

Six Options for Japan's Mid-term Target (1)				
	Description	Reduction in 2020		Necessary Policies and Measures
		% above/ below 1990	% above/ below 2005	
1	"Business as usual" case based on Long-term Energy Demand and Supply Outlook /	+4%	-4%	Spontaneous renewal of machines and facilities based on existing technologies
2	25 % reduction of overall developed countries' emissions below 1990 (allocated on a basis of equivalent marginal abatement cost)	-5 ~ +1%	-12 ~ -6%	
3	Introduction of best available technologies to machinery being renewed based on Long-term Energy Demand and Supply Outlook	-7%	-14%	Introduction of best available technologies to machinery being renewed partly with compulsory measures
4	25 % reduction of overall developed countries' emissions below 1990 (allocated on a basis of equivalent cost as a percentage of GDP)	-17 ~ -8%	-23 ~ -13%	
5	Introduction of best available technologies to machinery being renewed and, partly, still used	-15%	-21 ~ -22%	Mandatory introduction of best available technologies to machinery being renewed and ,partly, still used
6	25 % reduction below 1990 levels	-25%	-30%	Mandatory introduction of best available technologies to almost all machinery

Establishment of the Committee

Cabinet Office

The Council on the Global Warming Issue

- Established in February 2008
- Discuss a variety of issues toward a low-carbon society
- Chair: Mr. Hiroshi OKUDA (former TOYOTA president)

The Mid-term Target Committee

- Established in October 2008
- Consider Japan's mid-term target from a scientific viewpoint and offer options
- Chair: Mr. Toshihiko FUKUI (**former governor of the Bank of Japan**)

Process of the Consideration

Establishment of
Mid-term Target Committee

Scientific examinations and analysis of
options in the Committee

Concluded
on 14 April

Public Comments
~16 May

The Japanese Government will choose the mid-term
target from the options and announce it by June.

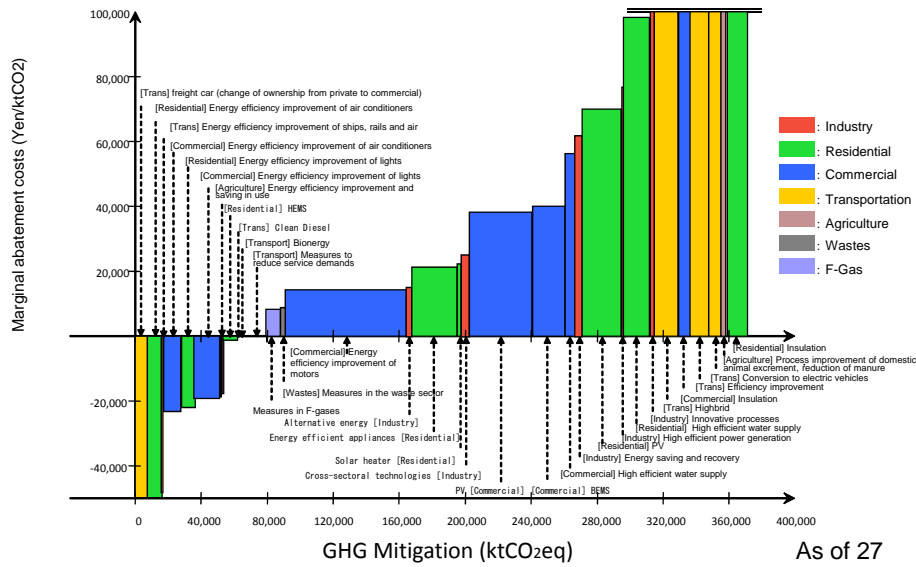
Japan's policy on mid-term targets

- **Set quantified national emissions reduction targets**
- **Ensure comparability based on mitigation potential analysis**
- **Evaluated with regard to domestic mitigation efforts**
- **Use of flexibility mechanisms as a supplementary measure**
- **Include land use, land use change and forestry (LULUCF) as part of the national commitment**

