

Rare Earth Statistics of Japanese Market in 2006

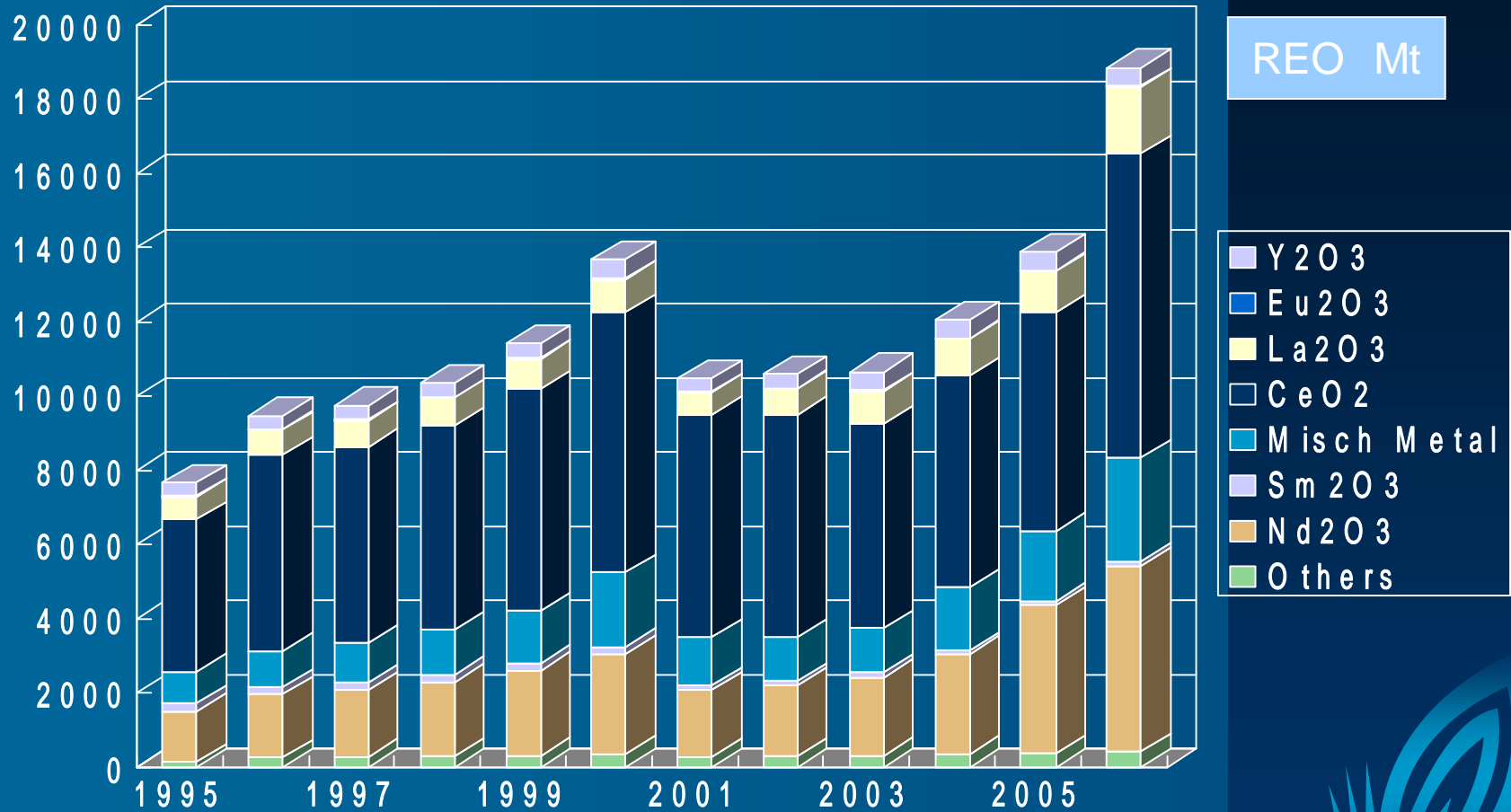
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Beijing Conference of Minor Metal 2006



Advanced Materials Japan Corporation
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Japanese Rare Earth Demand



Regarding the Rare Earth Demand of Japanese market, growth rate is 14.9% increase in 2005 and it becomes 13,864Mt REO base.

This figure is new record after 2000 year record of 13,690Mt. In 2006, growth rate will become double digit. Probably more than 15%. Regarding in April data it hits more than 30%.

Japan-China rare earth conference data.

Japanese Rare Earth Demand

(REO Mt)

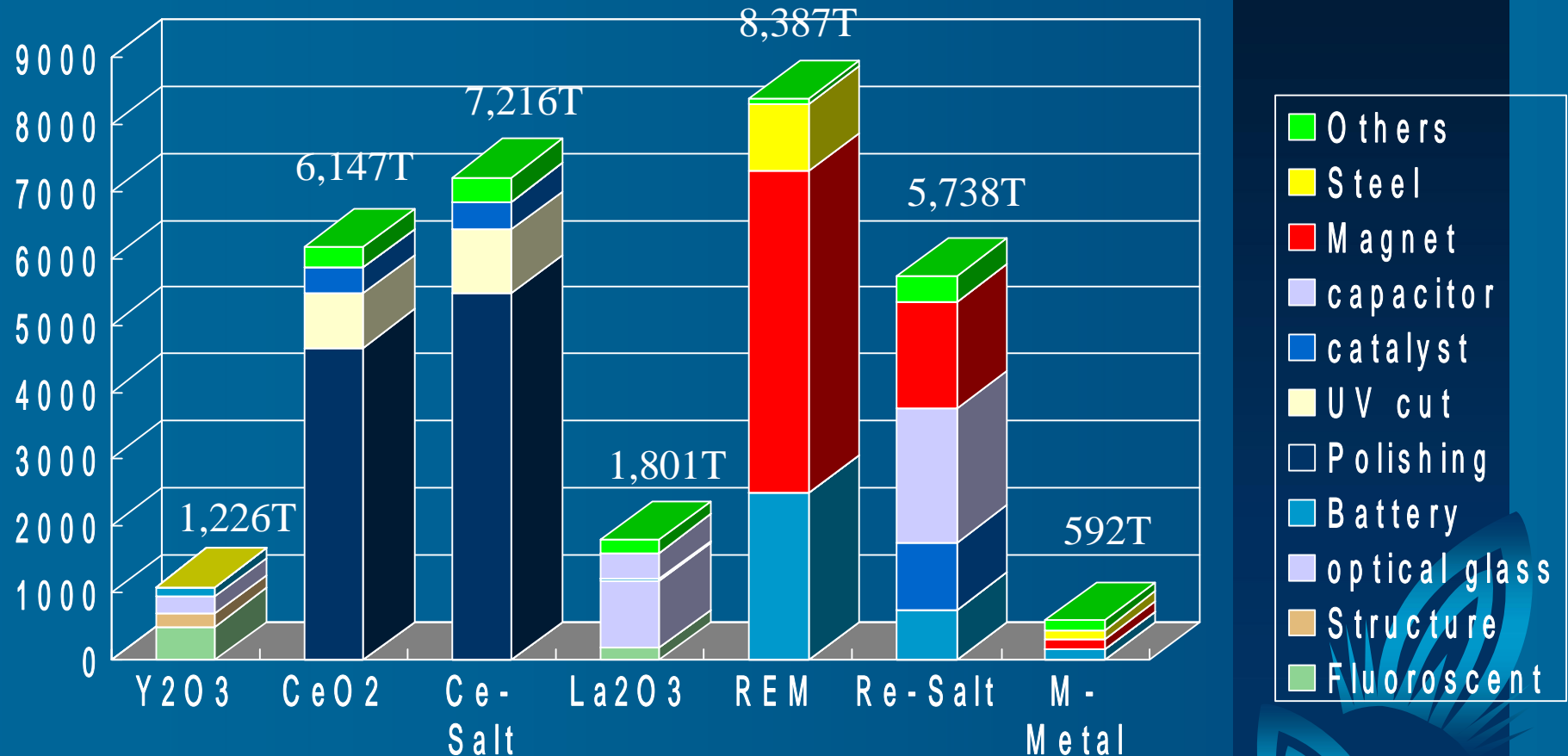
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006Es
Others	140	260	280	295	310	350	280	290	320	350	370	420
Nd ₂ O ₃	1364	1700	1800	2000	2300	2700	1800	1900	2100	2700	4000	5000
Sm ₂ O ₃	206	206	200	200	200	200	120	120	120	100	100	120
Misch Meta	860	960	1060	1200	1400	2000	1300	1200	1200	1700	1900	2800
CeO ₂	4100	5300	5300	5500	6000	7000	6000	6000	5500	5700	5900	8200
La ₂ O ₃	620	670	710	760	800	900	600	700	900	1000	1100	1800
Eu ₂ O ₃	14	14	15	15	16	20	14	15	15	14	14	15
Y ₂ O ₃	350	360	380	380	400	520	360	380	500	500	500	500
Total	7654	9470	9745	10350	11426	13690	10474	10605	10655	12064	13884	18855
Increase Rate	12.9%	23.7%	2.9%	6.20%	10.4%	19.8%	-23.5%	1.3%	0.5%	13.2%	15.1%	35.8%

These data is based on the report of the rare earth producer in Japan.

