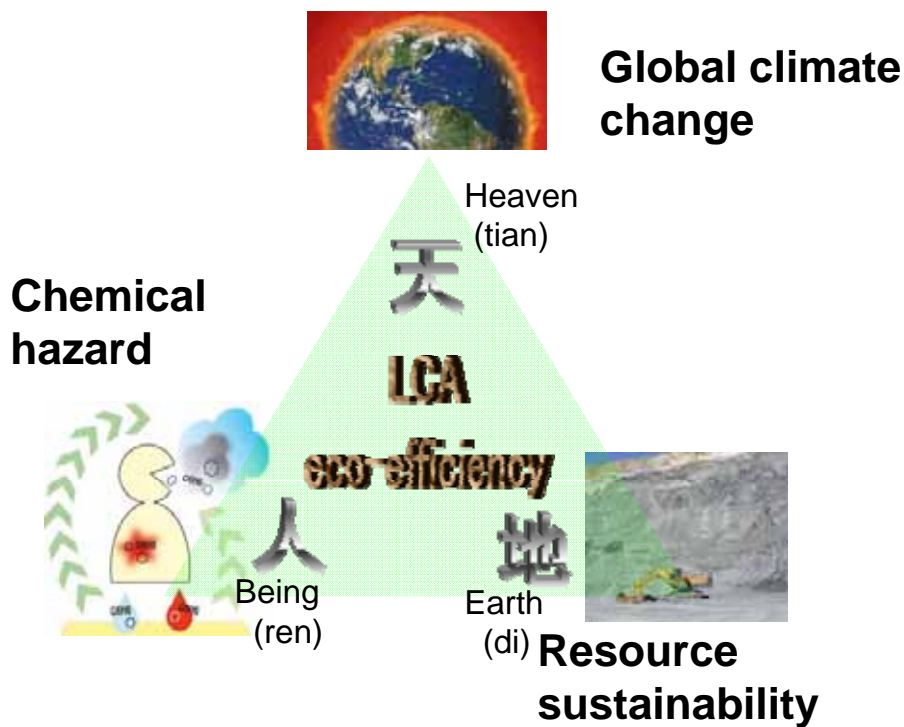


# Sustainable Material Use 持続可能な物質利用

2010.7.13

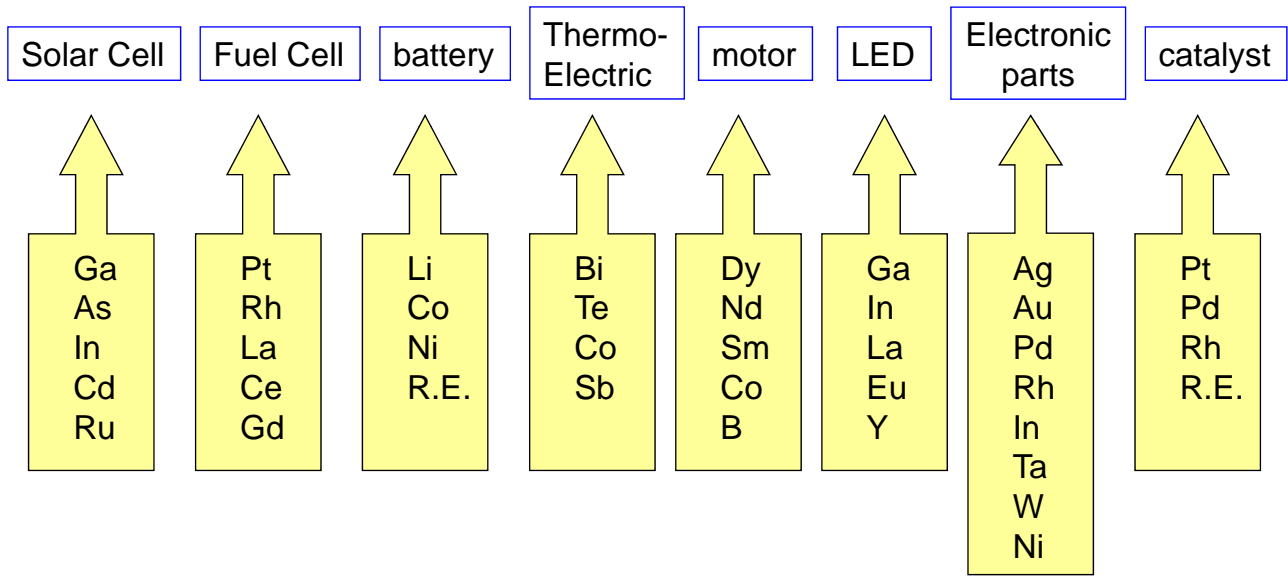
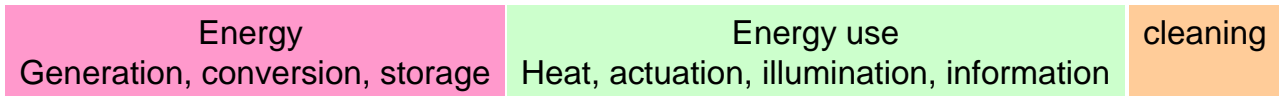
Kohmei HALADA