Techno-Economic Models Applied for Analysis

- **International Comparability: MAC (marginal abatement cost) and Cost/GDP analysis models by:**
 - National Institute for Environmental Studies (NIES)
 - Research Institute of Innovative Technology for the Earth (RITE)
- **Domestic Reduction: Bottom-up technology-based analysis models by:**
 - National Institute for Environmental Studies (NIES)
 - Institute of Energy Economics Japan (IEEJ)
- **Economic Evaluation: General Equilibrium / Macro-economic models by:**
 - Japan Center for Economic Research (JCER)
 - National Institute for Environmental Studies (NIES)
 - Keio University

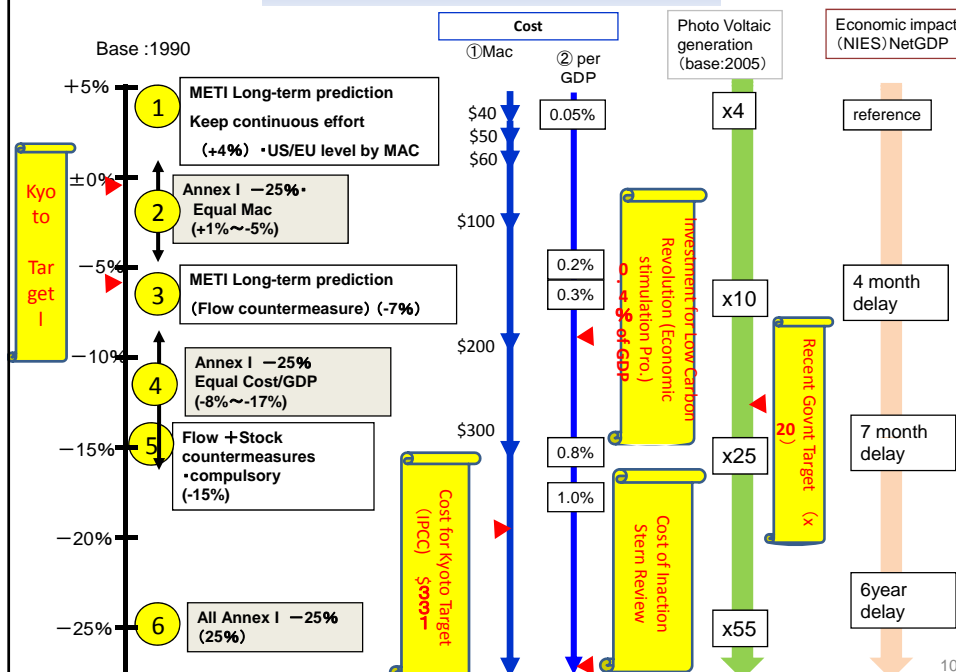
Marginal Abatement Cost to Reduce GHG emissions in Japan



AIM/Enduse[Japan]

As of 27 March 2009
in 2020 (Case III)

Evaluation of Options



Japan's Mid-term Target

Japan's mid-term target was announced by Prime Minister Aso on June 10, 2009. The target is



**15 percent reduction from
the 2005 level by 2020
(domestic reduction)**

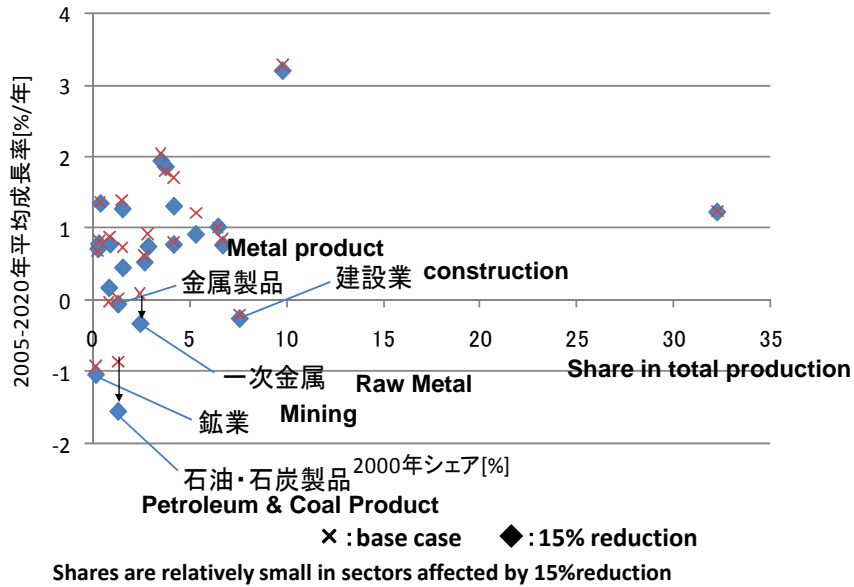
	Mid-term target		Kyoto target
Target Year	2020		2008 - 2012
Base Year	2005	1990	1990
Domestic reduction	15	8	0.6*

