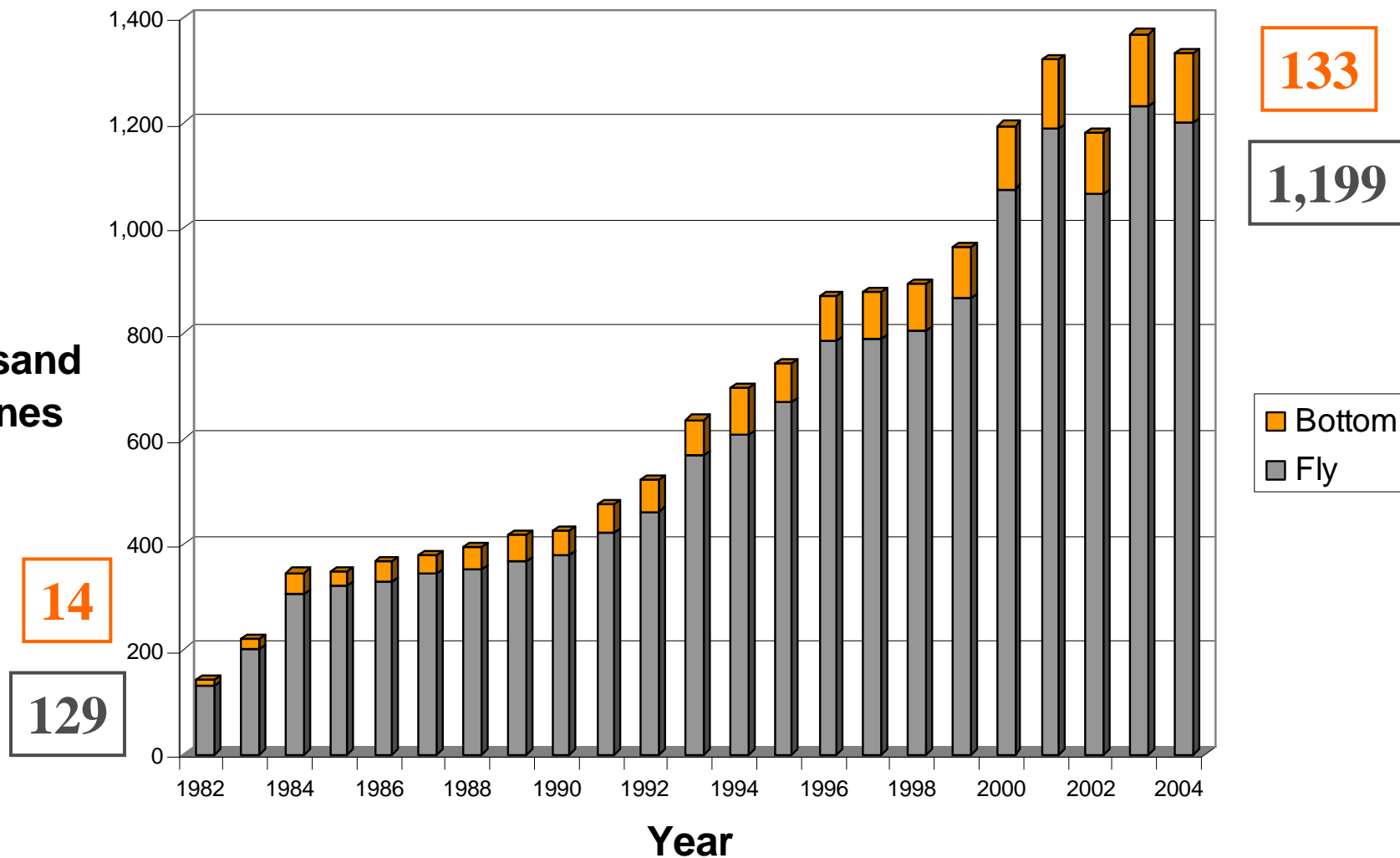
**November 2005**

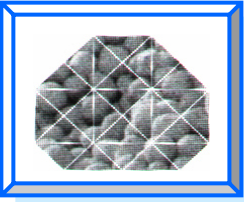


# National Coal Ash Board

## Coal Ash Production

Thousand  
Tonnes

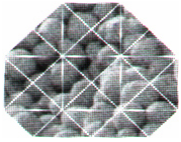




## **National Coal Ash Board**

### **State Policy of the Israeli Government**

- \* Defining coal ash as a recyclable material required environmental control.**
- \* Giving priority to economic uses to prevent disposal of ash as a waste.**
- \* Setting up facilities for the temporary storage of large amounts of ash for future use.**
- \* Preparing land site for disposal of ash remaining with no foreseeable use in the long run.**
- \* Directing public funded entities to cooperate in the recycling of coal ash.**



# National Coal Ash Board

~10µm

**Ministry of  
Environment**

**Min. of National  
Infrastructures**

**Ministry of  
Interior**

**Israel Electric  
Corp.**

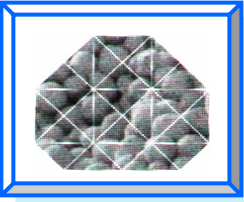
**National Coal  
Supply Corp.**

**Coal Ash  
Directorate**

**Consultants**

**Managing Director**

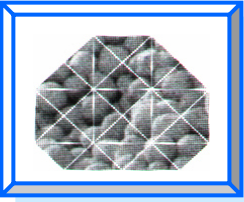
**Chemistry  
Radioactivity  
Building Construction  
Road Making  
Hygienic Safety**



# **National Coal Ash Board**

## **NCAB's Main Activities**

- **Definition of environmental conditions for coal ash uses.**
- **Writing engineering standards and establishing quality control systems.**