National Institute for Materials Science

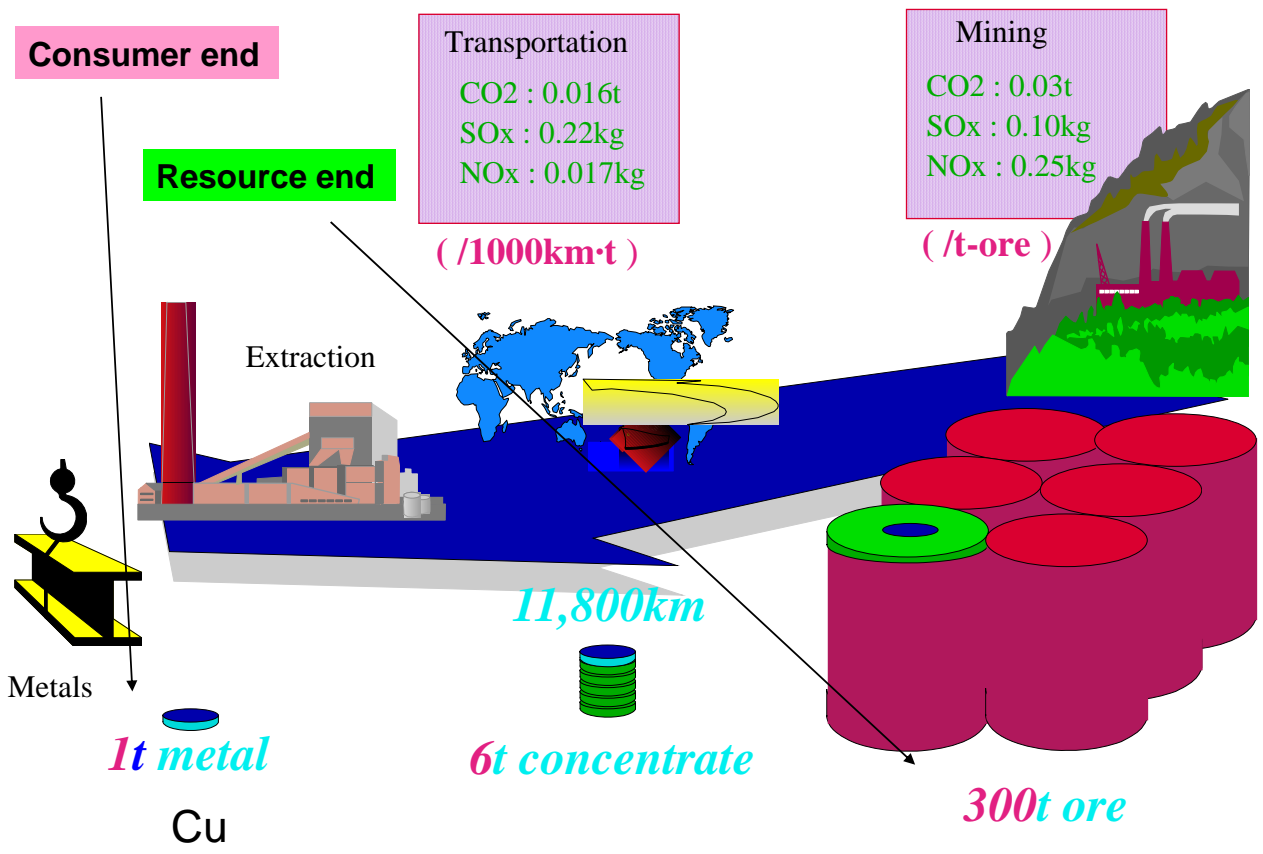


As the climate change is getting important, therefore,  
we need to take care of other risks.

**Catastrophe comes from neighboring risks.**



Eco-innovation requires new demand of rare & special materials.



Material involves a large amount of materials behind.

**Ecological rucksacks**

**TMR: Total Materials Requirements**

One **gram** of Pt  
Involves  
**1.2 tons** of  
Materials.



TMR: 3.6 ton



Platinum ring : 3 g



Equivalent to 0.7 ton of steel

**automobiles**



**Pt for Fuel Cell**

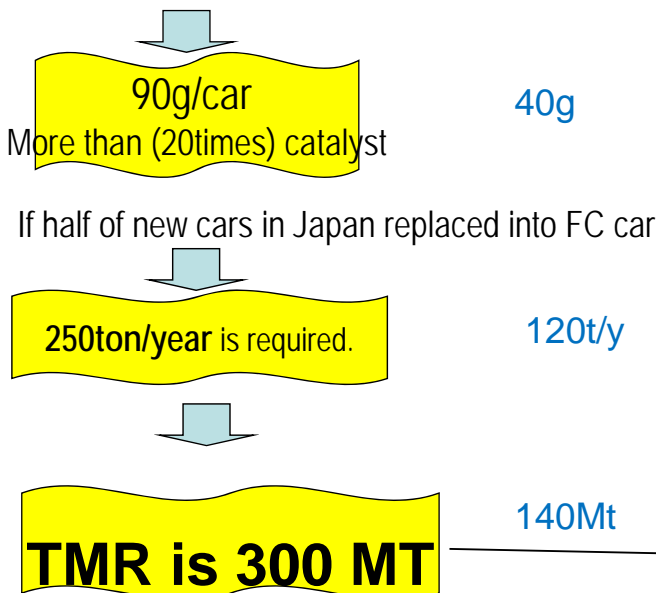
(2007)

