



Guangxi' s Mn Industry: Today and Future

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IMnI China Conference

March 30, 2007 Guilin China



1. Mn industry in Guangxi

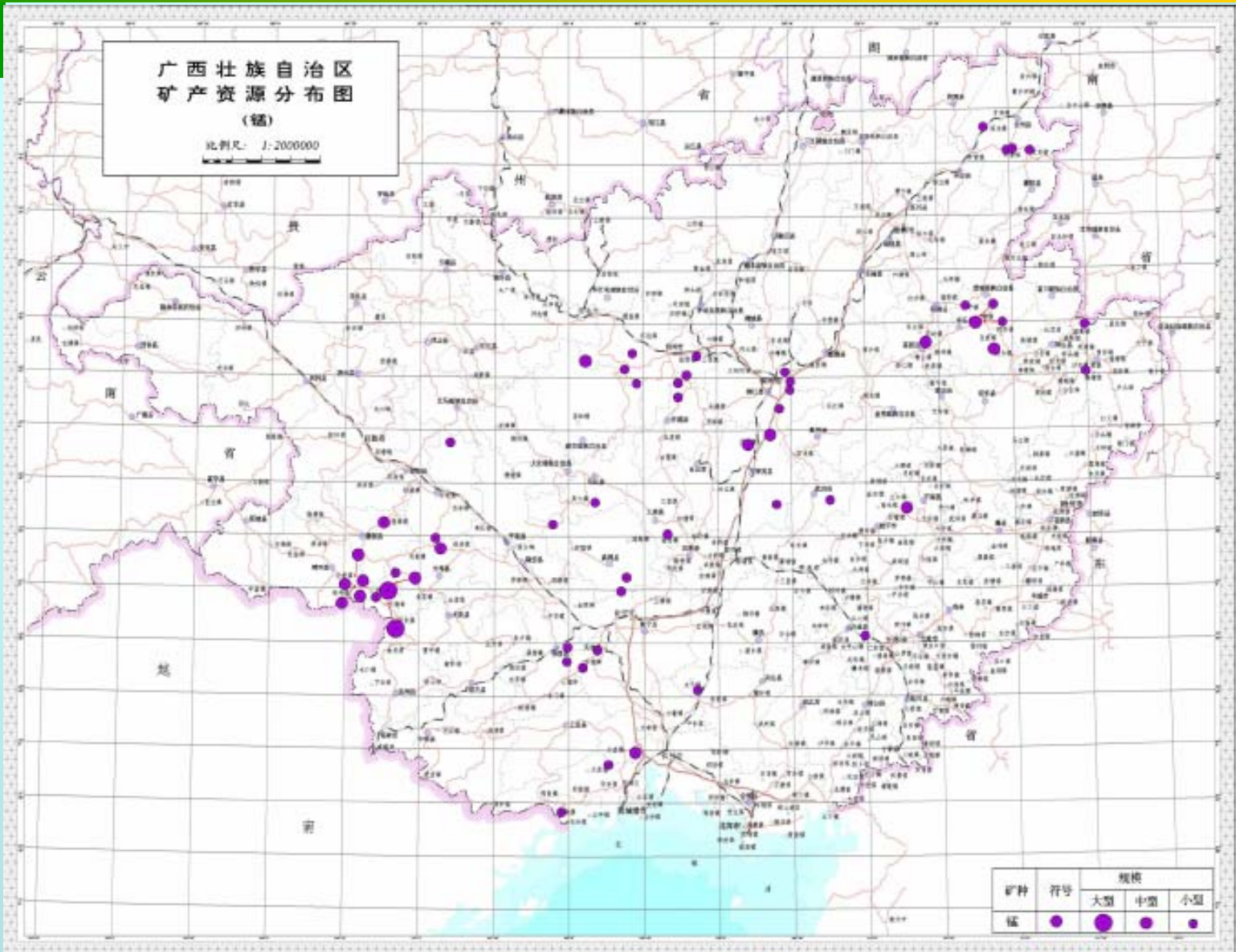
Production capacity grows rapidly and industry status was lifted through construction, technical innovation, restructure and structure adjustment.

