

Post MoMo

– A personal view –

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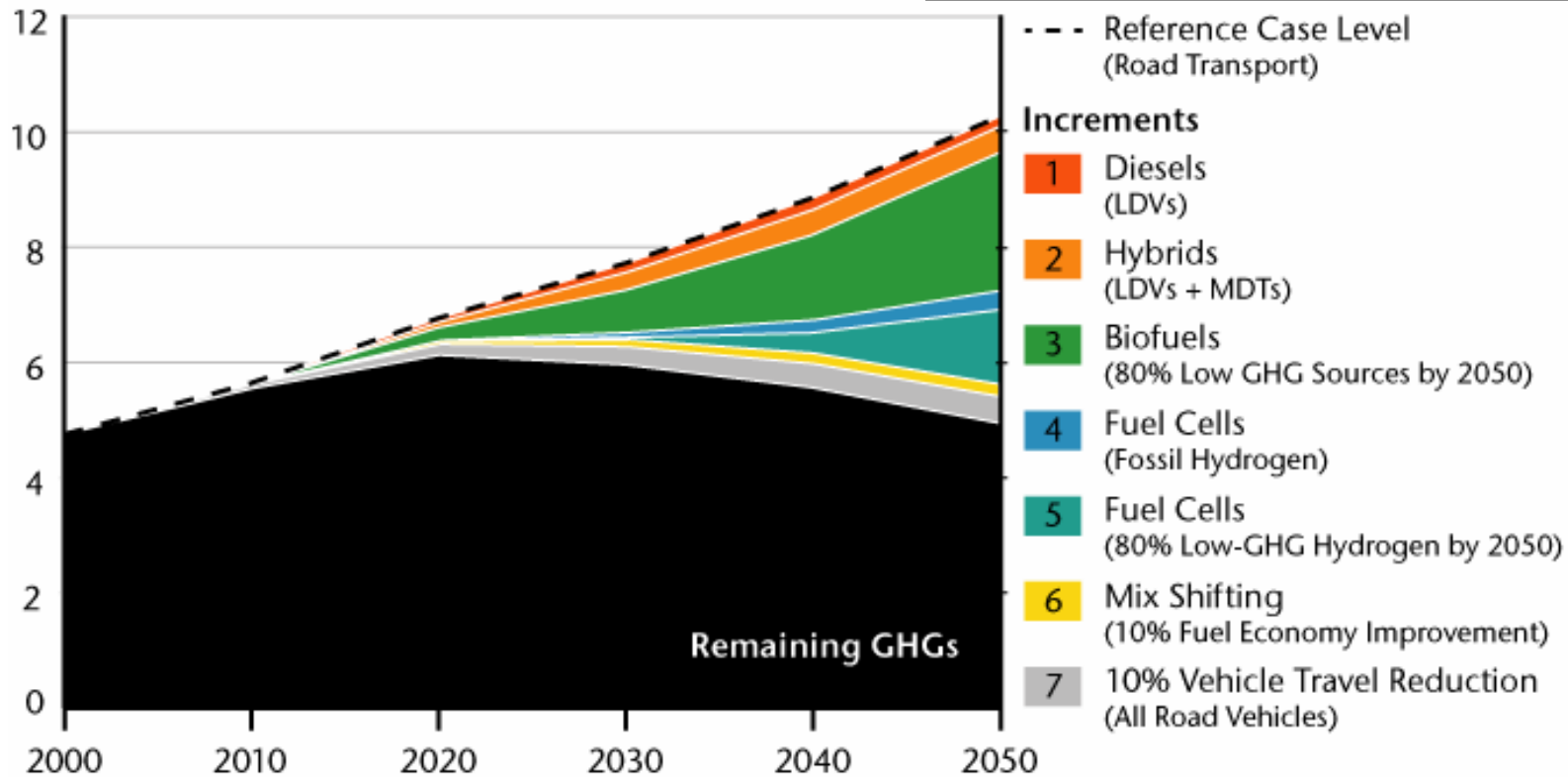
Takanori Shiina (Honda R&D)

WBCSD-SMP Report said ...

Combined technology case

- Q. What is it in each country ?
- Q. Do we have enough resources ?
- Q. What will it be after 2050 ?
- Q. Is this efficient society ?

