



한국환경정책·평가연구원



Korea's vision Dynamic 2030 for LCS using ESS

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- Residential and Commercial sector
- Transportation sector

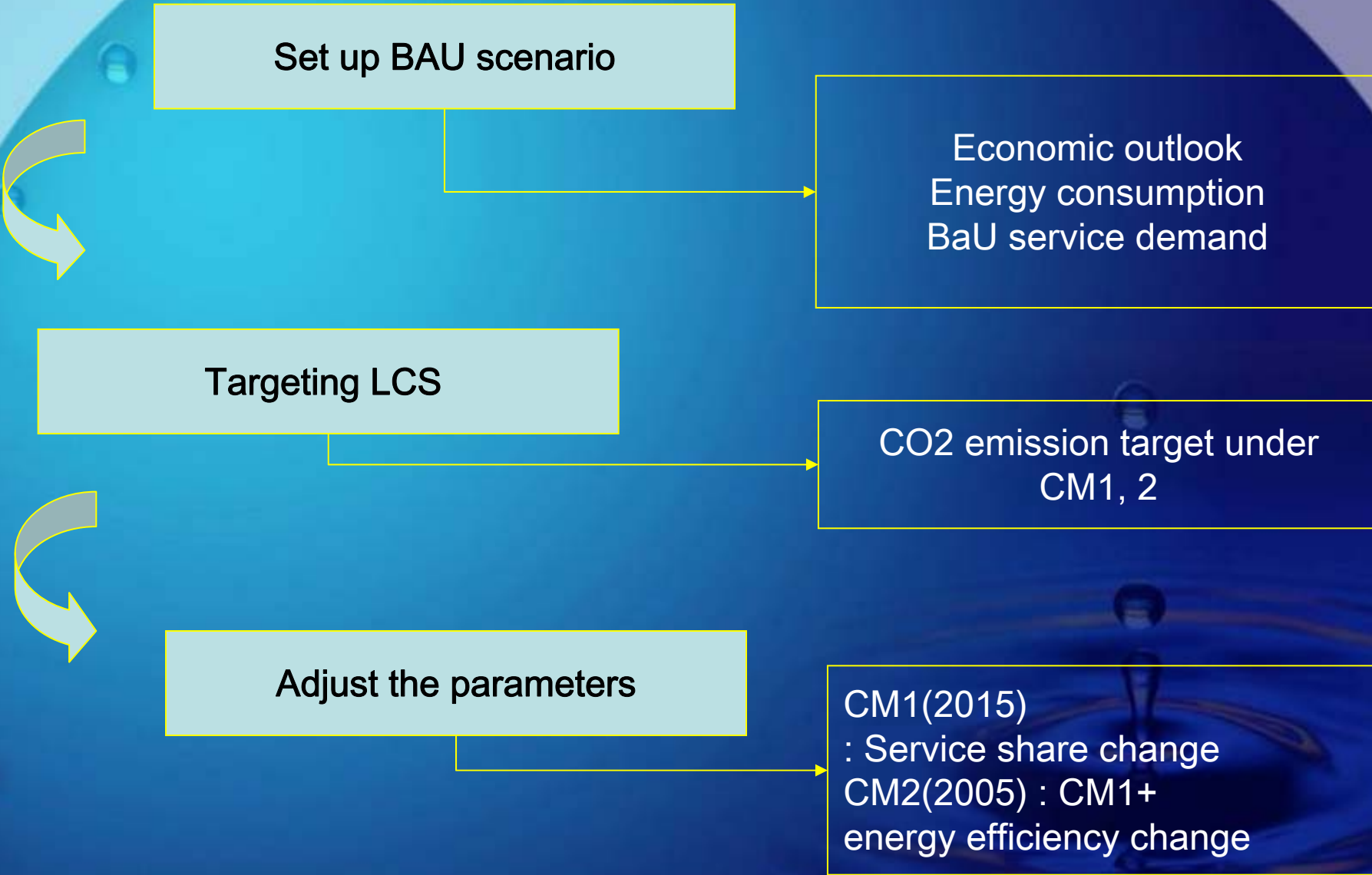
2007 AIM Training Workshop

22 Oct ~ 2 Nov, NIES, Tsukuba, Japan

KIM and PARK

Residential and Commercial Sector

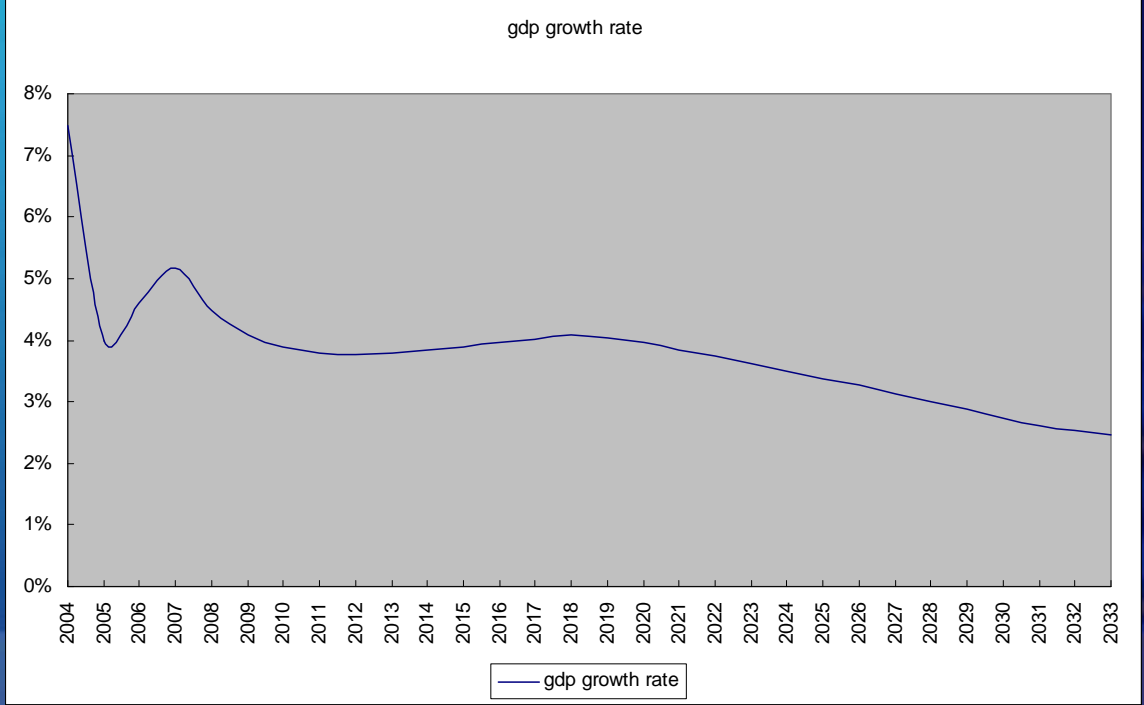