Japan-China rare earth conference data.

Usages of RE import in 2005

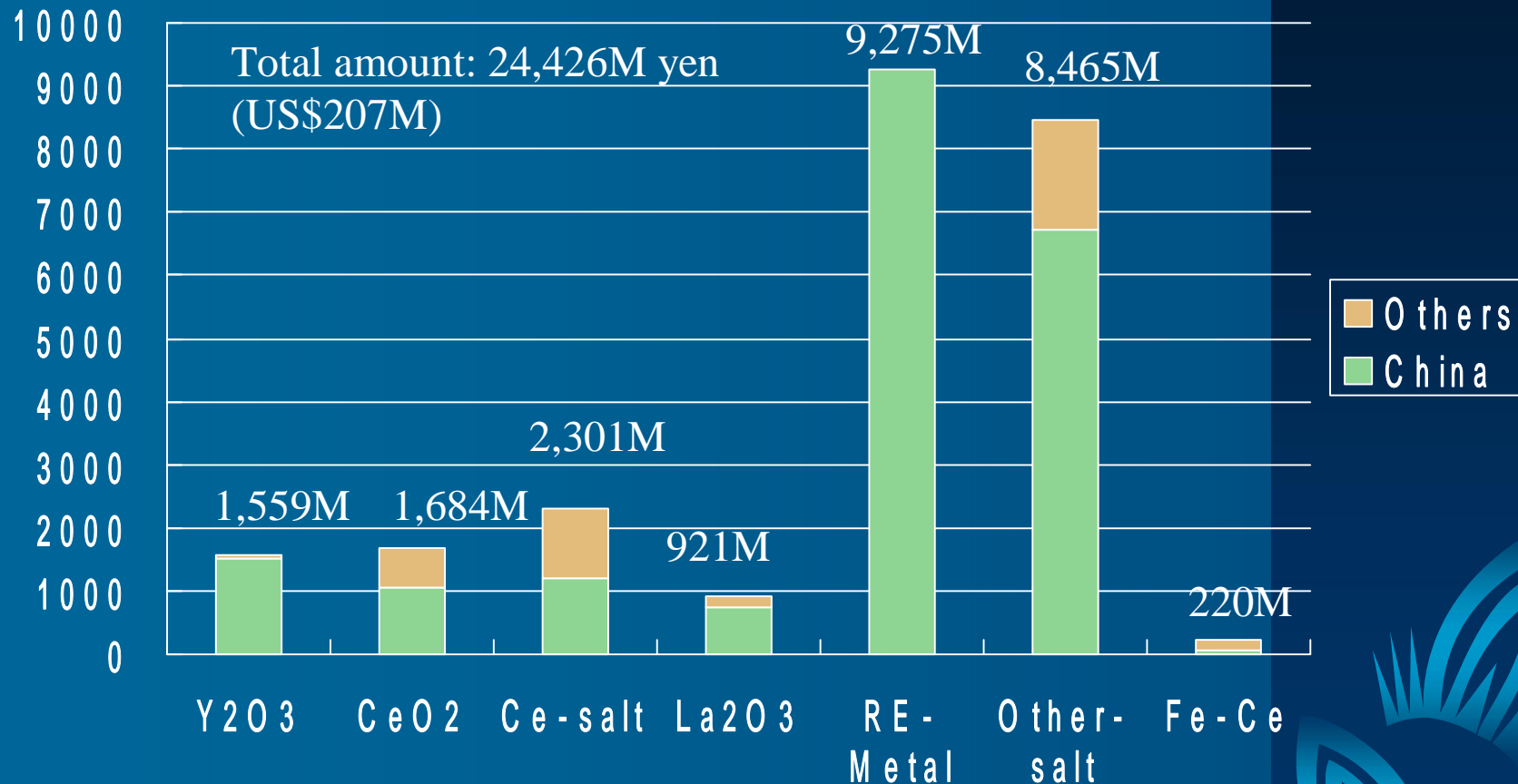
(Total:31,106Mt Material Base)



These data is based on the custom clearance and analyzed by AMJ.

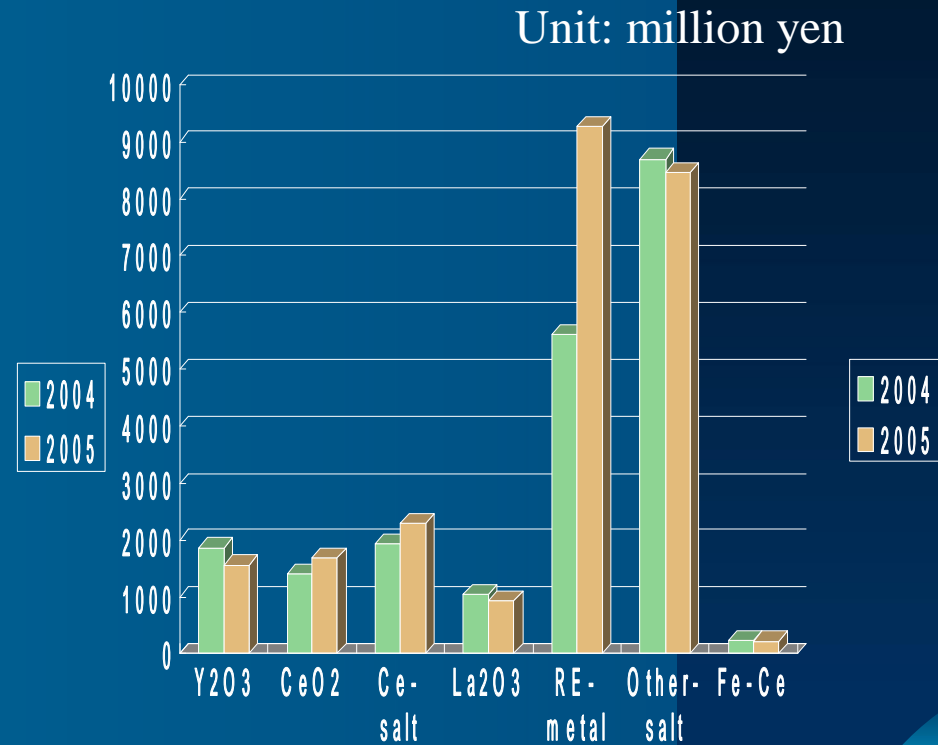
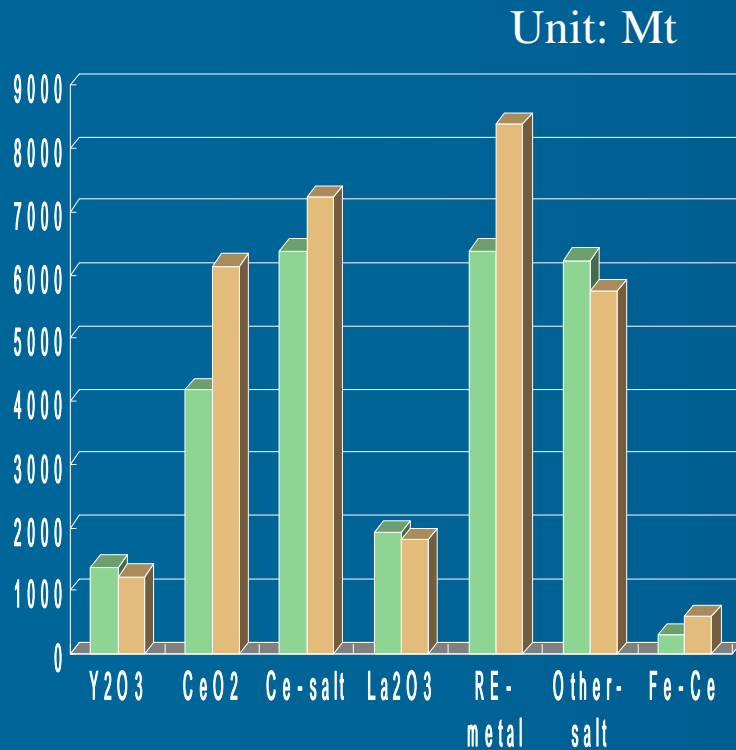
Rare Earth Import Amount in 2005

