

Industrial Minerals Conference

The Americas - Minerals into the Millennium

Brazilian Industrial Minerals Overview:

Selected Highlights and Perspectives

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Brazilian Industrial Minerals Overview: *Selected Highlights and Perspectives*

- **Macroeconomic Environment**
- **Mineral Sector Overview**
- **Supply of Industrial Minerals**
- **Highlights from the Demand Side**
- **Outlook and Perspectives**

Macroeconomic Environment

➤ Inflation & Growth

➤ Balance of Payments

➤ International Reserves

➤ Net Flow of Foreign Investments

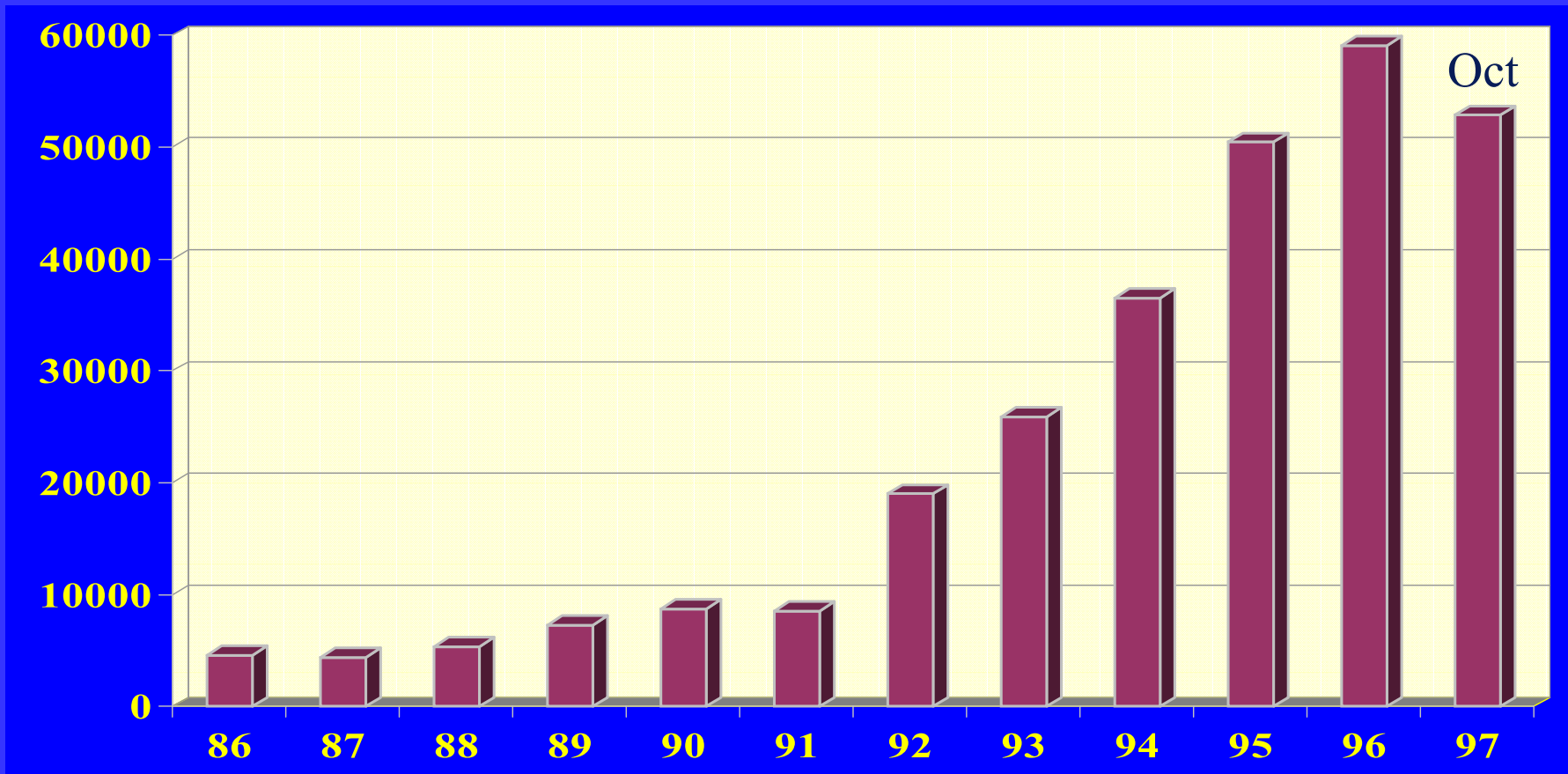
➤ Climate of Investments

➤ Fundamental Challenges

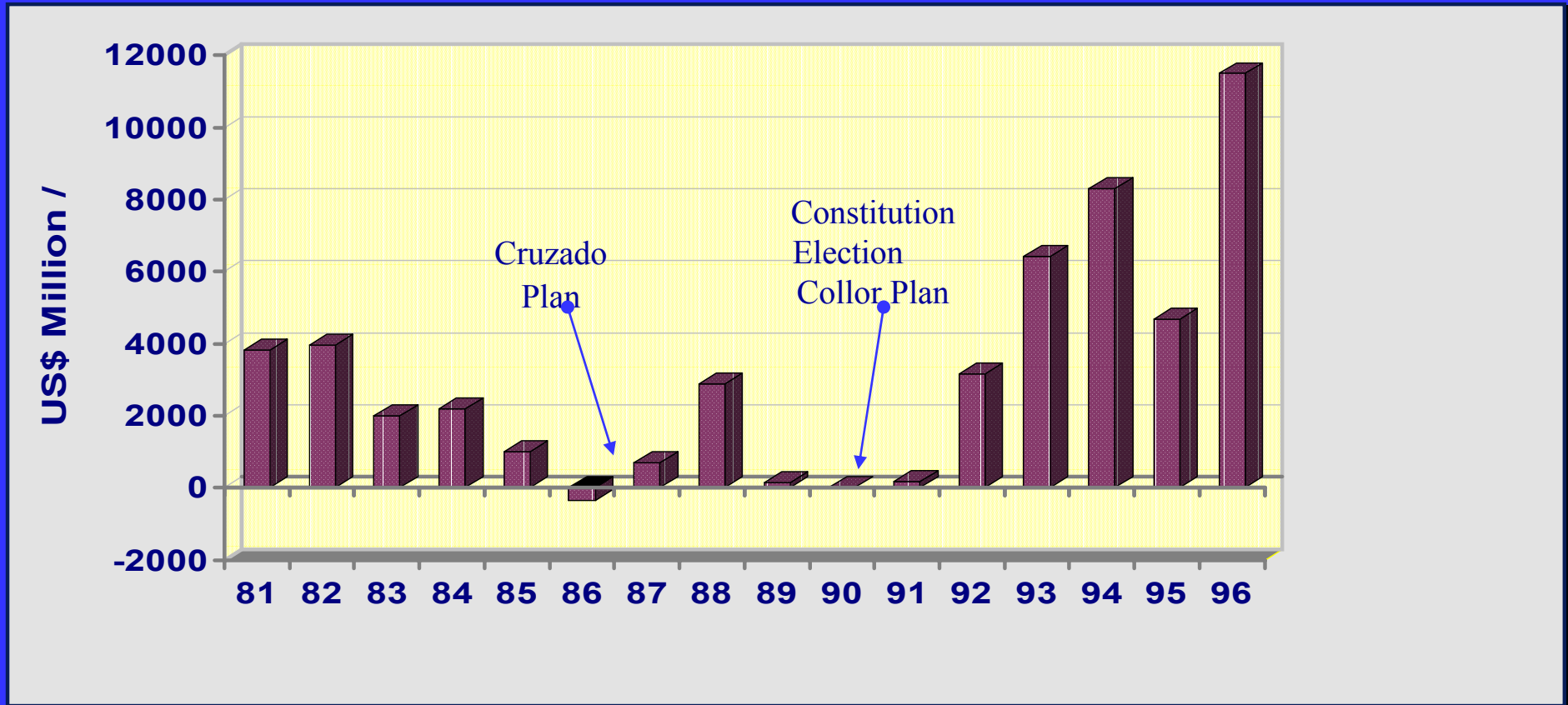
International Reserves

1986 / 1997

US\$ Million