□ Introduction: approach



□ BAU Scenario – Economic growth

Korea's Economic Outlook

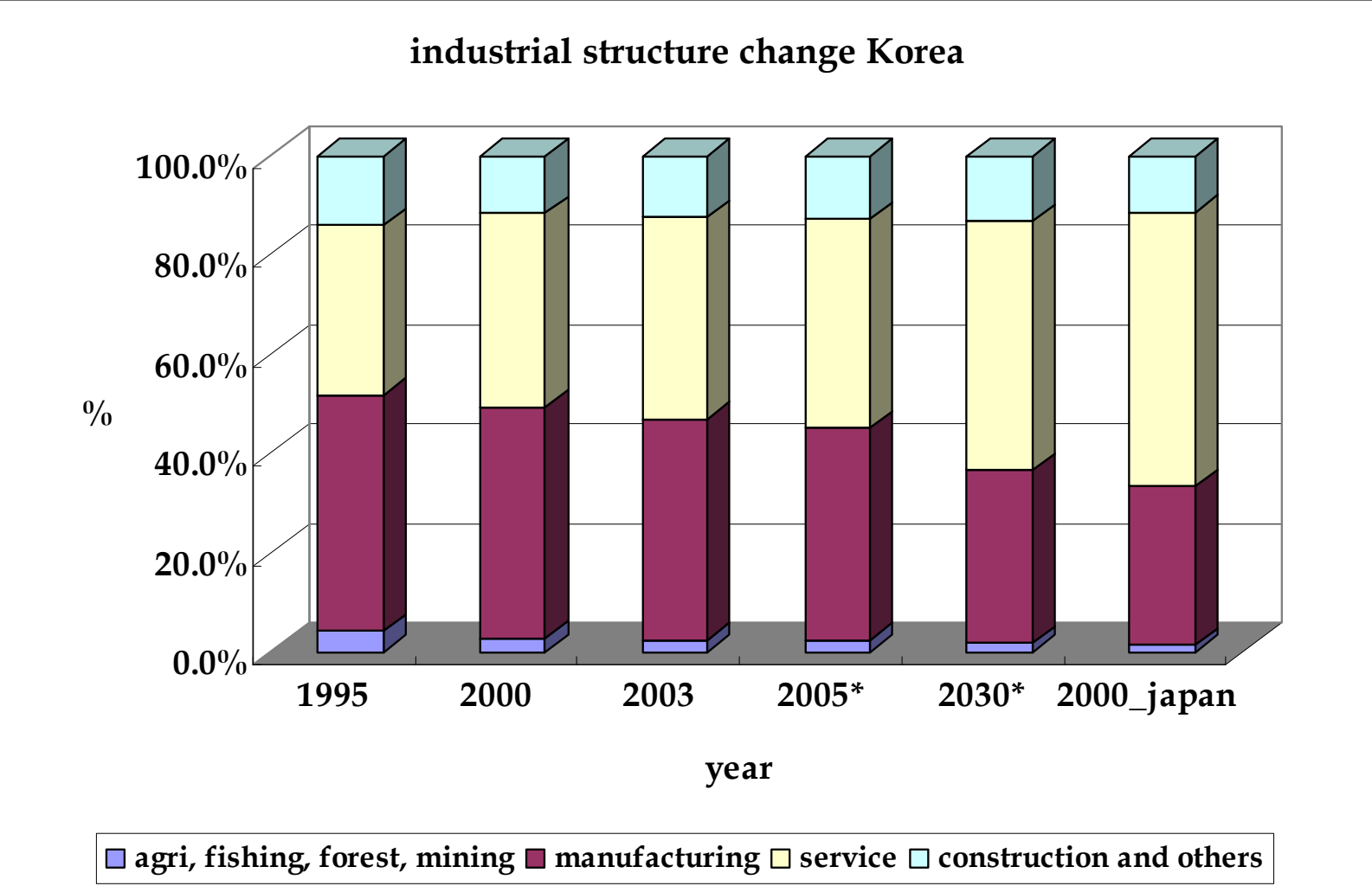
- Expect to be more developed until 2030
 - With 3~4% of average gr of GDP
- applied the simulation result of KEI-EEI in residential and commercial sector
 - : energy consumption increases in household and service sectors