- **Handling of trial projects for the demonstration of coal ash applications.**
- **Advancement of economic coal ash uses.**



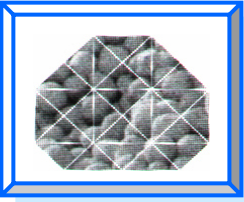
# National Coal Ash Board

## Environmental Directives for Use of Coal Ash

### Infrastructures

#### *Paving & Structural fill*

- \* unrestricted in areas with no danger of polluting water.
- \* Subject to a local hydro geological assessment, in other areas.
- \* Exemption for bottom ash in case of low boron in underwater.
- \* Subsoil stabilization depends on leaching tests.



# National Coal Ash Board

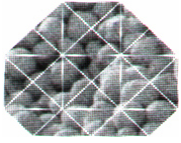
## **Environmental Directives for Use of Coal Ash** **Marine Construction**

- \* Accepted engineering separation between ash and seawater.**

## **Building & Building Products**

- \* Exemption for fly ash as an additive to cement and concrete.**
- \* Dose constraint of 0.3 mSv/y, as addition to the natural background radiation, for building products.**
- \* Leaching tests on products made mainly of Coal Ash.**





# National Coal Ash Board

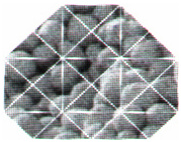
## Environmental Directives for Use of Coal Ash

### Agriculture

- \* Exemption for bottom ash in cultivation bedding for plants and animals (still in review).
- \* Land stabilization and soil improvement depend on leaching tests.