(Unit: Million Yen)



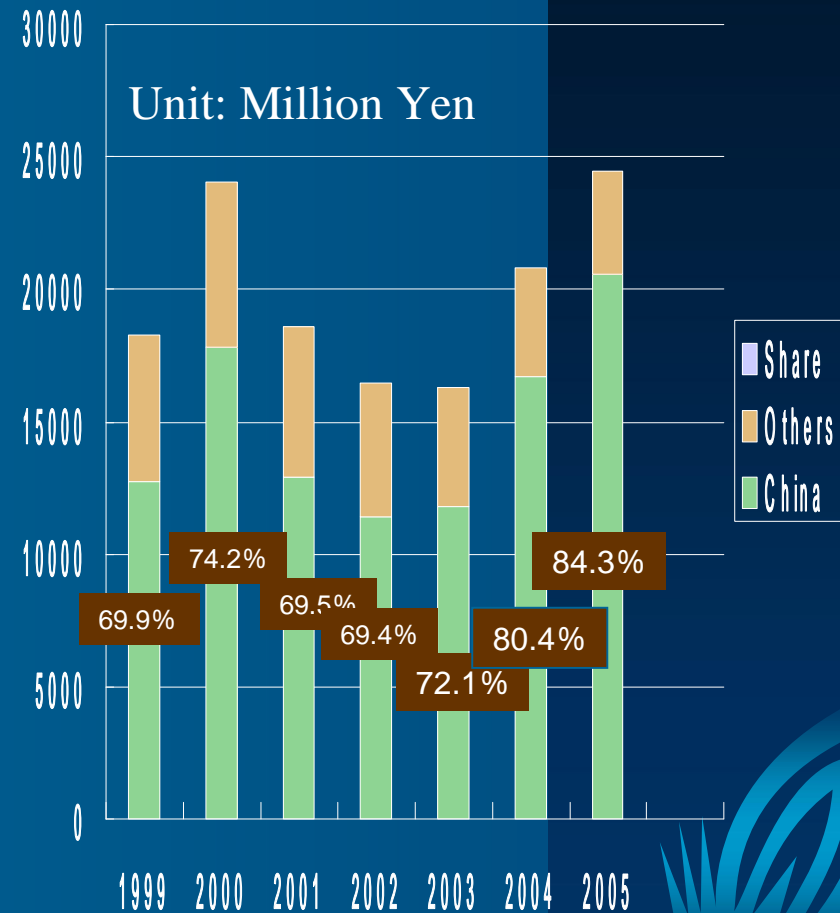
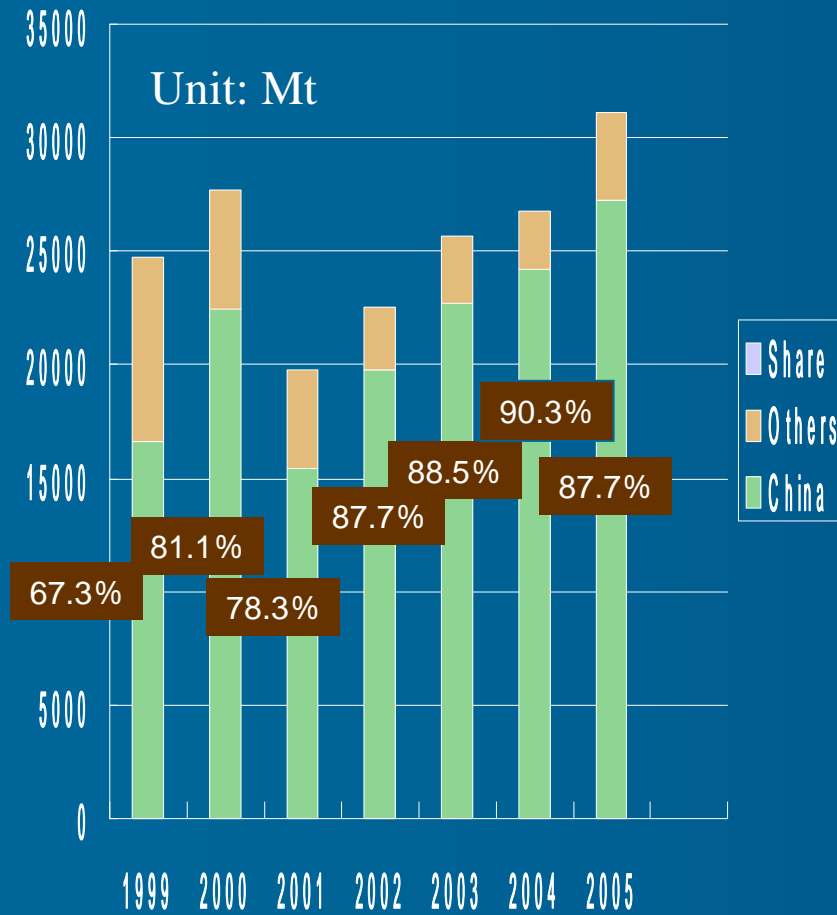
Rare earth import amount share for magnet raw materials becomes Almost 100% from China. Total amount is 24,426M yen and the growth rate is 18% from 2004. These amount will be dramatically increased in 2006.

Rare Earth Import Quantity & Amount between 2004 and 2005



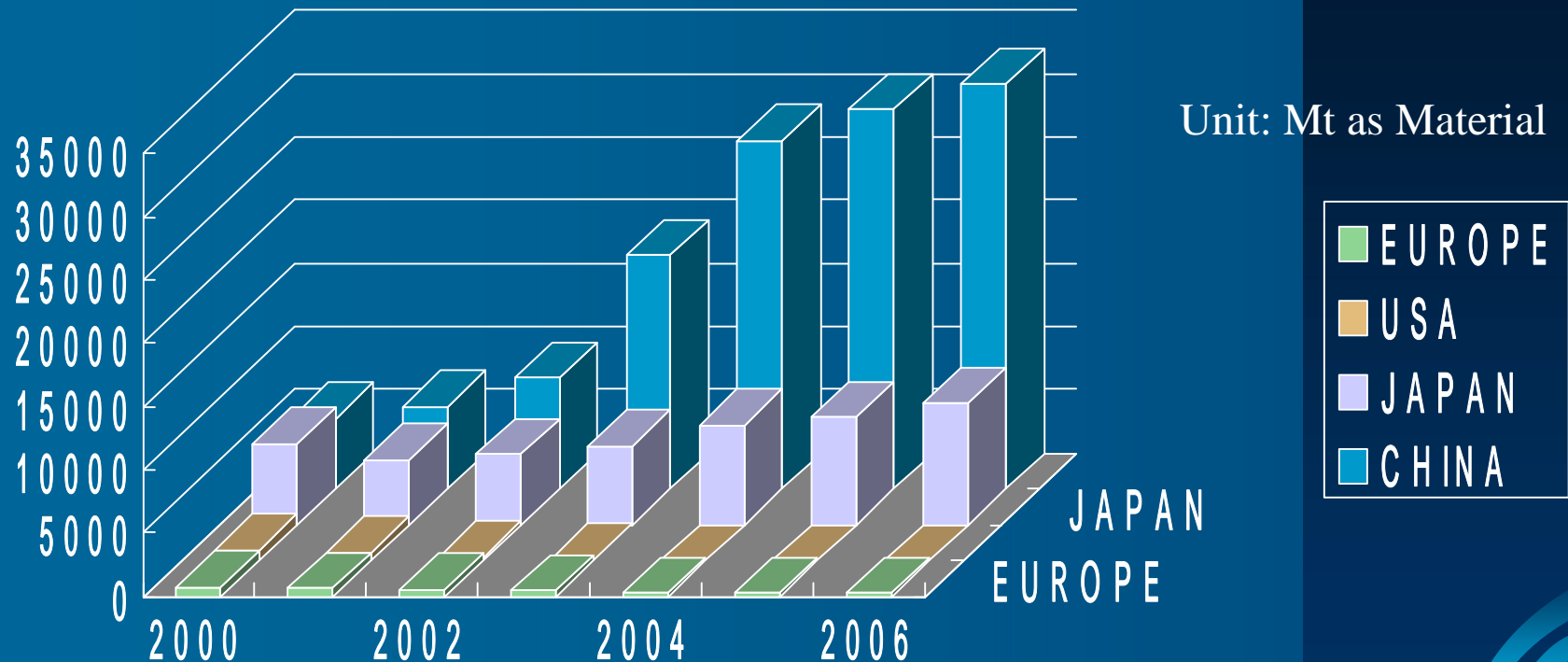
The import market of the rare earth which was 26,758Mt in 2004 became 31,106Mt in 2005. The growth rate was 16%. In the amount of import, 20.7 billion yen(176 million US\$) turned into 24.4 billion yen(207 million US\$), respectively. The growth rate showed 18%. And this trend will be continued into 2006. Rare earth metal market price will go up further.