Gigatonnes CO₂-Equivalent GHGs



Source:
Sustainable Mobility Project calculations.

Question of region – example –

Resulting estimates of bioenergy production potential (exajoules/yr)

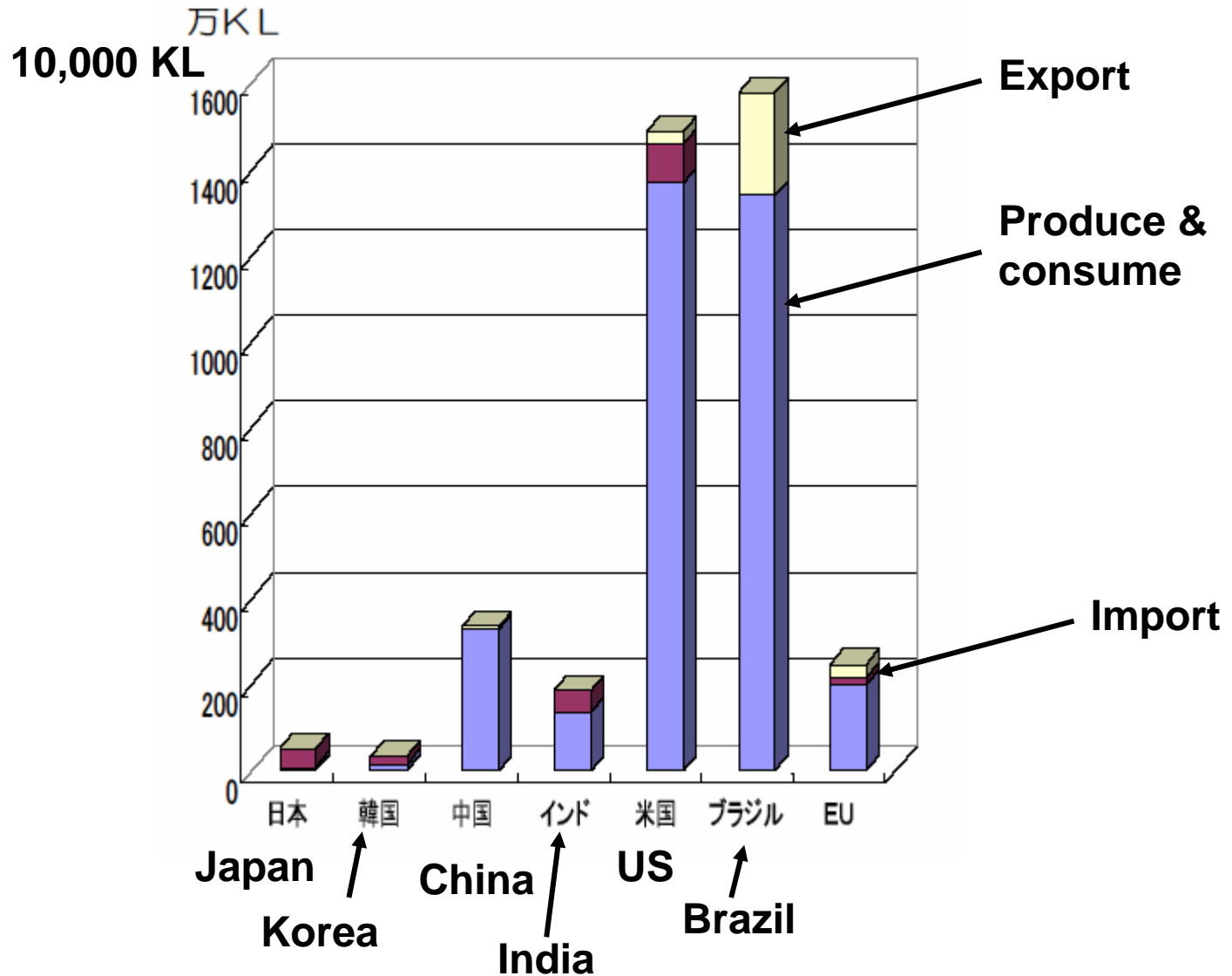
Region	Scenario 1	Scenario 2	Scenario 3	Scenario 4
North America	20	53	144	174
Oceania	38	51	87	102
Japan	0	0	0	0
West Europe	5	11	16	30
East Europe	3	11	22	26
C.I.S. and Baltic States	45	73	184	199
sub-Saharan Africa	31	102	260	317
Caribbean & Latin America	47	120	190	221
Near East & North Africa	2	1	30	31
East Asia	11	17	146	147
South Asia	15	17	21	25
World	215	455	1,101	1,272

Smeets et al, 2005

Remarks : World transport consumes 80 exajoules / year now and projected to 175 @ 2050.