Required power 90kW

80kW

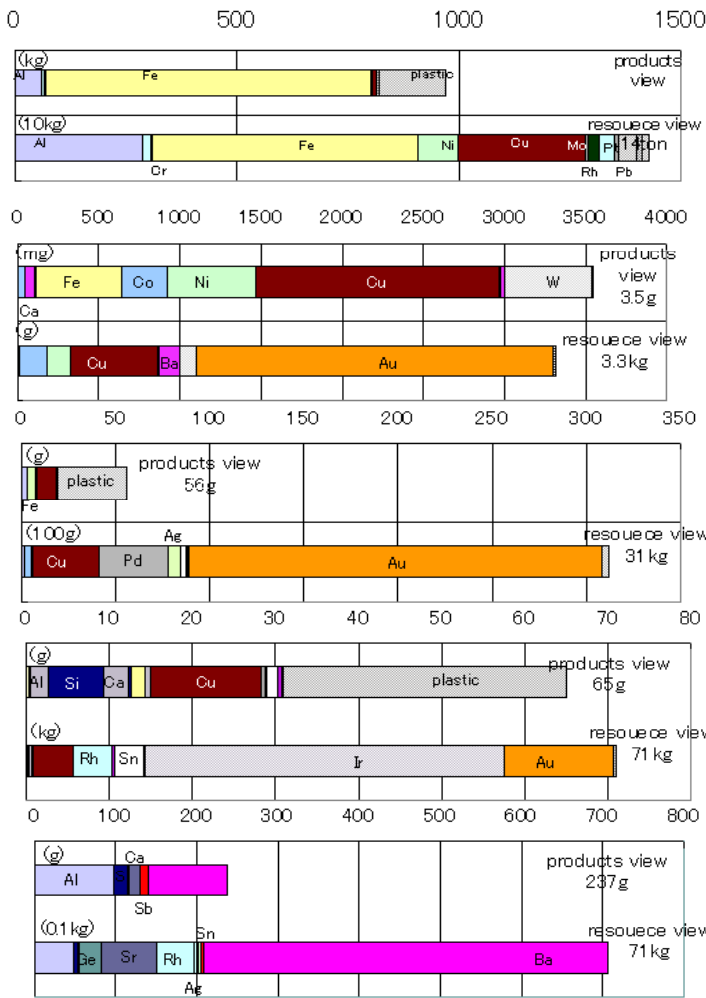
Pt is used as 1g/kW ( at 2004)

0.5g/kw



Equivalent to  
the production of  
19Mt 40Million tons Fe

Weight of material at consumer end (upper) and resource end (lower) of each product



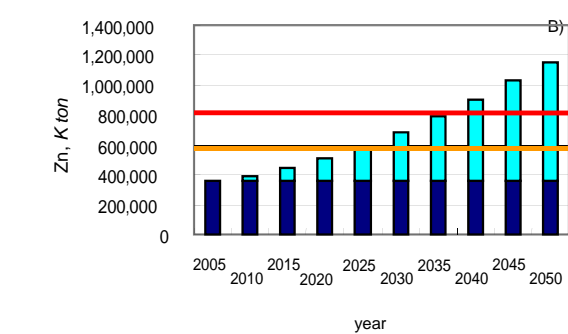
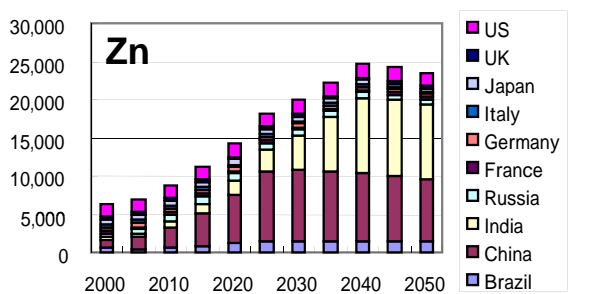
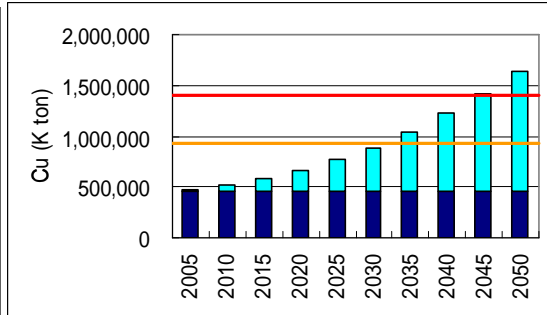
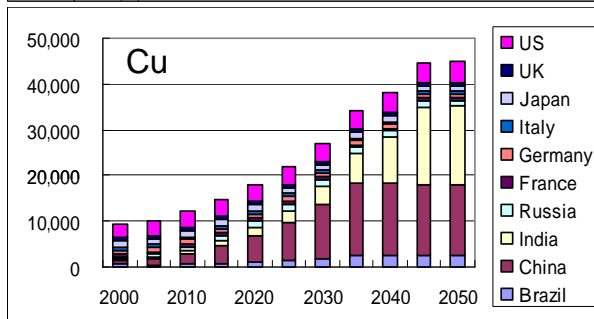
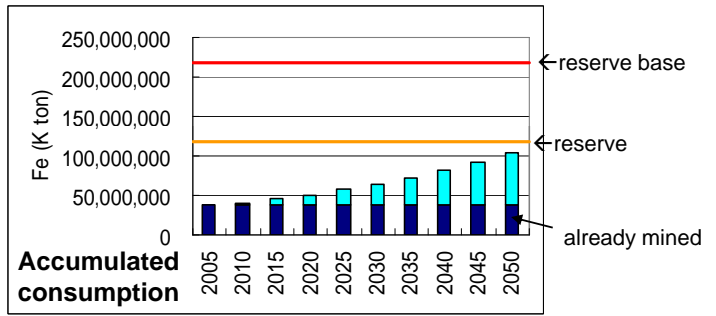
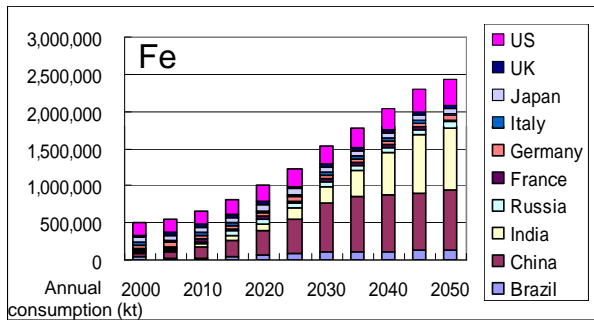
**car** 15time  
consumer end 970kg  
resource end 14 ton

