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2006 EMD Market Review and Forecast

**Li Tongqing
CITIC Dameng Mining Industries Ltd.**

**IMI EPD Meeting, March 30, 2007
Guilin, China**

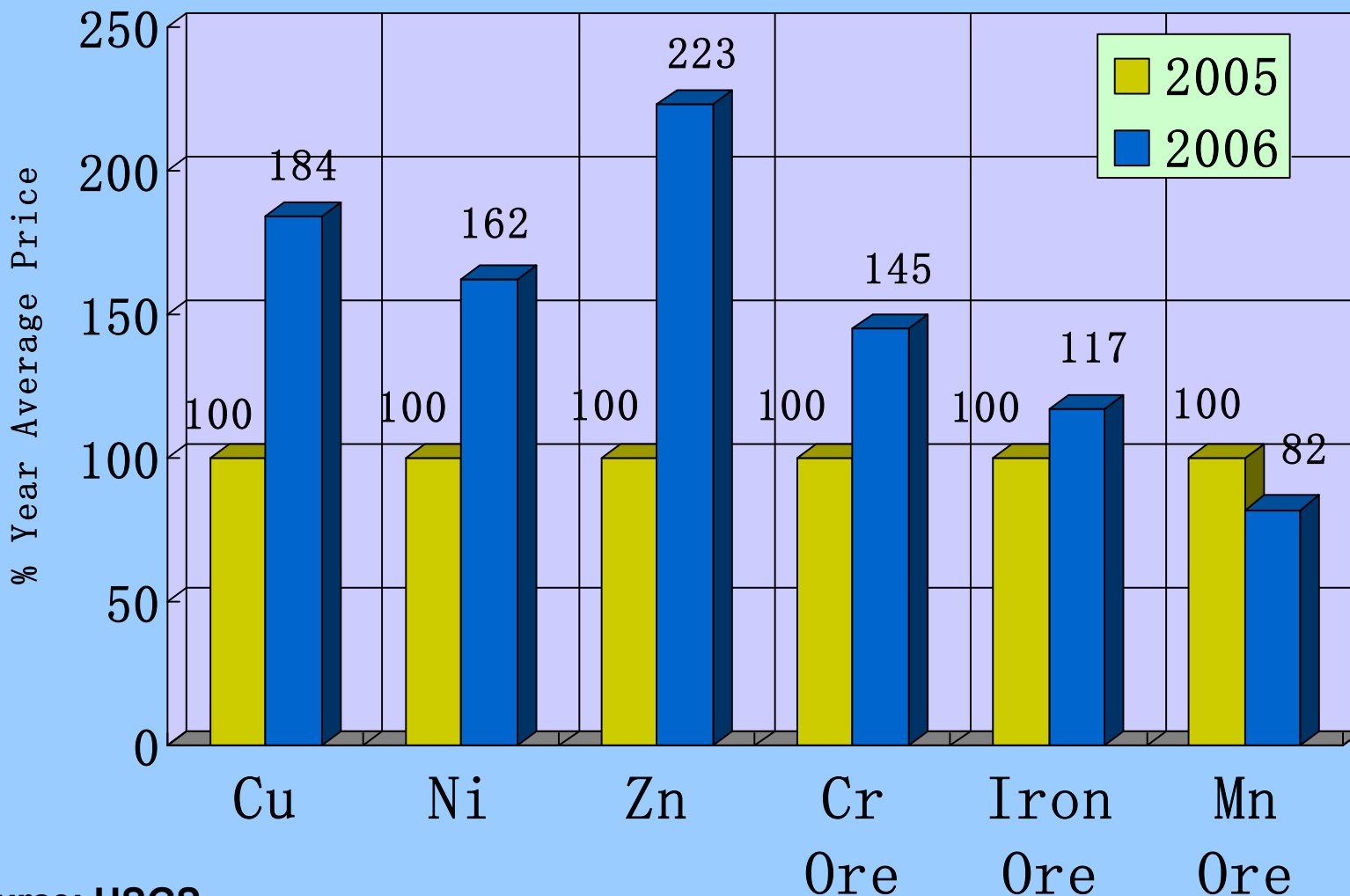


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2006 EMD Market Review (1)

- The price of manganese ore decreased in world market.
- The price for alkaline grade EMD was stable or slightly rising, while the price for C-Zn grade EMD has declined due to over supply in the market.
- The surplus supply situation has emerged in world market.
- Mitsui of Japan and Eveready India discontinued their EMD production in 2006.
- China increased exports of both grade EMD significantly in 2006.

Price Changes of Mn Ore vs Base Metals



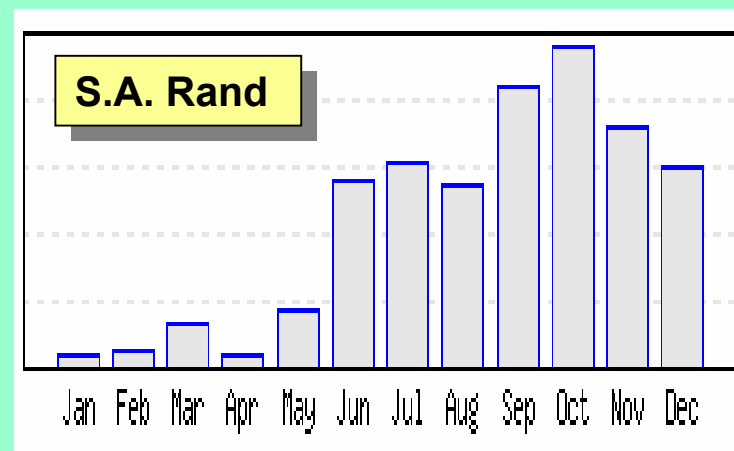
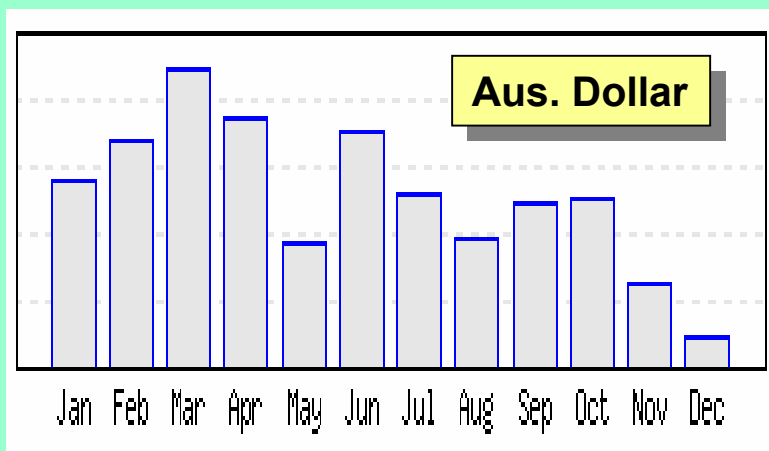
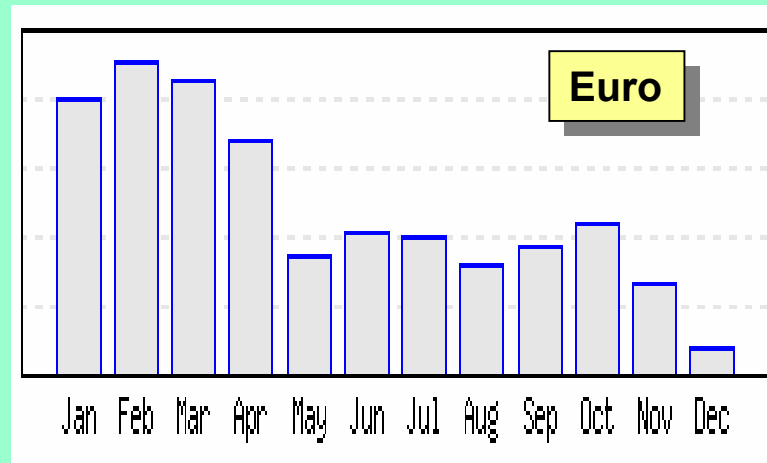
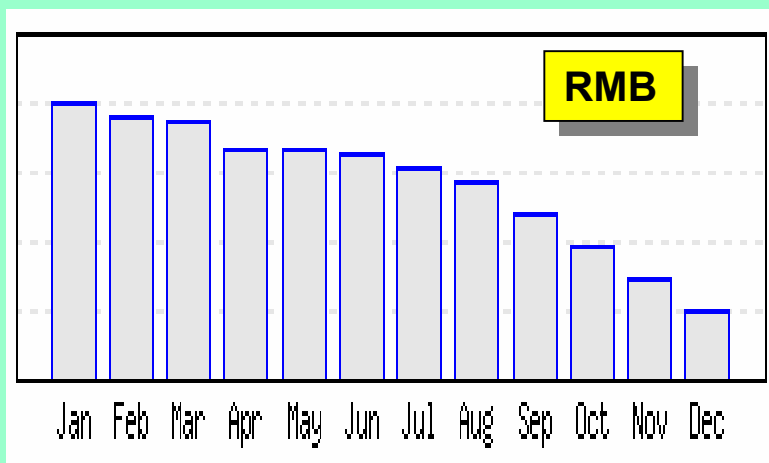
Source: USGS



2006 EMD Market Review (2)

- The weak US Dollars impaired EMD producers in China, Australia and Europe.
- Having a deficit of Rand 86 million, Delta fall again in a losing proposition in 2006,
- Delta is facing an antidumping investigation requested by an EMD producer from Greece concerning Delta's EMD production in South Africa. Indeed, ***the future challenges of EMD industry are here TODAY.***
- It is likely that the market strategy of defaming competitors does not work in retrieving oneself from an inferior position.