Chinese RE import share in quantity and amount



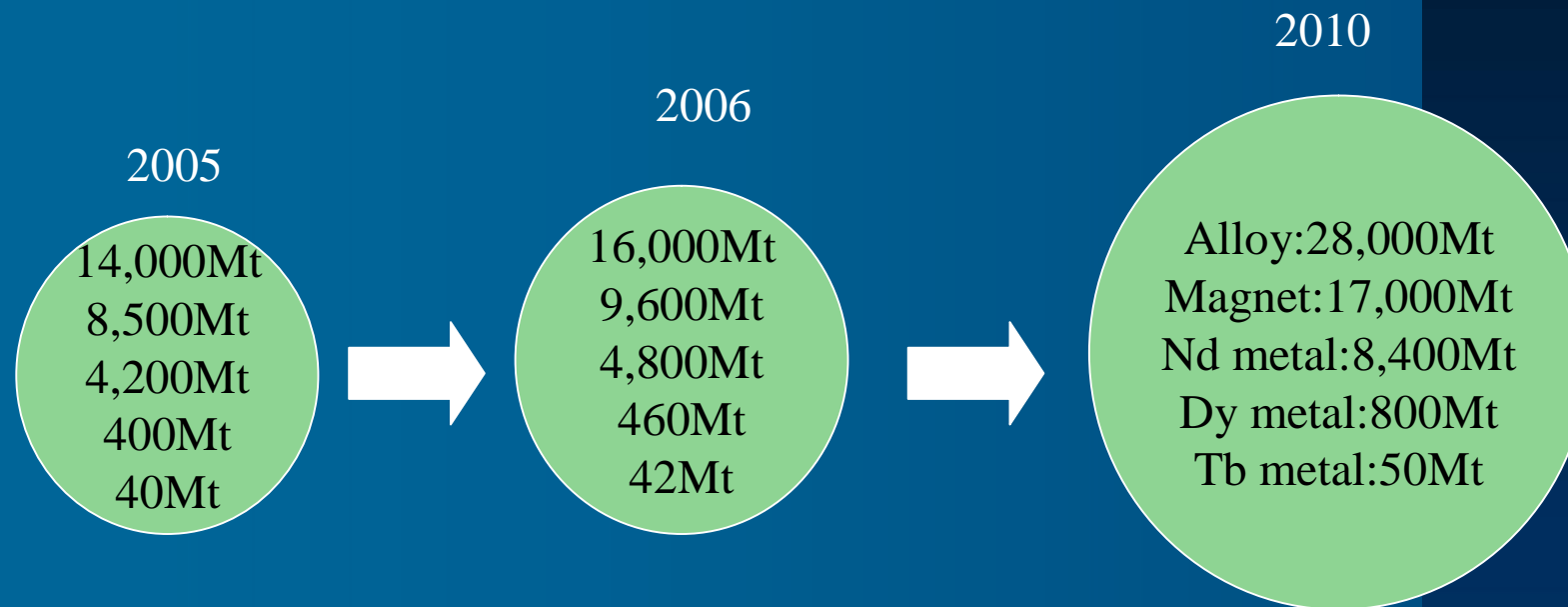
The quantity of 2005 import becomes 31,207 Mt from 26,758Mt in 2004. The amount of 2005 import becomes CIF base 24,421M-yen (207Million US\$) from 20,775M-yen (176Million US\$) in 2004. Growth rate is 17% in quantity and 17.5% in its amount respectively.

World Nd·Fe·B Magnet Production



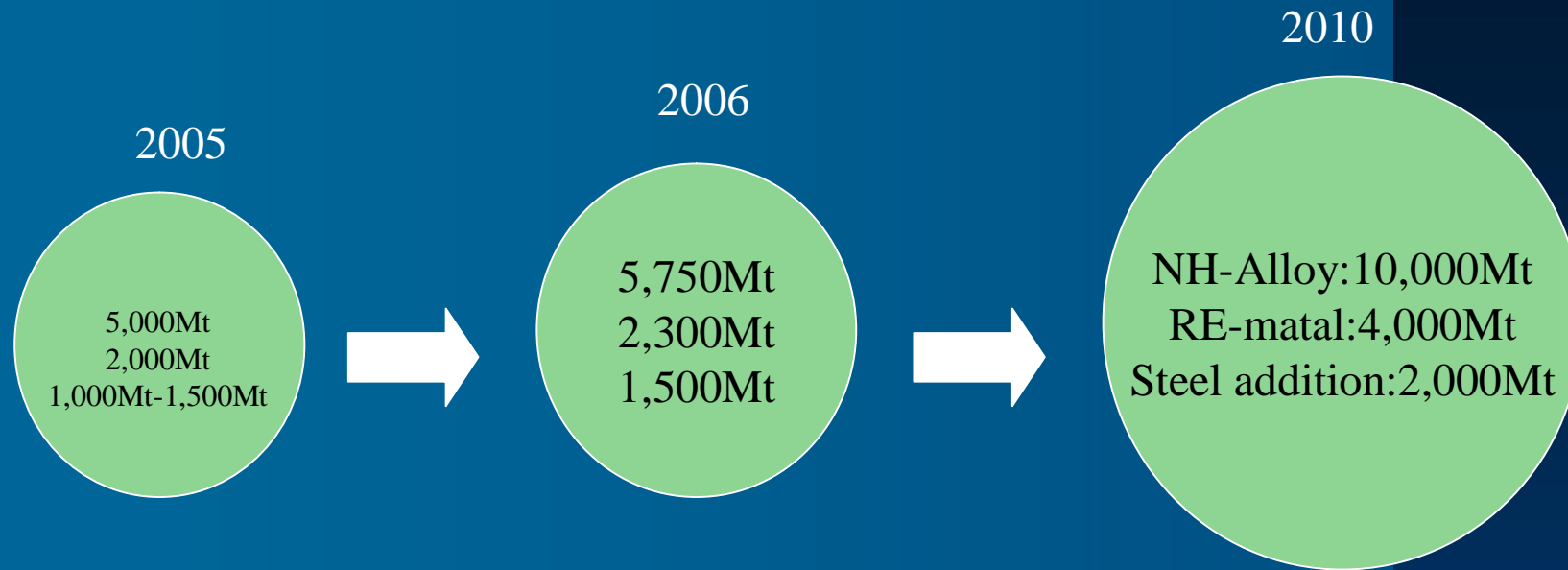
- Demand of Nd Metal in Japanese market will increase sharply to 4,800Mt in 2006 from 4,200Mt in 2005.
- NdFeB magnet demand in Japan becomes around 9,600Mt in 2006 from 8,500Mt in 2005.
- NdFe-Alloy demand in 2005 is 14,000Mt and in 2006 it will become 16,000Mt base.
- Growth rate of magnet market in Japan will maintain more than 15% till 2010.