### Novel uses

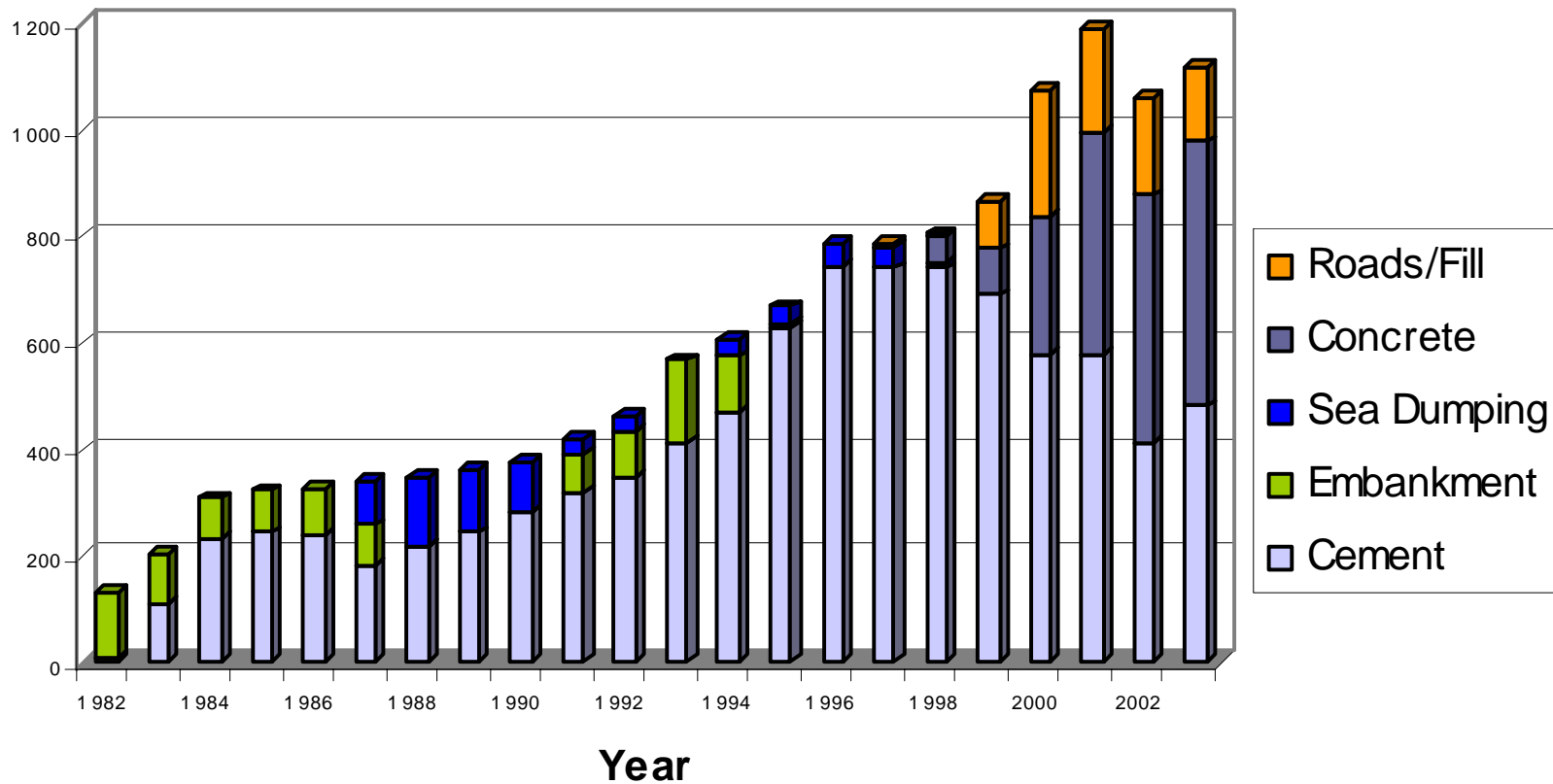
- \* Depend on tests to be determined by the Ministry of the Environment.