Selected Foreign Exchange Rate Trends to US Dollar in 2006





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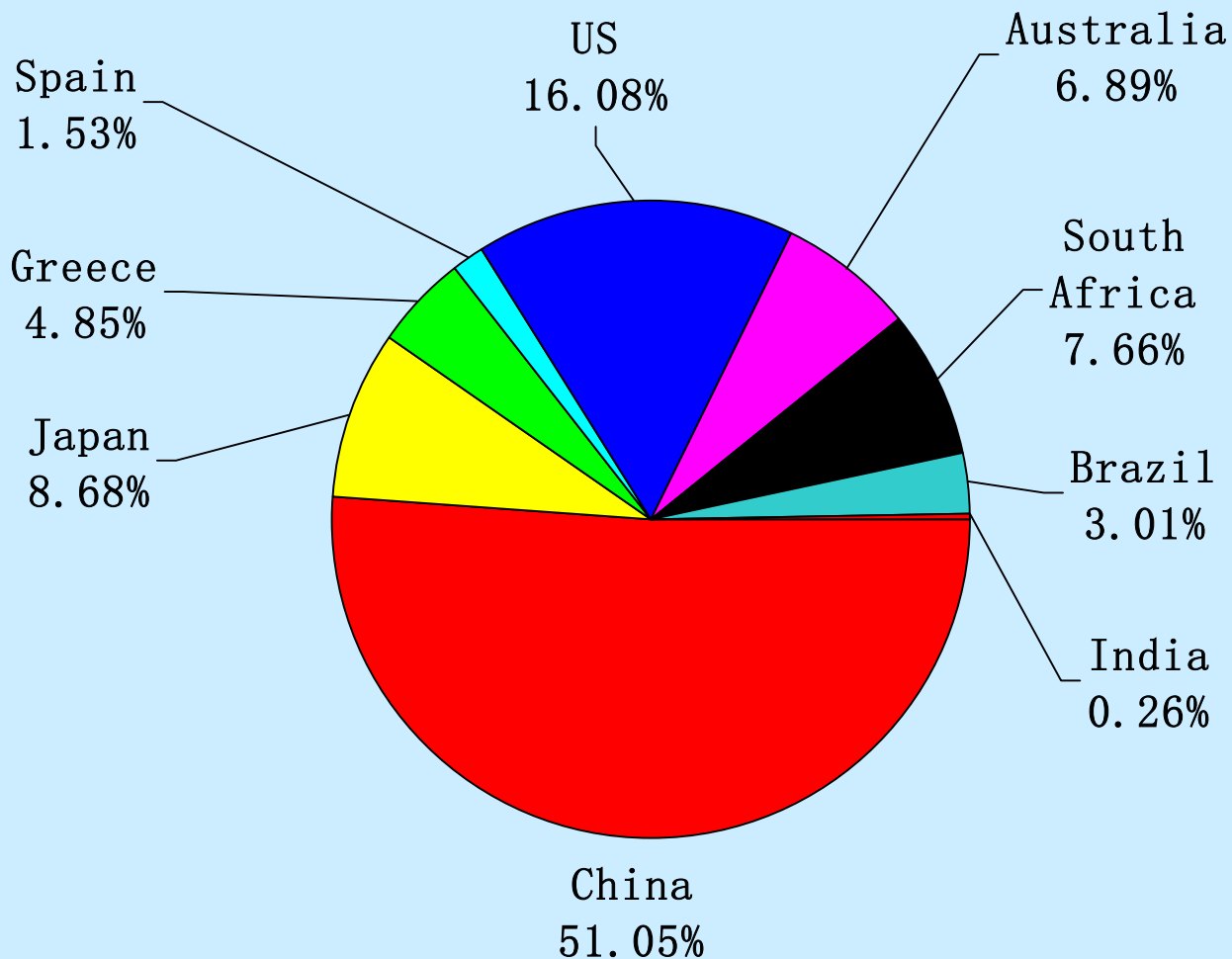
Global EMD Business:

World EMD Production Capacity (at the end of 2006)

Country	Company	MT/y	Country	Company	MT/y
China	15 Companies	200,000	U S	Erachem	25,000
Japan*	Tosoh	34,000	Australia	Delta	27,000
Greece	Tosoh	19,000	South Africa	Delta	30,000
Spain	Cegasa	6,000	Brazil	SBEL	6,000
U S	Eveready	11,000	Brazil	EML	5,800
U S	Tronox	27,000	India*	MOIL	1,000
Total:		367,800			
*Excluding the capacity of Mitsui, Japan (24,000) and Eveready India (5,000), which discontinued EMD production in 2006.					



World EMD Production Capacity (at the end of 2006)





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Major EMD Exports by Country

Unit: MT

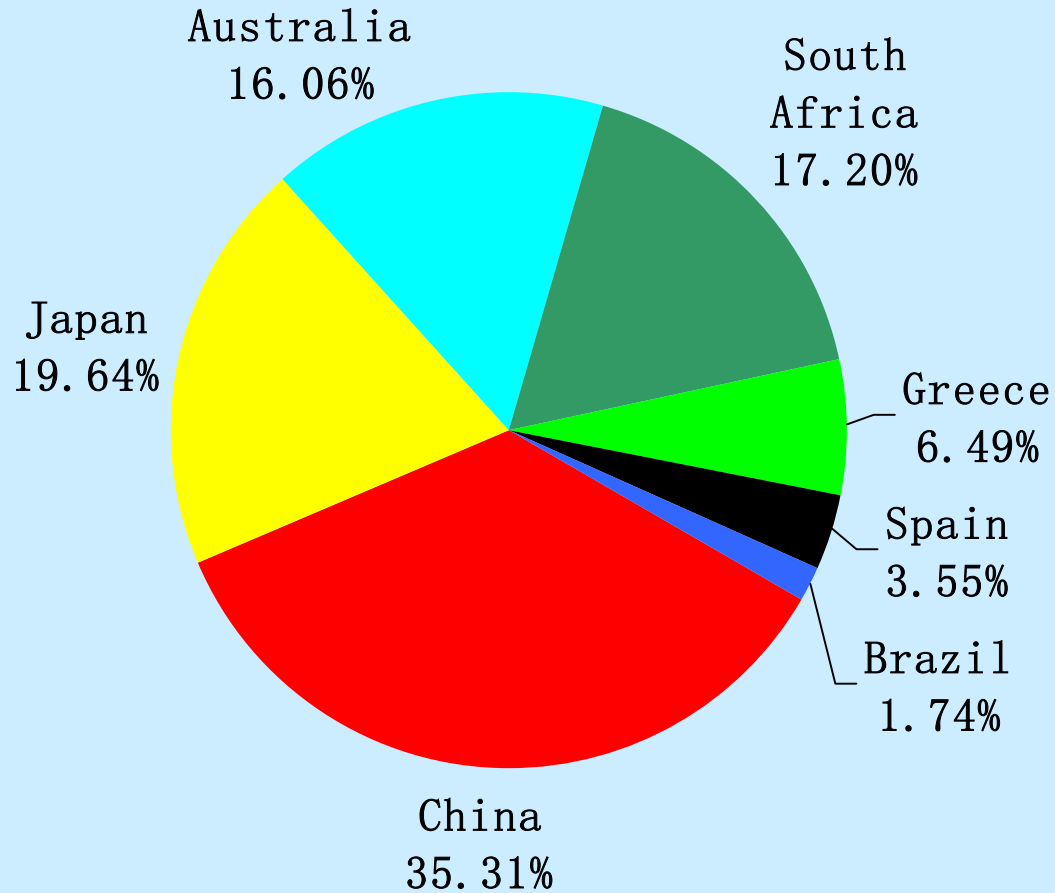
Country	2005	2006	Change %
China	34,339	52,758	+ 53.64
Japan	29,086	29,341	+ 0.88
Australia	33,236	24,000 ^e	- 27.79 ^e
South Africa	32,262	25,696	- 20.35
Greece	11,007 ^e	9,700 ^e	- 11.87 ^e
Spain	2,426	5,307	+ 118.75
Brazil	6,408	2601*	- 59.42*
Total	148,764	149,403	+ 0.43

^e Estimated

*Including NMD



2006 Major EMD Exports by Country





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Major EMD Imports by Country

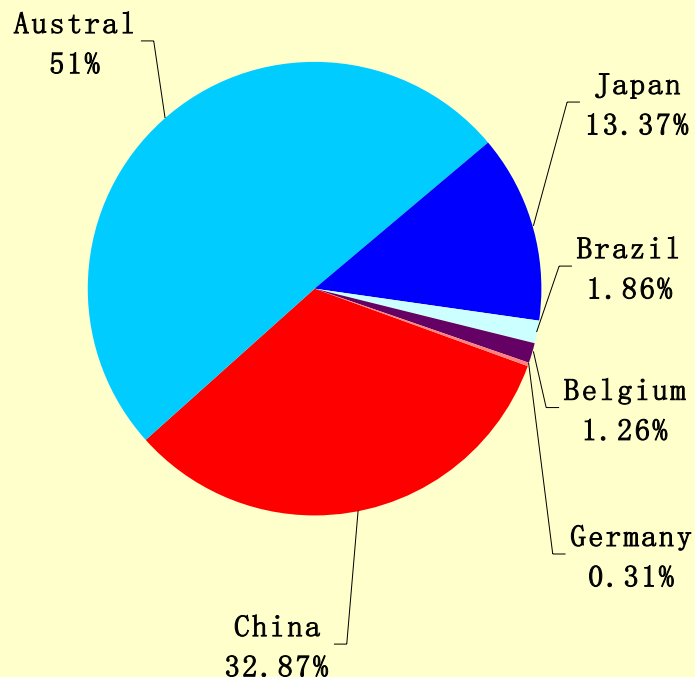
Unit: MT

Country	2005	2006	Change %
U S	31,940	36,861	+ 24.80
Belgium	27,013	24,798	- 8.20
Indonesia	20,685	21,760	+ 5.20
Japan	13,399	14,050	+ 4.86
Germany	10,487	11,019	+ 5.07
Singapore	10,005		
China	9,010	7,942	- 11.85
India	5,458	8,966	+ 64.27
Korea	4,412	4,000	- 9.33
Switzerland	3,945	3,065	- 22.30
Thailand	2,201		
Poland	1,959	2,146	+ 9.54
Malaysia	1,699		
Total	142,213		