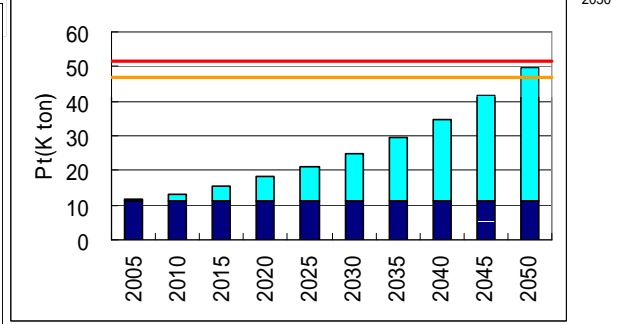
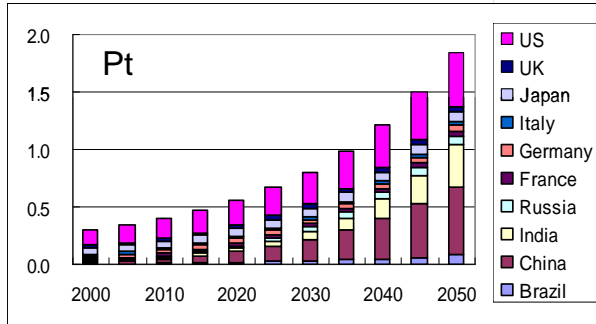
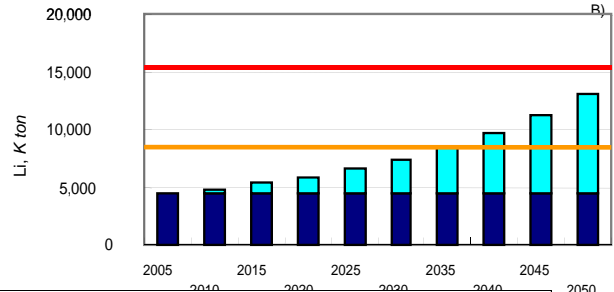
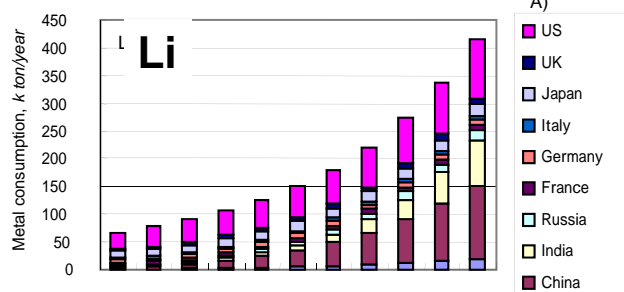
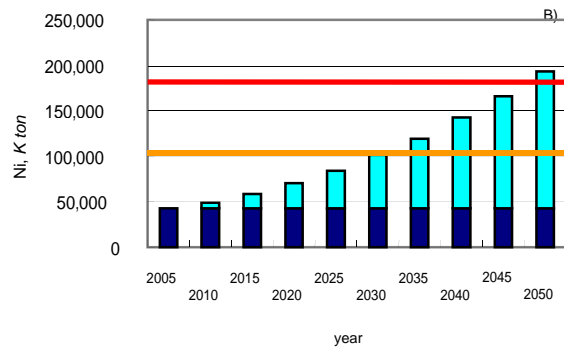
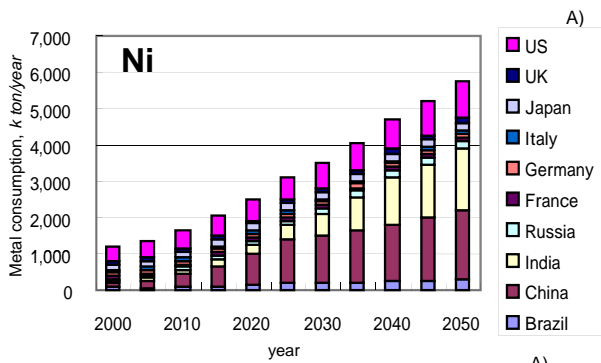
**CPU** 1,000time  
consumer end 3.5g  
resource end 3.3kg