□ BAU Scenario – industry structure, Commercial sector

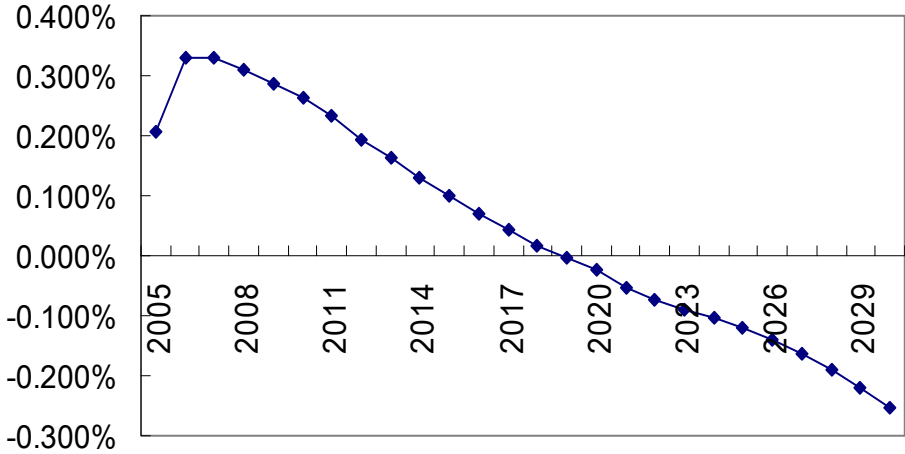
- Service industry will grow up continuously
- Service output change + 40% versus base year

Applied to the commercial sector

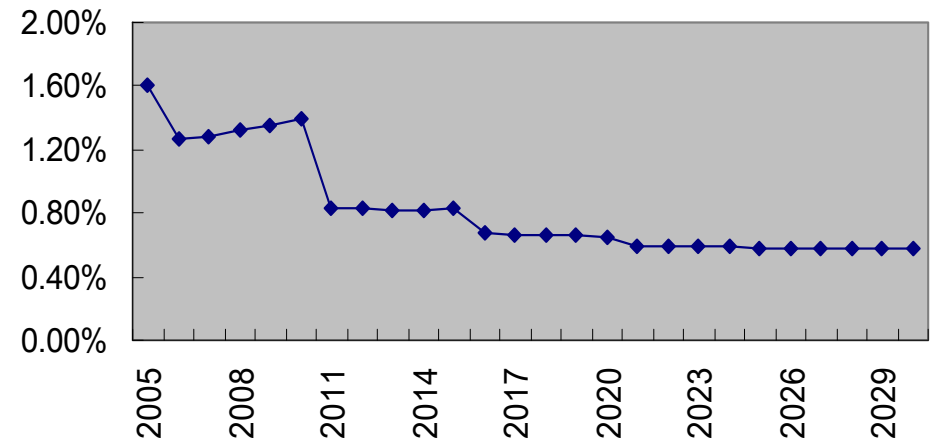


BAU Scenario – Num of Pop. and household, Residential sector

PoP growth rate



Household growth rate



- PoP + 1.03% vs 2005, Hos +13.3% vs 2005
- Single family and small scale family will increase

$$\begin{array}{l}
 \text{Marginal change of household space} \\
 = \frac{\% \text{ change of space household}}{\% \text{ change of Num Population}} = 13\%
 \end{array}$$