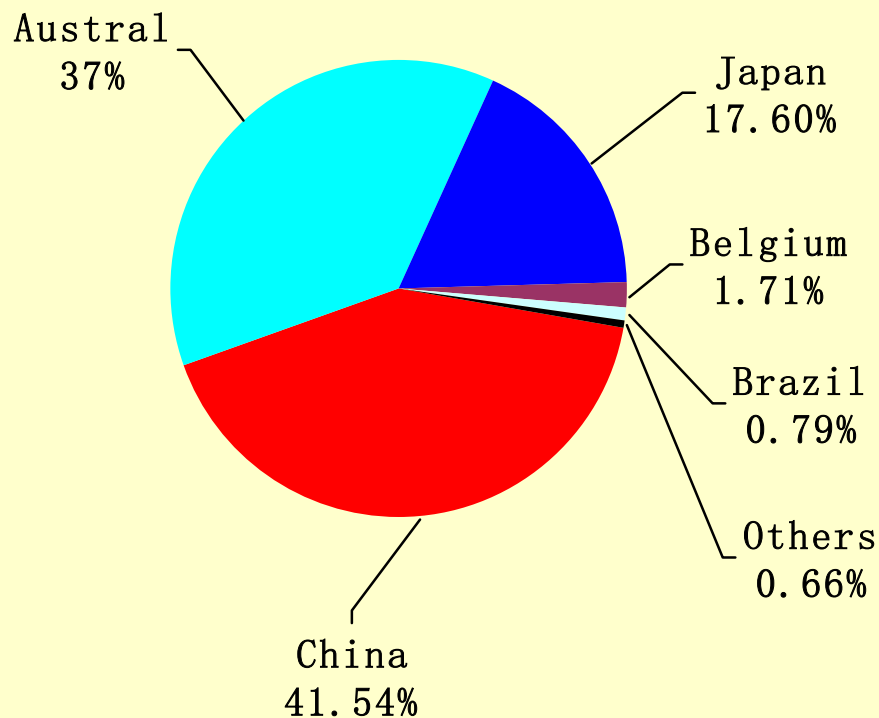


2005 - 2006 US EMD Imports

2005 31,940MT



2006 36,861 MT

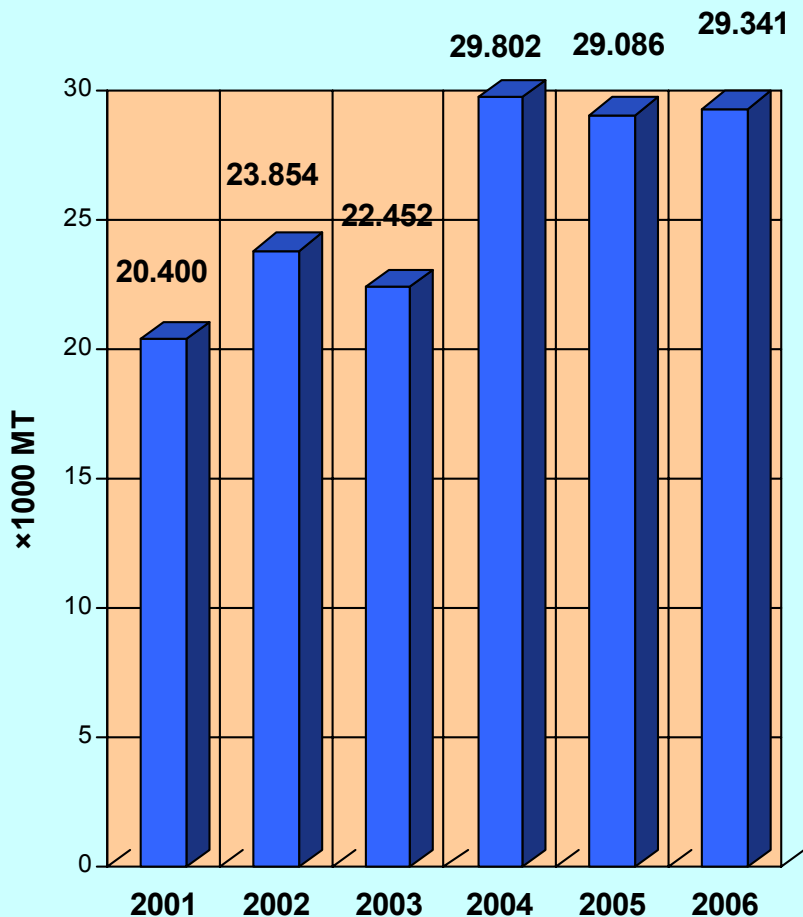




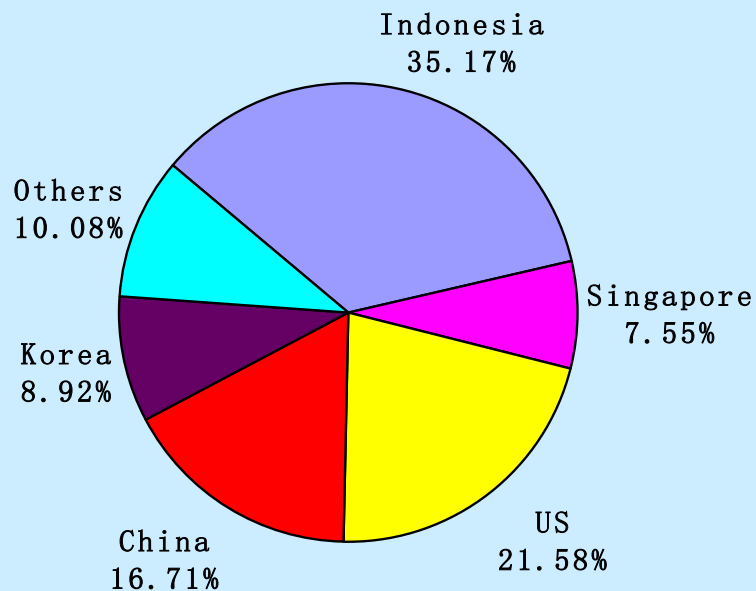
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Japan EMD Exports