Source “Bioenergy findings” – May27’05 MoMo meeting by Dr. Fulton

Ethanol trading



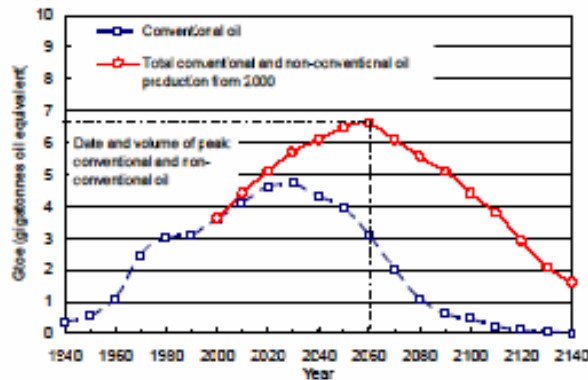
Question of resources – example –

IEA forecast

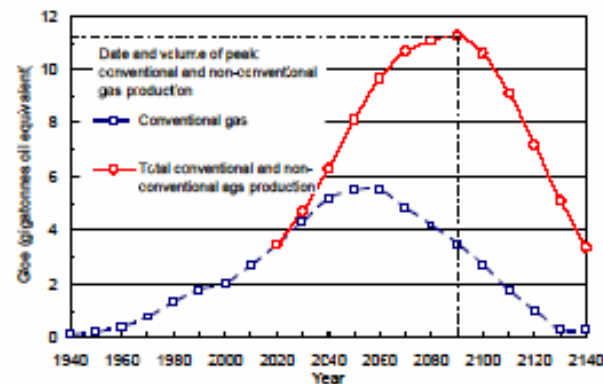
	Reference scenario	Low resource case	High resource case
Remaining ultimately recoverable resources base for conventional oil, as of 1/1/1996 (billion barrels)	2,626	1,700	3,200
Peak period of conventional oil production	2028 - 2032	2013 - 2017	2033 - 2037
Global demand at peak of conventional oil (mb/d)	121	96	142
Non-conventional oil production in 2030 (mb/d)	10	37	8

There are various arguments in the fossil resource reserves from pessimistic ones to optimistic ones. These estimates do not reflect all variations of factors, and the indicated values should be regarded with some degree of margin.

Estimates by P. R. Odell (Professor, Erasmus University, the Netherlands)



The Complementarity of Conventional and Non-Conventional Oil Production: giving a Higher and Later Peak to Global Oil Supplies



The Complementarity of Conventional and Non-Conventional Gas Production: giving a Higher and Later Peak to Global Gas Supplies

On the other hand, in order to prepare for the future risks, it is appropriate to assume in the examination that oil production will peak around around the middle of this century and natural gas production will peak at the end of this century at the earliest.