**Cell phone** 500time  
consumer end 56g  
resource end 31kg

**IT board** 1,000times  
consumer end 65g  
resource end 71 kg

**LCD panel** 300times  
consumer end 237g  
resource end 71 kg



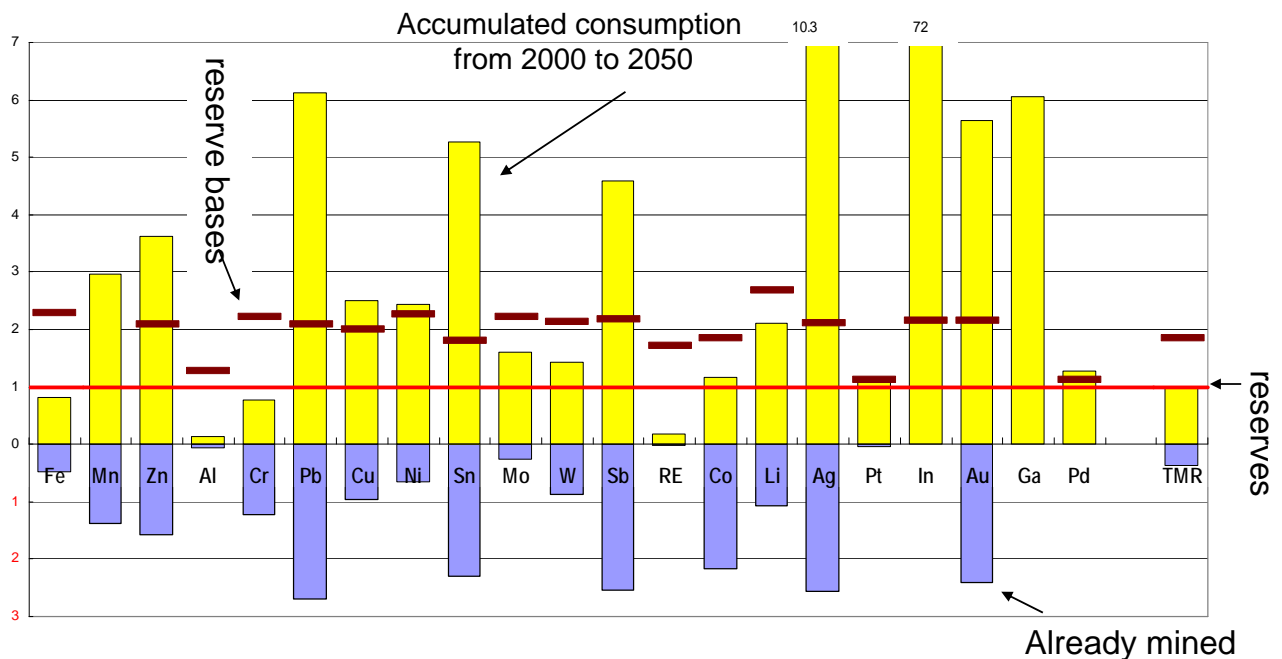


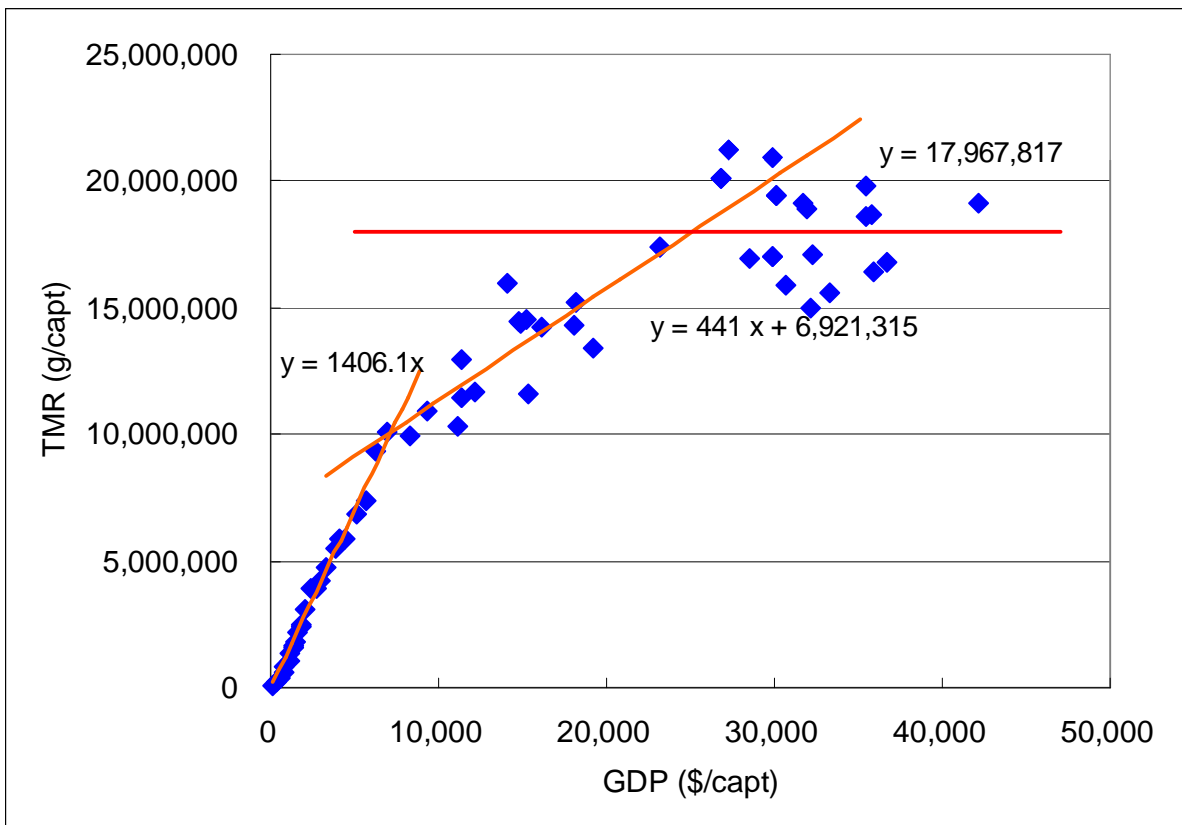
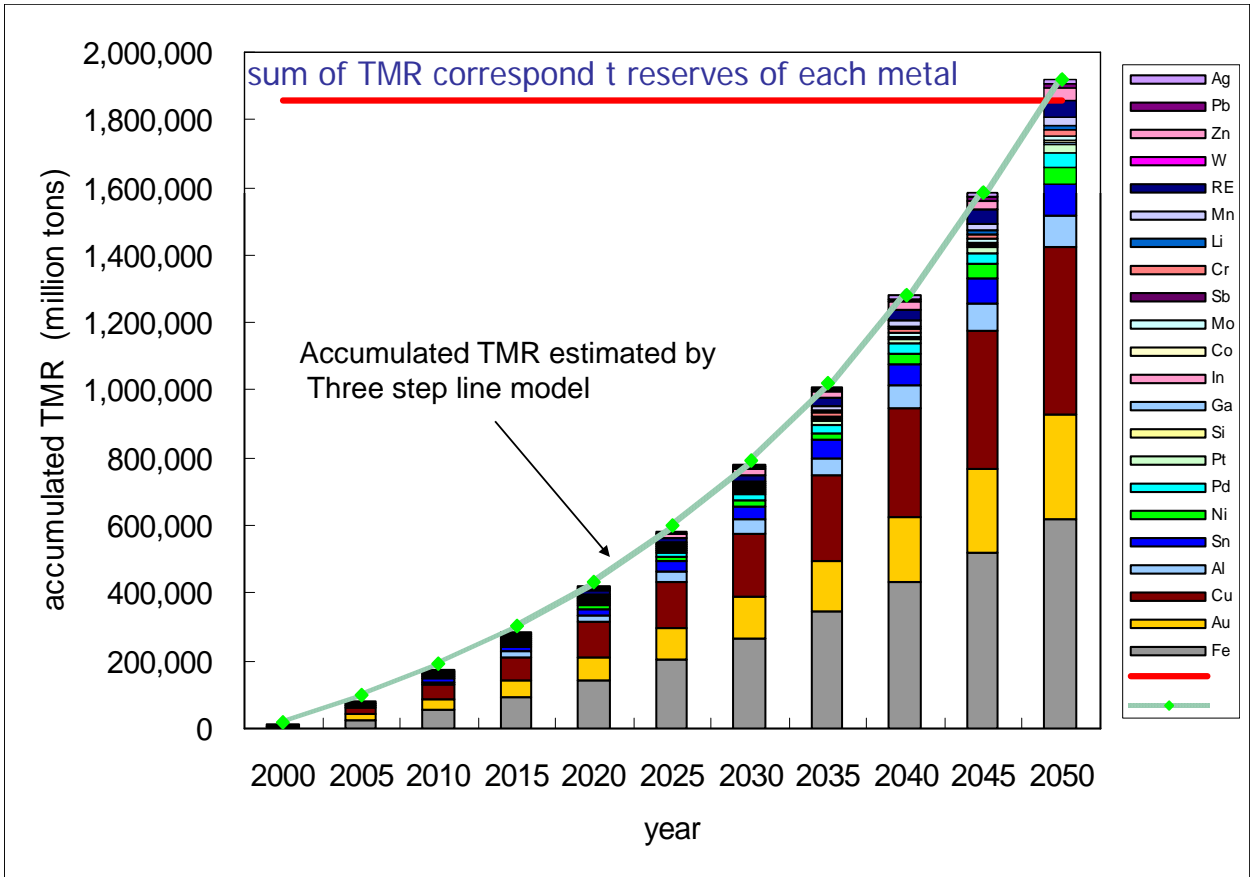
Several times amount of resources will be required by 2050. 2050年までに現在よりも数倍の資源が必要となる