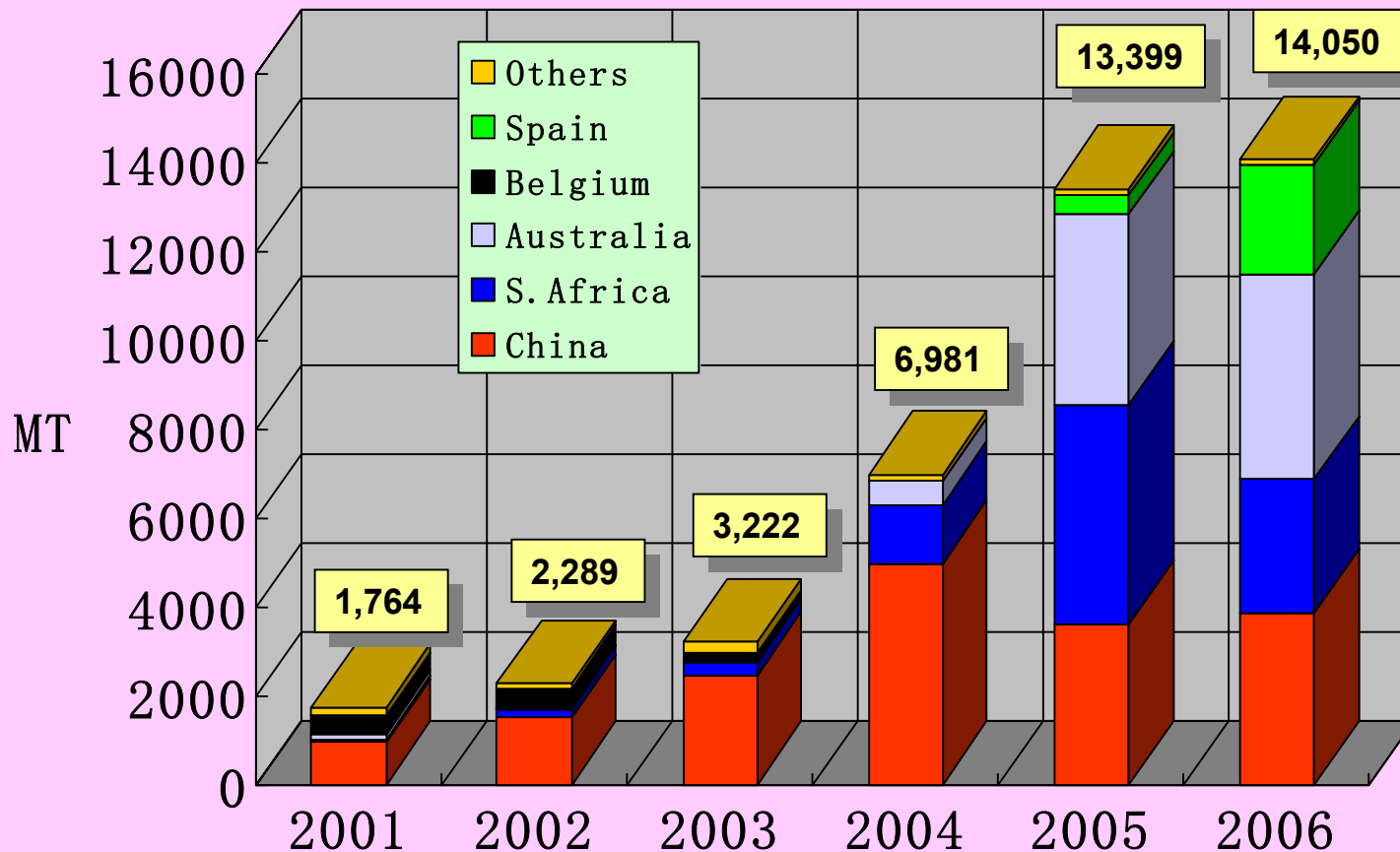
2001- 2006 Japan EMD Exports



2006 Japan EMD Exports by Country



Japan EMD Imports by Country

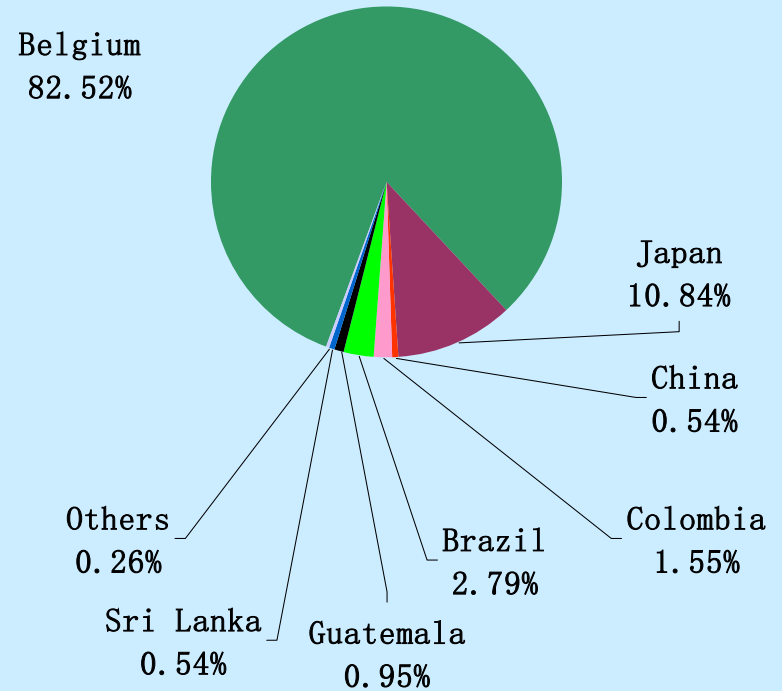
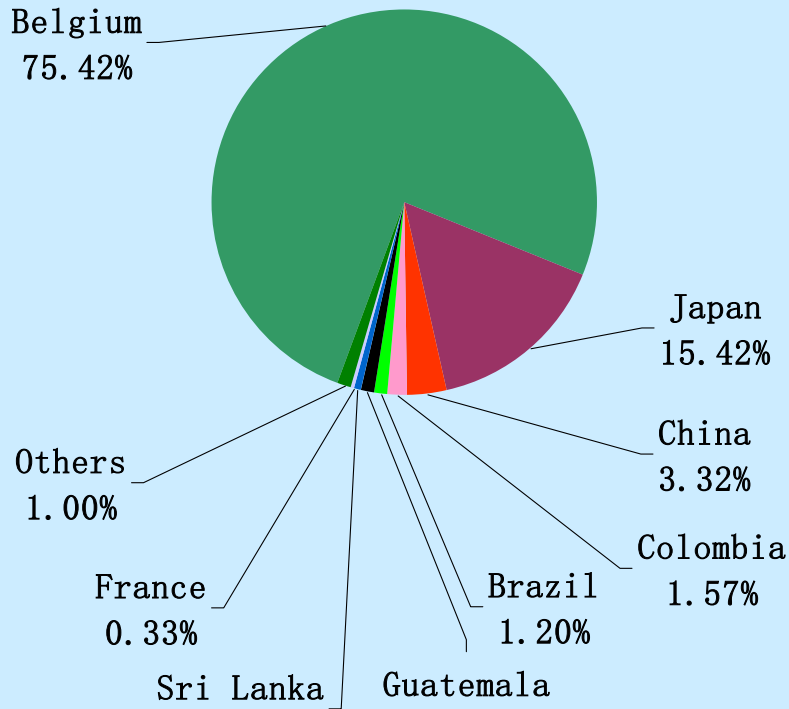