Applied to the residential sector



□ BAU Scenario – Energy consumption

MOCIE (Ministry of Commerce, Industry and Energy) 's

key plan for future new technology

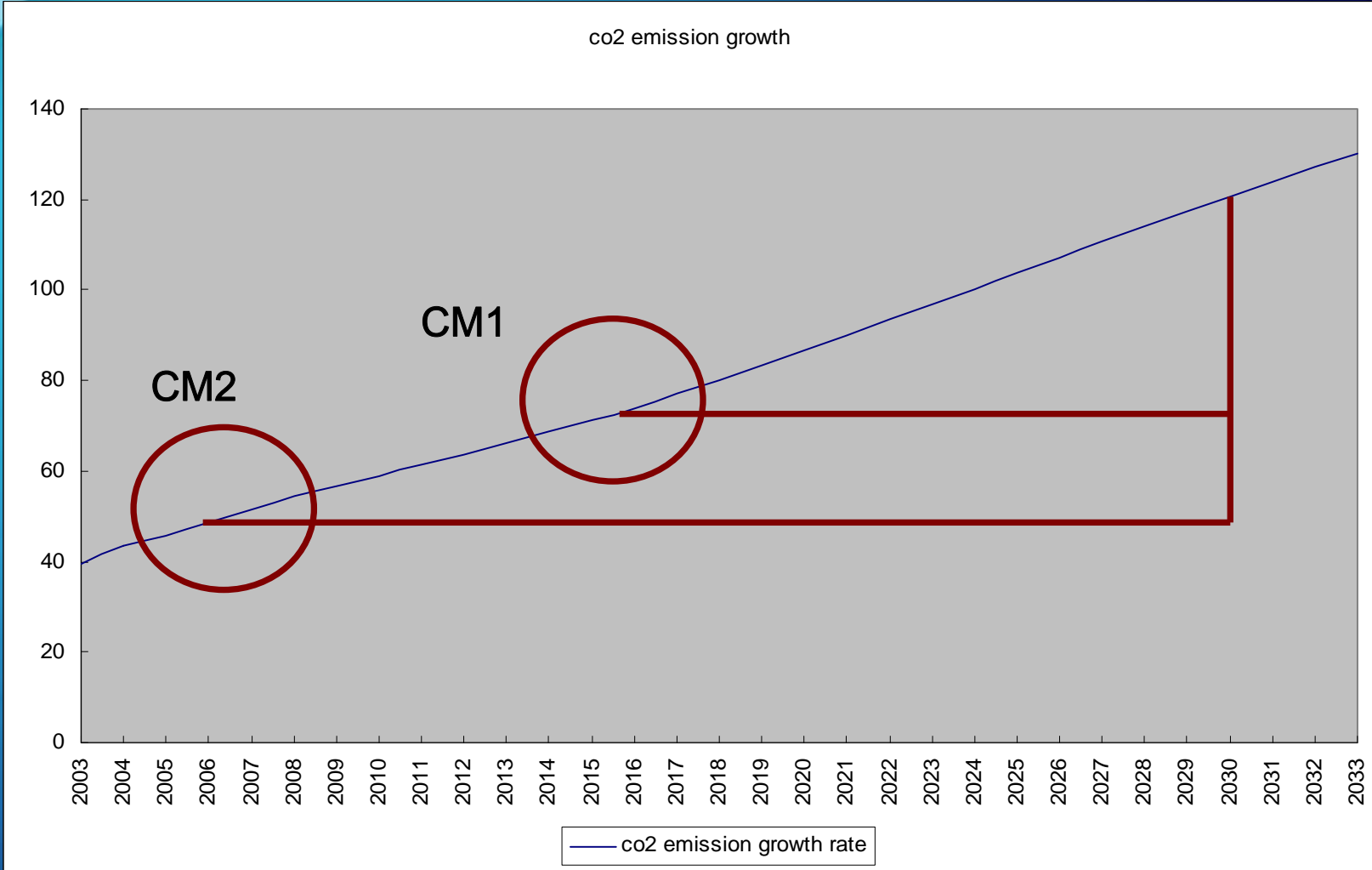
1st step : Development of new and renewable energy technologies

2nd step : targeting the proportion of - 5% of total energy consumption (2012)

set up CM Scenario ; control the emission level

- CO2 emission reduction target
 - Residential sector : CM1- 13% , CM2- 35%
 - Commercial sector CM1- 47%, CM2- 61%

□ BAU Scenario – Energy consumption



□ BAU Scenario – Energy consumption

Basic Assumption :

Commercial sector will be more accelerated in substituting new and renewable energy. The increasing amount of energy demand comes from new and renewable energy in commercial sector.