It will be close to the amount of reserve by 2050: Fe, Mo, W, Co, Pt, Pd

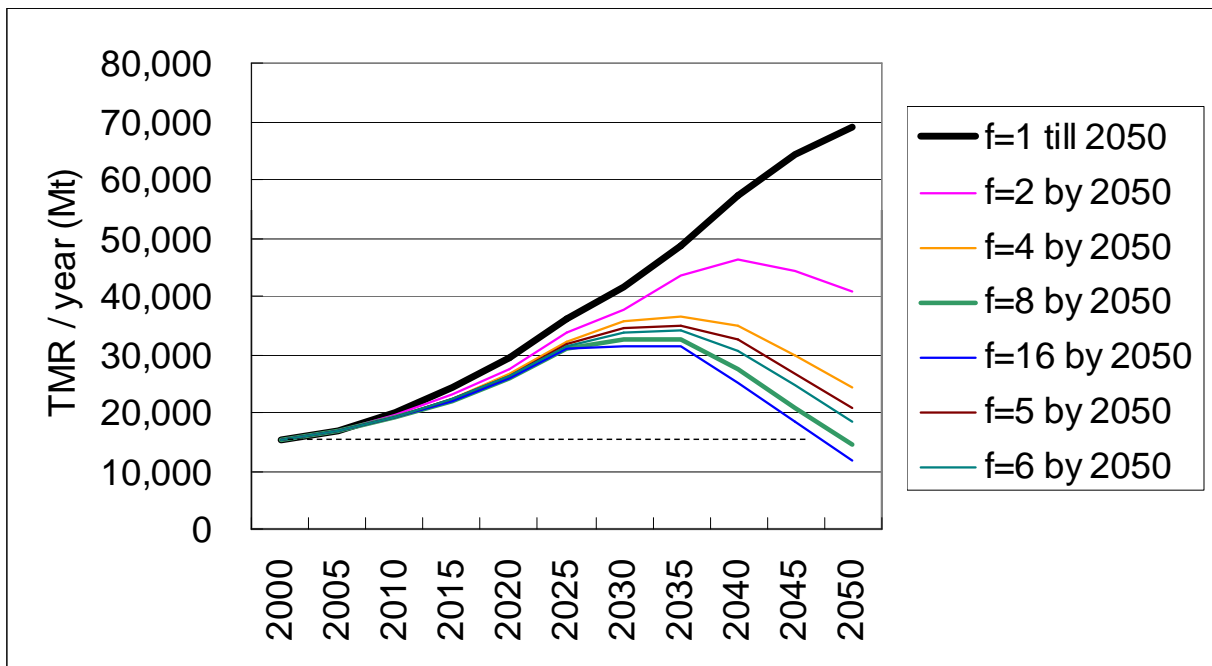
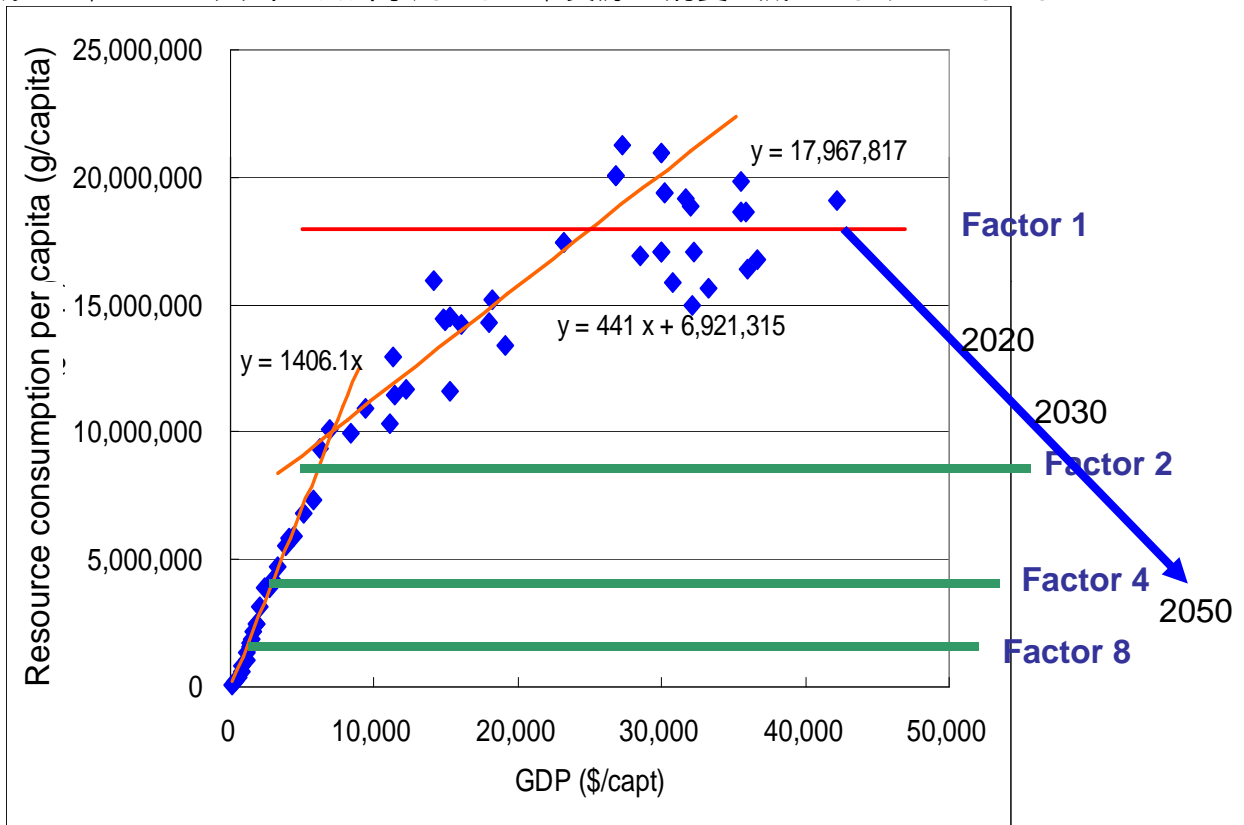
It will require several times amount of reserve by 2050: Ni, Mn, Li, In, Ga