Calculation of NdFeB-Alloy and Magnet and Nd metal and etc.'s demands of Japanese market



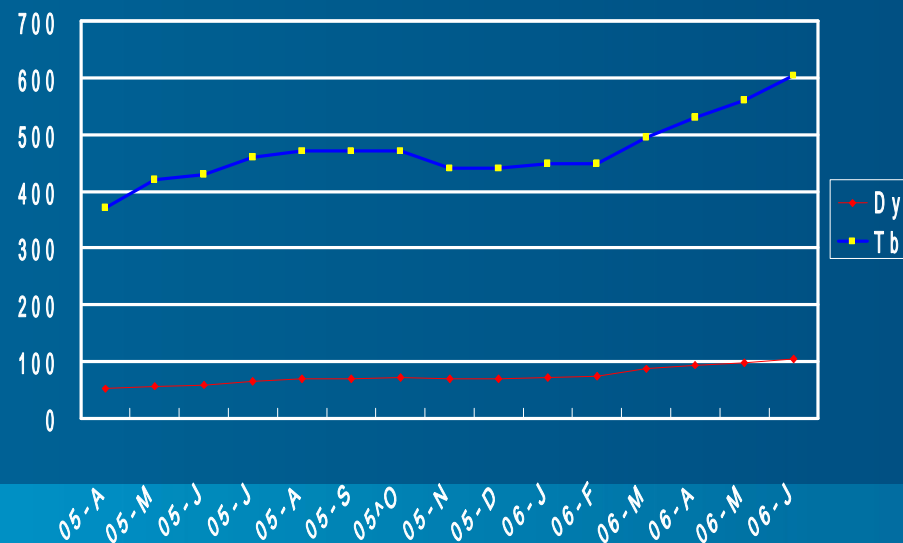
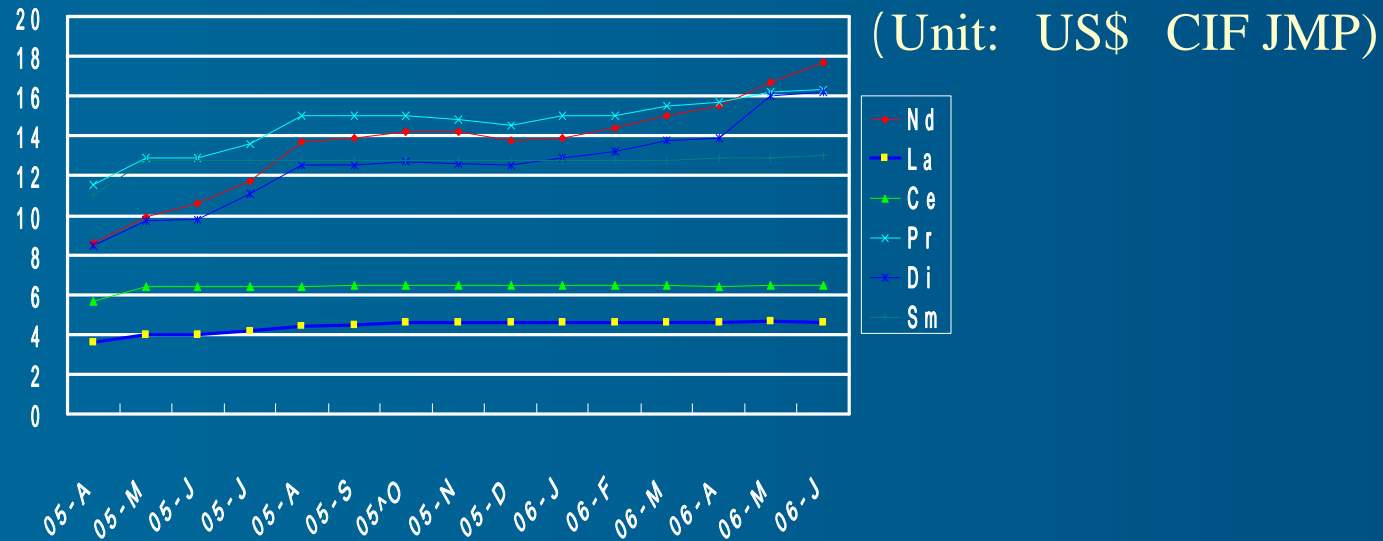
- In 2005, NdFeB-Alloy demand is 14,000Mt and NdFeB magnet is 8,500Mt and Nd is needed at least 4,200Mt. Dy is needed 400Mt and Tb will be less than 40Mt.
- In 2006, Alloy will become 16,000Mt. Growth rate is 15%. In case of the yield rate is 60%, Magnet will become 9,600Mt scale and Nd is 4,800Mt, Dy is 480Mt and Tb will be 42Mt.
- In 2010, Alloy will become 28,000Mt and Magnet will become 14,000Mt base and Nd metal demand will become 8,400Mt scale.

Calculation of Nickel hydrogen battery and Steel additive market in RE Metals demand



- The demand for nickel hydrogen batteries (hydrogen storing metal alloy) in 2005 is presumed to be 5,000Mt in the amount of alloys. If it converts into the amount of misch metals, although it will become 2,000Mt, if an inventory element is considered in practice, it will be presumed that there was 2,500Mt.
- 2006, since 15 % or more of increase in demand is expected, it is expected as 5,750Mt in the amount of hydrogen storing metal alloys, and will be expected as 2300Mt from 2,000Mt in the amount of misch metals.
- The demand of the misch metal for steel addition is increasing similarly. Although the 2005 fiscal year was good, since it is competing with Mg addition and Ca addition , etc., the exact amount of demand is unknown. If it expects from import customs clearance statistics, 1000Mt to 1500Mt demand will be presumed. The same level will be predicted also in the 2006 fiscal year.

Chart of Rare earth element Metal price from 2005 April till 2006 June



New Growing Field of Rare Earth

- Magnetic material
- Nickel hydrogen battery,
- Luminescence and fluorescence material,
- Ceramic condenser,
- Polishing powder
- Optical glass & Lenz
- Superconductivity MRI
- Sintering assistant agent,
- Catalyst Paints and glaze,
- Magnetic optical recording material
- Hard disk material
- Medical clinical field,
- Atomic power
- Structure material,
- Agricultural application



Hydrogen storing metal alloy (Nickel hydrogen battery)

- Energy is stored and it is utilized for convey.
- It is used for NH battery, heat pump, a hydrogen fuel tank, and electro mobile. As for a rate of change, quantity and the amount will grow 15% per year.
- Development of an electro mobile may be shifted from the danger of a lithium ion battery to NH battery.
- La Rich MM and CeMM quantity and amount
2005 3,500MT (2.8 billion yen)
2006 4,000Mt(3.2 billion yen)
2010 7,000Mt(5.6 billion yen)

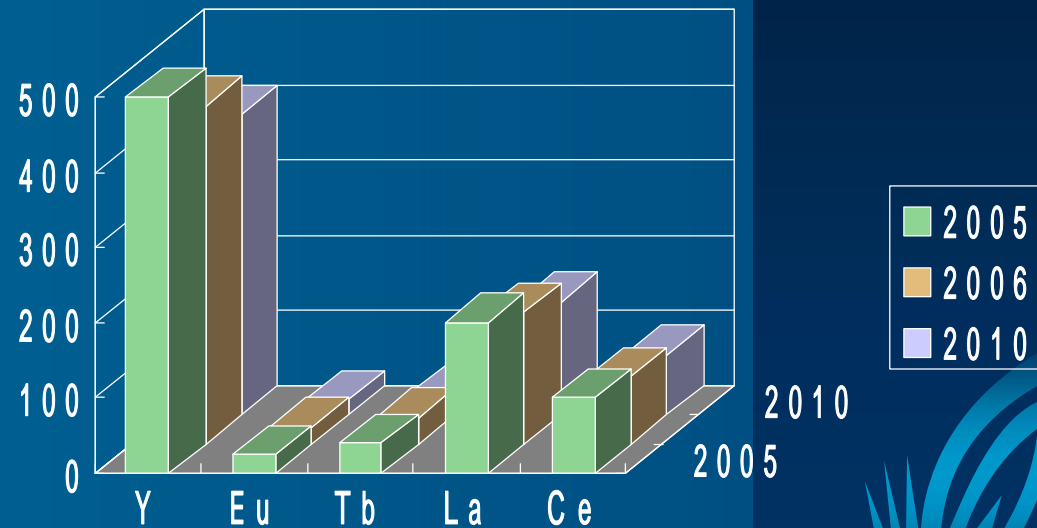


Luminescence and fluorescence material

The fluorescence material for cathode-ray tubes and for three-wave lamps, for halogen lamps. Markets will decrease in number, in order to move from a production base from Japan to China and Southeast Asia.

