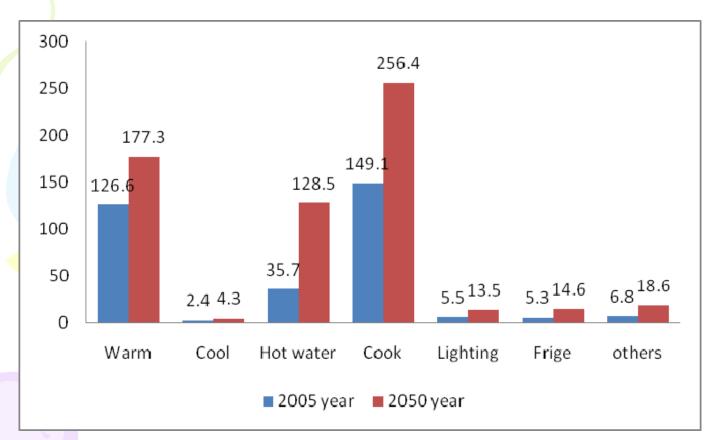
LCSs for China

Residential sector and transportation sector

China team
Tsukuba, workshop
2008/10/31

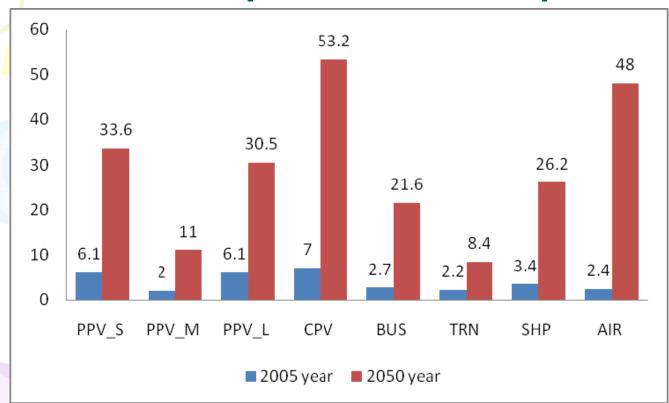
Demand change from ESS

Demand change (residential sector)



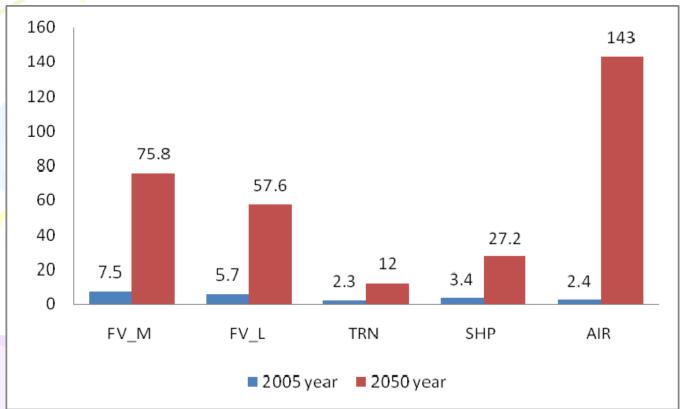
	2050/2005
Warm	1.40
Cool	1.79
Hot	3.60
water	
Cook	1.72
Lighting	2.45
Frige	2.75
others	2.74

Demand change (transportation-p sector)