It will run over the amount of reserve base by 2050: Cu, Pb, Zn, Au, Ag, Sn



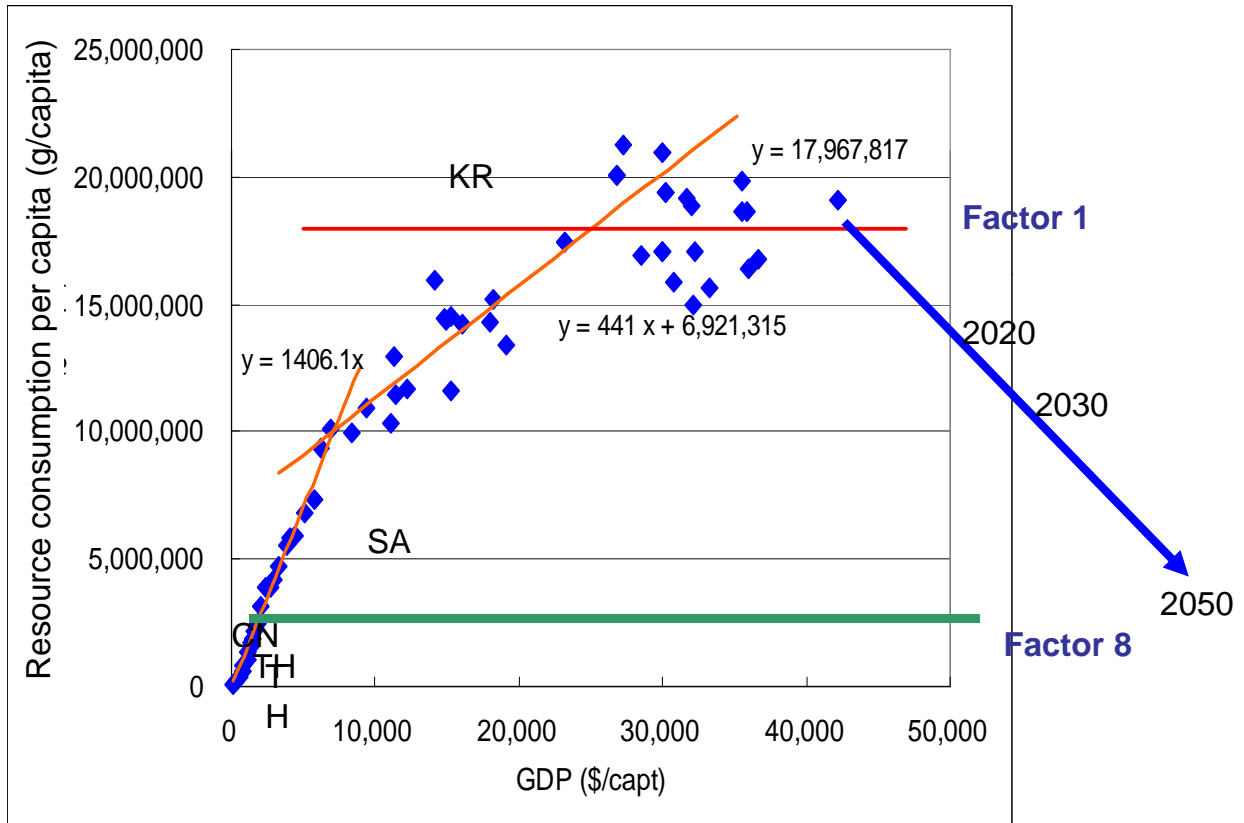


We need reduce the resource consumption level at higher GDP/capita  
 我々は、GDP一人当たりが高くなるほど、資源の消費を減らさなければならない



**Lifestyle change into “Factor8” is required !**

We need reduce the resource consumption level at higher GDP/capita  
 我々は、GDP一人当たりが高くなるほど、資源の消費を減らさなければならない



### DECLARATION OF ISSEM 2007 at ISHIGAKIJMA

While materials play an essential role in the development of human society, their negative aspects of environmental burden through the massive production, consumption, and disposal have been pointed out.

The demand for materials is now expanding further in order to satisfy growing human needs. It may cause a rapid increase in the resource risk.

We, who aim to utilize materials to construct a sustainable society, reconfirm the importance of the following three principles.

Three principles in the area of resource use

- Resource Conservation
- Environmental Protection
- Regional and Generational Equity

Based on these principles, we ask you, consumers of materials, to observe the following four practices. We also pledge ourselves to advance technologies which realize these four practices in material research.

Four practices in the area of resource use

- Use minimum quantity (量を減らす)
- Use completely (できるだけ長く使う)
- Circulate as many times as possible (何度も使う)
- Use abundant resources (量の多い資源を使う)