Resource security

The security of supply with resources

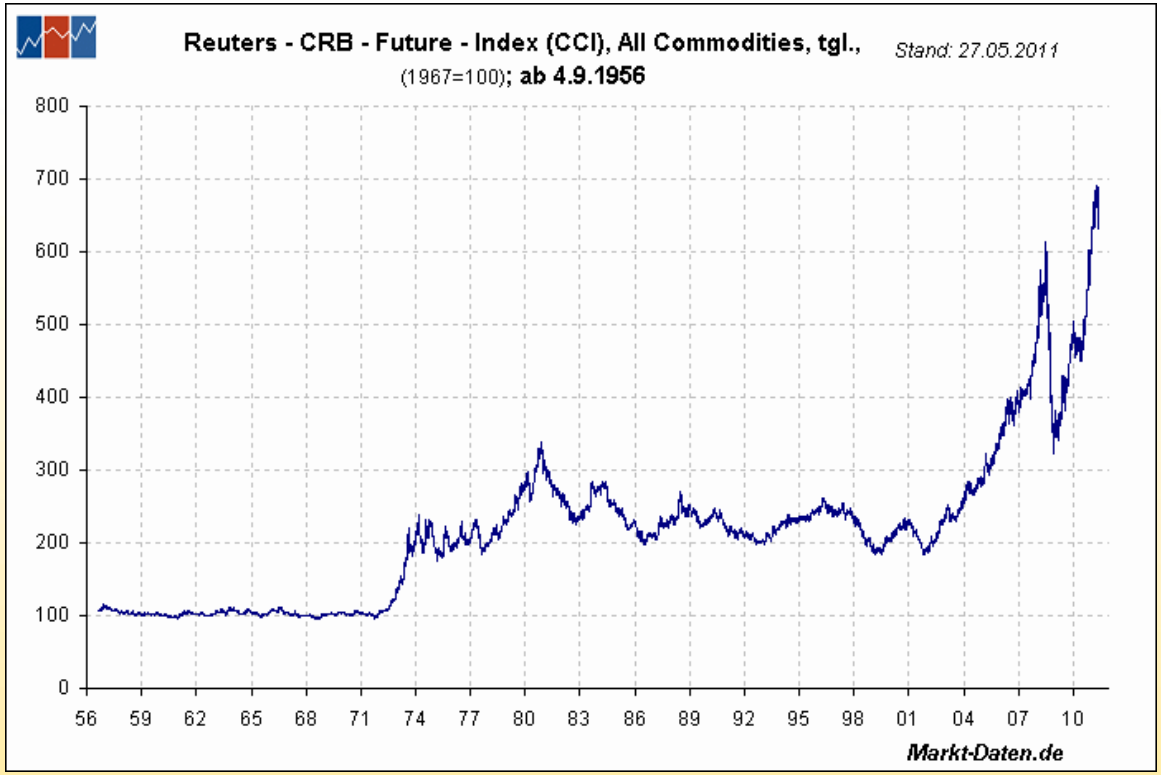
Robert Holnsteiner
Federal Ministry of Economy, Family and Youth
Denisgasse 31
A-1200 Vienna
robert.holnsteiner@bmwfj.gv.at