Household will substitute high carbon intensity energy to low carbon intensity energy. (from oil to gas)

CM1 – Residential: the proportion of new and renewable energy reach
- 18% (2030),

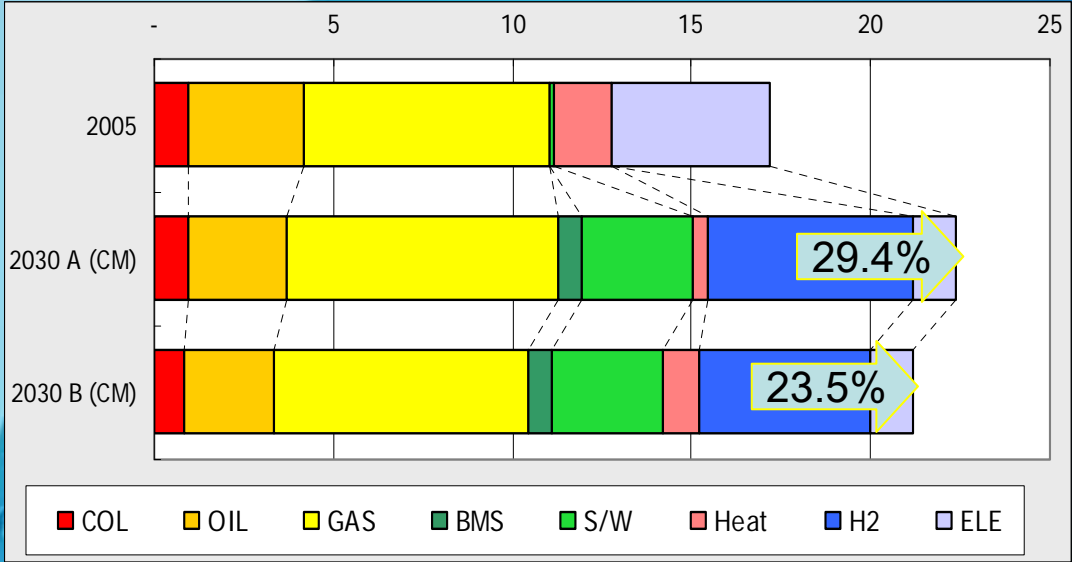
CM1 – Commercial: fossil fuel energy consumption will decrease
- 11% (2030)

CM2 – Residential: 24%, energy efficiency change

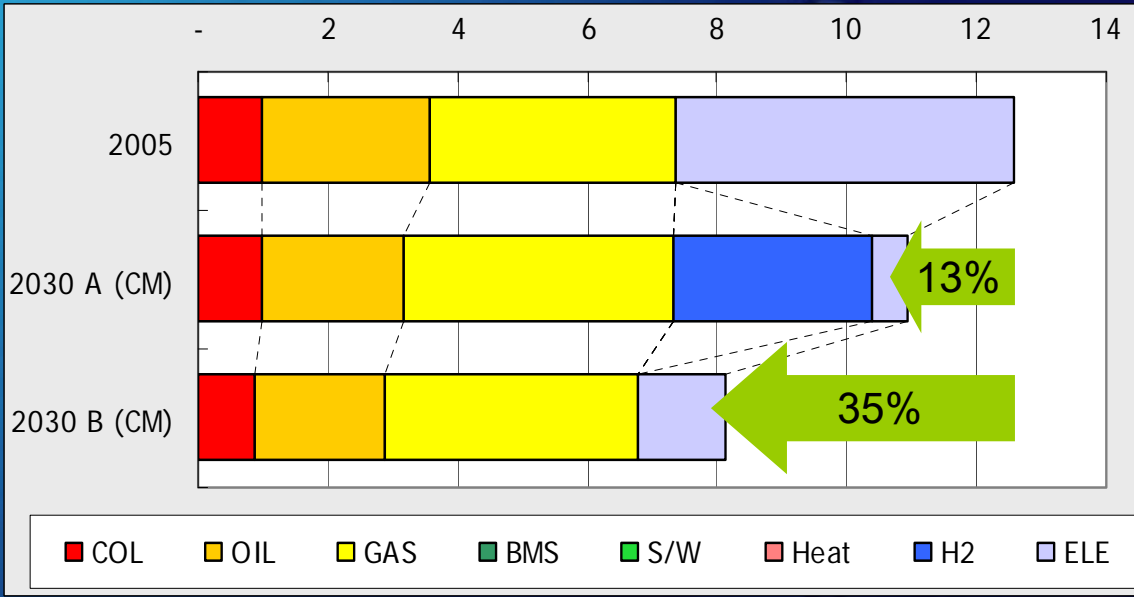
CM2 – Commercial: 22%, energy efficiency change