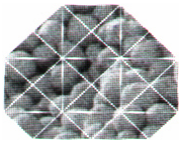


# National Coal Ash Board

## Fly Ash Destination

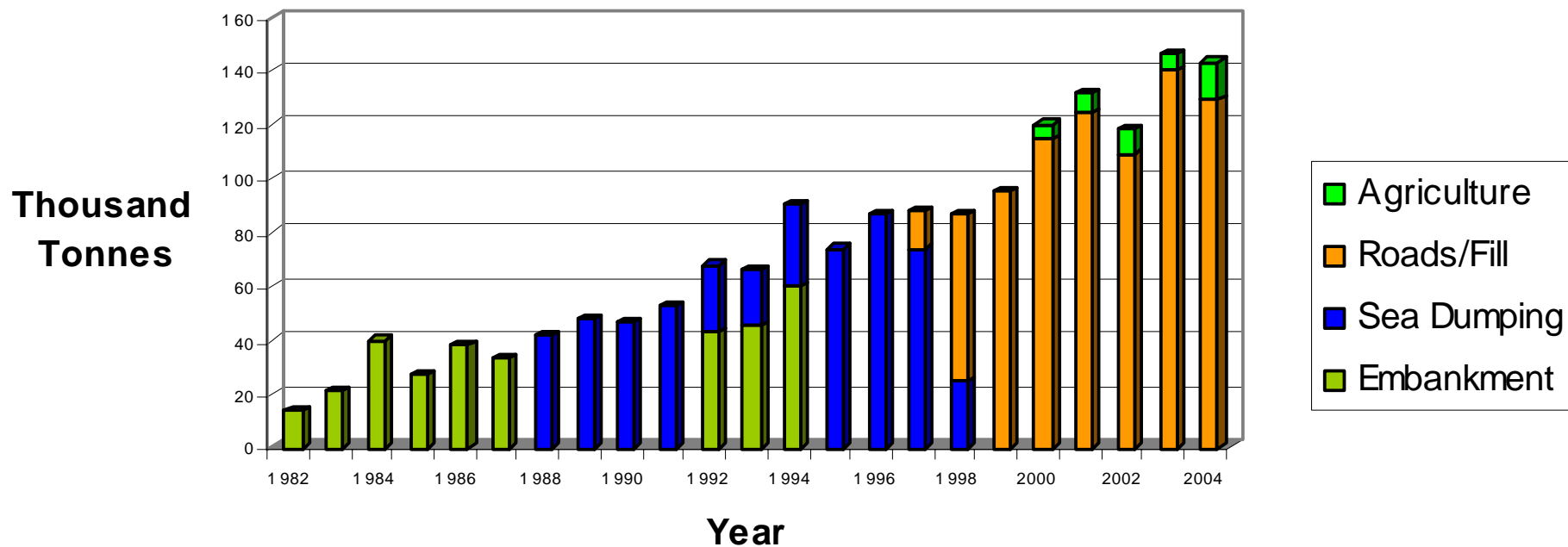
Thousand  
Tonnes

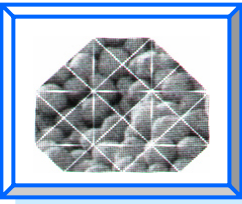




# National Coal Ash Board

## Bottom Ash Destination





# National Coal Ash Board

## Coal Ash Destination

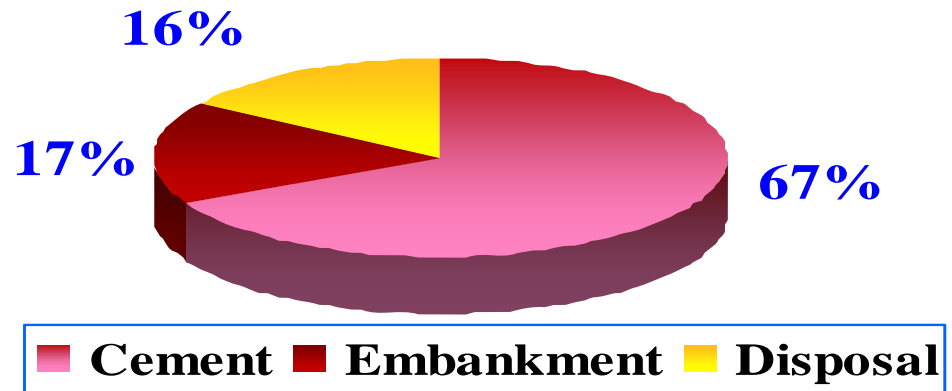
### Characteristics

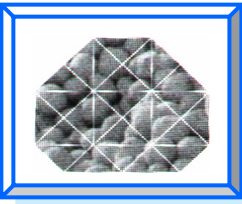
A Single Customer

A Once Only Project

Disposal of the Remainder

1982 - 1996  
1 Mil. Tonnes





# National Coal Ash Board

## Coal Ash Destination

**Characteristics**

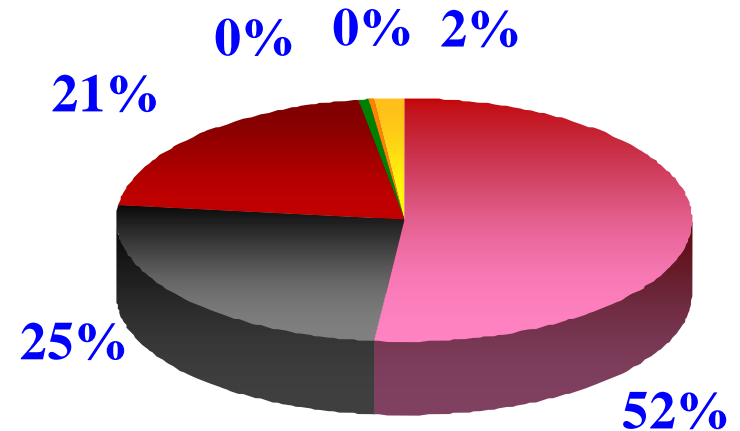
**Customers Dispersion**

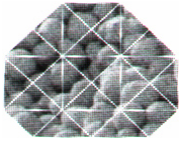