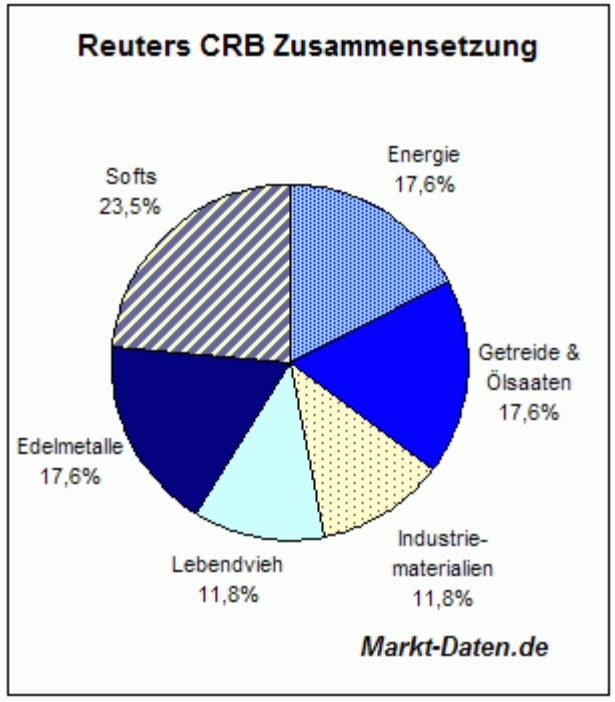
Contents

- introduction
- definition
- policies
- examples
- recommendations

drivers of „crisis“

commodity prices





consumption

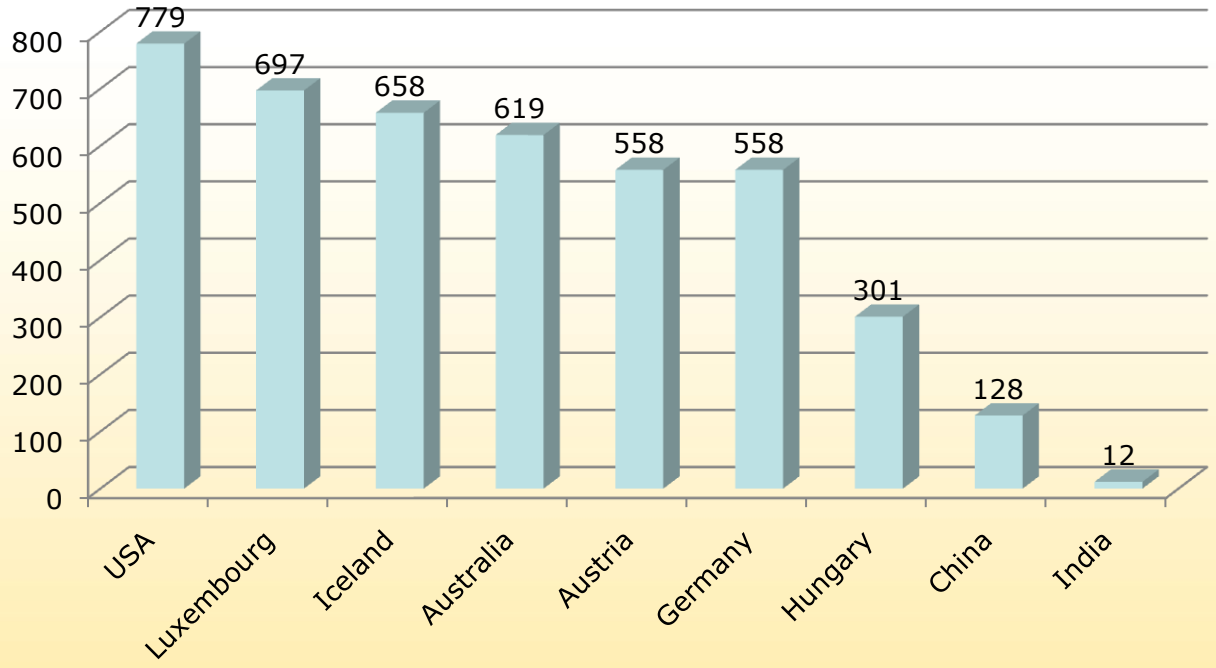
population – policy – industry - aspirations

China: 1.3 billion (2010)

India: 1.2 billion (2010)

consumption

motor vehicles per 1000 people (2008)



European Environmental Agency (2009)

consumption

13 % of chinese people have a car

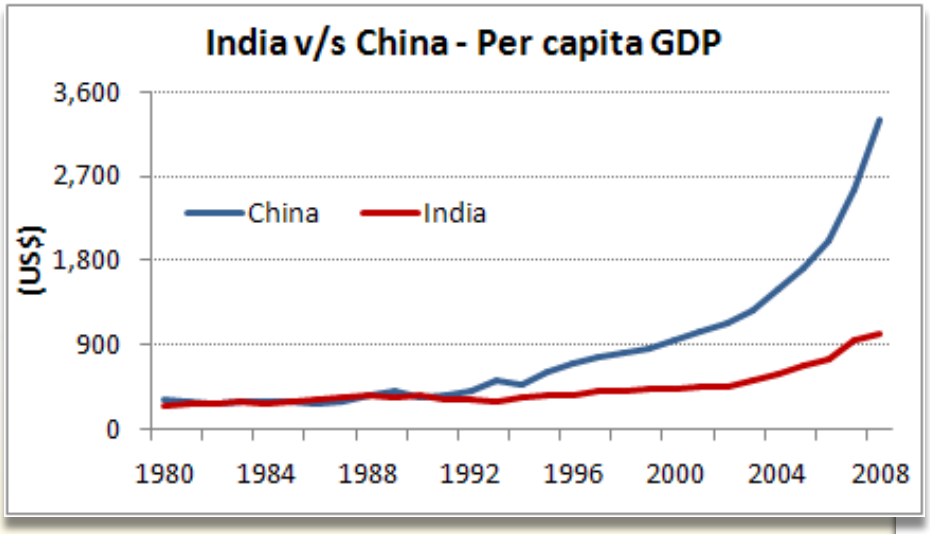
the day after tomorrow?

