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.
One gram of Pt Involves 1.2 tons of Materials.

Platinum ring: 3 g

 Equivalent to 0.7 ton of steel

TMR: 3.6 ton

Pt for Fuel Cell (2007)

Required power 90kW
Pt is used as 1g/kW (at 2004) 0.5g/kW

90g/car
More than (20 times) catalyst

If half of new cars in Japan replaced into FC car

250 ton/year is required.

TMR is 300 MT

Equivalent to the production of 40 Million tons Fe
**Weight of material at consumer end (lower) of each product**

- **Car**: 15x time consumer end 970kg, resource end 14 ton
- **CPU**: 1000x time consumer end 3.5g, resource end 3.3kg
- **Cell phone**: 500x time consumer end 56g, resource end 31kg
- **IT board**: 1000x times consumer end 65g, resource end 71kg
- **LCD panel**: 300x times consumer end 237g, resource end 71kg
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
sum of TMR correspond to reserves of each metal

Accumulated TMR estimated by Three step line model

GDP ($/capt)

TMR (g/capt)

$y = 17,967,817$

$y = 1406.1x$

$y = 441x + 6,921,315$
We need to reduce the resource consumption level at higher GDP/capita.

Lifestyle change into “Factor 8” is required!
We need to reduce the resource consumption level at higher GDP/capita.

DECLARATION OF ISSEM 2007 atISHIGAKIJMA

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
- Use completely
- Circulate as many times as possible
- Use abundant resources