*Japan's Kyoto target (6% reduction) includes carbon sinks and credits through the Kyoto mechanisms.

Issues to be discussed

- **Endurable economic impact to business, Industry and household?**
 - ~0.5 % GDP of additional cost
 - Industrial structure change necessary
 - Energy security (cost of \$200 Tri./y to domestic investment)
- **Sufficient international contribution to stabilize climate?**
- **Ambitious enough?**
 - To pull out innovations to Low Carbon Future
 - To encourage big emitter countries to participate
 - Green investment?

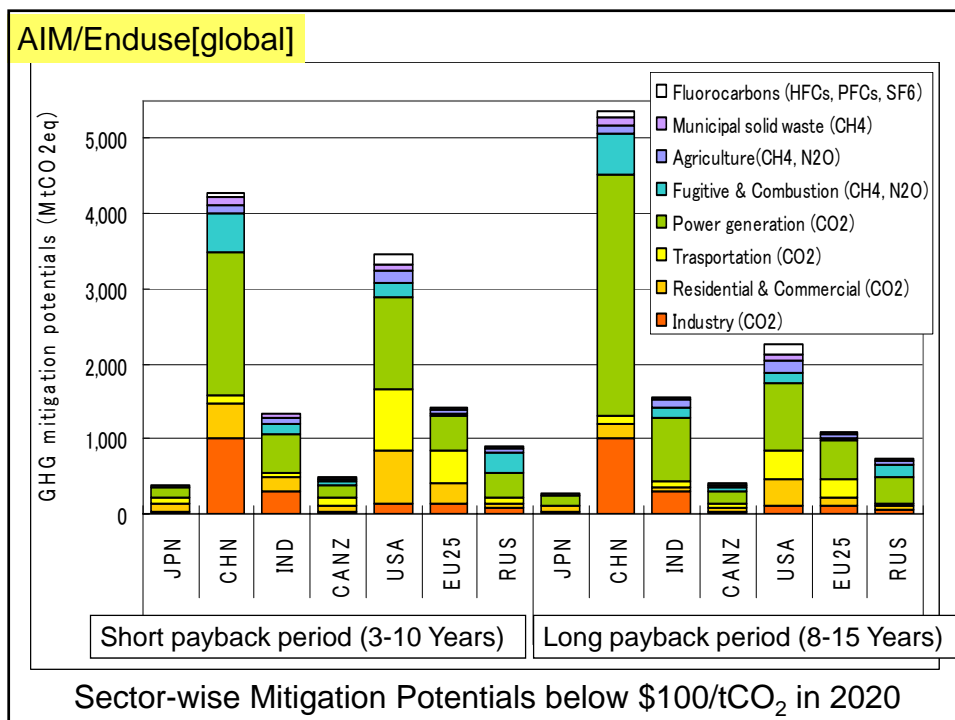
Additional impact to sectors' gross production



Limitation of modeling work:
 Flexibility of structure change and policy introduction are limited under fixed Macro frame

	Common assumption for modeling analysis
Net GDP Growth rate	2006~2020 average 1.3%/year
Population	World: UN Middle Estimation (2020:12,449million) Japan: National Inst. for Population Middle Estimation (2020: 12,281Million)
Oil Price (Nominal)	56\$/Bbl (2005) ⇒121\$/Bbl (2020)
Raw Iron Production	113Million ton (2005) ⇒120Million ton (2020)
Transportation Volume	Passenger level off from 2005 towards 2020 Cargo 10%increase in 2020 from 2005
Nuclear Power	437.4Bil.kWh (9 Nuclear newly build、LF: 80%)