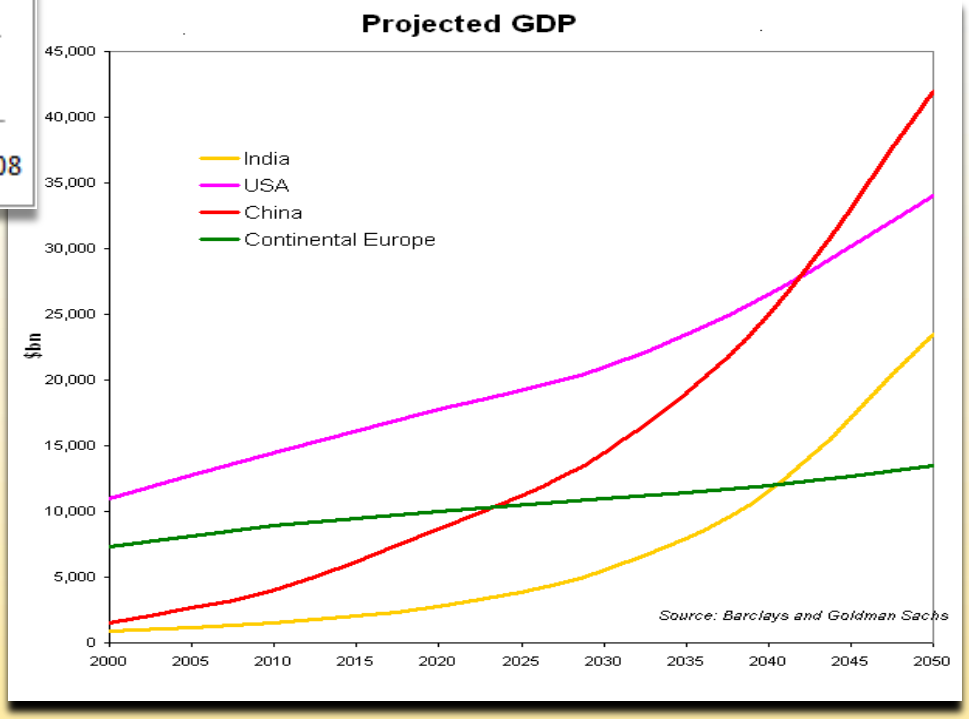
consumption

economic growth

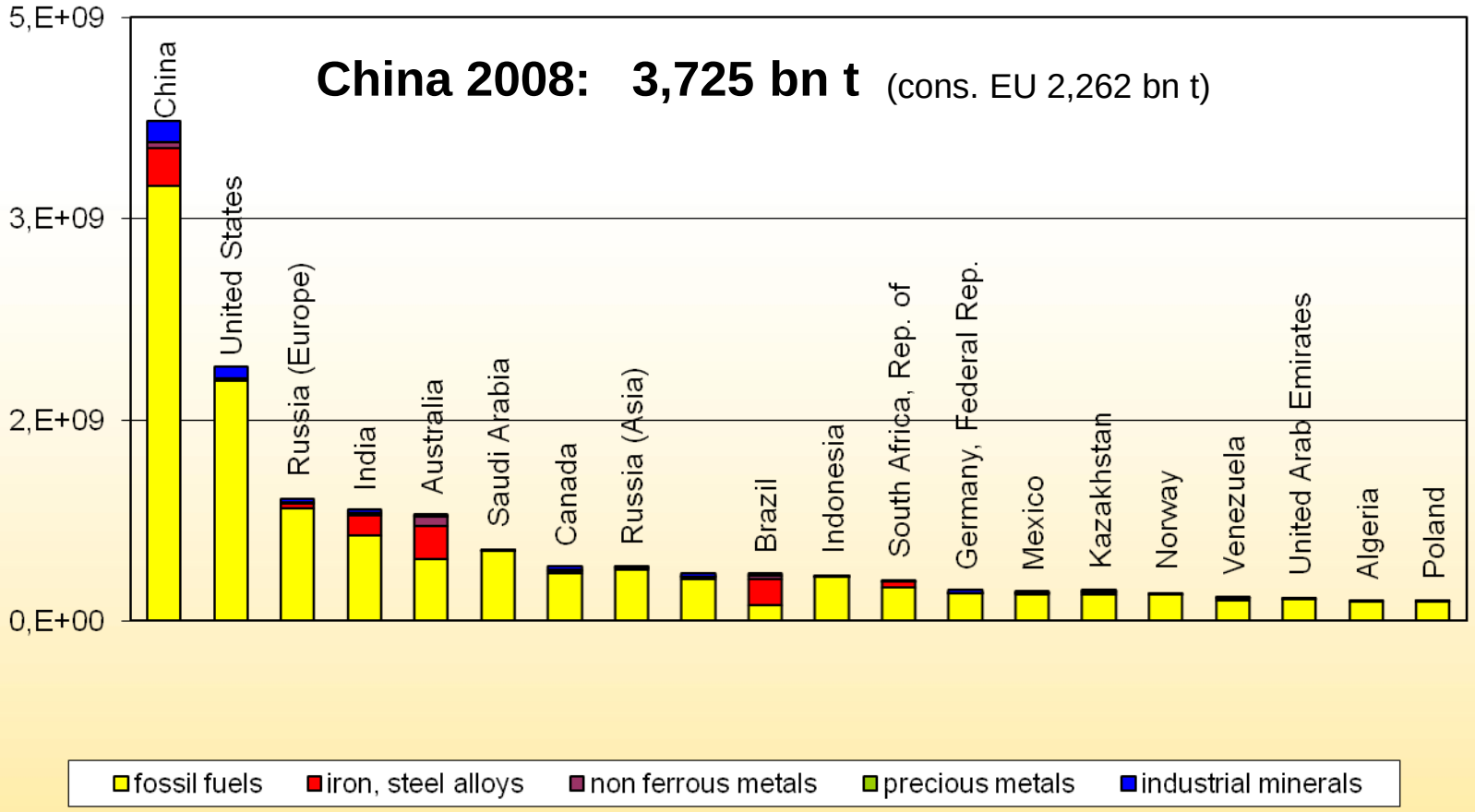
www.bmwfj.gv.at

Federal Ministry of
Economy, Family and Youth



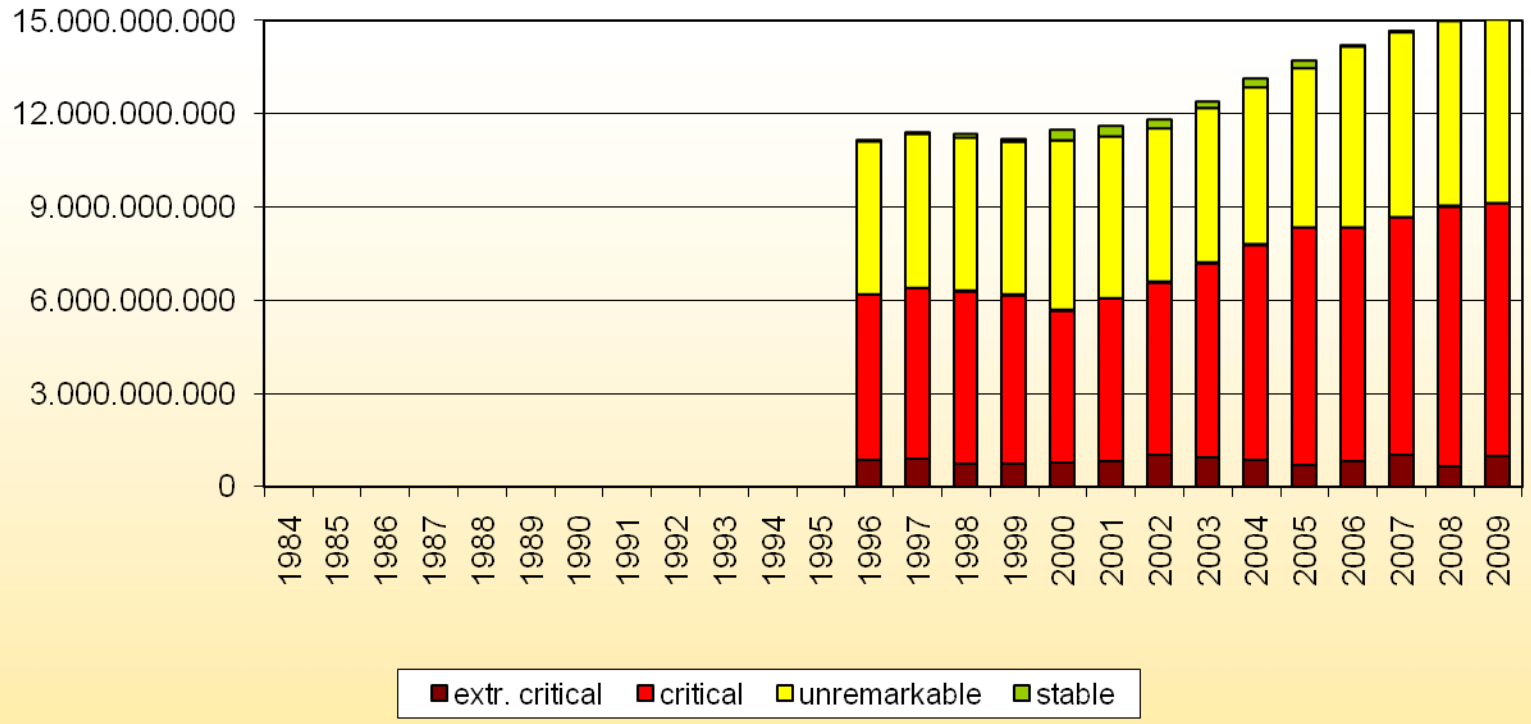


minerals production



minerals production

political stability