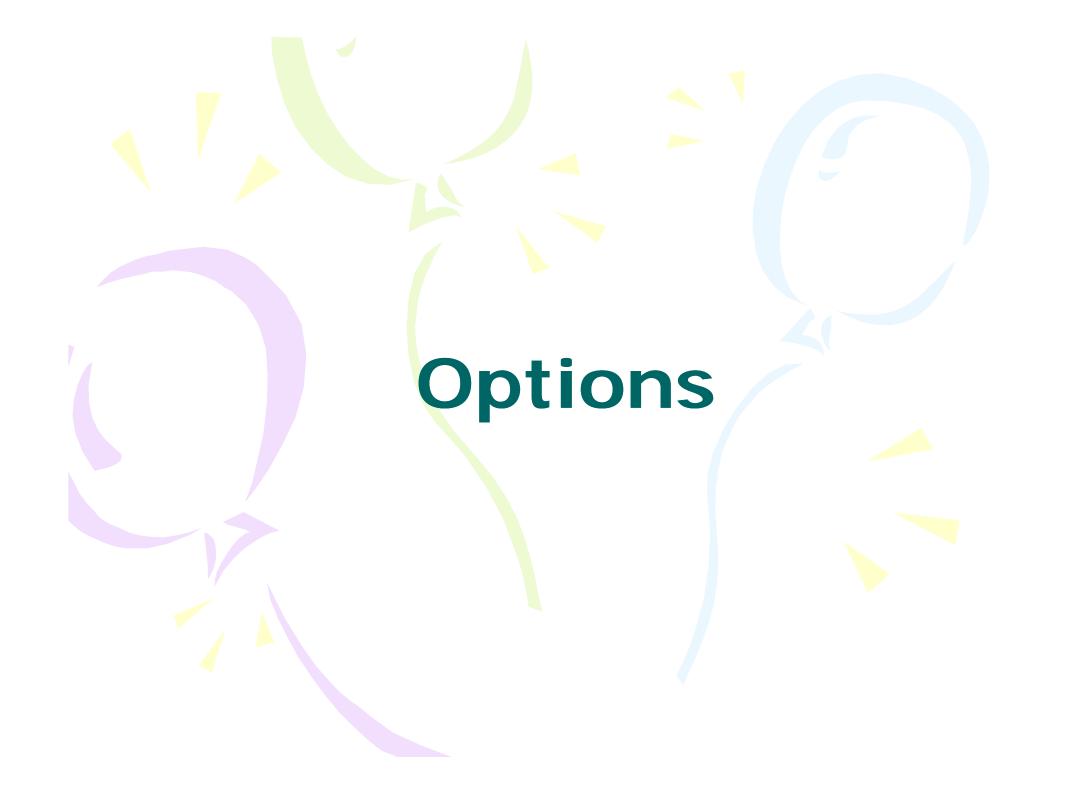


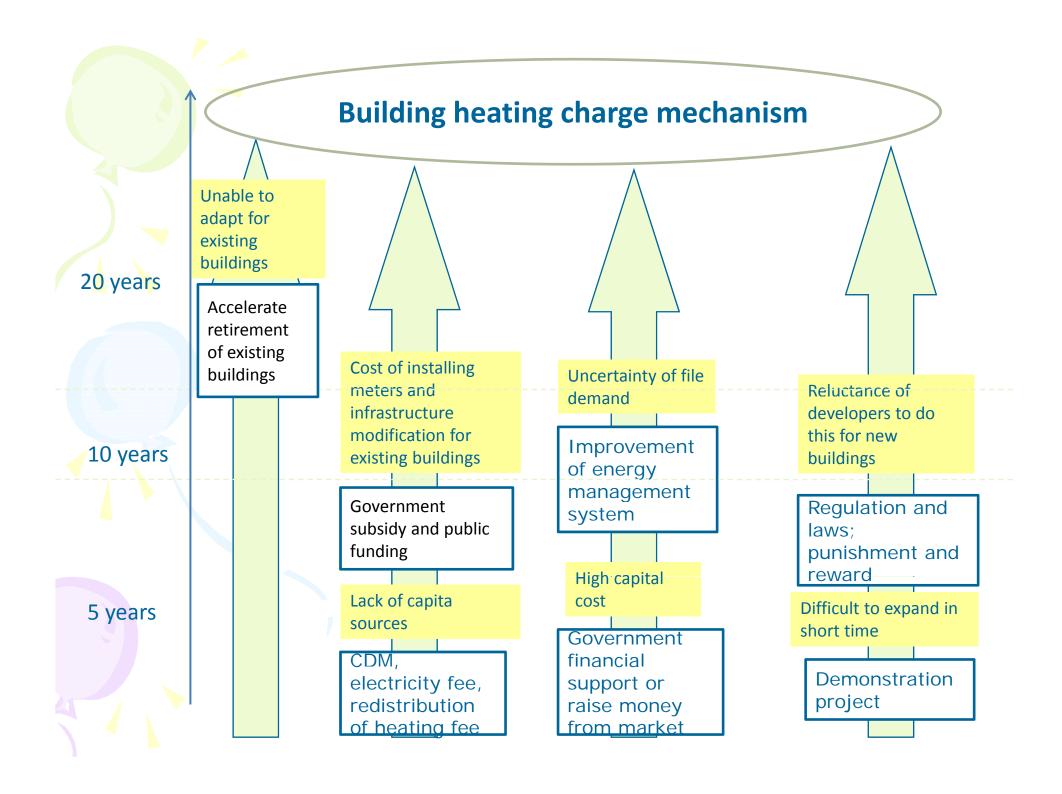
	2050/2005	
PPV_S	5.51	
PPV_M	5.50	
PPV_L	5.00	
CPV	7.60	
BUS	8.00	
TRN	3.82	
SHP	7.71	
AIR	20.00	