- ★ **Products include EMM, EMD, MnSO₂, Carbonate Mn ore, Mn power for battery and chemistry, FeMn, SiMn, etc.**
- ★ **Production of Mn ore and Mn powder lead the country, Ferroalloy production rank second and other Mn related products have a big share in the country.**
- ★ **Owns major producers like Citic Dameng, Guangxi Bayi, Guangxi Eramet Comilog, Zhenxin, Huiyuan, Tianhongxin, etc.**
- ★ **Mn industry has become one of the advantageous industry in Guangxi.**



Mn Resources in Guangxi

- Abundant Mn resources with large scale of ore bed and 43 mines
- Mn ore mostly located in Chongzuo City(Daxin county and Tiandeng County), accounting for 69.5% of the reserves of the province
- Mostly Carbonate Mn ore, accounting for 60% of total reserves
- A group of major ore producers in shape with a total production capacity to around 2 million tons
- Citic Dameng owns the largest open mine in China
 - Production capacity 1 million mt/year
 - New operation set up in 2006 to select 600 thousand carbonate ore
 - Carbonate ore mining project(600kt/year)



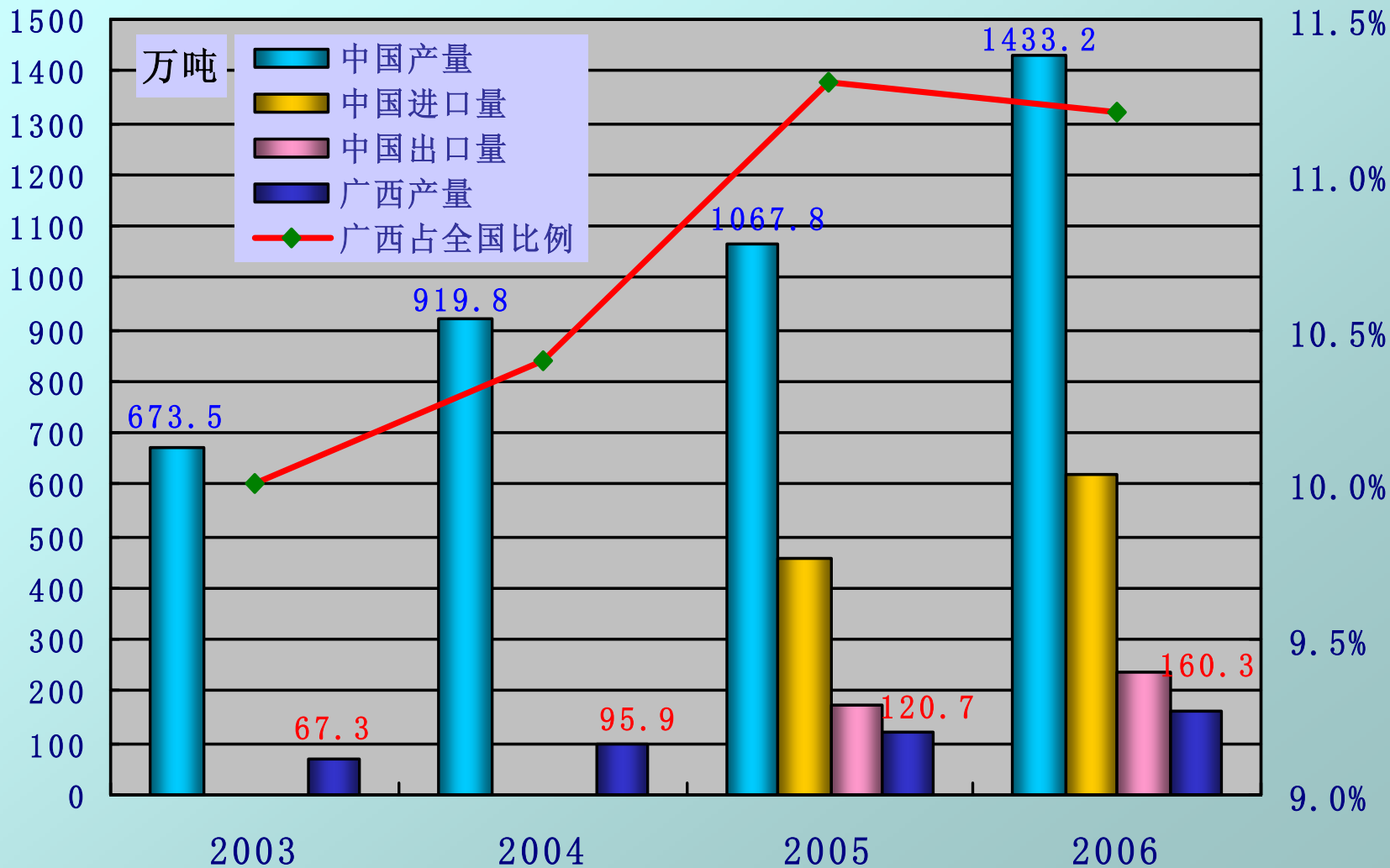


Ferroalloys

- China has become the leading ferroalloy producer, consumer and exporter of the world with production, consumption and exports accounting for 40%,30% and 30% of the world respectively.
- Ferroalloy producers numbered 1570 with a total production capacity of 22.13 million tons
- 14.33 million mt of ferroalloys were produced in 2006.Capacity utilization was 48%.
- 1.61 milion mt capacity is under construction, another 1.23mt is in planning.