Result – Residential sector

Energy consumption

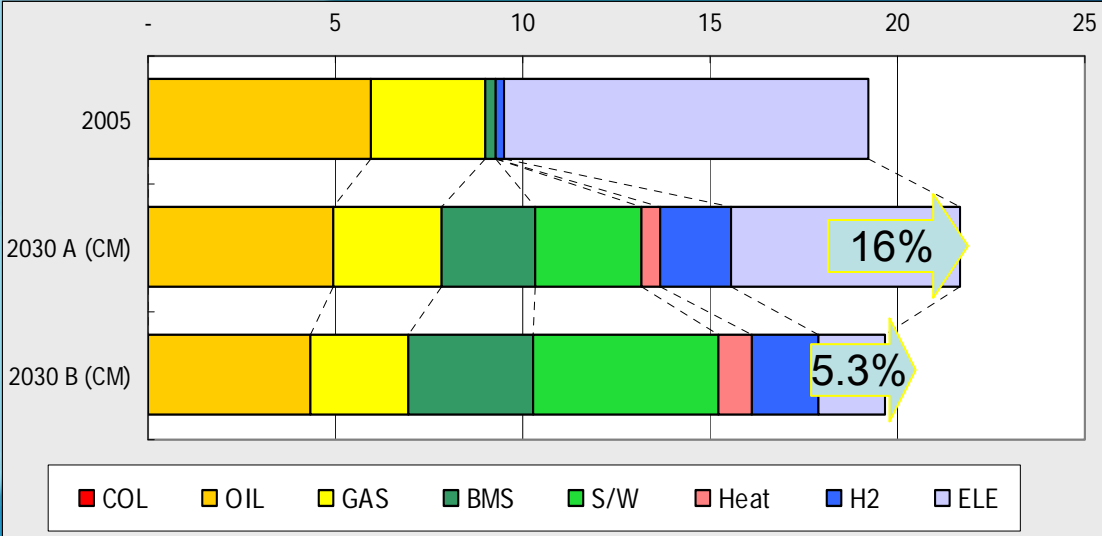


CO2 Emission

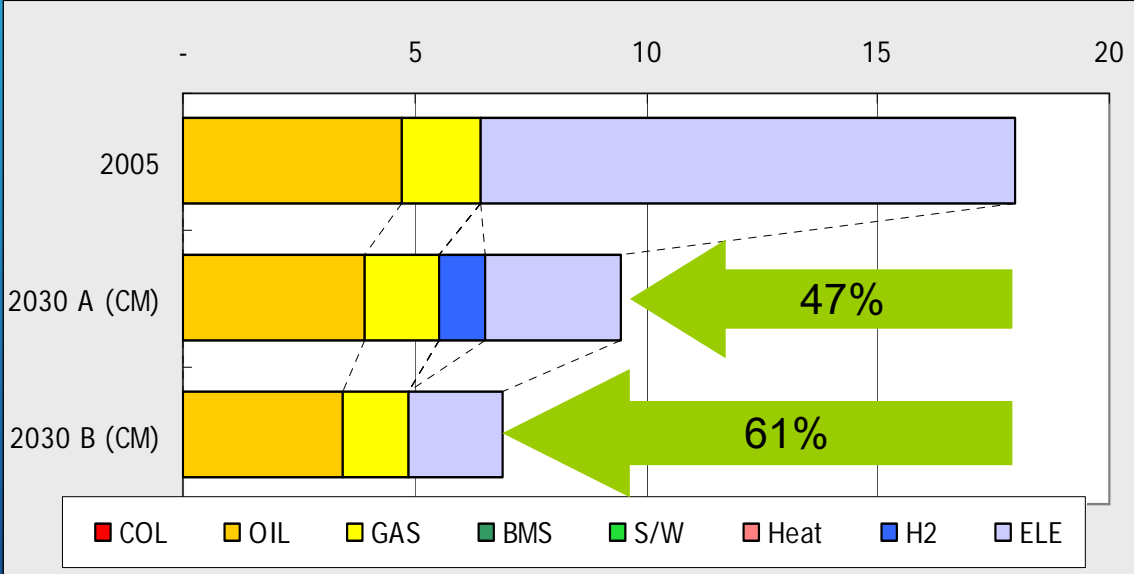


□ Result – Commercial sector

Energy consumption



CO2 Emission





Transportation Sector



□ Background

- Longer trip distances derived from demand of trip
- Changes in trip characteristics associated with population change. Population of 2030 is 1.03 times of that in 2005 year
- Korea government constructs many highway and railway to solve traffic problem(efficiency)
- 2030year's ton-km will increase every year
- Energy efficient will improve in each sector

□ Assumption-Passenger

- Scenario A(Korea case)
 - Passenger-km data source : KTDB(Korea transport database)
 - Annual growth rate : 2%
(refer to KEEI(Korea Energy Economics Institute)'s projection(2002 ~ 2009))
 - 2005 Service Share : reference data sheet
 - 2030(A) Service Share