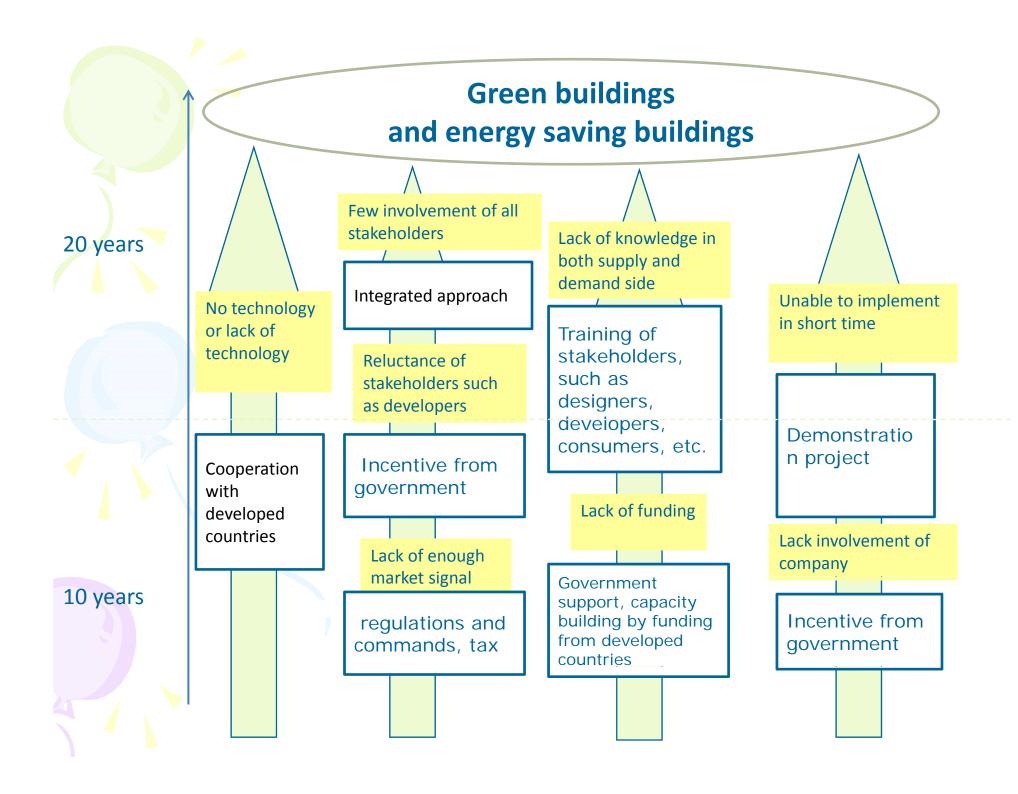
Demand change (transportation-f sector)