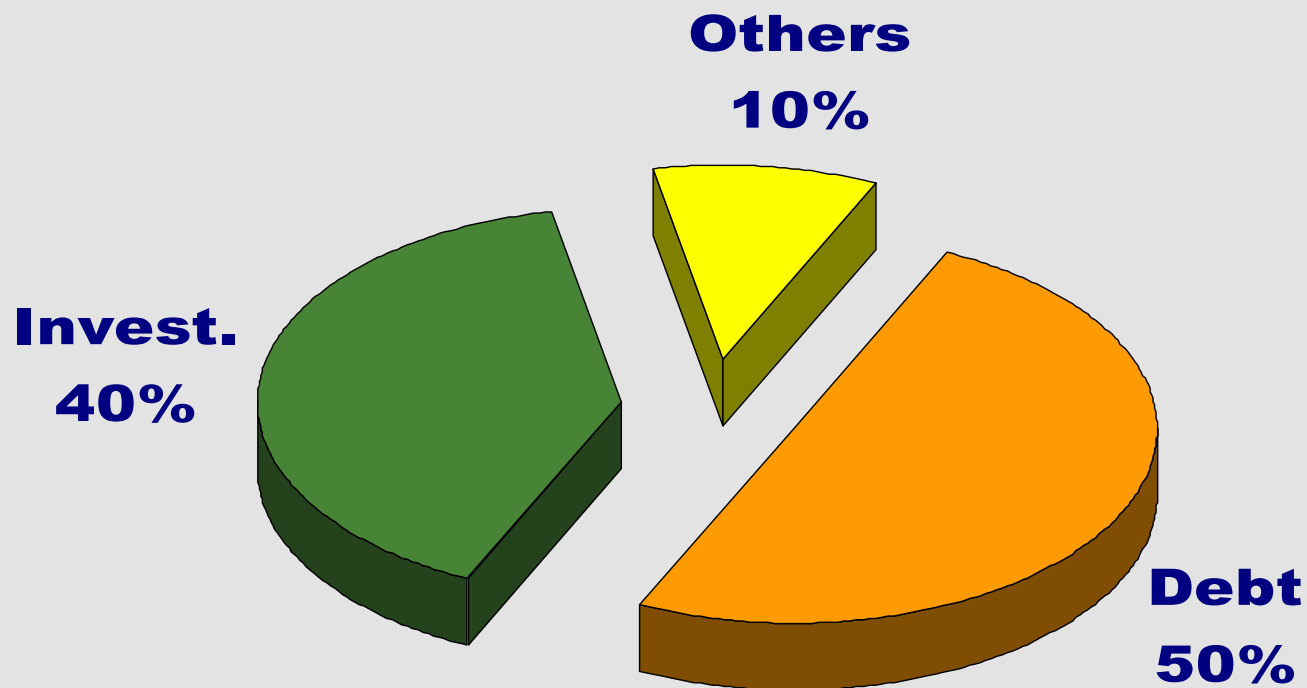


Net Flow of Foreign Investments



Net Stock of Foreign Capital: US\$115 Billion

Profile: 1981/96



Climate of Investments

- ◆ **Political Stability**
- ◆ **Confidence in the Political Economy**
- ◆ **Tradition as a Good Guest to Foreign Capital**
- ◆ **Actual and Potential Size of Domestic Market**
- ◆ **Diversity, Level of Integration and Sophistication of the Industrial and Technological Base**
- ◆ **Speed and Scope of the Privatization Program**

Climate of Investments

- ◆ **Competitive Advantages as a Launch Pad to Global Exports**
- ◆ **Significance within the MERCOSUR**
- ◆ **Competitive Taxation System**
- ◆ **Modern and Large Financial Market**
- ◆ **Clear and Liberal Legal Frame Regulating Flows of Foreign Capital**