	Unit	2005				2030 A-scenario					2030 B-scenario				
		OIL	GAS	ELE	Total	OIL	GAS	BMS	ELE	Total	OIL	BMS	H2	ELE	Total
Autos	-	70%	30%	0%	100%	50%	30%		20%	100%	20%	20%	60%		100%
Bus	-	100%	0%	0%	100%		100%			100%			100%		100%
Passenger Train	-	16%	0%	84%	100%	10%			90%	100%				100%	100%
Passenger Ship	-	100%	0%	0%	100%	50%		50%		100%	50%	50%			100%
Passenger Air	-	100%	0%	0%	100%	100%				100%	100%				100%

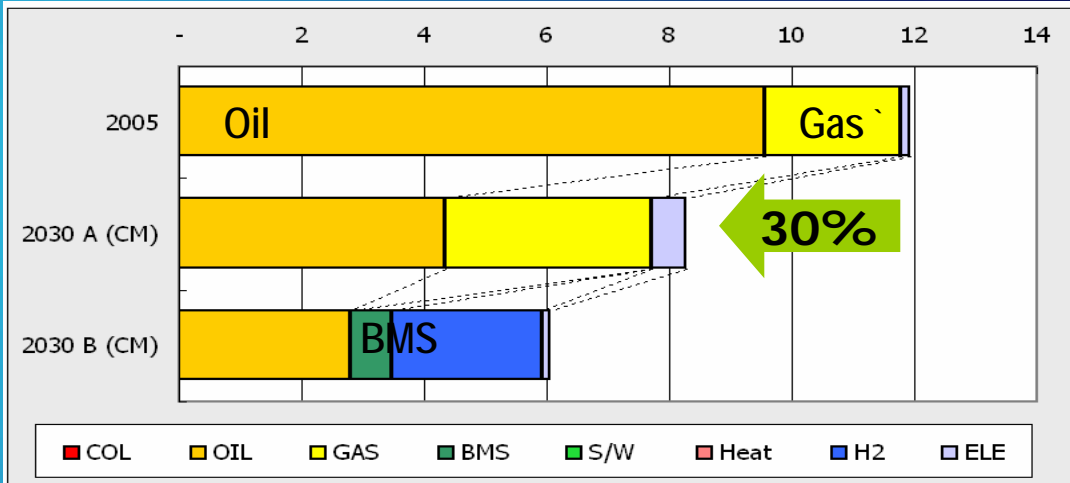
- Energy efficiency : Japan's data
- Energy consumption : EBT
- Scenario B (Japan's scenario "Doraemon")



□ Result-Passenger

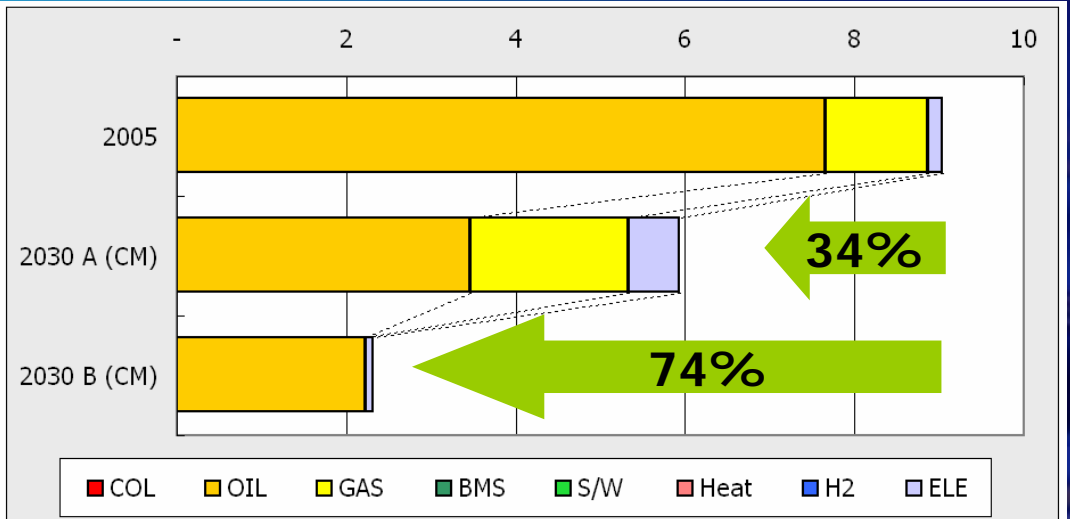
- 30% energy demand reduces by efficiency improvement
- 50% energy demand can reduce by Japan's scenario
- 34% CO2 emission reduce by efficiency improvement

Energy demand



Energy consumption in passenger transportation sector (Mtoe)

CO2 Emission



□ Assumption-freight

- Scenario A(Korea case)
 - Freight ton-km data source : KTDB(Korea transport database)
 - Vehicle, Train, Ship, Aviation(data limitation)
 - Annual growth rate (refer to KEEI's projection(2002~2009))
 - Vehicle and Train : 3%
 - Ship and Aviation : 5%
 - 2005 Service Share : reference data sheet
 - 2030(A) Service Share