	2005	2010
Y ₂ O ₃	500T	400T
Eu ₂ O ₃	25T	20T
Tb ₂ O ₃	40T	30T
La ₂ O ₃	200T	150T
CeO ₂	100T	80T

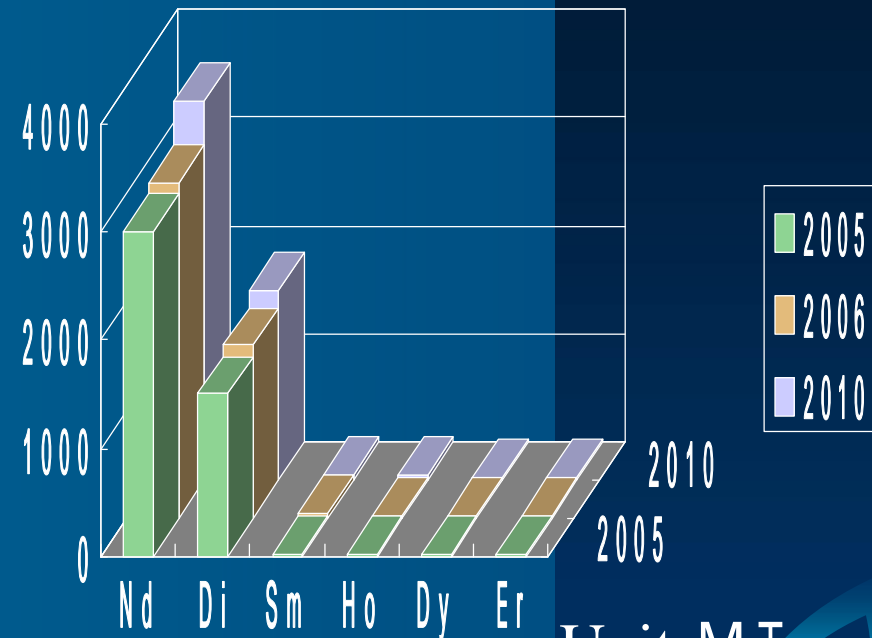
China Market Expects 4 to 5 Times Growth till 2010.



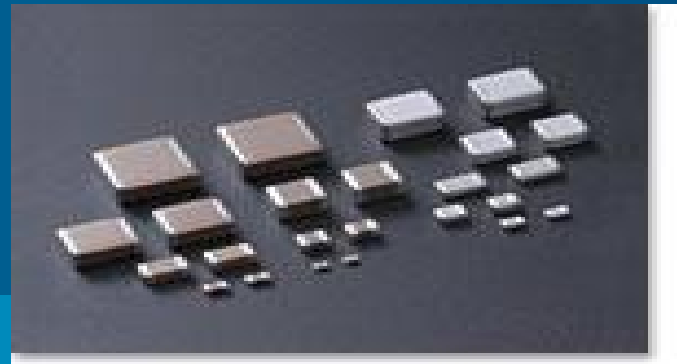
Unit: Mt

ceramic capacitor

- (ceramic capacitor)
- 2005 2010
- Nd₂O₃: 3,000Mt (3.5 B yen) 3,500Mt (4.3 B yen)
- Di₂O₃: 1,500T (0.75 B yen) 1,750Mt (0.9 B yen)
- Heavy RE 100T 120Mt
- (0.22 B yen) (0.26 B yen)



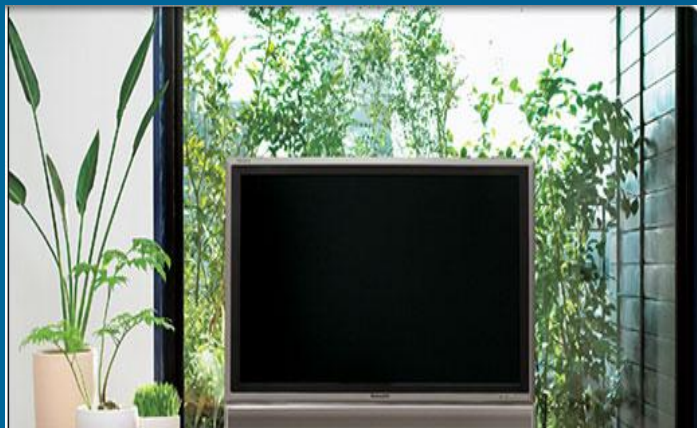
Unit: MT



Polishing powder & optical glass

It is used for polish of an optical lens, sheet glass, a liquid crystal cover glass, hard disk, and a semiconductor wafer. For an ultraviolet-rays cut and An automobile catalyst use is also good.

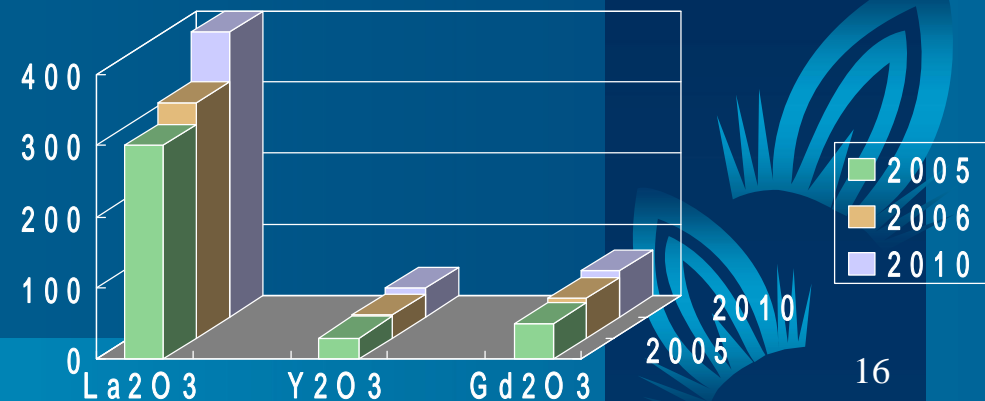
Demand of the polishing powder is 8,000Mt in 2005.



Although the kind of optical lens will increase from now, digital camera use is decreased.

High refraction lenses and for low distribution lenses increase.

	2005	2010
La ₂ O ₃	1,200Mt	1,300Mt.
Y ₂ O ₃	15Mt	20Mt
Gd ₂ O ₃	50Mt	65Mt

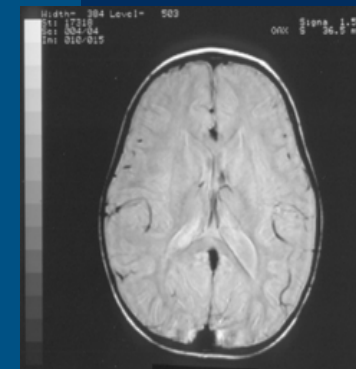
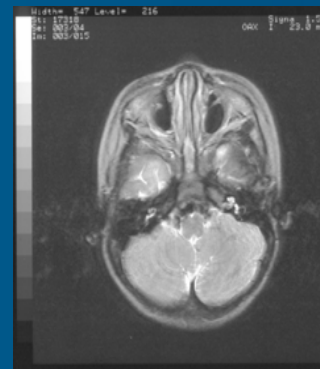


MRI (Magnetic Resonance Imaging)

- NdFeB-Magnet use for MRI (nuclear magnetic resonance diagnostic equipment)

	2005	2010
• MRI	630Mt (7 B yen)	1,000Mt (11B yen)
• Gd ₂ O ₃	20Mt (0.2B yen)	50Mt (0.5B yen)

- Gd₂O₃ as blood vessel contrast media for MRI will also grow up

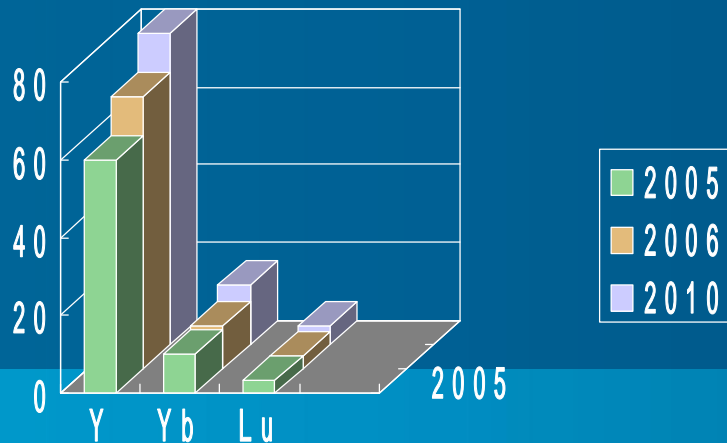


Sintering assistant agent, Catalyst, Paints and glaze

- When sintering alumina, AlN, and Si₃N₄, Y₂O₃/Yb₂O₃ of fine powder is added in order to maintain density predetermined at low temperature)

- | | 2005 | 2010 |
|------------------------------------|------|-------|
| • Y ₂ O ₃ : | 60Mt | 80Mt |
| • Yb ₂ O ₃ : | 10Mt | 15Mt |
| • Lu ₂ O ₃ : | 3Mt | 4.5Mt |

growth rate at an annual is 10%.