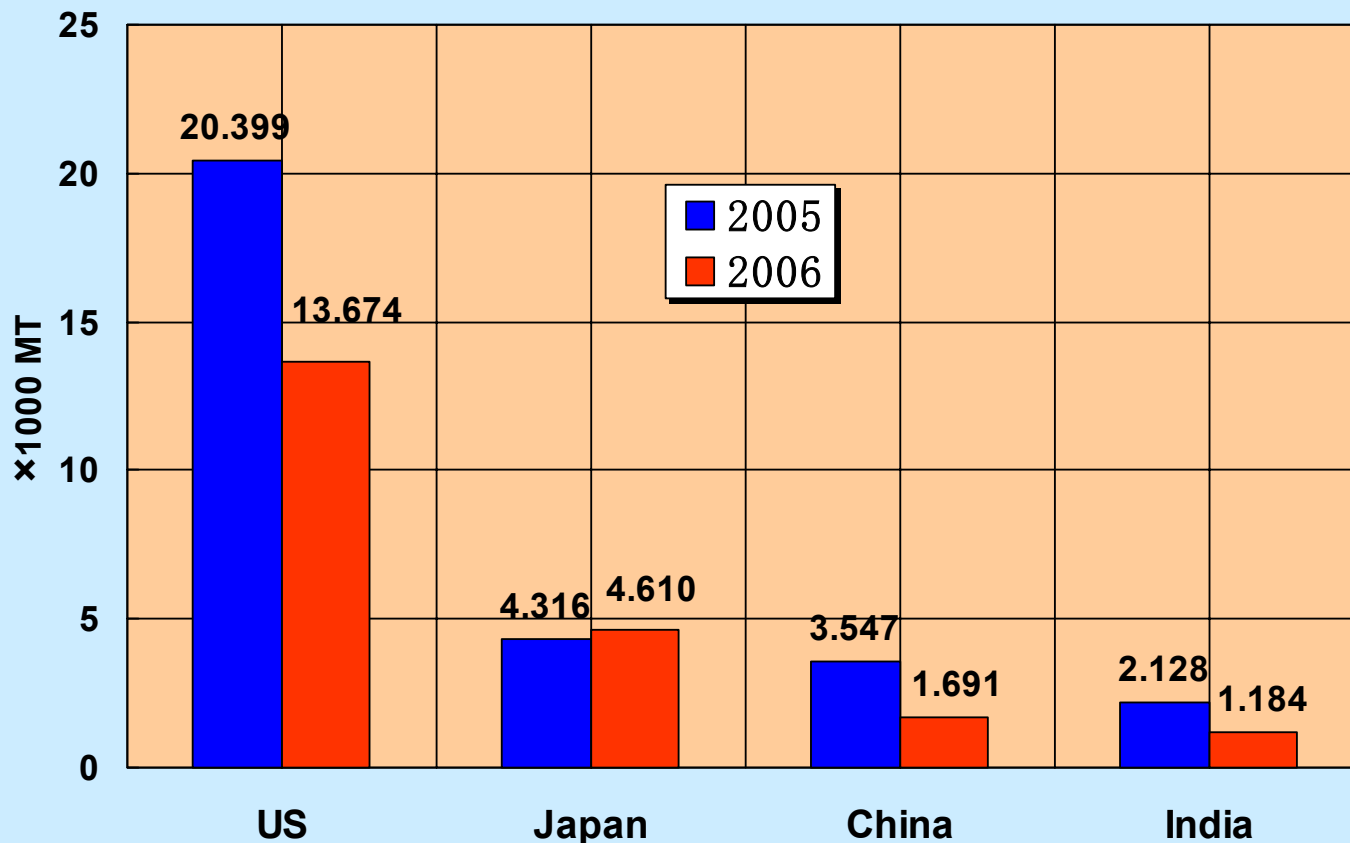
South Africa EMD Exports by Country

2005 32,262 MT

2006 25,696 MT



Australia EMD Exports by Main Import Countries

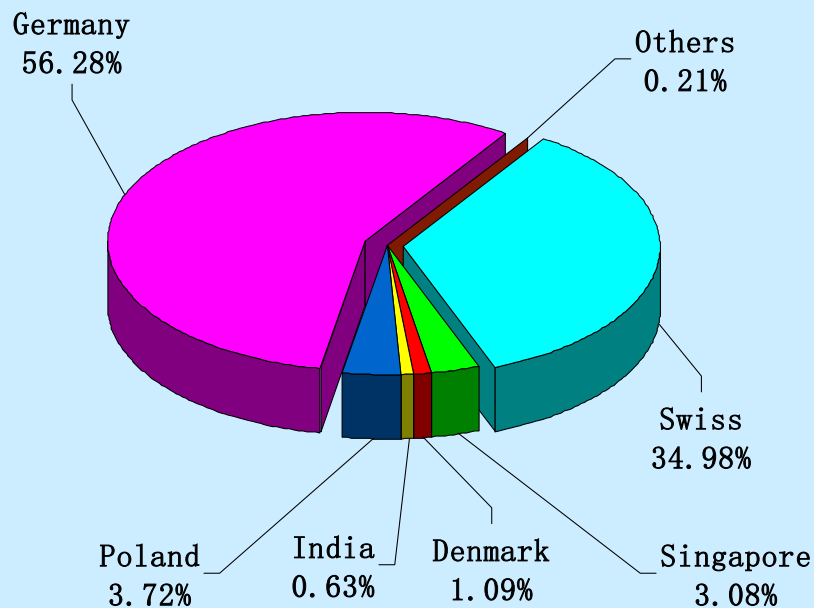


- Sources: 2005 --- Australia Customs
2006 --- Data from Import Countries

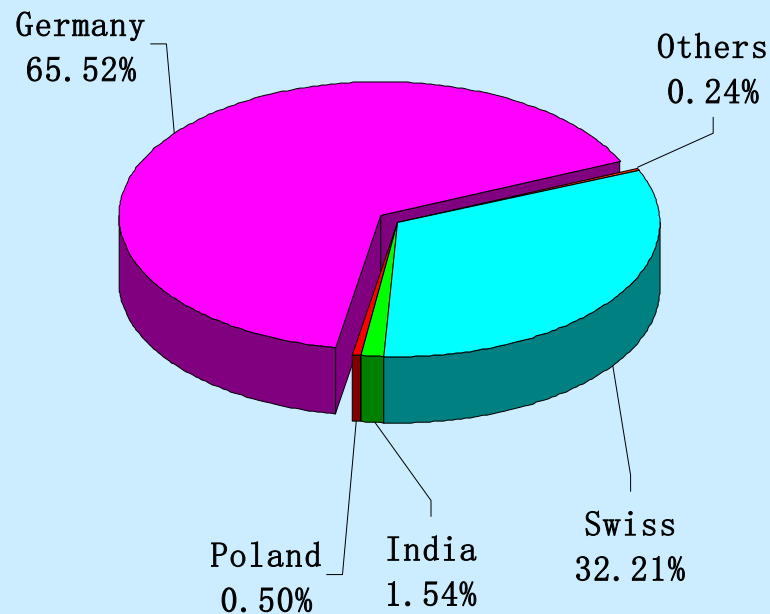


EMD Imports from Greece by Country

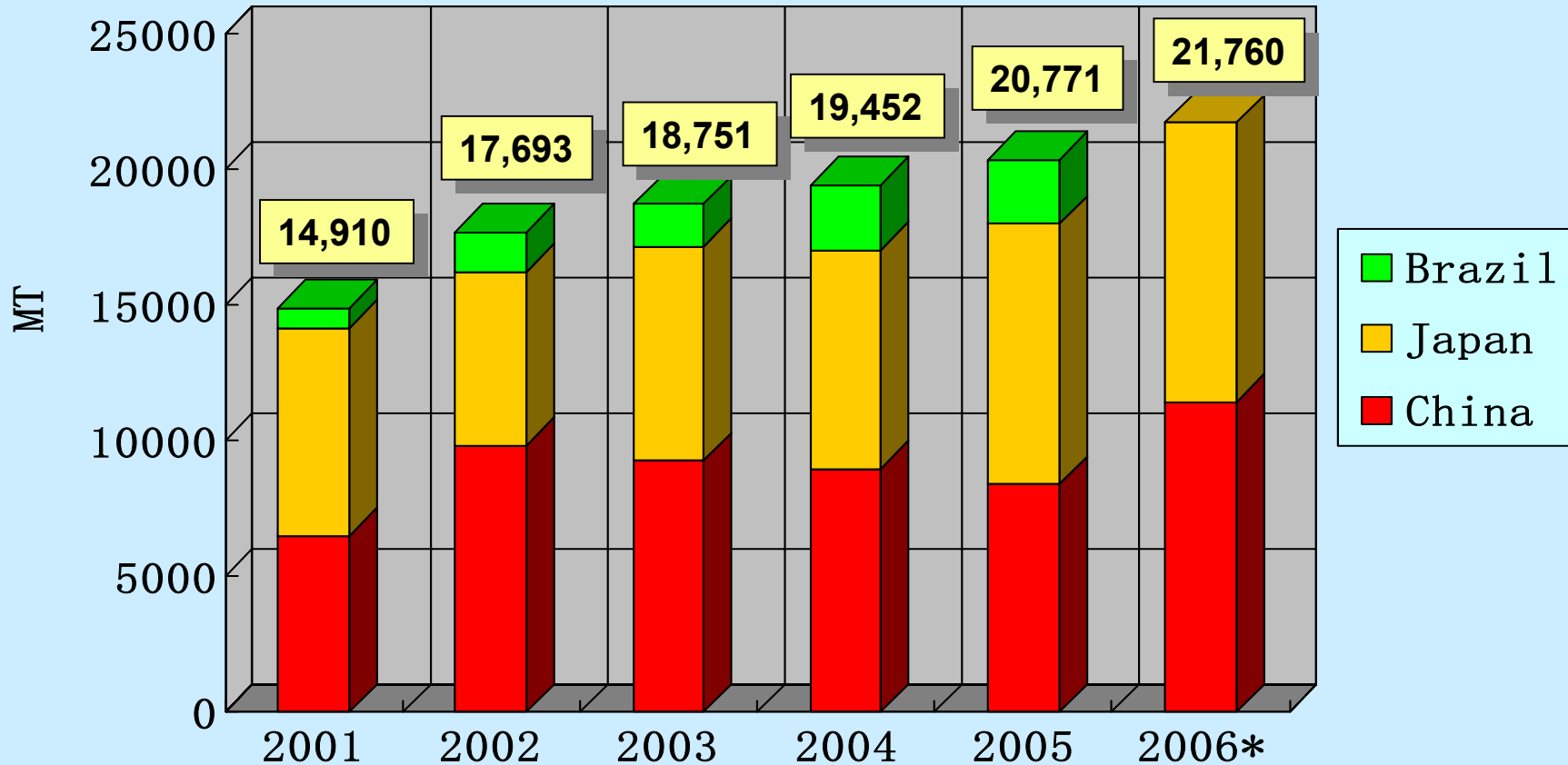
2005 11,077 MT



2006 9,688 MT



Indonesia EMD Imports by Country 2001 – 2006*

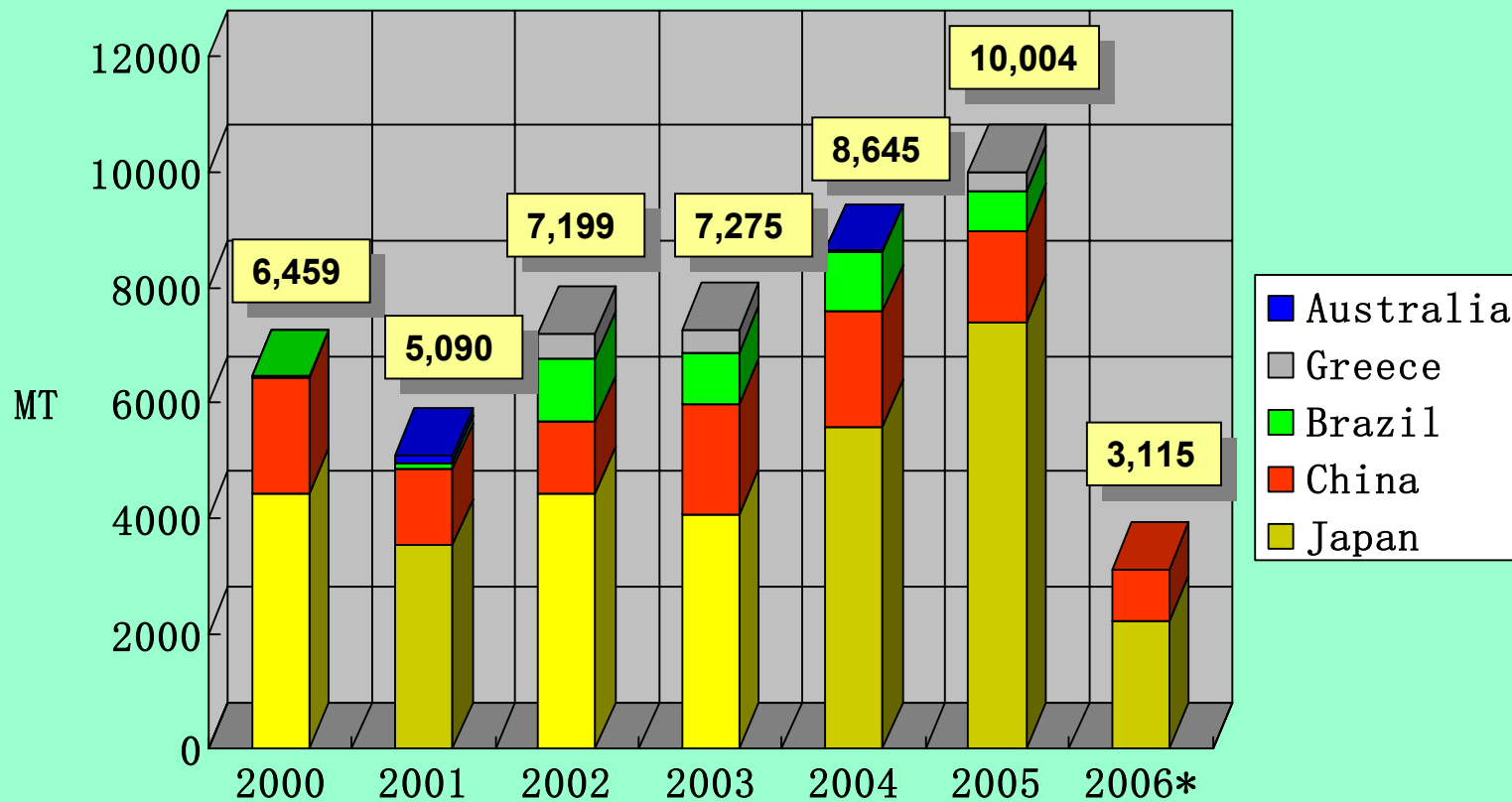


Indonesia is the third largest EMD import country in the world.