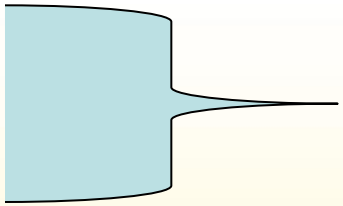


Weber et. al. (2011)

market concentrations

iron ore (2008)

Total prod.	**956 Mio. t**
Vale	301 Mio. t
Rio Tinto	171 Mio. t
BHP	114 Mio. t
Kumba	41 Mio. t
LKAB	28 Mio. t
SNIM	15 Mio. t
Sesa Goa, Sail, Essar	110 Mio. t
Rest	176 Mio. t



3 enterprises are producing 60 %

market distortions

financial speculation

market distortions

climate change – natural catastrophies

developments

www.bmwfj.gv.at

Federal Ministry of
Economy, Family and Youth

studies

EU-policy

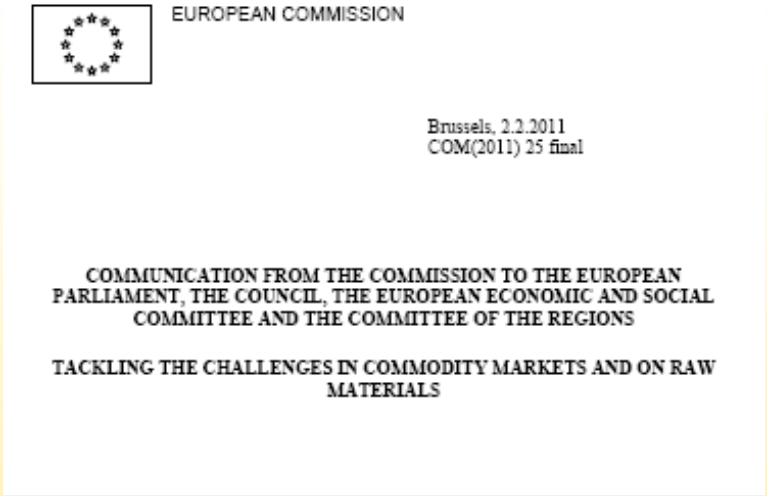
COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels,
COM(2008) 699