Example of estimates for oil and natural gas production

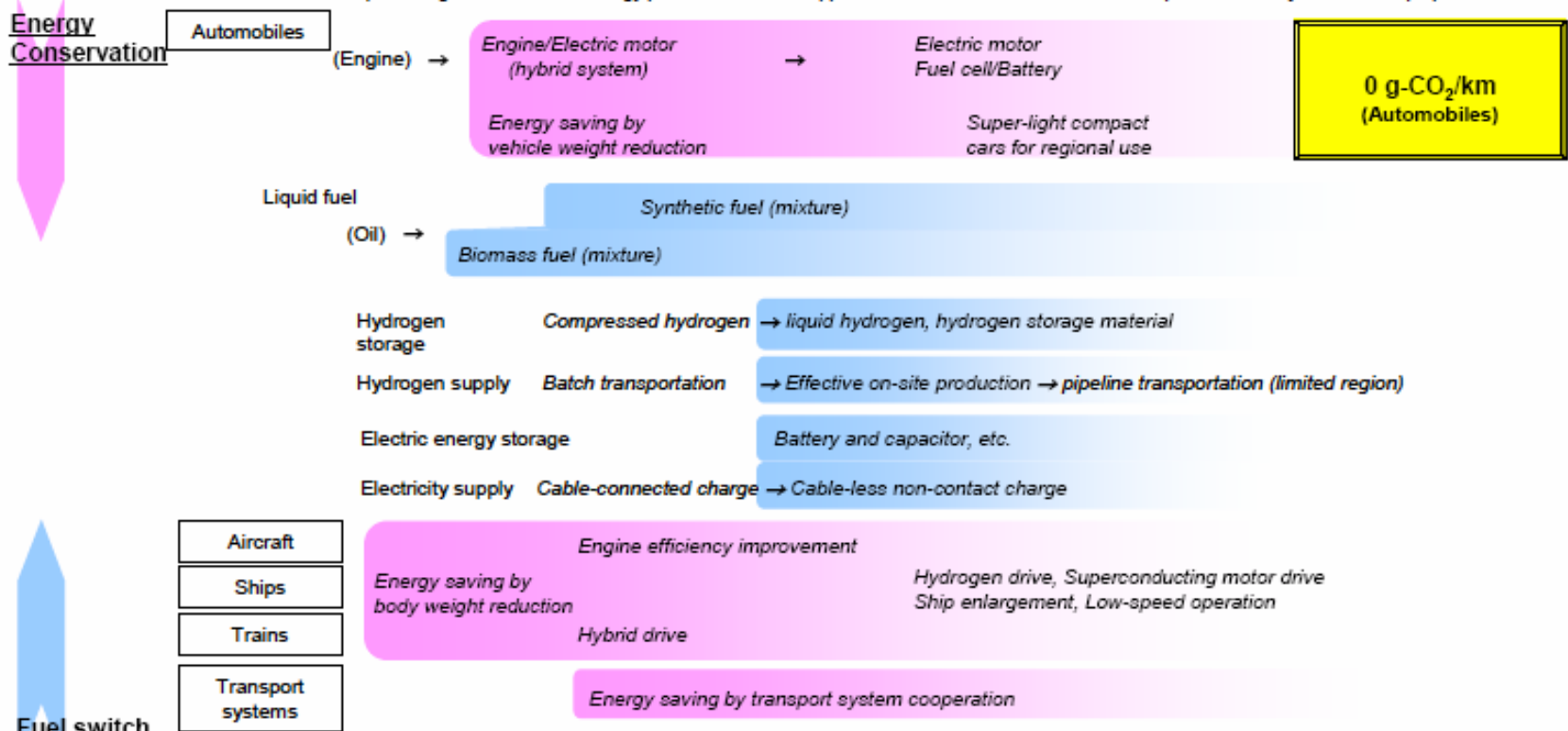
Source : Strategic Technology Roadmap(Energy Sector)~ Energy Technology Vision 2100 ~, October, 2005, Ministry of Economy, Trade and Industry *Tentative Translation, Jan. 2006*

Question of time frame – example –

Transport	2000	2030	2050	2100
Utility (person-km, ton-km)	1 time		1.5 times	2.1 times
Energy supplied from transformation sector* (overall)		20% reduction	50% reduction	70% reduction
Automobiles				
Energy demand		30% reduction	60% reduction	80% reduction
Share of electricity and/or hydrogen	0%	1% or more	40%	100%
CO ₂ intensity	160 g-CO ₂ /km (1 time)	100 g-CO ₂ /km (2/3 times)	50 g-CO ₂ /km (1/3 times)	0 g-CO ₂ /km
Aircraft, ships, and trains				
Energy demand		10-20% reduction	20-35% reduction	30-50% reduction

→ Consequentially, 1/10 or less is achieved.

*The percentage of reduction of energy per unit should be supplied from the transformation sector, compared with utility increases in proportion to GDP.