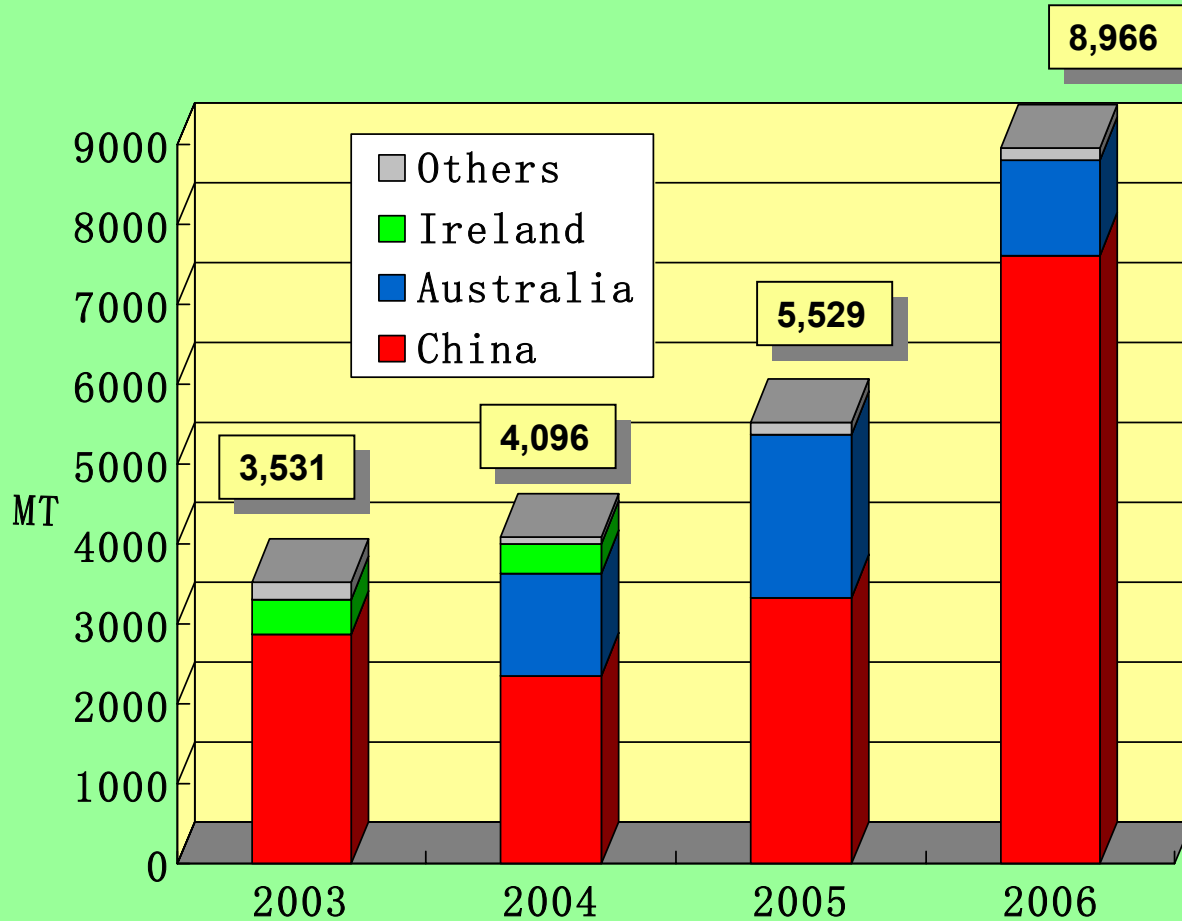
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Singapore EMD Imports by Country 2000 – 2006*





India EMD Imports by Country 2003 - 2006





2006 China EMD Market Review (1)

- China produces 28 billion units of primary manganese batteries, and among which 7 billion units are alkaline batteries in 2006.
- China exports 20.4 billion units of primary manganese batteries, and among which 5.1 billion units are alkaline batteries in 2006.
- Recent statistic data on EMD business in China (see table below)
- The price of low grade MnCO_3 ore, which is an essential raw materials for the production of EMD in China, fluctuates with the market situation of Electrolytic Manganese Metal market.



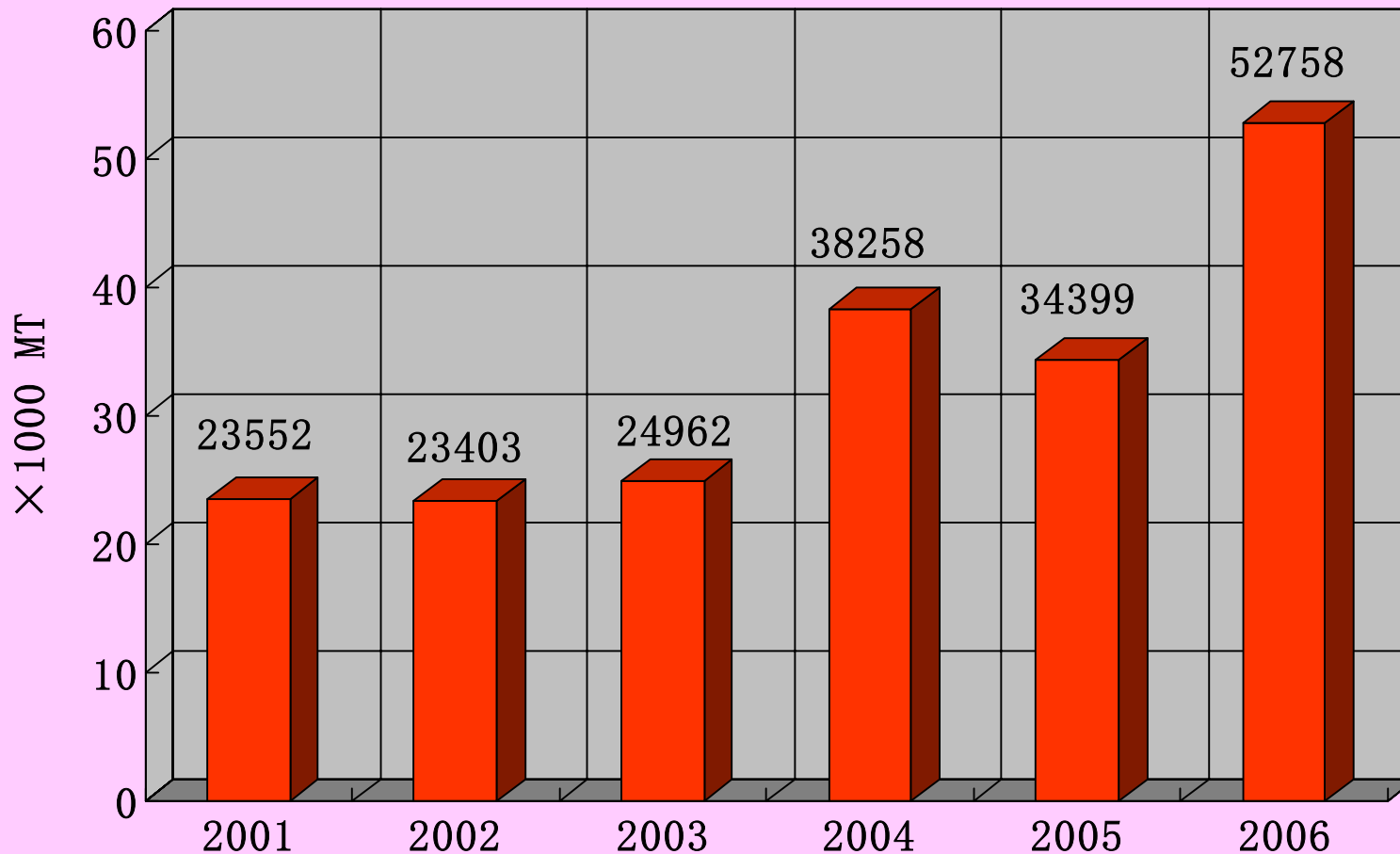
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Recent Statistic Data of EMD Business in China

Items	2005	2006	Increase Rate
Producers	16	14	- 12.50%
Capacity* (tpa)	188,800	200,000	+ 5.93%
Output (t)	149,407	160,000	+ 7.09%
Export (t)	34,339	52,758	+ 53.64%
Import (t)	9,010	7,942	- 11.85%
Export ratio	23.04%	32.97%	+ 9.93%

*at the end of the year.