Mineral Sector Overview

➤ **Basic Indicators**

➤ **Links with the Macroeconomic Expectancies**

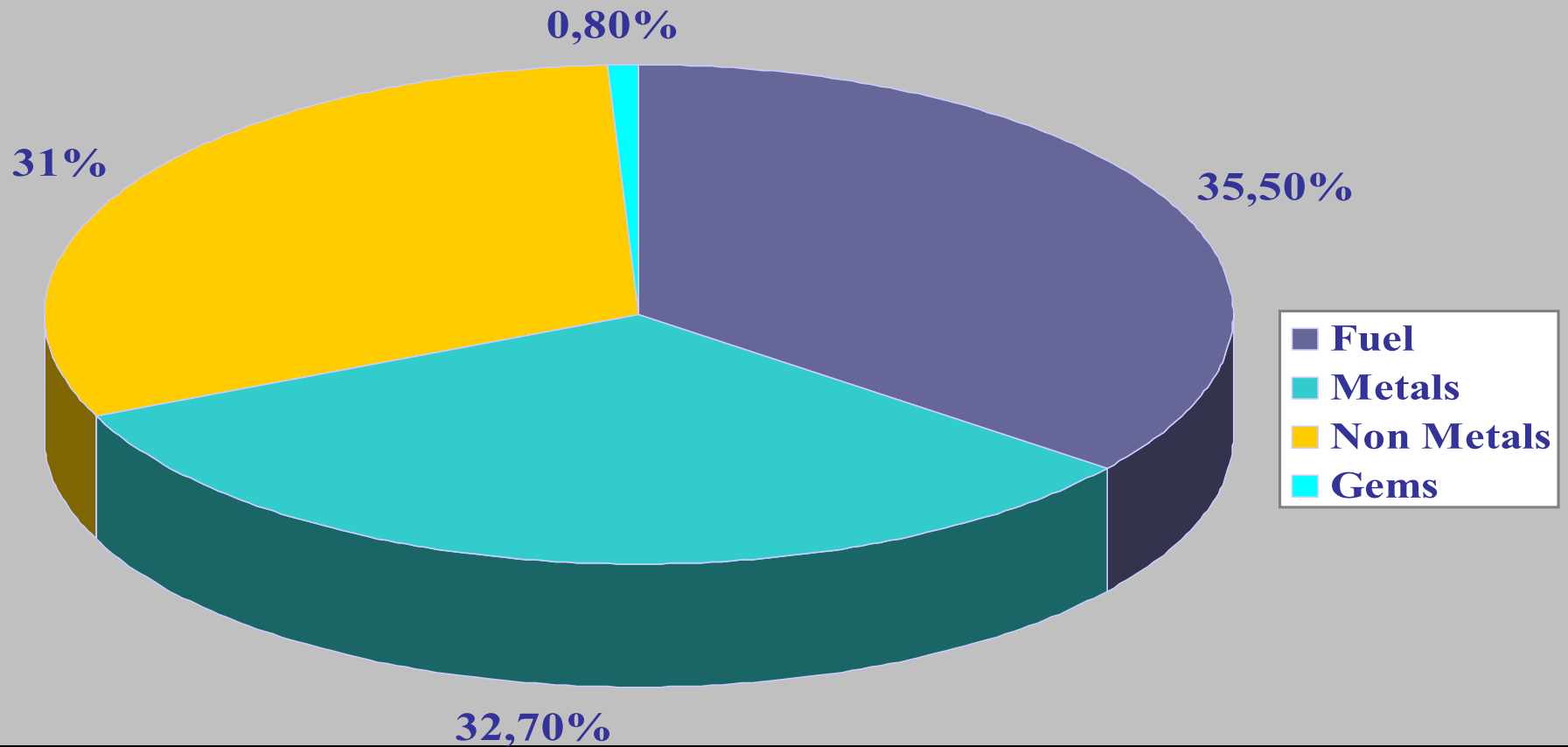
➤ **The Role of Foreign Capital**

➤ **The Change in *Minebusiness* Climate**

Mineral Sector Indicators : 1996

- **Gross Value of Mining Production : US\$ 14.4 Billion**
- **Added Value of Mining Production : US\$ 10.3 Billion**
- **Added Value of Mineral Production : US\$ 76.9 Billion**
- **Total Exports of Mineral Products : US\$ 11.4 Billion ^P**
- **Total Imports of Mineral Products : US\$ 10.0 Billion ^P**

Mineral Sector Indicators : 1996



Mineral Sector Indicators : 1996

Relevance in World Reserves

- **Niobium :** (1st / 88%)
- **Kaolin :** (2nd / 14%)
- **Graphite :** (2nd / 13%)
- **Aluminum :** (3rd / 14%)
- **Vermiculite:** (3rd / 6%)
- **Iron Ore :** (5th / 9%)
- **Magnesite :(5th / 5%)**
- **Manganese :** (5th / 1%)
- **Fluorite :** (6th / 3%)
- **Tin :** (7th / 7%)

Mineral Sector Indicators : 1996

Relevance in World Production

- **Niobium :** (1st / 88%)
- **Iron Ore :** (2nd / 18%)
- **Tin :** (4th / 10%)
- **Magnesite:** (4th / 12%)
- **Aluminum :** (4th / 9%)
- **Kaolin :** (4th / 4%)
- **Manganese :** (5th / 13%)
- **Asbestos :** (5th / 7%)
- **Graphite :** (5th / 4%)
- **Talc :** (6th / 6%)
- **Fluorite :** (6th / 2%)
- **Dim. Stones :** (7th / 5%)

Foreign Investments in Mineral Sector

Countries

- ❑ **Australia, Argentina, Belgium, Canada,**
- ❑ **China, France, Germany, Holland, Italy,**
- ❑ **Japan, Norway, Portugal, South Africa,**
- ❑ **South Korea, Spanish, United Kingdom,**
- ❑ **United States**

Foreign Investments in Mineral Sector

Groups and/or Companies

- **AKW, Alcan, Alcoa, Ambrex, Anglo American,**
- **Bayer, Barrick, BHP, Billiton, CEMEX, Echo Bay,**
- **Eldorado, ECC, Gold Star, Gencor, Holderbank,**
- **Homestake, IFC, Inco, Itochu, JMC, Jordex,**
- **Kawasaki, Lafarge, Lysander, Madison, Marubeni,**
- **Mitsubishi, Mitsui, Molycorp, Newmont, Nippon**
- **Steel, Nisho Iwai, Noranda, Norsk Hydro, Nomura,**
- **Pegasus, Posco, Placer, Reynolds, RTZ, Santa Fe,**
- **Southern Copper, Teck, TVX, Utah, WMC**