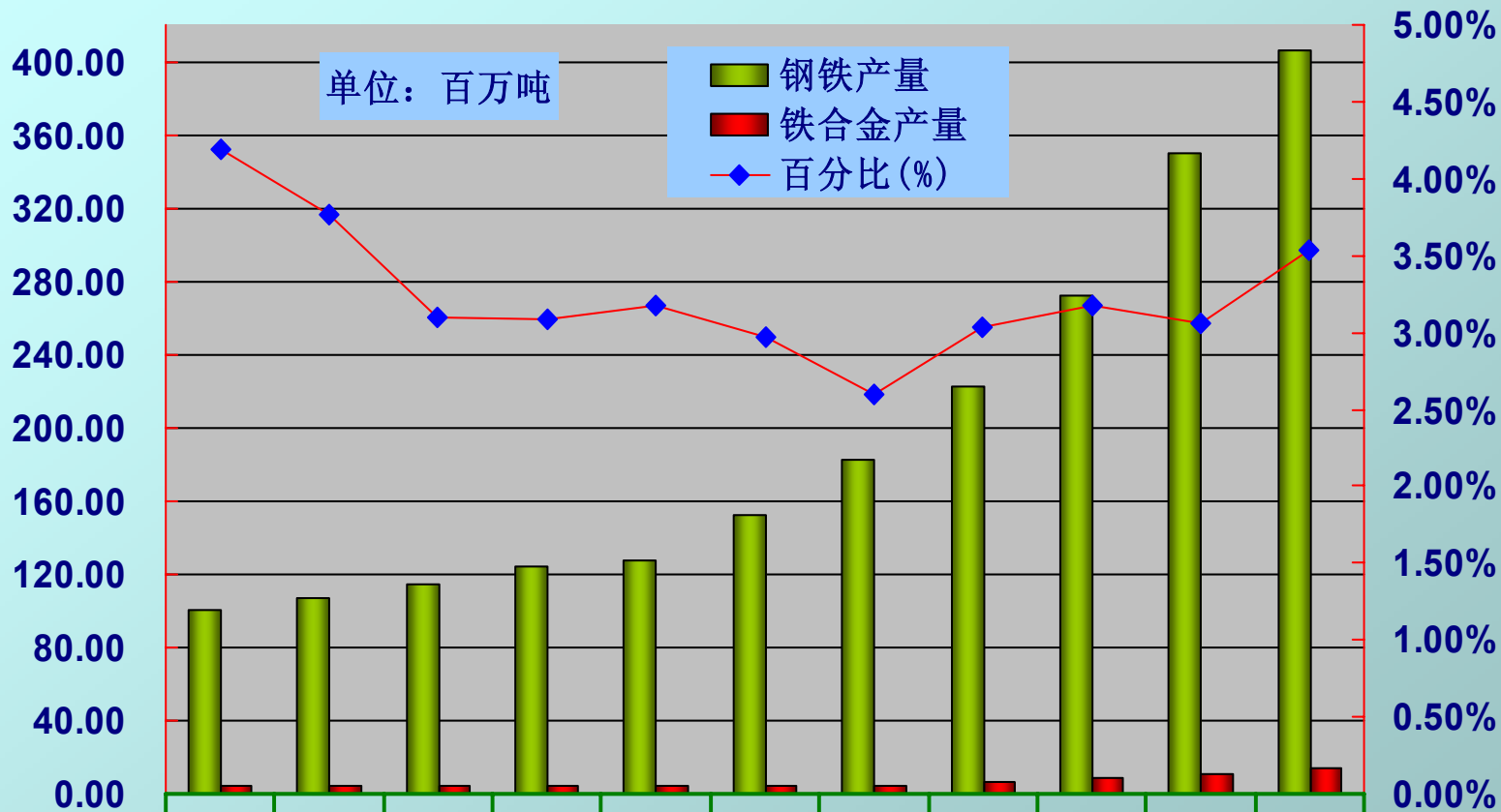


Ferroalloy production China and Guangxi 2003~2006





Steel and Ferroalloy produciton in recent 10 years



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
钢铁产量	100.0	107.3	114.5	123.9	127.2	152.6	182.2	222.3	272.4	349.3	406.4
铁合金产量	4.19	4.04	4.04	3.81	4.03	4.53	4.73	6.73	8.66	10.68	14.33
百分比 (%)	4.19%	3.76%	3.10%	3.08%	3.17%	2.97%	2.60%	3.03%	3.18%	3.06%	3.53%



Problems for Chinese Ferroalloy industry

- **Overcapacity, Pollution, Lack of consolidation**
- **Regarded as high energy consumption, polluted industry and applied to entry permission policy**
- **To apply differential prices on electricity and apply export tax**
- **Quality of domestic ore went down and in short supply, imported ore went up, cost went up accordingly**
- **Export blocked, limited increase on domestic consumption, surplus on supply and demand result in low prices**



Ferroalloy industry in Guangxi

- Most of ferroalloy producer in normal operation, there are plants planning to shift production
- Chrome alloys and Ni alloys are the direction for those plant to shift production. Guangxi's ferroalloy industry is in adjustment
- Logistics cost has become a benchmark for producers, costal area shows advantages



Low grade Mn ore will move to electrolytic production from ferroalloys

- **MnO₂ ore decrease in grade (main stream ore below 28%), resulting higher power consumption in alloy production**
- **As the** 随着氧化锰还原工艺的改进和多样化（如还原窑、回转窑、微波炉等），使其用于电解金属锰、电解二氧化锰等的原料成为可能。
- **Low grade MnO₂ ore is abundant and cheap in Guangxi, a perfect materials for EMM and EMD production**



EMM

- **Stainless steel production soared, pushing the demand for EMM**
- **According to statistics of 2006, there are 165 EMM producers with a capacity of 1.2 million mt, accounting for 95% of world capacity**
- **Total EMM production in 2006 reached 660k mt, of which 300k mt were exported**
- **34 producers(392,500 mt in capacity) met the entry permission standard, of which two are in Guangxi province, one is Dameng and the other is Sanmenglong**
- **21 emm producers in Guangxi with a total capacity over 200k mt. Citic Dameng,Huiyuan,Tianhongxin are the ones with capacities from 30k to 40k mt**