- Rare earth chloride used for the FCC catalyst for oil refining. (Unit: REO Mt)

	2005	2010
Re-Chloride:	500Mt	1,000Mt
	(120 million)	(250 million).
Pr ₂ O ₃ :	20Mt	20Mt
• CeO ₂ :	30Mt	30Mt
• Er ₂ O ₃ :	3Mt	5Mt



Structure material · Agricultural material

- The addition stabilizer use to partially stabilized zirconia. The zirconia as structure material has a phase transition at 1,170 degrees. Addition of Y_2O_3 prevents volume change to 2,360 degrees.
- Y_2O_3 demand of this field is 120Mt in 2005 and it will increase 5% growth rate in the future for 2010.

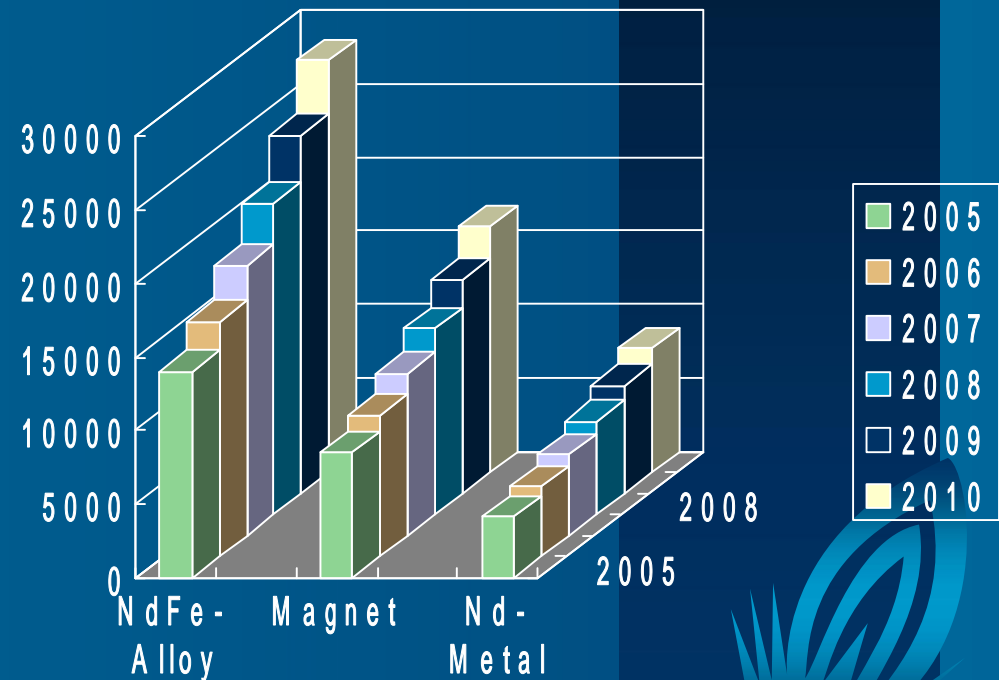


No market in agricultural usages in Japanese market.



Magnetic material of Alloy (NdFeB Magnet)

- NdFeB-magnet will become more than 16,000Mt in 2010 from 8,500Mt in 2005. growth rate will be more than 15% in 2006.
- It is extended to an automobile motor, IT related MRI diagnostic equipment, etc.
- NdFe-Alloy also become 28,000Mt level in 2010 from 14,000Mt scale in 2005 and its growth rate is nearly 15% average a year.
- Nd Metal demand will be needed 8,400Mt in 2010 from 4,000Mt scale in 2005. and it will be arranged recycle system in Japanese market in the future.

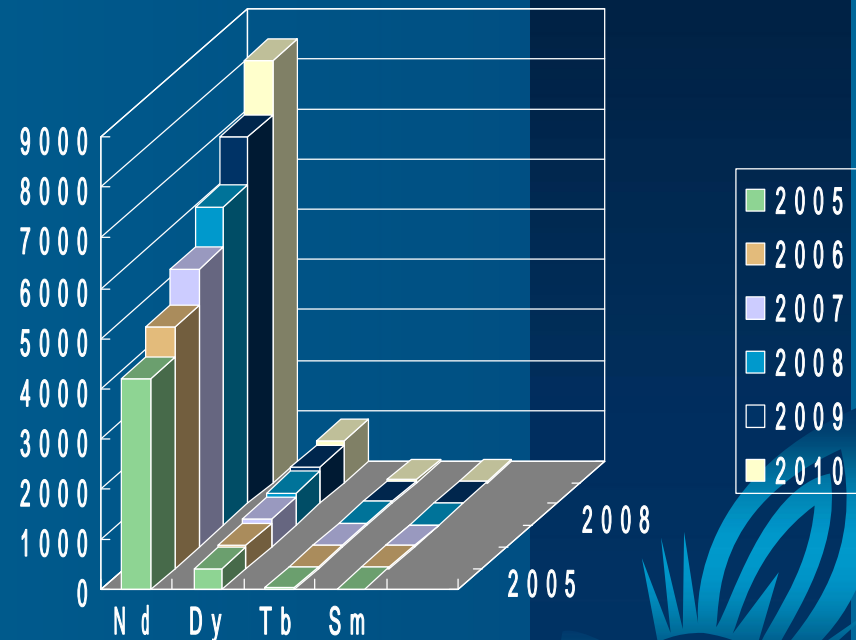


Unit: Mt

Magnetic material element, (Nd, Dy, Tb and Sm metals)

- NdFeB-magnet of 50MGOe has 50 times power than ferrite.

	2005	2006	2010
Nd-Alloy	14,000Mt	16,000Mt	28,000Mt
Nd :	4,200Mt	4,800Mt	8,400Mt
	(US\$46.2M)	(US\$96M)	(US\$168M?)
Dy :	420Mt	480Mt	840Mt
	(US\$25.2M)	(US\$41M)	(US\$72M?)
Tb:	40Mt	42Mt	51Mt
	(US\$16M)	(US\$ 25.2M)	(US\$32M?)
Sm :	24Mt	25Mt	30Mt
	(US\$0.3M)	(US\$0.3M)	(US\$0.4M?)
Total	(US\$87.7M)	(US\$162.5M)	(US\$104.4M?)



Unit: Mt

Cellular phone Energy-saving household electric appliances



Cellular phone



Air-conditioner



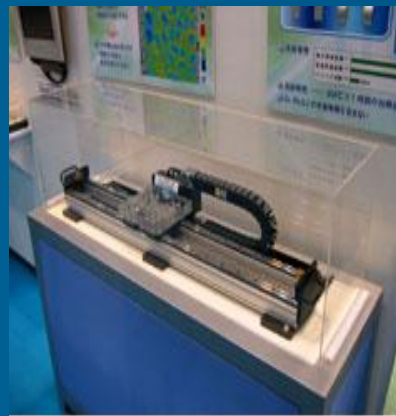
Washing machine



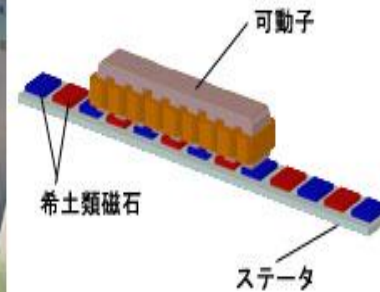
Cleaner

The automobile field

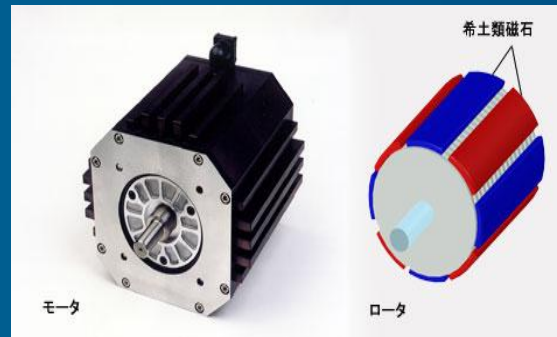
Hybrid car , Electro mobile and Electric hybrid bicycle and
Linear motor car