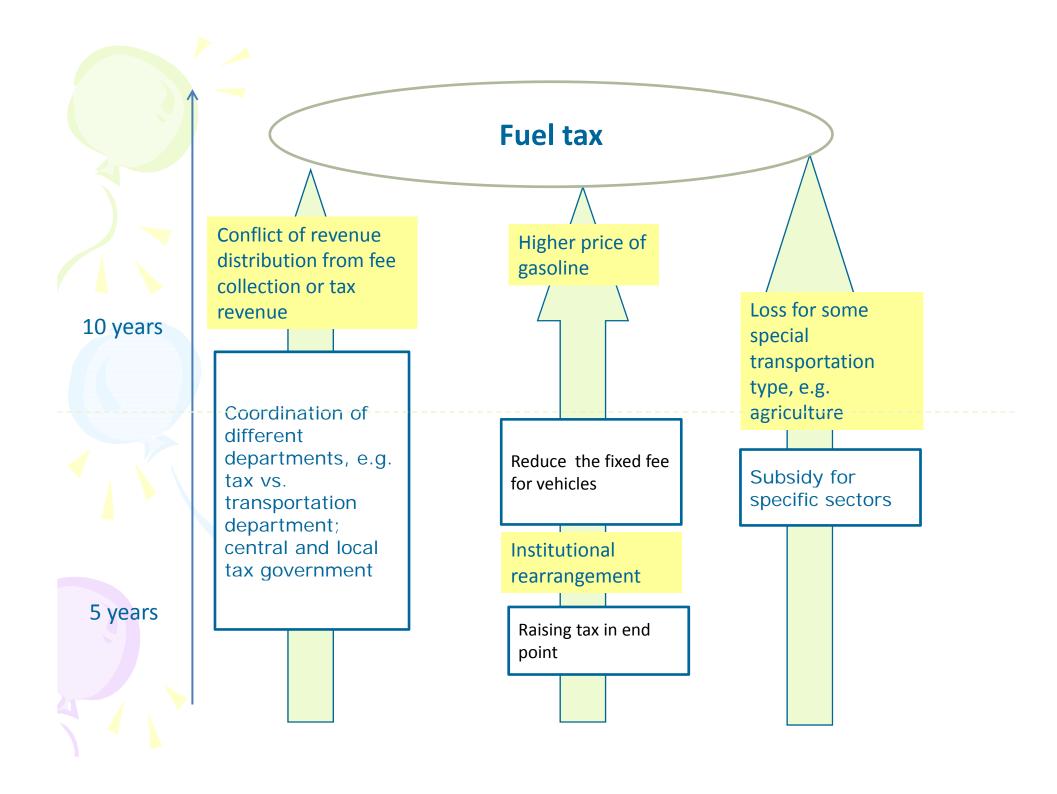


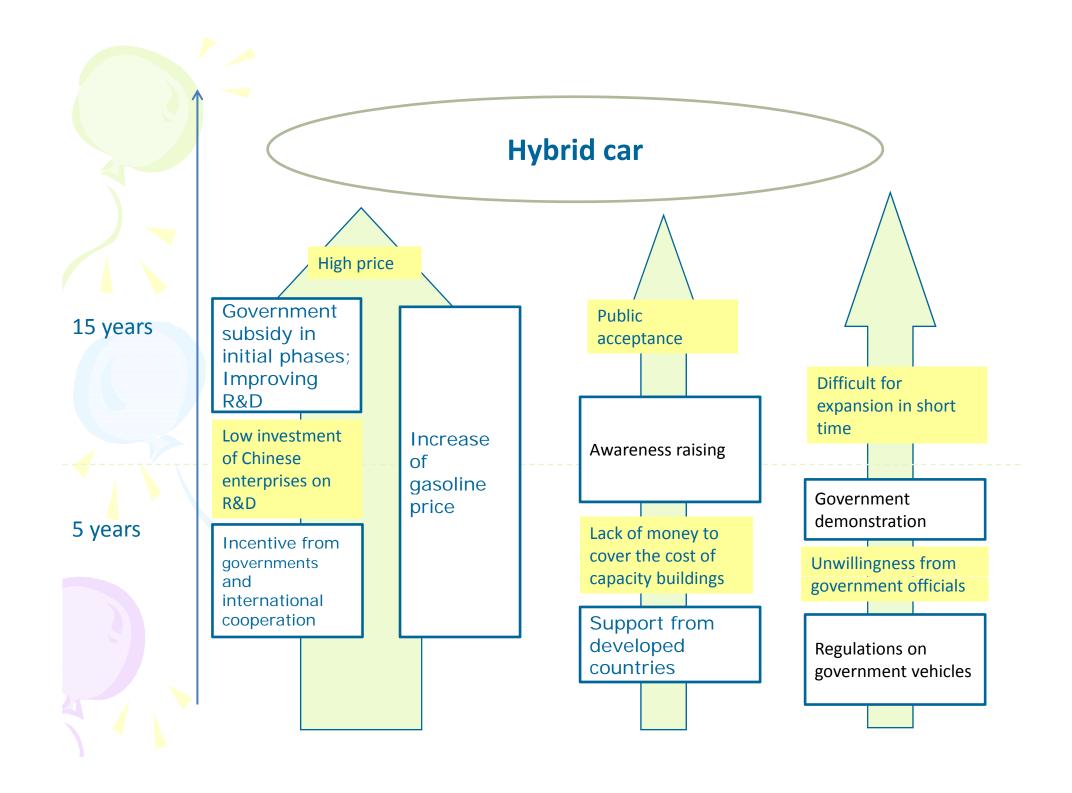
	2050/2005	
FV_M	10.11	
FV_L	10.11	
TRN	5.22	
SHP	8.00	
AIR	59.58	