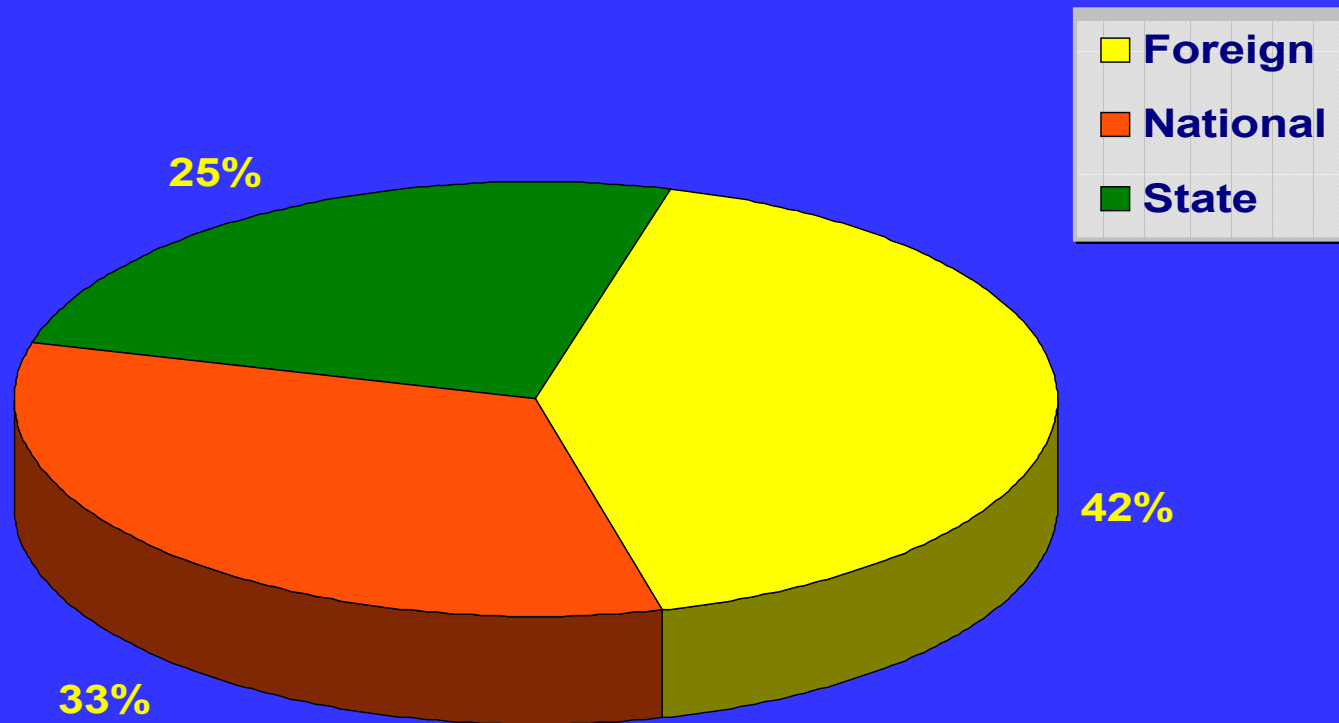
Foreign Investments in Mineral Sector

Mineral Products

- ◆ **Alumina, Aluminum, Bauxite,**
- ◆ **Cement, Copper, Chromium,**
- ◆ **Diamonds, Dimension Stones,**
- ◆ **Feldspar, Gold, Gypsum, Iron ore,**
- ◆ **Kaolin, Mineral Water, Niobium,**
- ◆ **Nickel, Steel, Tin, Titanium, Zinc**

Sources of Funds: 1980's

Prospection and Exploration



Climate of Investments in Mineral Sector

- ❖ **Removal of Constraints to Foreign Capital**
- ❖ **Sensitive Reduction in Taxation**
- ❖ **Modernization of the Mining Code**
- ❖ **Administrative Reform of Government Agencies**
- ❖ **Determination to Guarantee Legal Stability**
- ❖ **Ample Privatization Program**

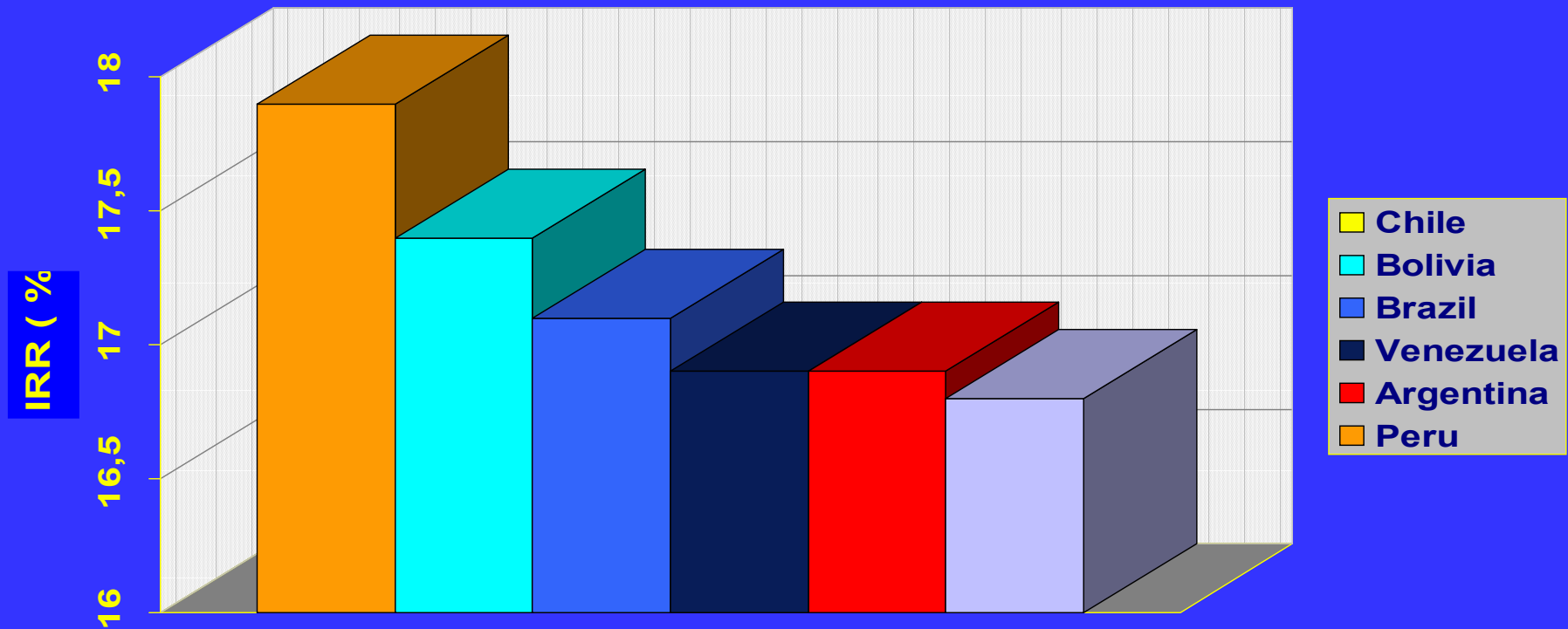
Climate of Investment in Mineral Sector

- ❖ **Real Commitment to Reduce the Brazil's Cost** => *taxation + infrastructure + cost of capital + administrative costs*
- ❖ **Extension and Diversity of Geological Environments**
- ❖ **Mining Legislation Clear and Transparent in Granting Exploration and Mining Concessions**
- ❖ **Exploration Permits are Granted for an Initial Maximum 3 year Period, but can be Extended if Justified**
- ❖ **It does not have a Maximum Period for the Mining Concession**