International Comparability of Six Options for Japan's Mid-term Target (2)									
		Comparability (Reduction in 2020)							
	Allocation approach	% above / below 1990				% above / below 2005			
		All Annex I Parties	Japan	U.S.	EU	All Annex I Parties	Japan	U.S.	EU
1	Equivalent in marginal abatement cost	-18 ~ -9%	+4%	-5 ~ +6%	-19 ~ -14%	-14 ~ -6%	-4%	-18 ~ -7%	-14 ~ -9%
2	Equivalent in marginal abatement cost	-25%	-5 ~ +1%	-24 ~ -19%	-27 ~ -23%	-23 ~ -22%	-12 ~ -6%	-33 ~ -30%	-23 ~ -18%
3	Equivalent in marginal abatement cost	-29 ~ -25%	-7%	-24 ~ -23%	-27 ~ -26%	-26 ~ -23%	-14%	-34 ~ -33%	-23 ~ -21%
4	Equivalent in abatement cost per Total GDP	-25%	-17 ~ -8%	-18 ~ -7%	-31 ~ -30%	-23 ~ -22%	-23 ~ -13%	-28 ~ -19%	-27 ~ -25%
5	Equivalent in marginal abatement cost	-39 ~ -29%	-15%	-39 ~ -29%	-33 ~ -29%	-36 ~ -27%	-22 ~ -21%	-47 ~ -38%	-28 ~ -25%
6	25% reduction	---	-25%	---	---	---	-30%	---	---



Allocation under various criteria

(2020 from 1990)

		Japan	US	EU25	Russia	Annex I				
							China	India	Non-Annex I	World
Existing research <small>Höhne, N., D. Phylipsen, Moltmann, S., 2007: Factors underpinning future action 2007 update For the Department for Environment, Food and Rural Affairs (DEFRA), UK</small>	Multi-stage¹⁾	-31%	-38%	-36%	-52%	-41%	62%	235%	89%	9%
	C & C (response)²⁾	-31%	-18%	-34%	-48%	-32%	62%	168%	76%	10%
	Common but Differential responsibility (CDC)³⁾	-33%	-9%	-35%	-47%	-29%	48%	180%	72%	10%
	Triptyk (Combined)⁴⁾	-29%	-8%	-31%	-45%	-26%	65%	103%	69%	10%
AIM Analysis	MAC (Efficiency)^{5), 10)}	-5%	-24%	-27%	-32%	-25%	-	-	-	-
	Cost/GDP (capability)^{6), 10)}	-17%	-18%	-31%	-31%	-25%	-	-	-	-
AIM and others	Cost/GDP Converge (Efficiency)^{7), 10)}	-3%	-10%	-26%	-52%	-25%	114%	65%	74%	14%
	C&C responsibility^{8), 10)}	-16%	-13%	-26%	-46%	-25%	72%	98%	74%	14%
	Emission/GDP equal rate reduction (efficiency)^{9), 10)}	-30%	-19%	-33%	-21%	-25%	160%	81%	74%	14%