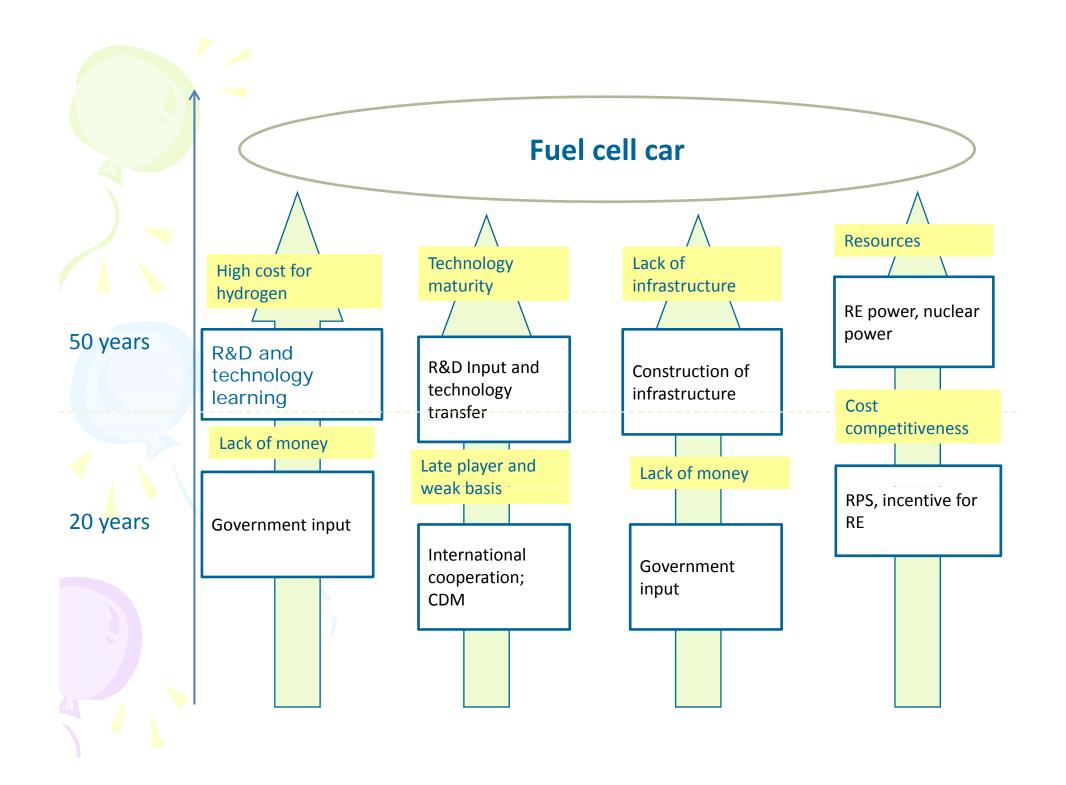










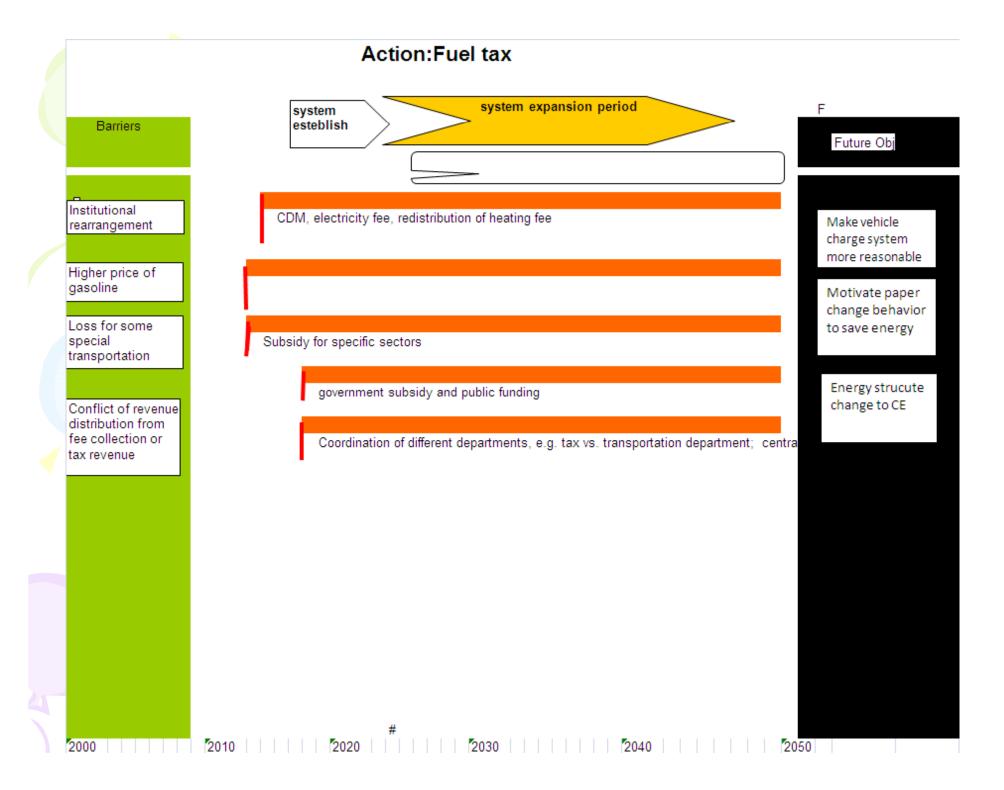


Action: Green building system system expansion period esteblish Barriers Future Obj Lack of enough market signal regulations and commands, tax Energy saving by at least 50% Lack of funding Government support, capacity building by funding Consolidated with nature and Reluctance of better living stakeholders such Incentive from government quality No technology or lack of technology Material Cooperation with developed countries saving, water saving and land Lack of knowledge in both supply and saving Training of stakeholders, such as designers, developers, consumers, demand side Unable to implement in short Demonstration project time Few involvement of all stakeholders Integrated approach 2010 2020 2040 2050

Action:Building heating charge mechanism

system expansion period system esteblish Barriers Future Obj lack of funding CDM, electricity fee, redistribution of heating fee Formulate more reasonable price scheme High capital cost government financial support or raise money from the capital market Improve the building energy Difficult to expand saving in short time Demonstration project Cost of installing meters and Promote the government subsidy and public funding fuel structure improvment for Uncertainty of file demand improvement of energy management system heating system Reluctance of developers to do regulation and law, punishiment and rewards this for new buildings Unable to adapt for existing buildings acceleration of deppreciation of existing buildings 2010 2020 2040 2050