Climate of Investment in Mineral Sector

- ❖ Good Flexibility in Transferring Exploration and Exploitation Rights**
- ❖ Great Number of Mining , Suppliers and Consulting Companies Composing an Expressive Network of Potential Partners, Sellers, Buyers and Customers**
- ❖ A Modern and Seasoned Institutional Frame of Specialized Government Agencies**
- ❖ Several Incentives at Regional and Sector levels**

IRR of a Simulated Gold Project

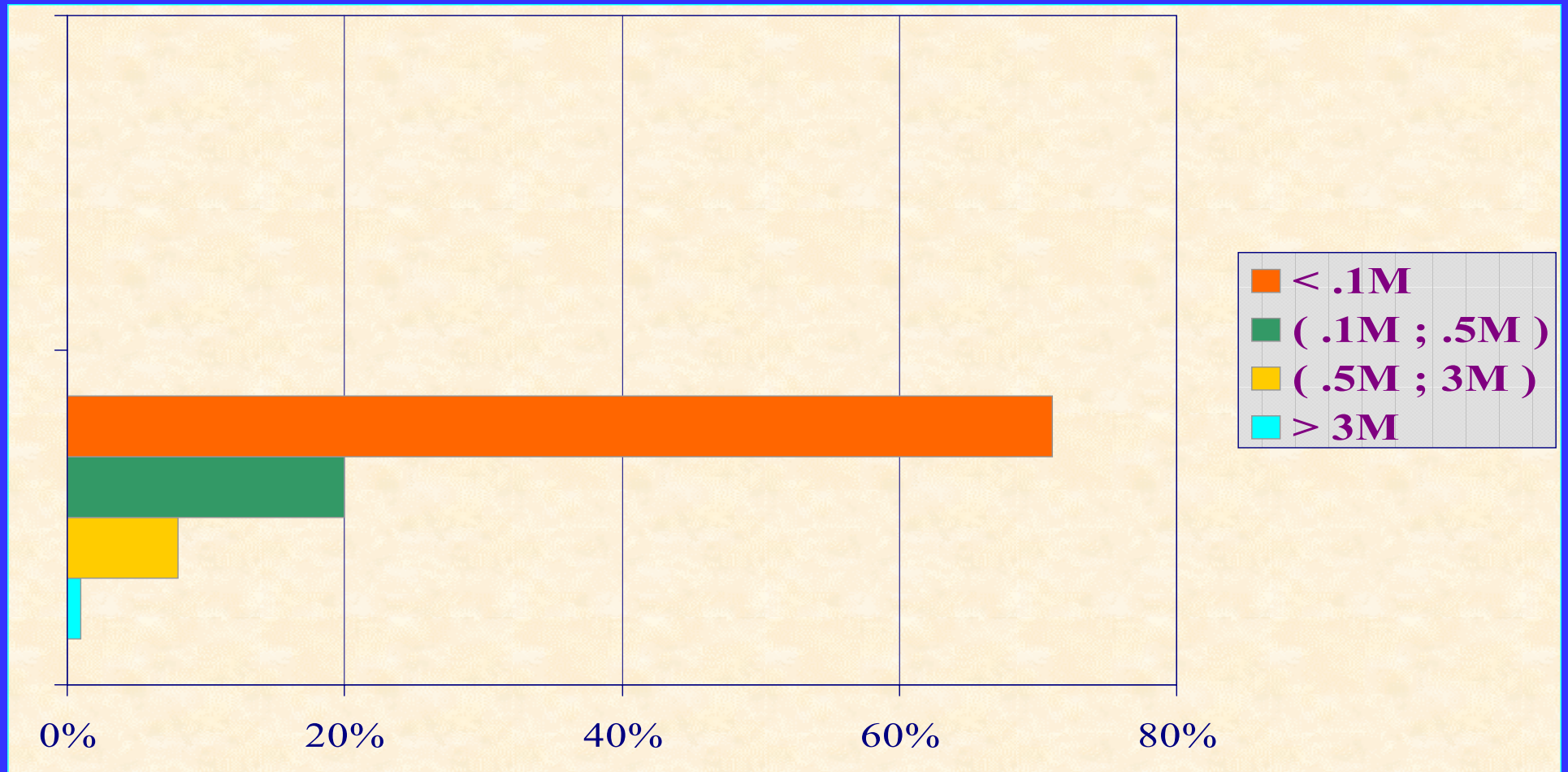


Supply of Industrial Minerals

Selected Issues

- ◆ **Expressive Geological Potential and Modest Reserves**
- ◆ **The Importance Attributable to the Exploitation and Processing of Industrial Minerals is Relatively Recent**
- ◆ **The Non Metals Answer for 31% of the Value of Mineral Production but the Major Share is Relating to Construction Industry**
- ◆ **Great Number of Small and Medium Sized Companies**
- ◆ **Low Price Products**
- ◆ **Focus on Regional Markets**
- ◆ **Low Level of Industrial Integration**
- ◆ **Low Level of Investments in R&D**