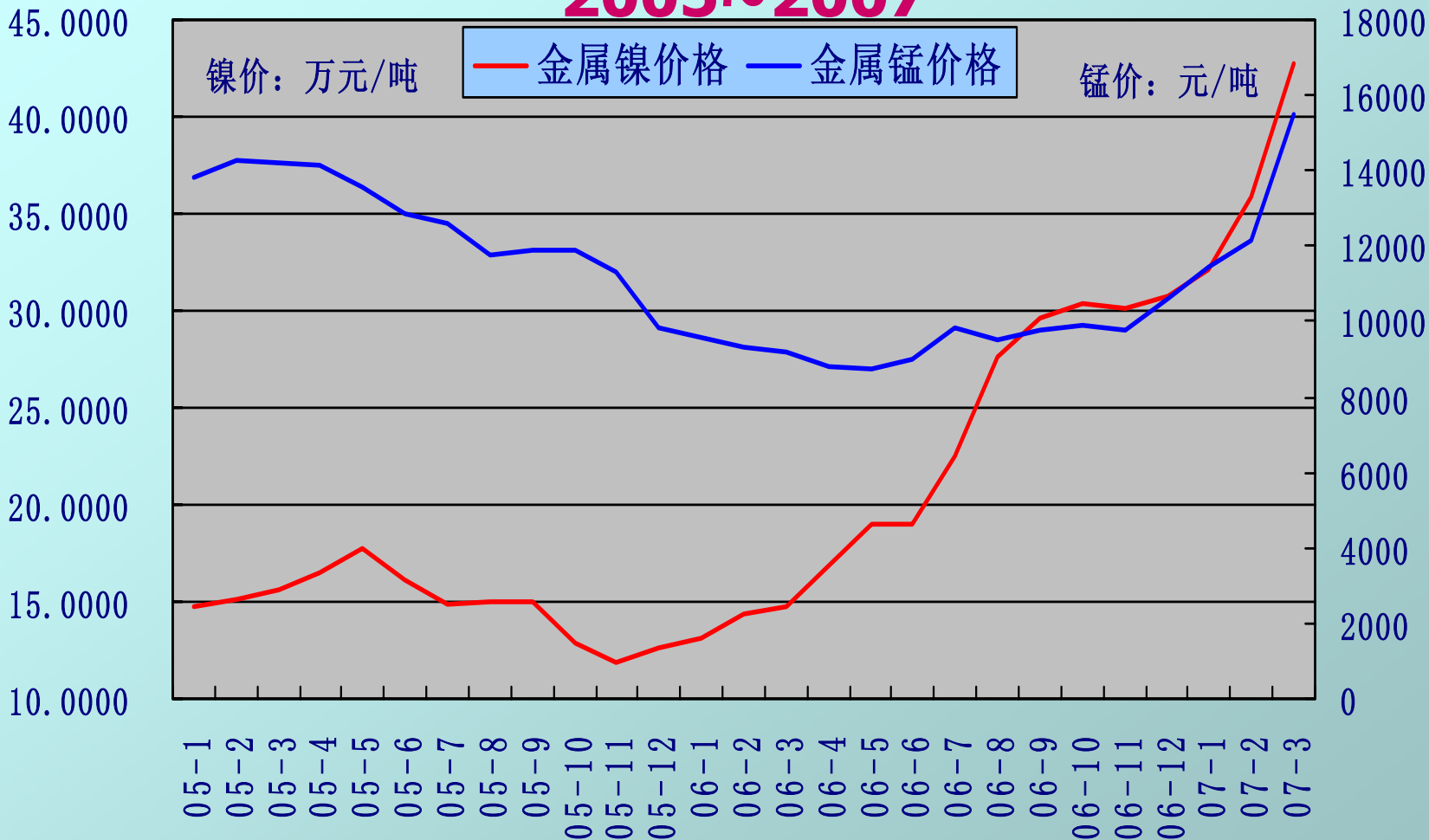


The Challenges for EMM Industry

- Rapid growth on Capacity: Producers regained confidence as the market resume strong performance from the end of 2006 . New investor are moving in and existing plants are expanding capacity
- Most of the plants are poorly equipped : not able to meet the environment requirement
- Raw materials in short supply and unbalanced ; Mn ore price went up due to short supplies in Hunan, guizhou and Sichuan provinces, resulting a higher cost of produciton
- Environment under pressure