Hybrid car system esteblish system expansion period Barriers Future Obj Low investment of Chinese regulations and commands, tax Increase fuel enterprises on economy of vehicles High price Government subsidies in R&D Technology innvoation for High price private vehicles Incentive from government No technology or lack of technology Less tail gas Cooperation with developed countries pollution Lack of money to cover the cost of Increase of gasoline price capacity buildings Public acceptance Awareness raising Difficult for expansion in short time Government demonstration 2010 2020 2030 2040 2050 2000



Typical situation from Chinese perspective

- Institutional change need time
- Culture difference
- Command and control methods vs. market-based instruments
- Obligatory vs. voluntary

Back casting model

Options definition

Building heating charge mechanism

parameter set

	Building warm
Demand change	-20
Efficiency	
Fuel consumption change by fuel shift	+5(gas)
Implement	30 years

Green buildings and energy saving buildings

parameter set

	Green building		Energy saving building	
	warm	cool	warm	cool
Demand change	-18	-1	-0.23	-1.36
Efficiency	50%	50%	50%	50%
Implement	35years	35years	35years	35years

Fuel tax-p

parameter set

	PPV-S	PPV-M	PPV-L	CPV
Demand change	-30	-2	-25	-30
Efficiency				
Implement	35years	35years	40years	40years

Hybrid car-p

parameter set

	PPV-L
Demand change	
Efficiency	100%
Fuel consumption change by fuel shift	-5(oil)
Implement	40years