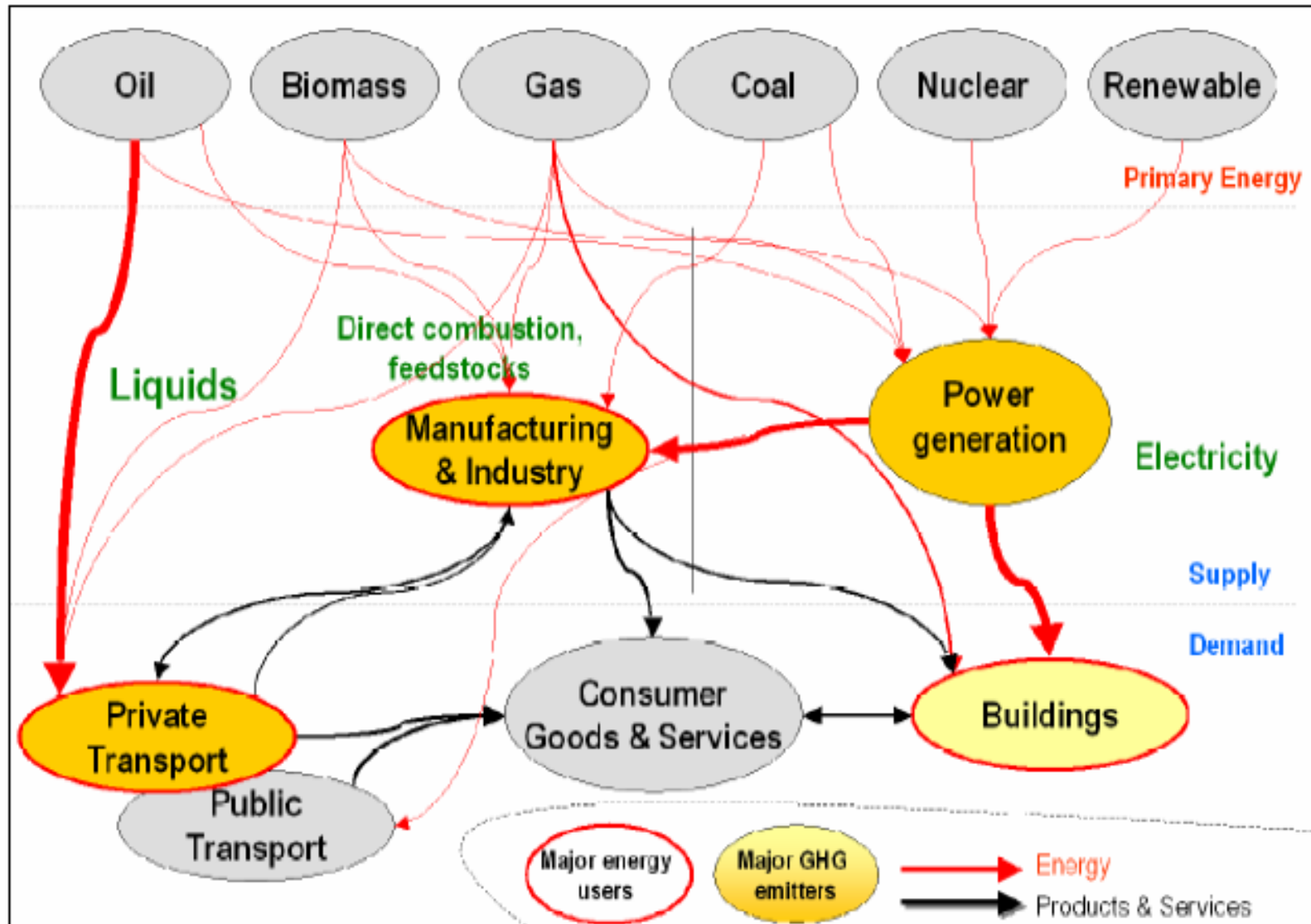


Jan/04/2006

Transport-4

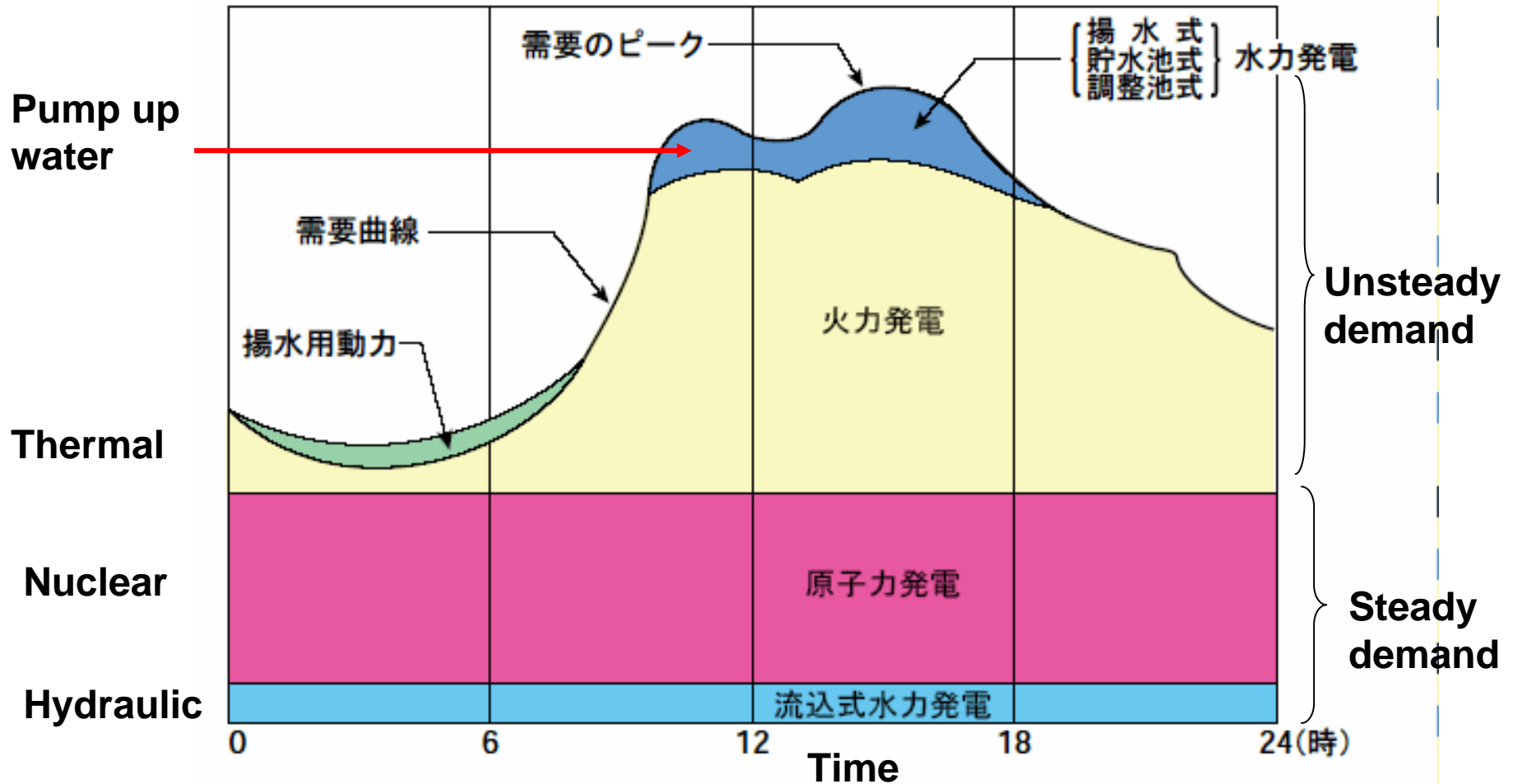
Source : Strategic Technology Roadmap(Energy Sector)~ Energy Technology Vision 2100 ~, October, 2005, Ministry of Economy, Trade and Industry Tentative Translation, Jan. 2006