Price trend of Mn metal and Ni metal 2005~2007



※ The prices above are on monthly average basis,

※ Source of Ni metal: Shanghai Metal ; Source of Mn metal: cm114.com



EMD

- Mr. Li Tongqing did excellent speech on it, I will skip this part
- Mercury free Alkaline EMD remain an investment hotspot; 而 The industry is moving to Guangxi due to the availability of Mn ore resources
- Guangxi's EMD production will be leading the country



2. Advantages of Guangxi' s Mn Indusgry

- ◆ **coast**
- ◆ **resources**
- ◆ **production technology**
- ◆ **government policy**



Coast

- Guangxi owns three ports, namely Beihai, Fangcheng, Qingzhou, railway, high class road, water and aviation formed a convenient transportation system
- Provincial government is making more efforts in strengthening the infrastructure
- A 10million mt steel project will provide a broader market for Mn industry
- A 10 million mt refinery project has initiated. It will produce sulfur as a byproducts, a stable material supply for vitriol production
- Based on the port logistics, Mn producers can lower the transportation costs of imported Mn ore



Resource

Mn ore

- Guangxi is abundant with Carbonate Mn ore, suitable for Mn deep processing
- Huge reserves of Mn ore features low price
- According to the latest government regulation, Mn mine will be under strict supervision by the government in a bid to logically and efficiently utilize the resources
- Guangxi is putting more efforts on prospecting backup resources, there are potentials for new reserves
- Superior location make it easy to utilized imported Mn ore

Vitriol

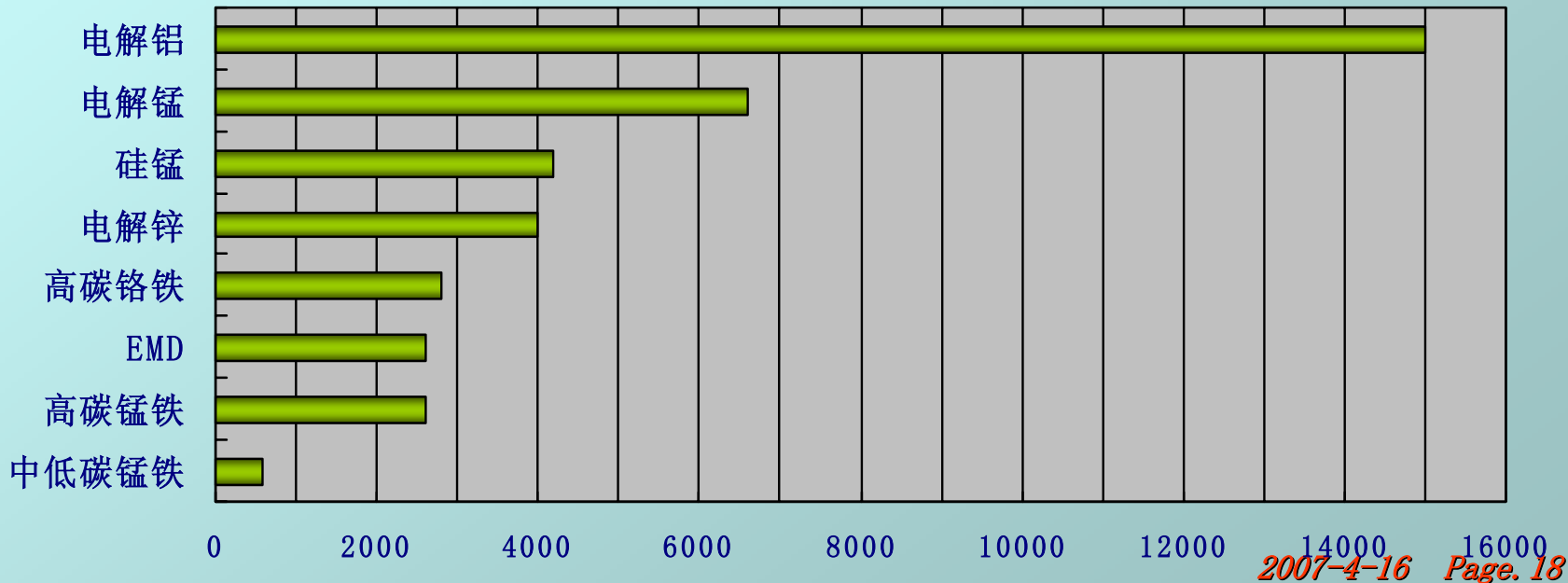
- Metal smelter generates plenty of vitriol as byproducts
- Cheap logistics for imported vitriol from Japan, Korea and other region