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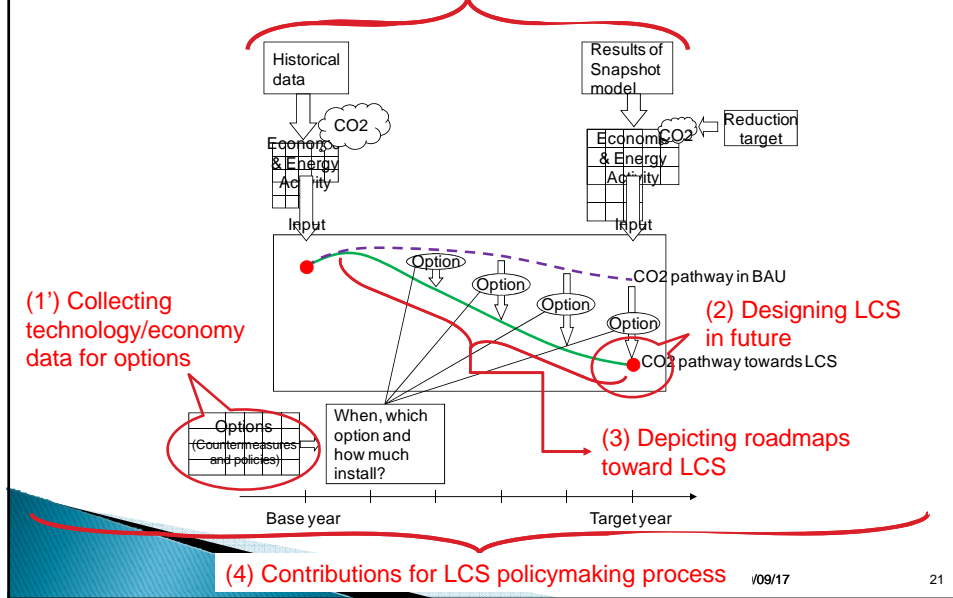
Japan LCS scenarios



NIES has coordinated this Japan LCS research project during FY2004-2008 in collaboration with around 60 researchers from Tokyo Univ, Kyoto Univ, TIT, TSU, Forest Research Institute, etc.