Question of efficient society – example –

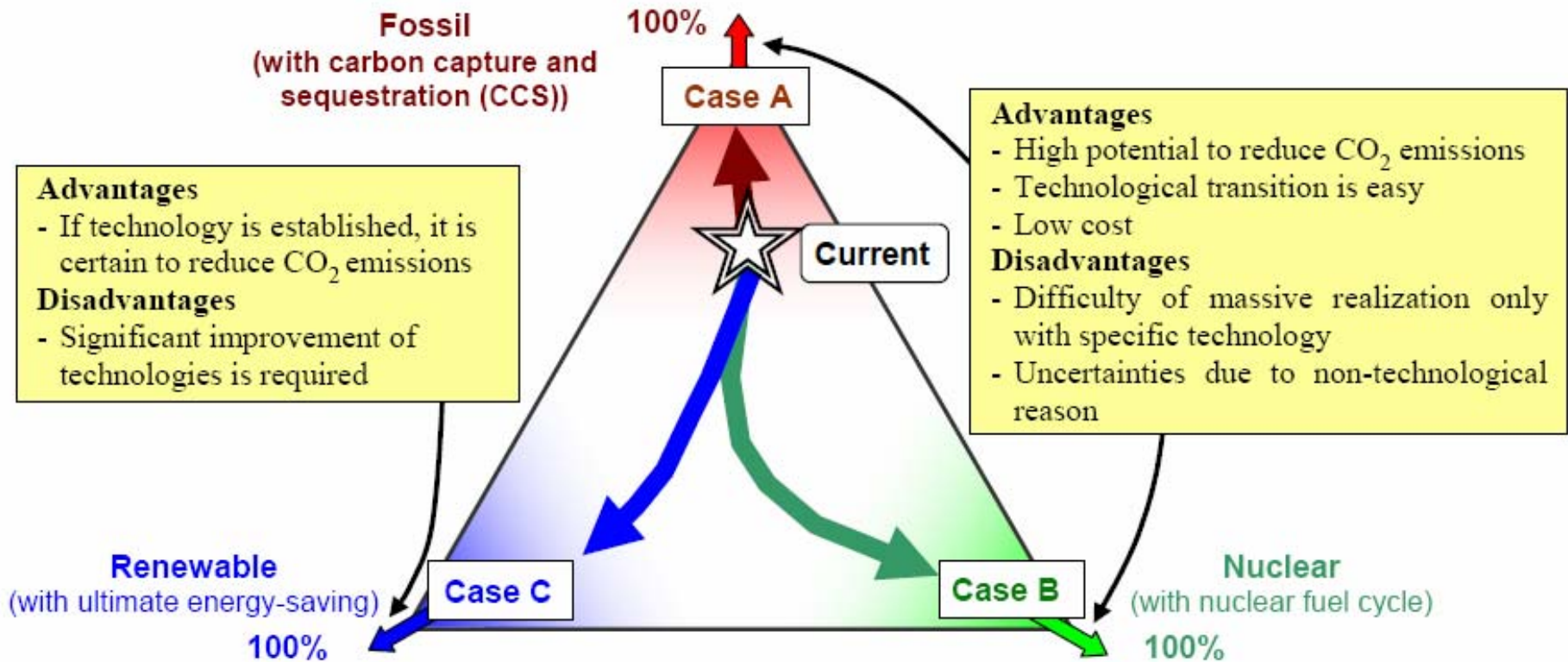


Power generation in Japan

需要の変化に対応した電源の組み合わせ (ベストミックス)



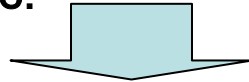
Where shall we go ?



Images of the three cases of primary energy supply structures

Summary

- SMP showed one example to achieve same CO2 level in 2050 as in 2000.
- Previous MoMo found the cheaper way and more reduction
 - Biofuels for hybrid vehicle use.



Questions:

1. Who has such enough cheap resources in 2050 ?
 - Regional issue** Europe / North America / Japan ... ?
2. Do we have enough resources in 2050 ?
 - Resource issue** Fossil fuels / biofuels / hydrogen ?
3. What comes after 2050 ?
 - Time frame issue** Resources / Price / Sector competition ?
4. Is the transport a good user of biofuels ?
 - Sector issue** Doesn't transform sector like it ?
5. What scenario does the society like ?
 - Social issue** What is the overall cost estimate ?

Conclusion

Expect post-MoMo includes :

1.Detail of region

(IEA) Introduction of several [new distinct regions](#). These could include Japan, China, India, Mexico, Indonesia and/or Brazil

2.Resources in each region

(IEA) Modules for the evaluation of [resource availability potentials for biofuels and conventional crude oil](#)

(IEA) More detailed analysis or case studies of [certain developing countries](#), such as China/India/Indonesia/Brazil.

3.Long term view

(IEA) Analysis of oil peaking and its impact on alternative fuel markets.

4.Efficient society

(IEA) Analysis of the competition of biomass use for transportation fuels, [heating or electricity](#) production