Mine Sizes Profile



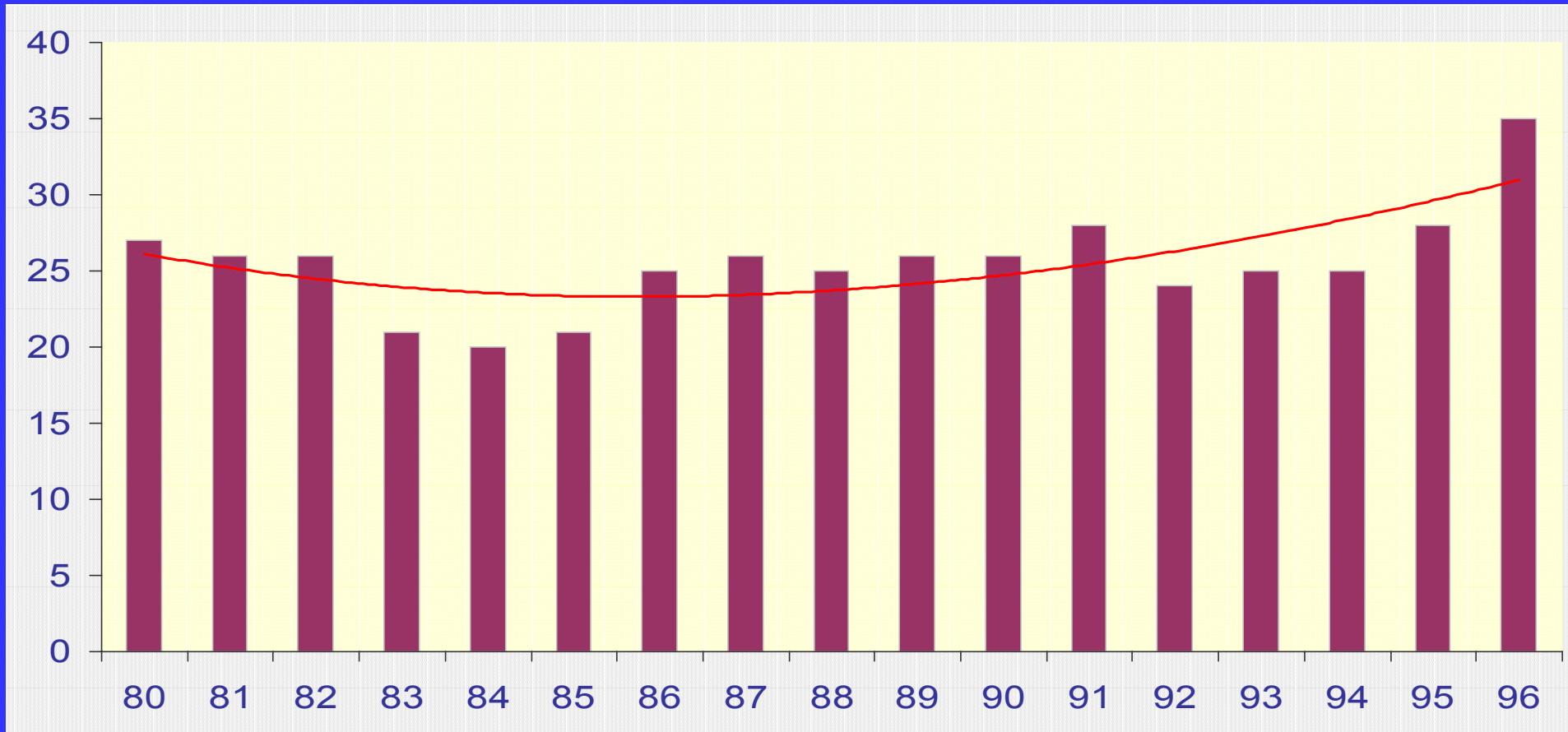
Supply of Industrial Minerals

MINERALS	RESERVES ¹	PRODUCTION ²	UNIT COST OF Δ RESERVES ³	UNIT COST OF Δ PRODUCTION ⁴
Asbestos	159,000	3,706	1	1,723
Barite	50,000	43	3.12	278
Refr. Bauxite	565,200	1,109	70.20	
Bentonite	33,652	167		
Clays	1,957,227	25,475		
Dolomite	1,800,971	2,912		
Fluorite	177,664	271	2.50	1,051
Gypsum	1,081,778	953	14	27
Granite ³	1,669,611	512		
Graphite	96,672	710	38	1,683
Kaolin	1,156,170	1,958	19	226
Magnesite	720,023	1,211	3.20	453
Phosphate	2,712,062	24,761	96	196
Potash	9,179,902	1,294	194	2372
Talc	64,018	298	6.54	89

- (1) Measure and Indicated Reserves (10³ tons of ore)
- (2) Run of Mine. (10³ tons of ore)
- (3) Unit Average Cost for Incorporation of New Reserves (US\$/t)
- (4) Unit Average Investment for the Increase of Annual Production