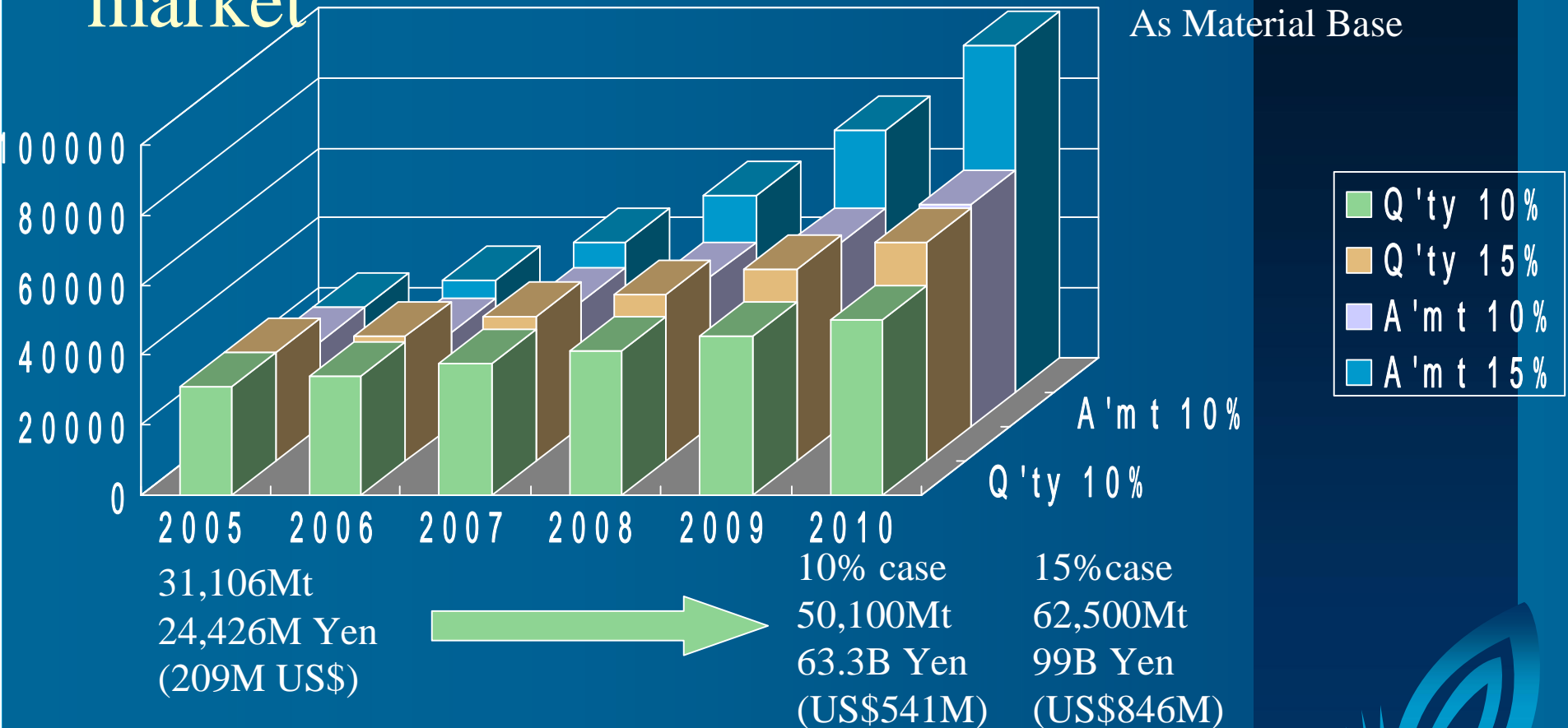
リニアモータ



Power station, Wind power and F A

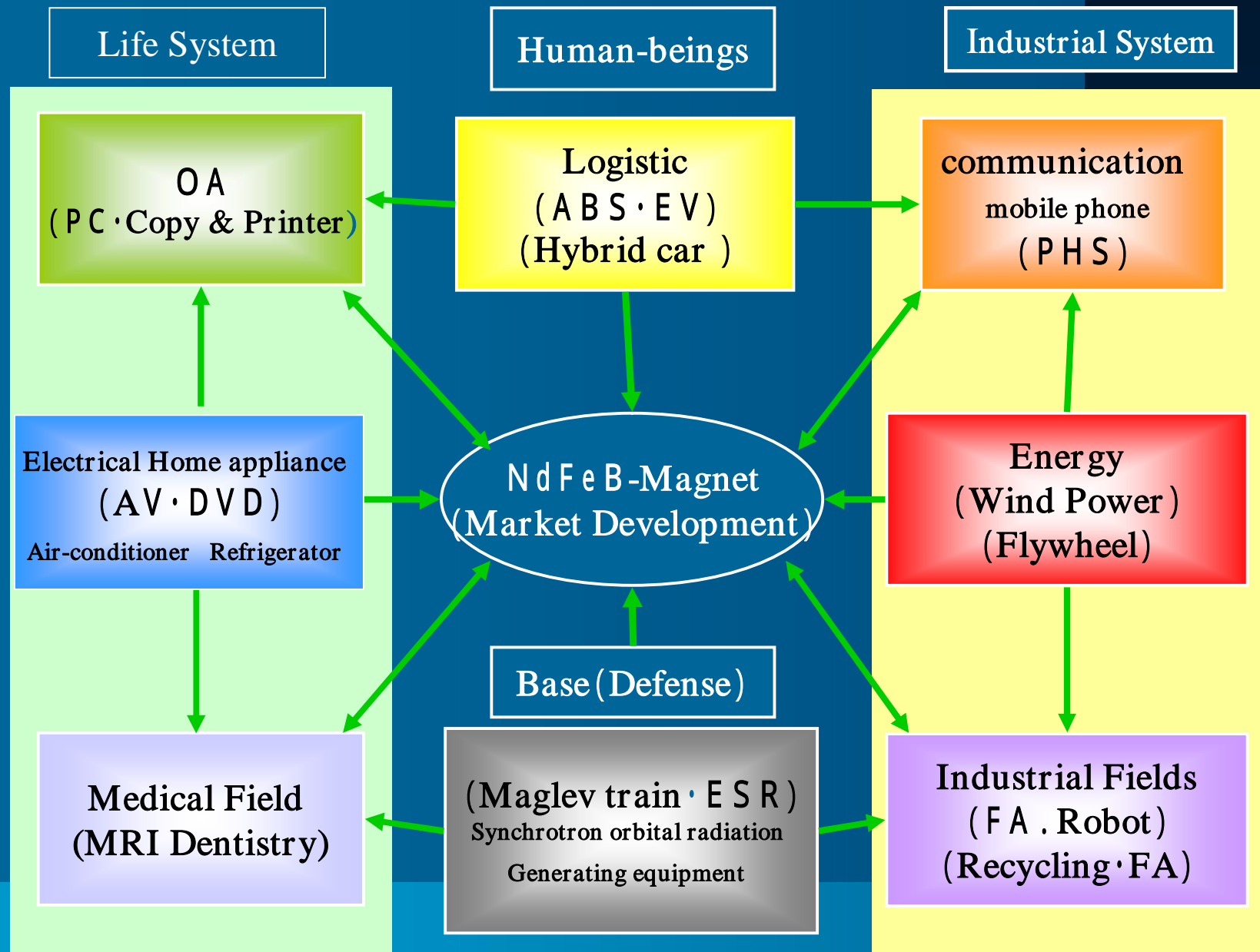


Future view and direction of Japanese market



- China shift is expected not only for the separation process of rare earth industry but for down stream (fluorescent substance industry, magnetic material industry, battery material industry, etc.), however, Japanese market will grown up till 100B Yen market.
- Also, new fields, such as an electromobile, MRI, a hard disk, an optical magnetic memory material, and a fuel cell, will developed more in Japanese market.
- The trend according to new developed industrial field is reported next page.

NdFeB magnet use development



Conclusion

- The volume of import in 2005 was 31,106t. 32,000t will be expected 2006 and 63,000t will be expected 2010. On the other hand, an market scale of raw material in 2005 was 24,426 million yen(207million \$), and it will become to 32,200 million yen(280 million \$) in 2006 and 50 billion yen (430 million \$) in 2010 , respectively.
- Japanese government starts to study about government stockpile of Rare Earth raw materials in 2006 and also try to develop new sources out of Chinese channel.
- Japanese Rare earth industry accelerates to develop new application of Rare Earth market fields, and it will be most important to corporate both technical exchange and stable supply of Rare earth reserves between Japan and China.

Thank you very much for your
attention



Advanced Material Japan
Corporation