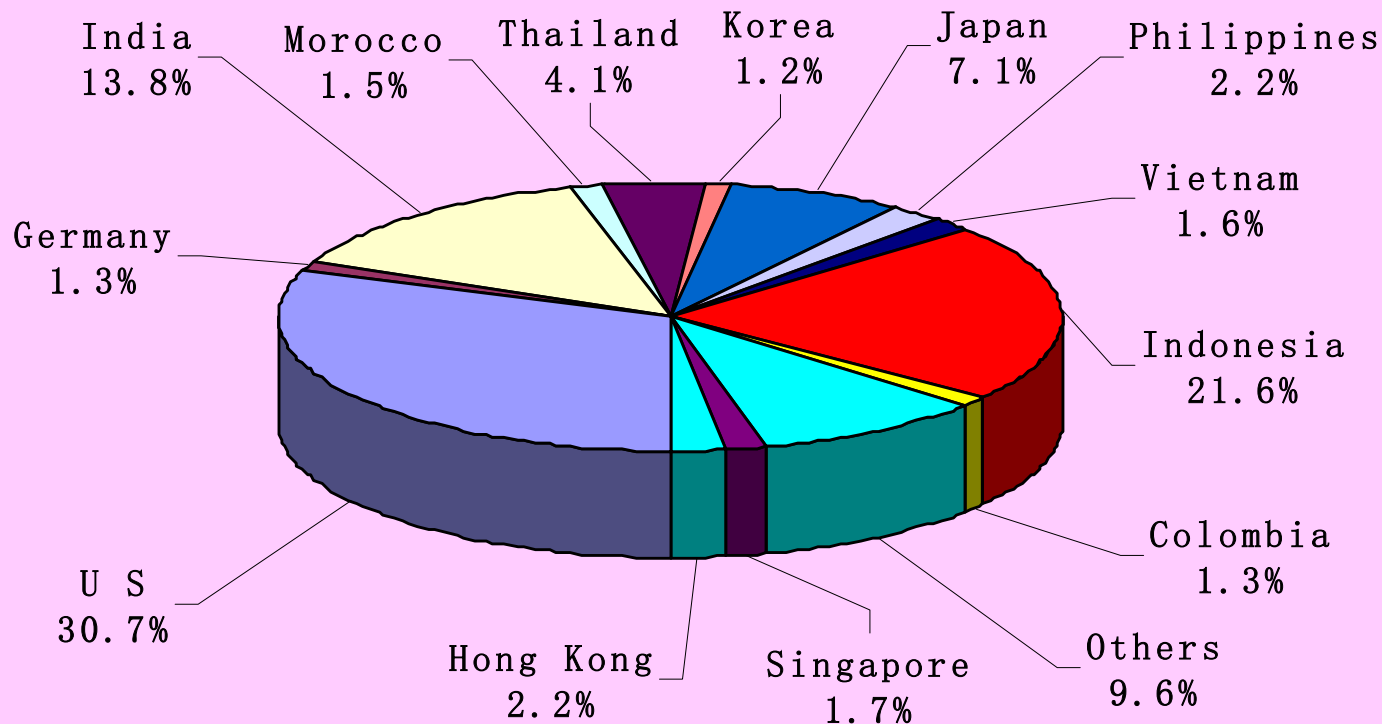
2001-2006 China EMD Exports





2006 China EMD Exports by Country

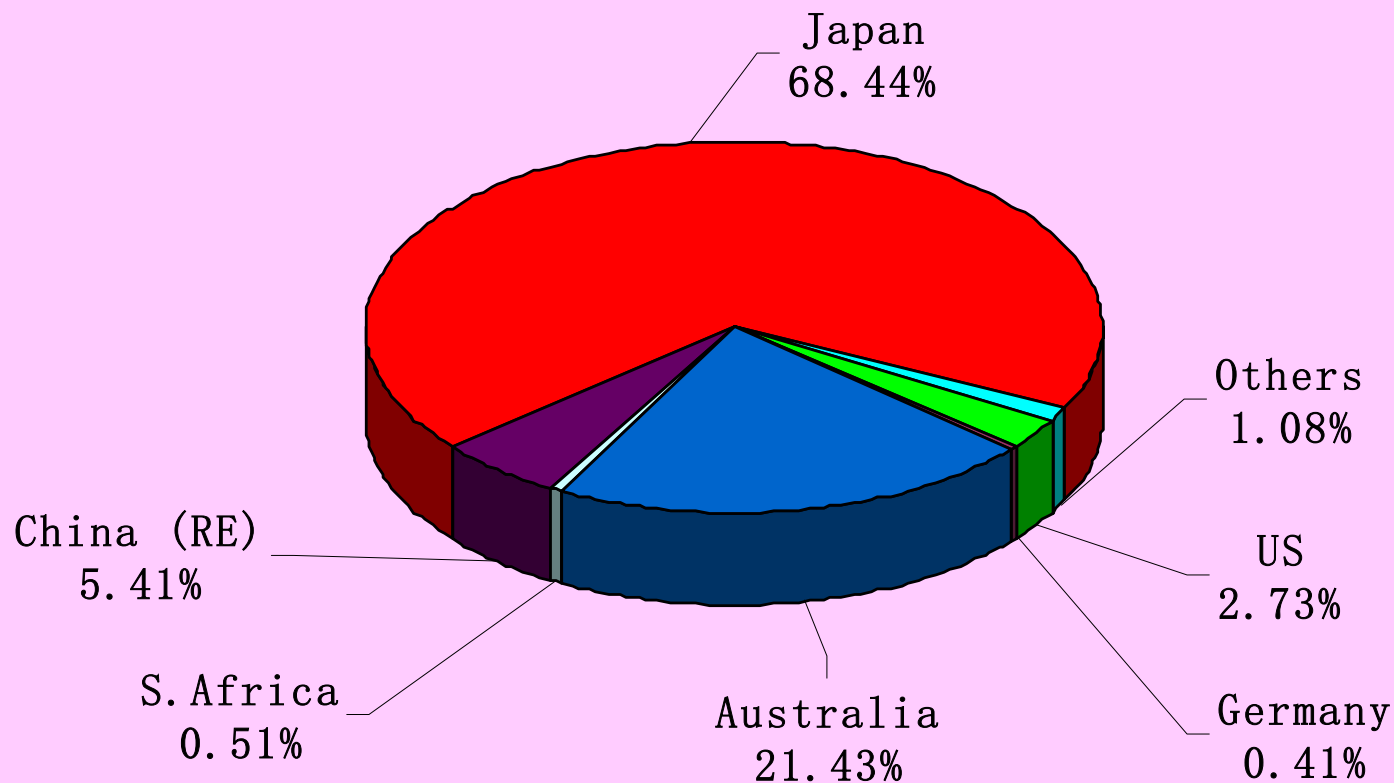
Total: 52,758 MT





2006 China EMD Imports by Country

Total: 7,942 MT





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2006 China EMD Market Review (2)

- Due to oversupply in market, the price of C-Zn grade EMD has come down, and some producers with limited capacity has ceased EMD production in 2006.
- The alkaline battery industry in China have been developing at a highly rate in recent years, and its demand for EMD is increasing year after year. The price of alkaline grade EMD maintains at an adequate level comparing to C-Zn grade EMD.
- The EMD manufacturers in China have made every efforts to conform the stringent environment regulations. As REACH will enter into force on June 1, 2007, the EMD manufacturers in China have devoted much attention to this issue.
- Several new EMD projects are under construction at present, most of them will be put into operation this year.



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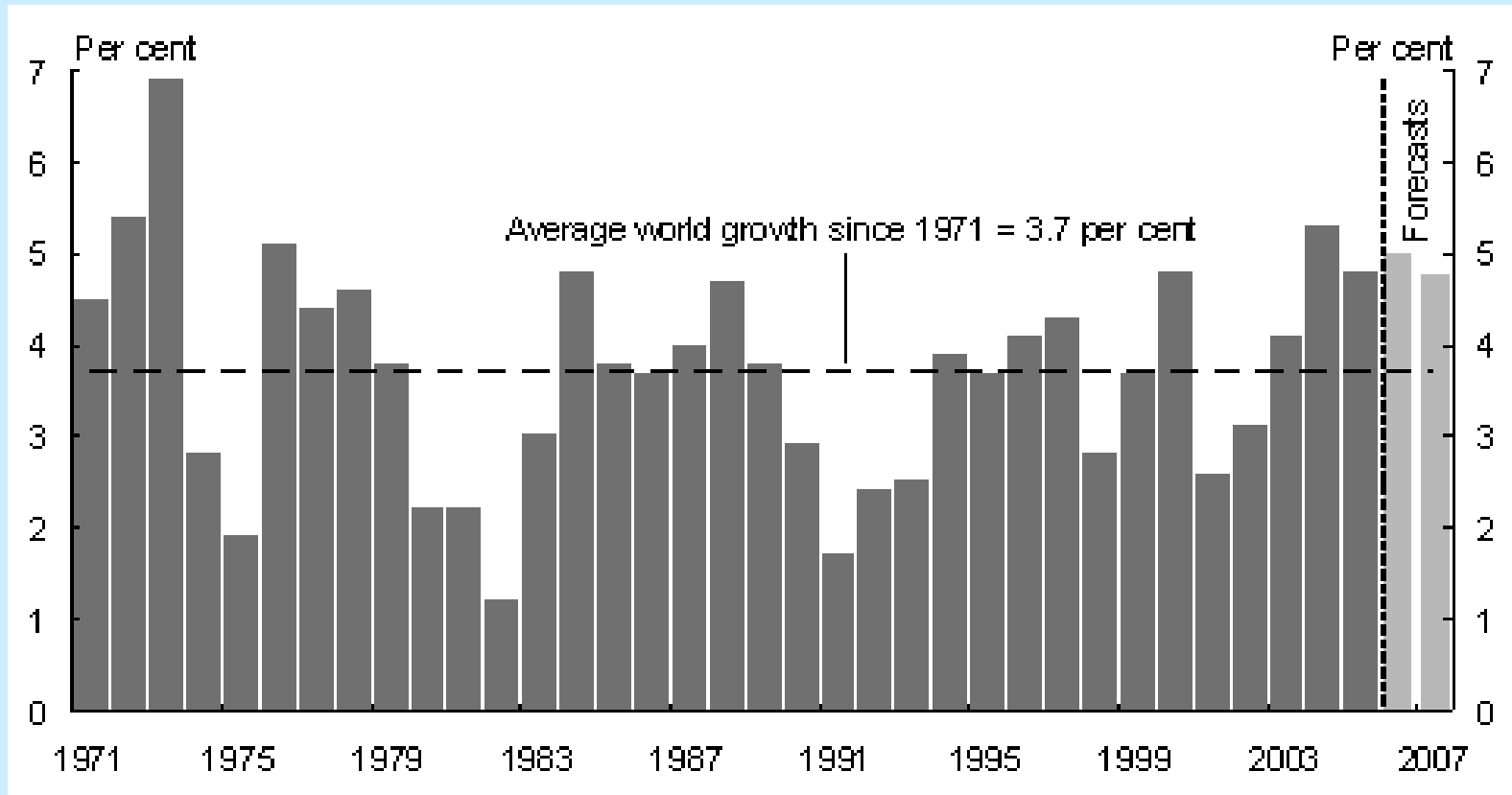
Market Forecast (1)