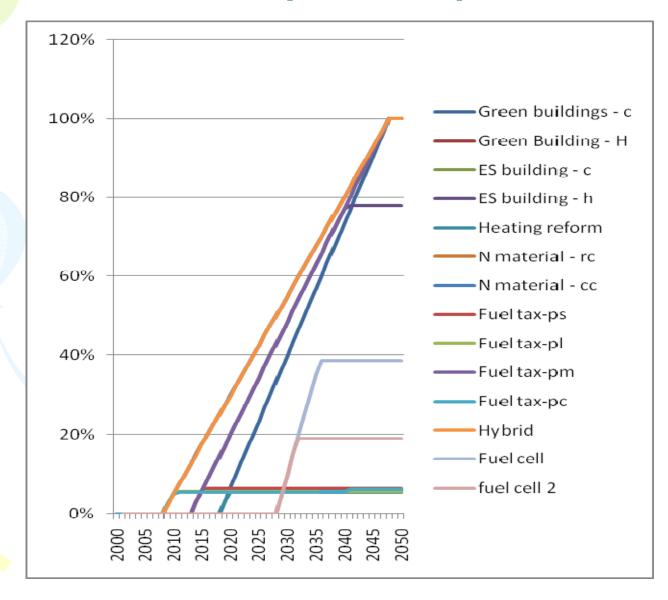
Fuel cell car-p

parameter set

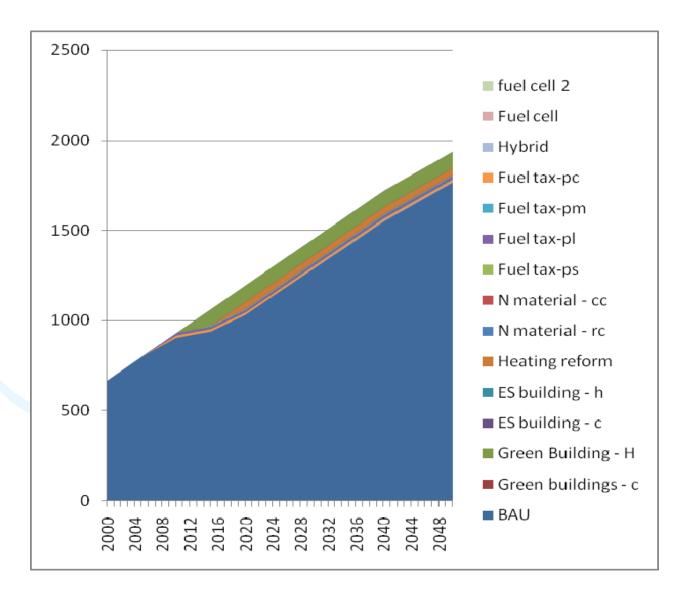
	PPV-S	CPV
Demand change		
Efficiency		
Fuel consumption change by fuel shift	-20(oil)	-30(oil)
Implement	20years	20years



Results – option penetraion



Results - CO2 emission



Discussion

- Setup of options
 - Barrier 1: Different sectors and fuels: too complex and easy to be confused
 - Options: flexibility for fuel and sector selection for one option
 - Barrier 2: Bugs, difficult to judge the reasonability of results
 - Options: update the program, which need every person's feedback

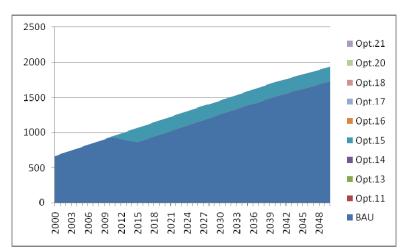


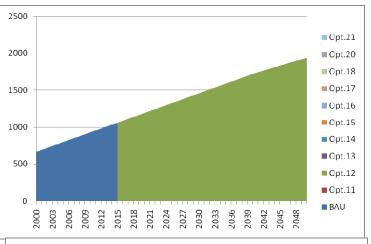
2015

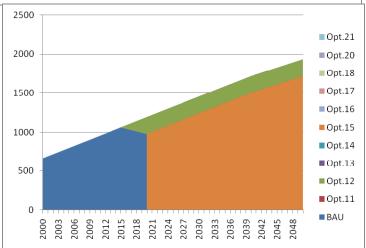
Strange Change of result

2020









Discussion

- Options: How to consider the pre-request options?
 - Model problem
 - How to do for the options with less carbon reduction but investment collection which is also crucial
- Uncertainties:
 - Time consuming
 - Assumption: too much, especially for cost
 - Linkage with other model: how to introduce?
 - Units: keep consistent
 - Effects: option do not take effect as assumed
 - Trend: linearly or other?