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

THE RAW MATERIALS INITIATIVE — MEETING OUR CRITICAL NEEDS FOR GROWTH AND JOBS IN EUROPE

{SEC(2008) 2741}



EUROPEAN COMMISSION

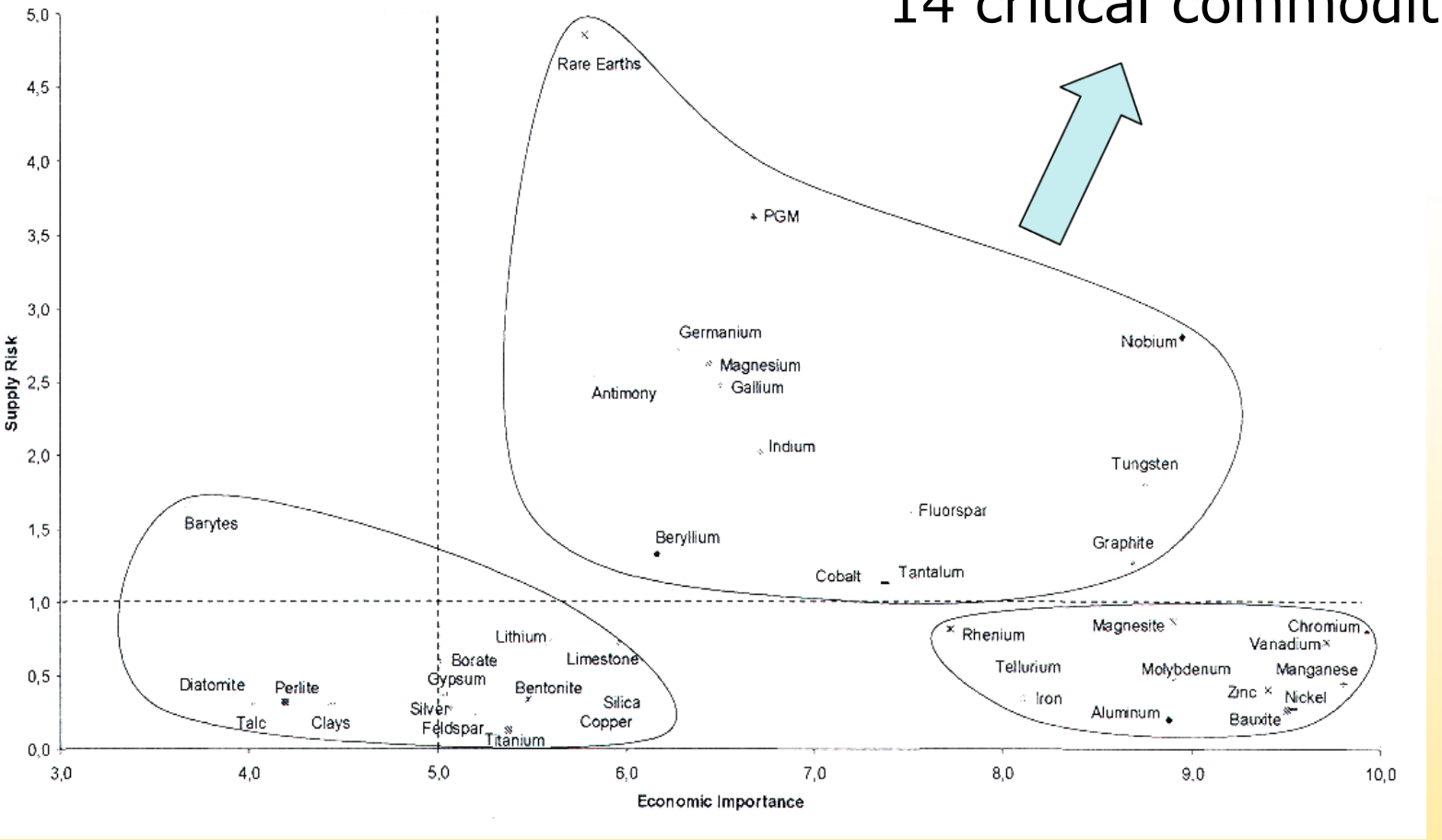
Brussels, 2.2.2011
COM(2011) 25 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

TACKLING THE CHALLENGES IN COMMODITY MARKETS AND ON RAW MATERIALS

developments – EU (RMI)