LCS scenario development and model contributions

(1) Setting future socio-economic conditions



(1') Collecting technology/economy data for options

(2) Designing LCS in future

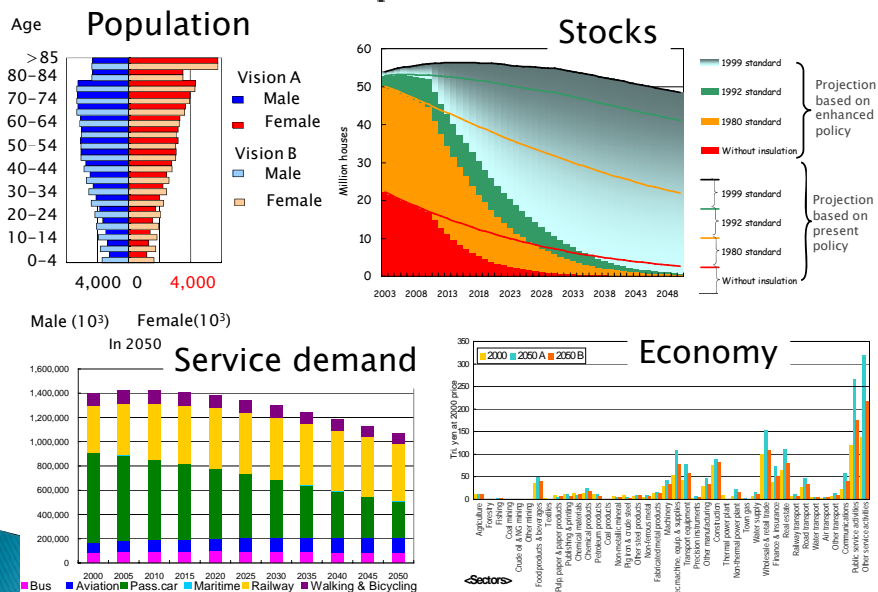
(3) Depicting roadmaps toward LCS

(4) Contributions for LCS policymaking process

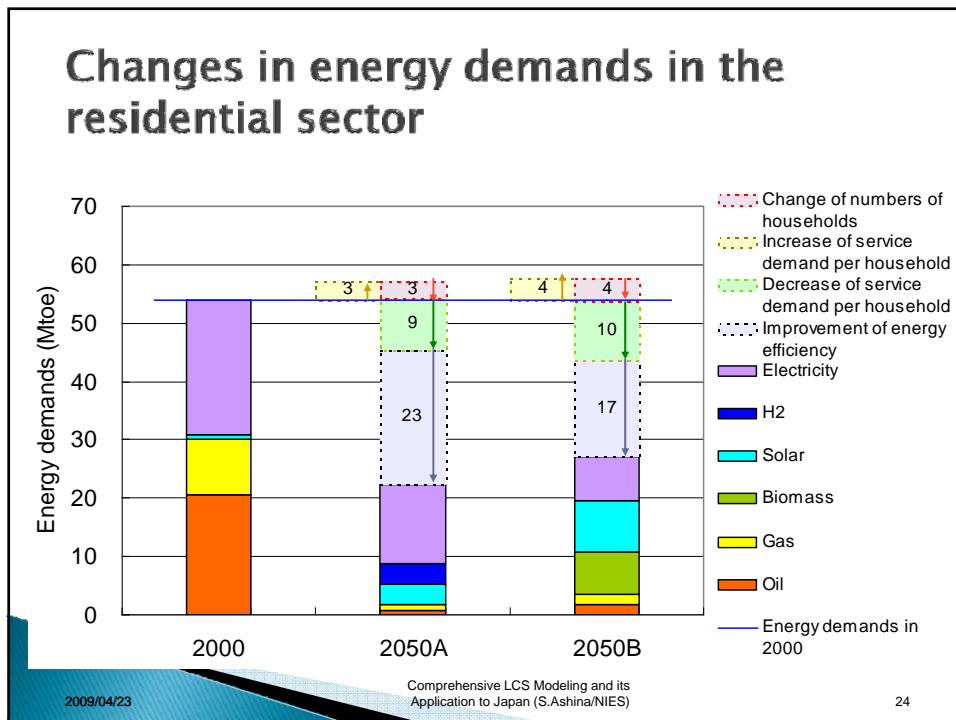
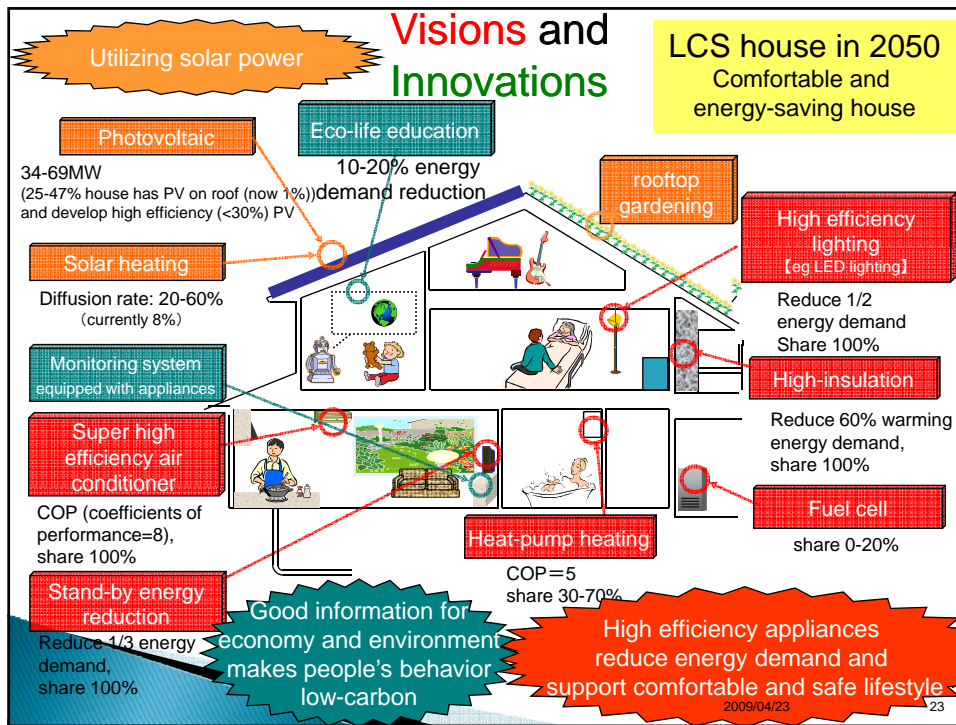
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Driving forces and socio-economic conditions for the future society