- **The global economy will be in moderate steady growth, while growth in Asia Pacific will remain strong in 2007.**
- **The market of alkaline battery is expected to grow further in the future.**
- **The market drivers for alkaline battery:**
 - Growing trends of transition from C-Zn to alkaline battery in China and other developing regions.**
 - Growing High-tech, High-drain devices**
 - Growing environment regulations and awareness**
- **Therefore, the market demand for EMD will be in steady growth in coming years.**



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World GDP Growth Rates (1971-2007)



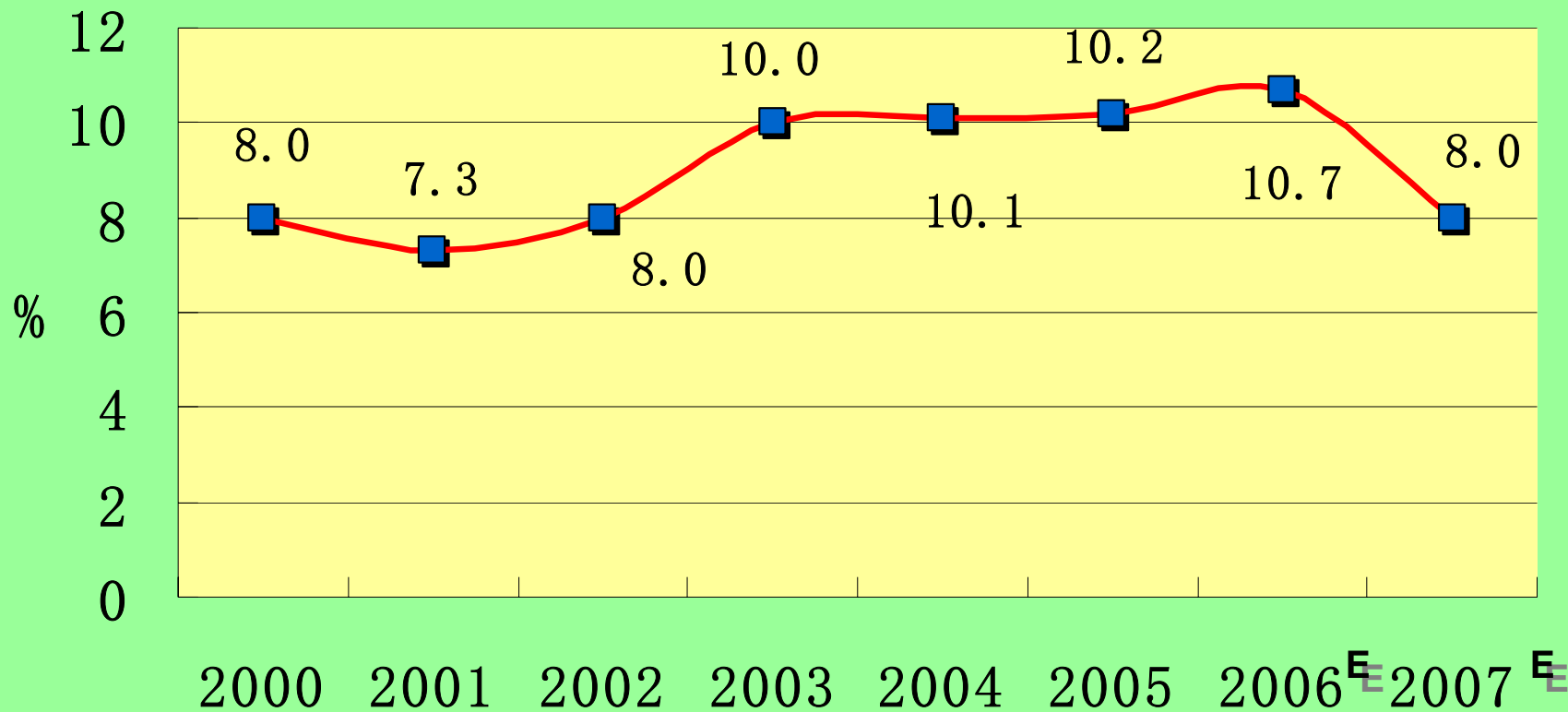
1. World GDP growth rates are calculated using GDP weights based on purchasing power parity.

Source: International Monetary Fund and Treasury.



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China GDP Growth Rates 2000-2007



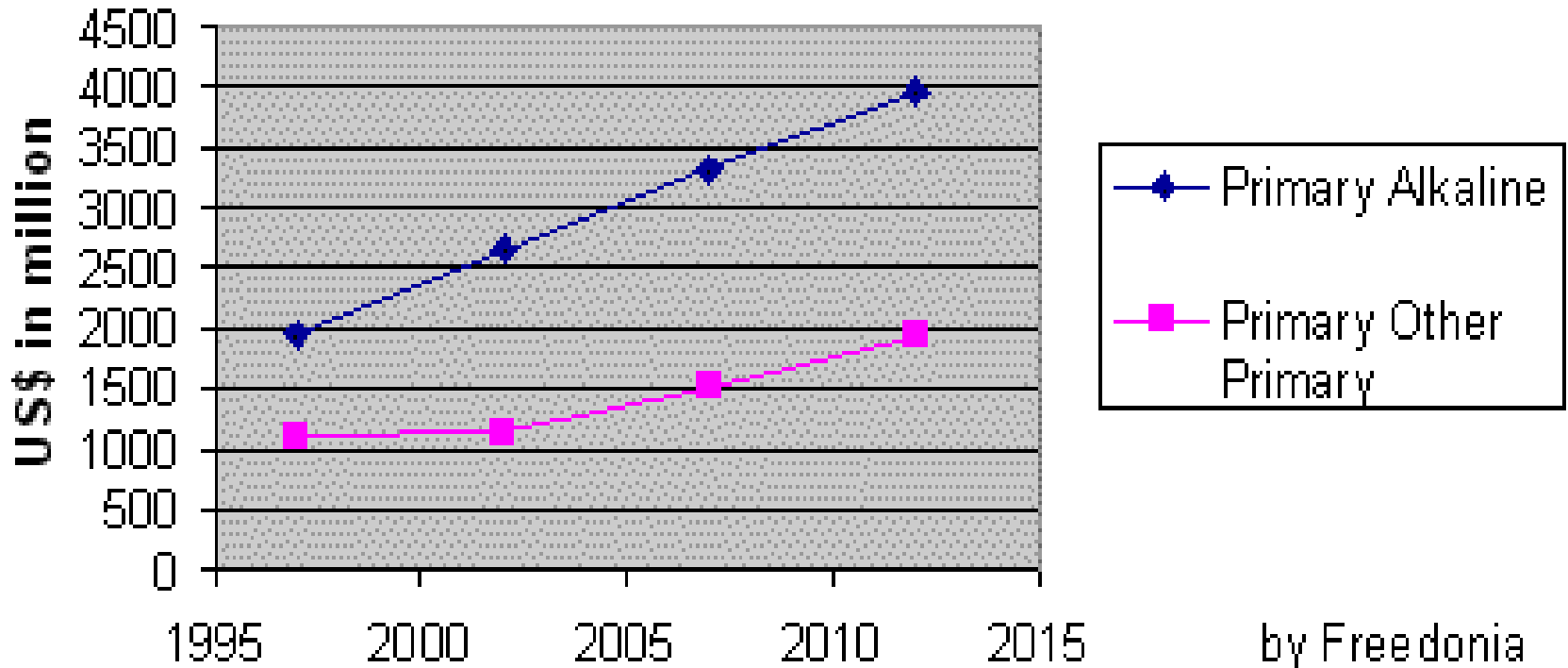
E-- Estimated



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US Demand prediction for Primary Batteries

Demand for primary batteries





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Market Forecast (2)

- **The annual production capacity of EMD in China will reach around 250,000 MT at the end of 2007.**
- **As there isn't any planned EMD project (brownfield or greenfield) outside China nowadays, the future increasing demand for EMD would be satisfied from China.**
- **Despite the strong growth of demand for alkaline grade EMD in the market worldwide, however, surplus supply situation will gradually emerge from the second half year of 2007 due to over expanding capacity of EMD in China, and the market situation will be more competitive in coming years.**
- **Growing competition necessitates EMD manufacturers to prioritize R&D activities to enhance their product's performance in the batteries.**