14 critical commodities



developments – EU (RMI)

$$EI_i = 1/GDP \ \Sigma A_{is} Q_s$$

EI_i	Economic Importance
A_{is}	Share of consumption of material in a given end-use sector
Q_s	economic importance of each sector that requires raw material i, measured by its value added

$$SR_i = \sigma_i \left(1 - \rho_i\right) HHI_{WGI}$$

SRI	supply risk index
σ_i	substitutability
ρ_i	recycling rate
HHI	Herfindahl-Hirschmann-Index
WGI	World Governance Indicator

future orientation EU-RMI

monitoring critical raw materials

- regulary updates

future orientation EU-RMI

fair and sustainable supply of raw materials from global markets (1st pillar)

- development policy and sustainable supply
- reinforcing raw material trade strategy

- (Dodd-Frank-Act/USA: transparency measure)

future orientation EU-RMI

fostering sustainable supply within the EU (2nd pillar)

- national minerals policies

future orientation EU-RMI

boosting resource efficiency and promoting recycling (3rd pillar)

- EU-waste legislation
- R & D
- ecodesign
- improving competitiveness of recyling industry

recommendations

reducing consumption (primary production)

- enhancing resource efficiency and recycling
- saveguarding national deposits by land-use measures
- elimination of trade barriers and distortion of competition
- R&D (unconventional sources, recyling, subsitution)

Intro

annual demand of metals

	mobiles	PC	share of WP
Ag	250 mg (ca. 300 t)	1000 mg (ca. 255 t)	**2,75%**
Au	24 mg (ca. 85 t)	220 mg (ca. 56 t)	**3,5 %**
Pd	9 mg (ca. 31 t)	80 mg (ca. 20 t)	**23 %**
Cu	9 g (ca. 11.000 t)	500 g (ca. 128.000 t)	**0,9 %**
Co	3,8 g (ca. 4.500 t)	65 g (ca. 6.500 t)	**17,7 %**

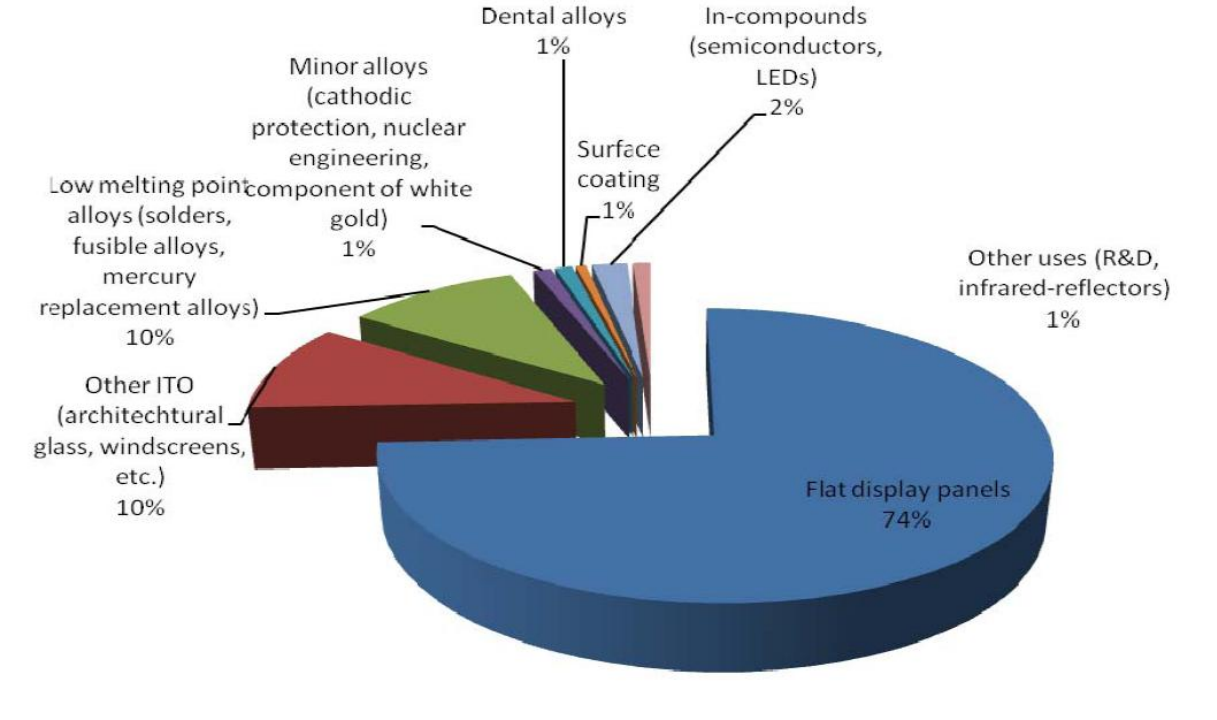
HAGELÜKEN, 2009;
WEBER, L., ZSAK G., REICHL C. & SCHATZ, M.: WORLD MINING DATA 2009