**Additional Uses Development**

**Remainders to Structural Fill**

**Storage Restrictions**

**1997 - 2004**  
**9.2 Mil. Tonnes**





# National Coal Ash Board

## Coal Ash Destination

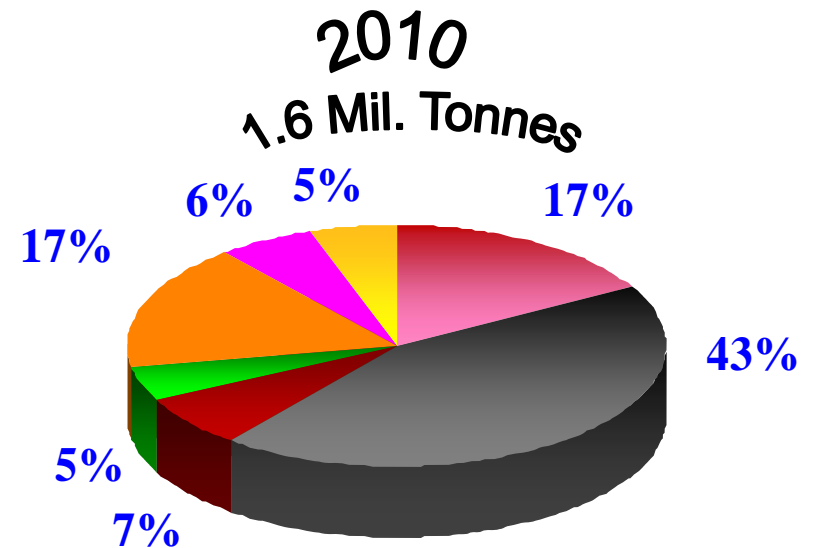
### Characteristics

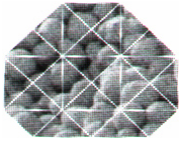
Uses Diversity

Customers Dispersion

Continuous Supply

Adequate Storage System





# National Coal Ash Board

## Potential Future Benefit

### *Macro-Economic Viewpoint*

**Present Value – 30 years, 5% discount**

Thousand tonnes, Million \$

Utilization Alternative					Uses
Partial Extraction			Max. Develop.		
Value		Quant.			
Fill	Paving			Value	
195	195	1,015	300	1,155	Building
-30	40	585	20	265	Paving
			30	95	Agricult.
			140	85	Industry
165	235	1,600	490	1,600	Total
10	15		30	Annual Benefit	