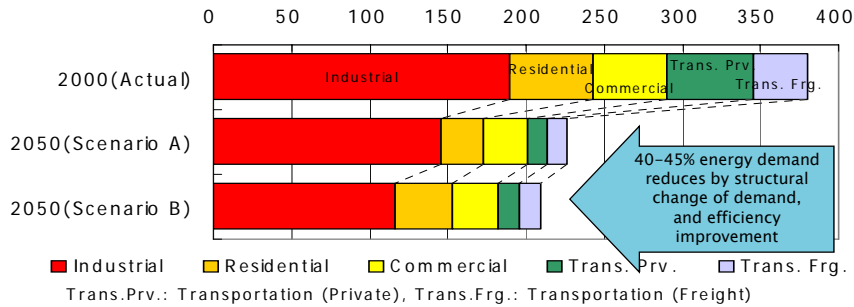


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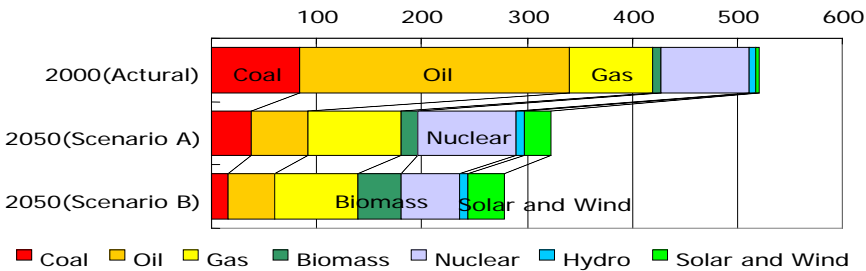


Energy demands and supply for Japan LCS

Secondary Energy Demands (Mtoe)

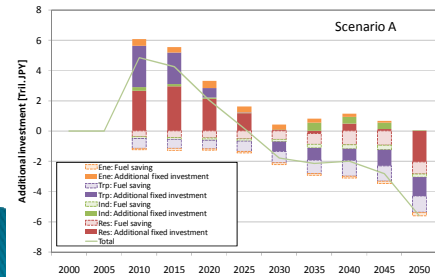
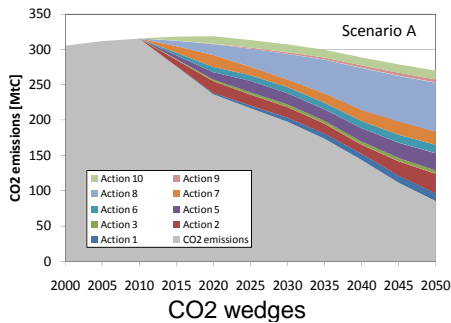


Primary Energy Consumption (Mtoe)

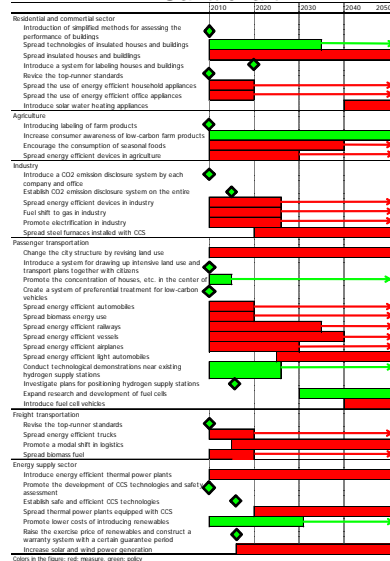


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How to reach the Japan LCS?