Electricity

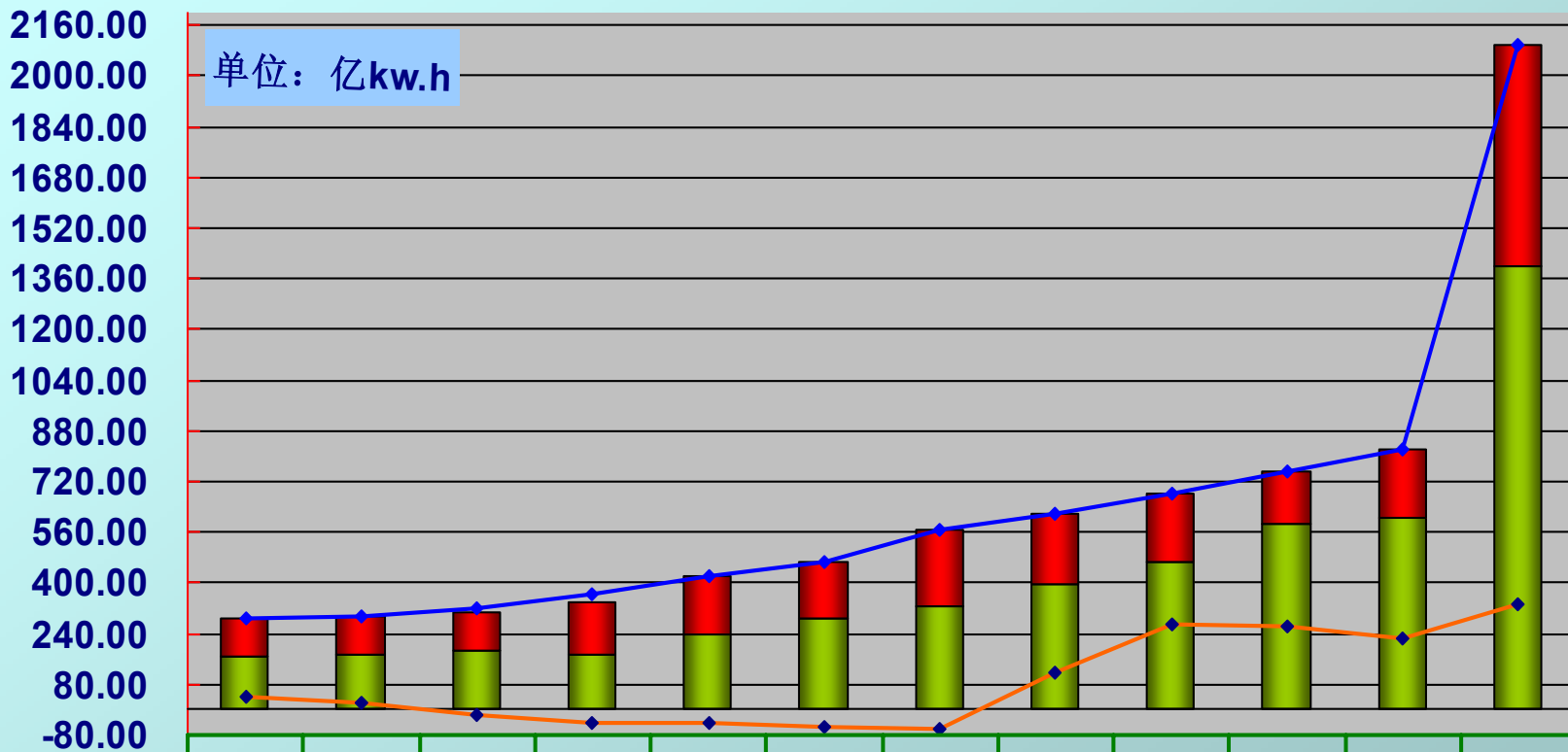
- As planned, the installed capacities will reach 25.68 million KW by 2010 and 35M to 43M KW by 2020, providing a solid supply of electricity
- As Longtan hydropower plant and some other thermal power plants are put into operation, power shortage will be eased and even be in surplus