Indium – economic importance

about 1 billion products manufactured per year contain indium

Silver Corporation (2011)

Indium - application



EU-Commission (2010): Critical raw materials for the EU

Indium - application

major drivers for future demand

ITO

CIS thin films for solar cells (copper-indium-selenide)

LED, blue ray discs (indium-gallium-nitride)

Fraunhofer Institut (2009): Rohstoffe für Zukunftstechnologien

Indium-tin-oxide (ITO) is normally used for the wafer-thin electrode under the glass surface of a touchscreen display - it's excellent at conducting slight currents and lets the colours of the display show through clearly

Indium - occourence

by-product of Zn-production

no primary mining

Indium - production

	Production (in t; 2008)		EU imports (in t; 2006)	
Belgium [1]	30	5,3%		
Canada	50	8,8%		
China	330	58,1%	47,3	81,3%
Japan [1]	60	10,6%	0,5	0,9%
Korea	50	8,8%		0,0%
Peru	6	1,1%	1,5	2,6%
Russia	12	2,1%	1,6	2,7%
Hong Kong			2,3	4,0%
Norway			0,6	1,0%
USA			2,2	3,8%
Singapore			2,2	3,8%
Switzerland				
others	30	5,3%		
Total	**568**		**58**	

Source: USGS 2010; trade data provided by ComExt (CN 8112 92 81)
[1] Imports of lend and zinc

Indium – production problems

30 % of indium containing base metal concentrates still do not reach indium capable smelters

70 % of indium containing concentrates that do reach indium capable smelters are extracted at a rate of 50 %

Indium – application problems

Sputtering, the process in which ITO is deposited as a thin-film coating onto a substrate, is highly inefficient; approximately 30% of an ITO target material is deposited onto the substrate

USGS (2011)

Indium - reserves (static):

100 years mining reserves at a rate of 500 t of virgin indium per year

30 years residues reserves at a rate of 500 t per year

reclaimed indium

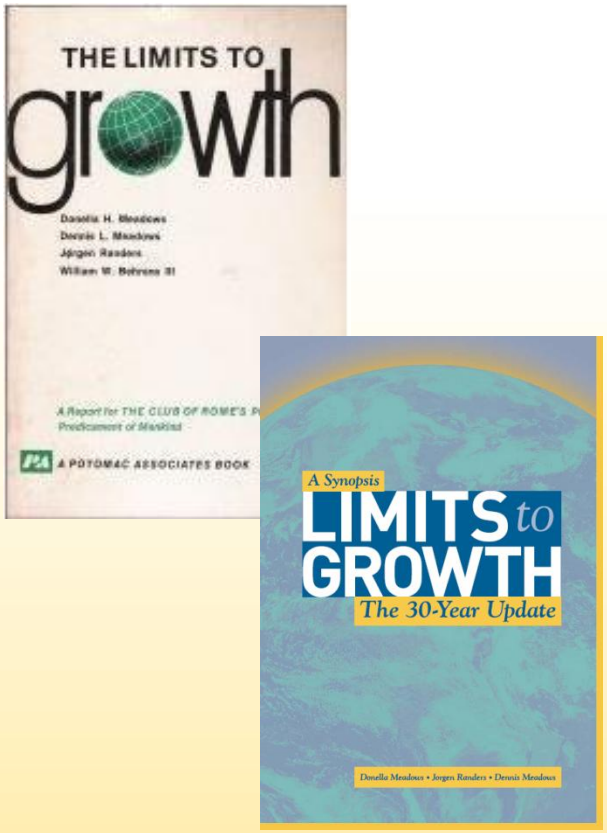
dynamic adaption of reserve quantities by continous on-going exploration

Indium Corporation (2011)

Substitution of ITO by

PET as carrier and mixture of carbon-nanotubes and electrically conducting polymers

Sb-Sn-Oxide-coatings



significant impact on the conception of environmental issues

minerals and energy resources would expire within 100 years of publication

gold would run out in 1981, silver and mercury in 1985, zinc in 1990