	Unit	2005				2030 A-scenario					2030 B-scenario				
		OIL	GAS	ELE	Total	OIL	GAS	BMS	ELE	Total	OIL	BMS	H2	ELE	Total
Freight Vehicle	-	86%	14%	0%	100%	65%	25%		10%	100%			50%	50%	100%
Freight Train	-	66%	0%	34%	100%	50%			50%	100%				100%	100%
Freight Ship	-	100%	0%	0%	100%	50%		50%		100%	50%	50%			100%
Freight Air	-	100%	0%	0%	100%	100%				100%	100%				100%

- Energy efficiency : Japan's data
- Energy consumption : EBT
- Scenario B (Japan's scenario "Doraemon")



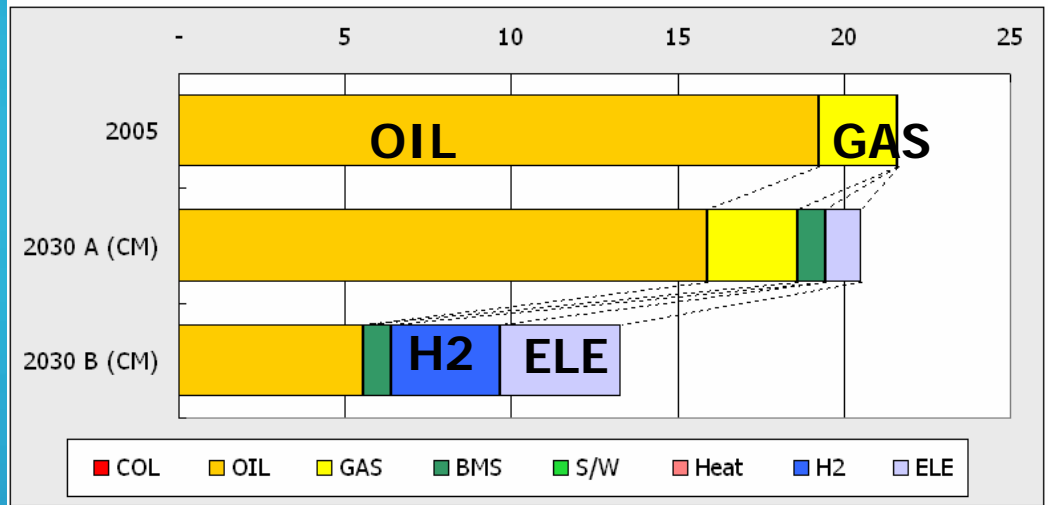
□ Result-freight

- 5% energy demand reduces by efficiency improvement

- 8% CO2 emission reduce by efficiency improvement

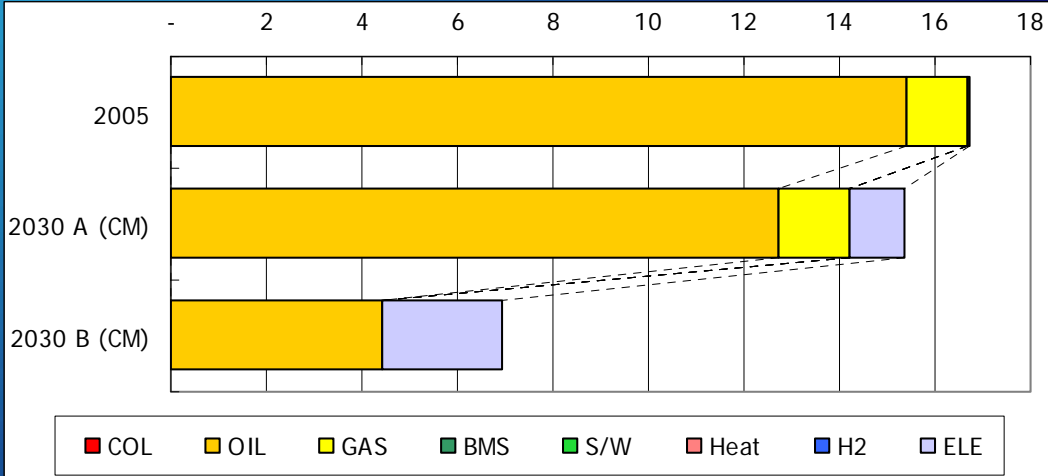
- 59% CO2 emission can reduce by Japan's doraemon scenario

Energy demand



Energy consumption in passenger transportation sector (Mtoe)

CO2 Emission



□ Conclusion-transportation

- Depending on the assumption energy efficiency, the energy demand in transportation sector will be reduced
- If we follow the Japan scenario, CO2 emission will be reduced to 65% of 2005
- Next time, We will focus on Its service share

ありがとうございます ii

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