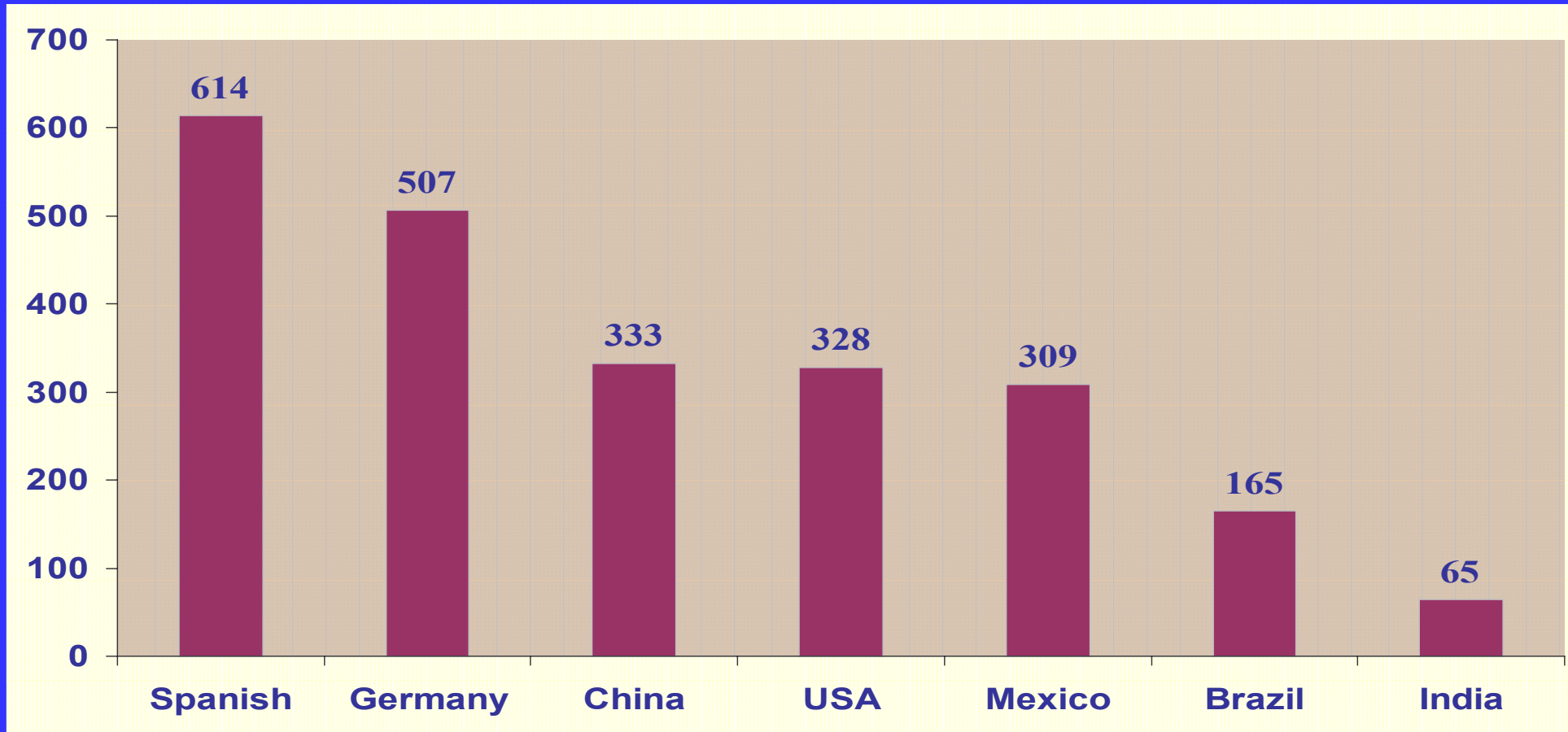
Cement Production

(Million of tons)



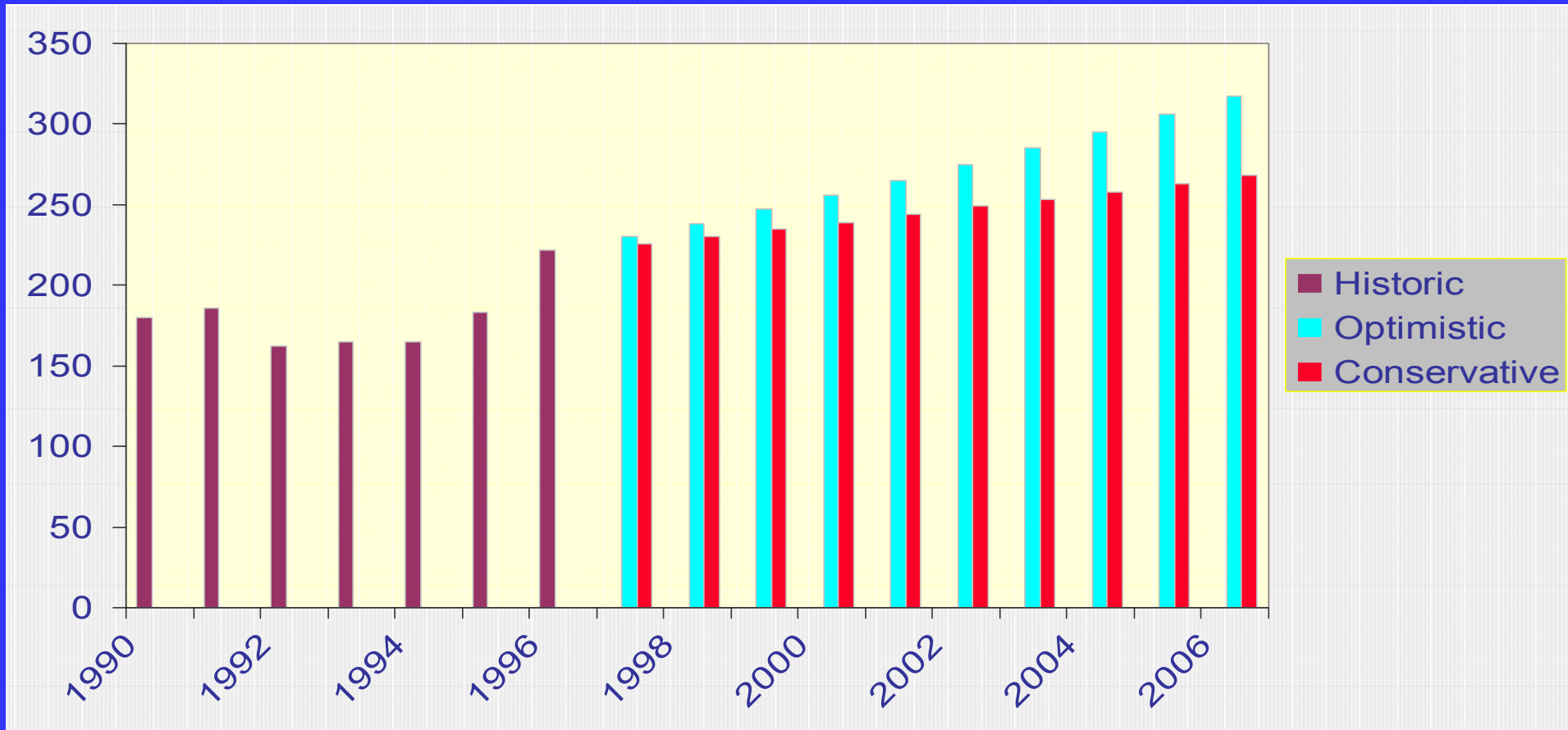
Cement Consumption

Per Capita (kg/year)