Electricity consumption of major metal production in Guangxi(kwh/ton)





Electricity supply&demand balance 2000~2020



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2020
Thermal power	120.2	121.1	126.0	161.7	185.0	177.0	241.0	222.0	212.0	166.0	215.0	700.0
Hydropower	168.9	176.1	184.0	176.0	237.0	288.0	329.0	398.0	468.0	584.0	605.0	1400.
total	289.1	297.2	317	363.7	422	465	570	620	680	750	820	2100
balance	40	20	-15	-41	-43	-53	-60	120	270	260	225	330



Technology

EMM

- 中信大锰矿业有限责任公司的电解金属锰生产已通过国家行业准入，标志着本公司的电解金属锰生产的工艺设备水平、环保治理、资源利用及能源消耗总体达到国内先进水平。

电解二氧化锰

- 中信大锰、汇元锰业等企业均引进先进的生产工艺技术，采用先进的生产设备，并聘请了具有丰富经验的**EMD**技术专家。
- 主要以生产汞碱锰级**EMD**产品为主，生产技术成熟，产品质量达到国际采购标准。
- 广西埃赫曼康密劳化工有限公司的电解二氧化锰技术直接来源于美国本土。



政策优势

- 广西锰业已从“特色产业”上升为“支柱产业”，崇左市打造“一黑一白”战略，其中“一黑”就是指锰业，目标是实现产值**100**亿元。
- 政府主导产业发展的力度加大，目前正筹划组建“中信大锰（集团）公司”，从源头上把资源整合，统一开发，提高回采率，从安全上、环保上实现国家的要求



四、广西锰矿产量增长的潜力和进口锰矿的发展需求

广西锰矿产量增长的潜力

- 广西锰矿开采的增量将从氧化锰转向碳酸锰为主：
- 氧化矿大体能保持目前的产量，大量小锰矿的开采维系着增长的潜力，主要集中在低品位矿，预计在相当长的时间内能维持在**150**万吨/年以上。
- 碳酸锰矿的产量会逐年提高，在很短的时间内将超过**150**万吨/年。
- 广西资源规模开发的集中度将不断提高，



进口锰矿的需求发展

- 广西锰系铁合金和锰盐产品的发展，对高品位的锰矿的需求量越来越大；以加蓬矿、澳矿为主的高品位氧化锰矿仍将支撑着广西铁合金行业的发展；
- 同时，借东南亚资源开发的东风，印尼、菲律宾、缅甸等国的中高度块矿、粉矿也将进入国内，供应铁合金及电化行业。
- 继加纳碳酸锰矿在铁合金行业成功采用后，又进入了电解产品领域，使用量不断增大，一定程度上缓解了国内电化产品原料供应的紧张局面。
- 进口锰矿量将越来越大，在国际上及时建立可靠锰矿生产基地是势在必行。国内部分企业已充分认识到资源的重要性，在海外开发资源已付诸实践。



五、综合评述

- ★ 由于广西全方位的综合优势，中国锰业尤其是电化行业向广西转移的趋势是必然的。
- ★ 广西电解金属锰产品规模将在不远的将来达到新的高度
- ★ 广西**EMD**将成为世界最大的供应基地。
- ★ 硫酸锰在产品品质等方面有较大的提高。
- ★ 铁合金主要以结构调整为主。