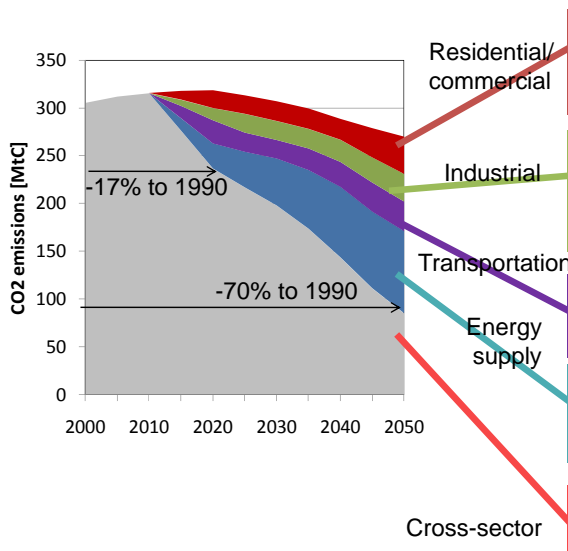
Gantt chart



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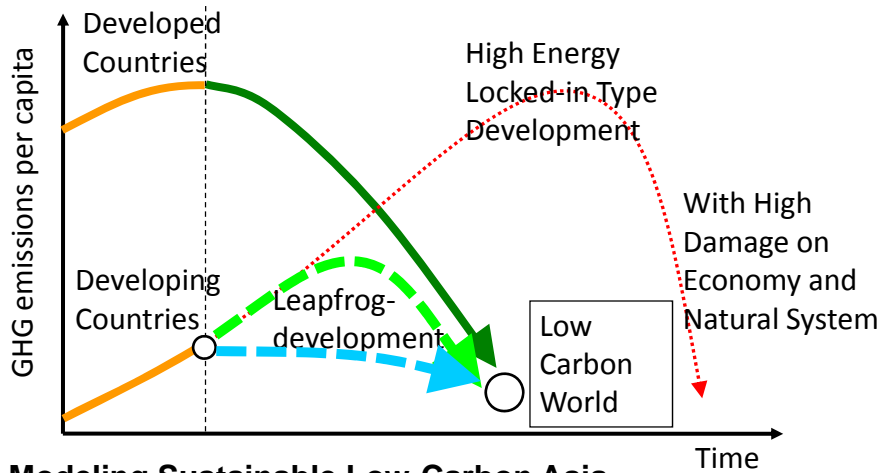
CO2 emission projections based on a dozen actions toward 70% reduction

A Dozen Actions



1. Comfortable and Green Built Environment
2. Anytime, Anywhere Appropriate Appliances
3. Promoting Seasonal Local Food
4. Sustainable Building Materials
5. Environmentally Enlightened Business and Industry
6. Swift and Smooth Logistics
7. Pedestrian Friendly City Design
8. Low-Carbon Electricity
9. Local Renewable Resources for Local Demand
10. Next Generation Fuels
11. Labeling to Encourage Smart and Rational Choices
12. Low-Carbon Society Leadership

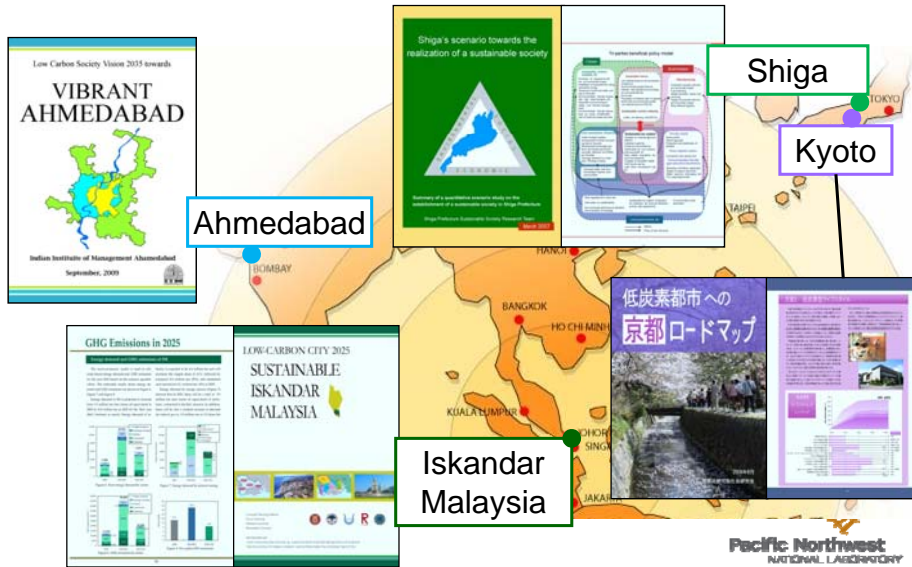
Low-Carbon Asia scenarios study



Modeling Sustainable Low-Carbon Asia

We have just started new research project "Asian Low-Carbon Society Scenario Development Study" (project leader: Mikiko Kainuma) during FY2009-2013, funded by Global Environmental Research Program, MOEJ

Model application in other regions



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