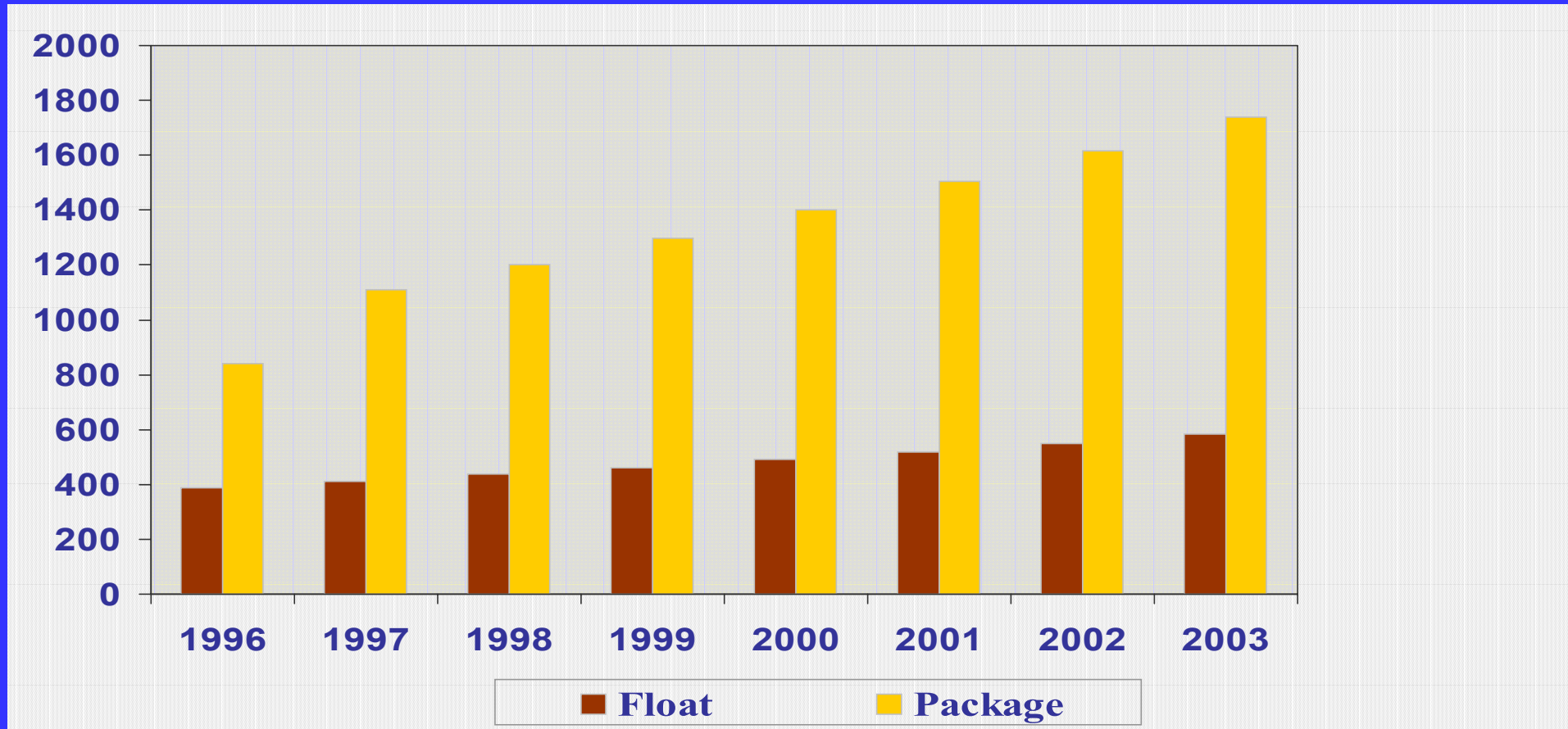
Cement Consumption

Per Capita (kg/year)



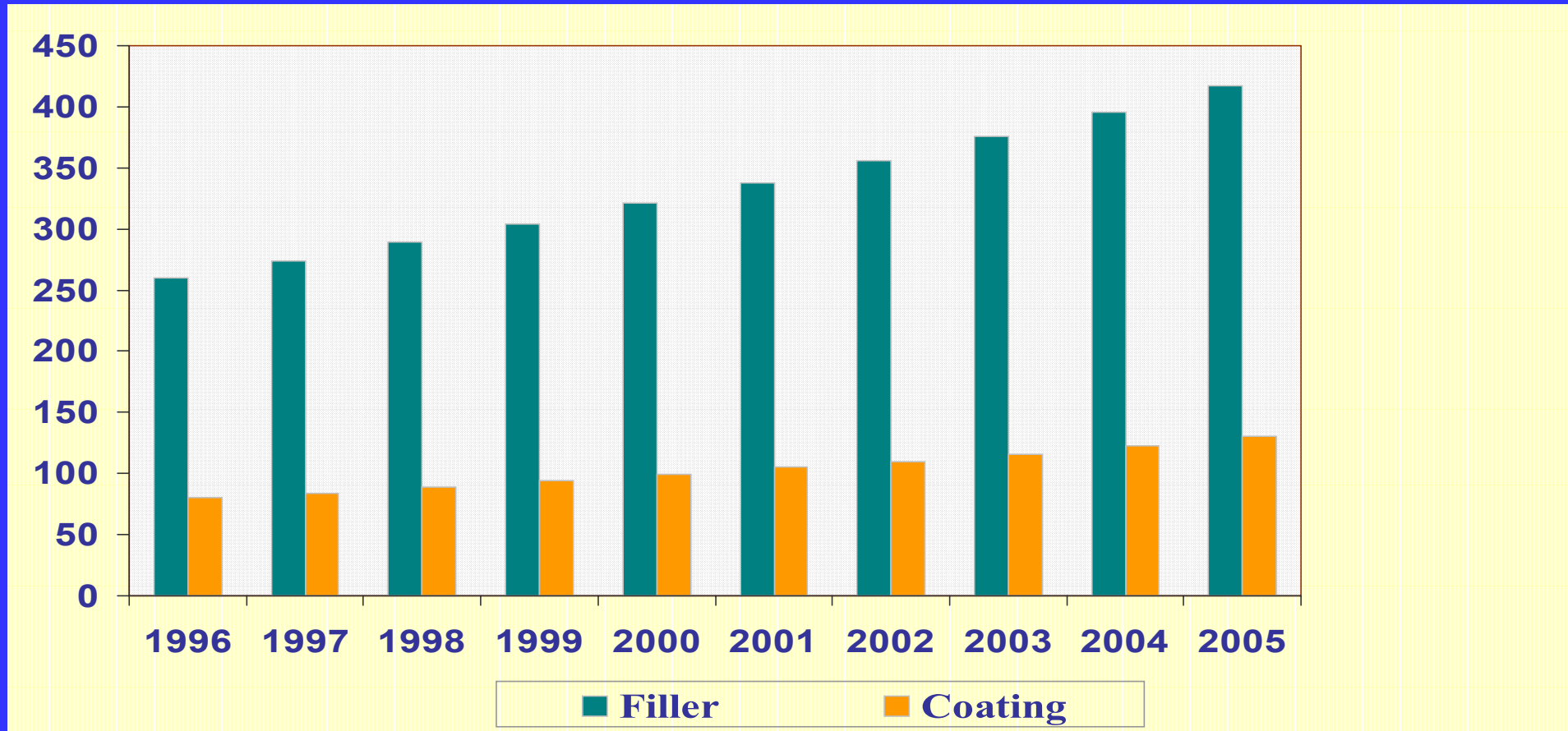
Consumption of Glass

(Thousand of tons)



Consumption of Kaolin

(Thousand of tons)



Investments in Mining: 1978 / 2010

