

Contribution of AIM (Asia-Pacific Integrated Model) to INDCs in Asia

Toshihiko MASUI

National Institute for Environmental Studies

masui@nies.go.jp

<http://www-iam.nies.go.jp/aim/index.html>

Policy Research Workshop on How to enhance climate actions to meet a long-term goal

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Asia-Pacific Integrated Model (AIM)

Asia-Pacific Integrated Model (AIM) is an integrated assessment model to assess mitigation options to reduce GHG emissions and impact/adaptation to avoid severe climate change damages. The model is extended to assess sustainable development policies together with Asian researchers. <http://www-iam.nies.go.jp/aim/>

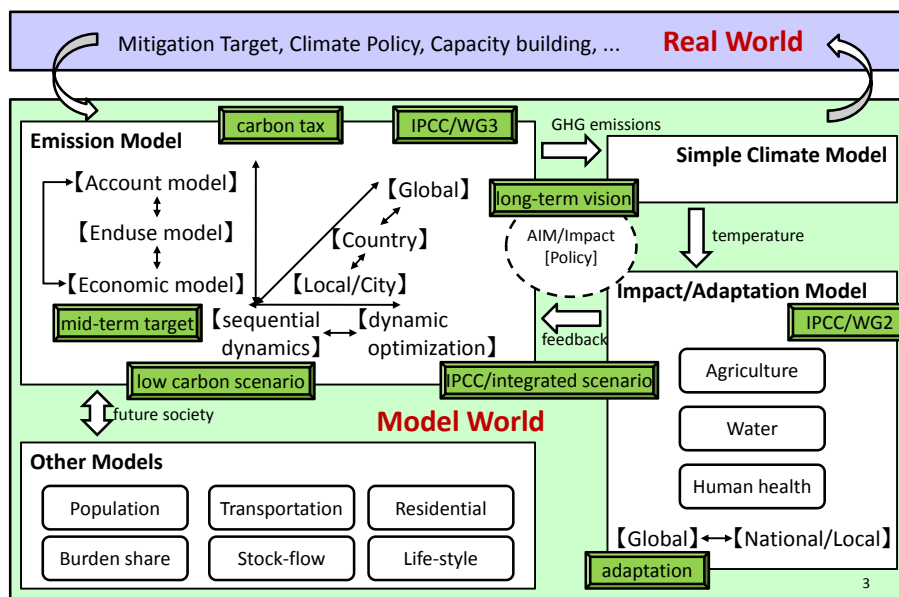


at the 20th AIM International Workshop in 2015



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Overview of AIM



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International Network of AIM

Japan
National Institute for Environmental Studies
Kyoto University
Mizuho Information Research Institute

China
Energy Research Institute, NDRC
Institute of Geog. Sci. & Nat. Res. Research, CAS
Institute of Env. & Sus. Dev. in Agri, CAAS
Guangzhou Institute of Ene. Conversion, CAS

India
Indian Institute of Management, Ahmedabad
School of Planning and Architecture, Bhopal

Korea
Seoul National Univ.
Korea Environment Institute

Thailand
Asian Institute of Tech.
Thammasat Univ.
King Mongkut's Univ.

Malaysia
Univ. of Malaysia

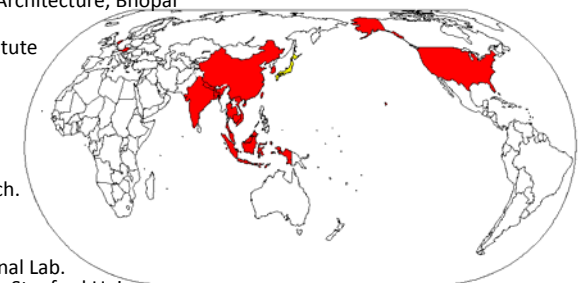
Indonesia
Bogor Agri. Univ.
Bandung Institute of Tech.

Austria
IIASA

Netherlands
PBL

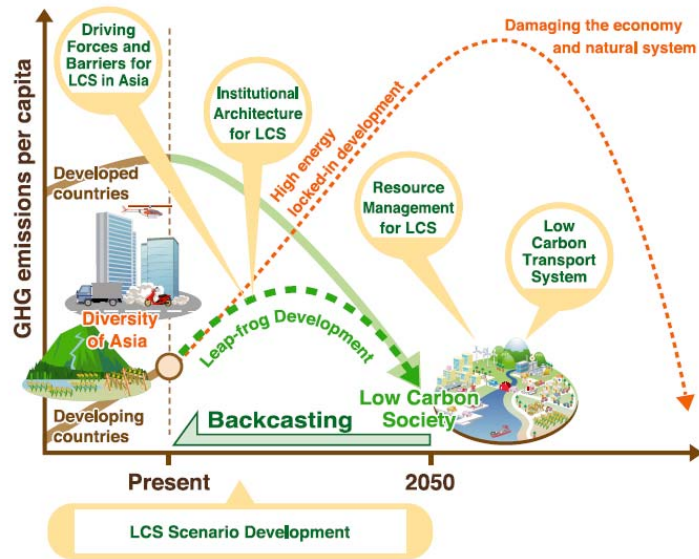
USA
Pacific Northwest National Lab.
Energy Modeling Forum, Stanford Univ.

In addition, collaborating with Vietnam, Cambodia, Bangladesh, Nepal, Taiwan, ...



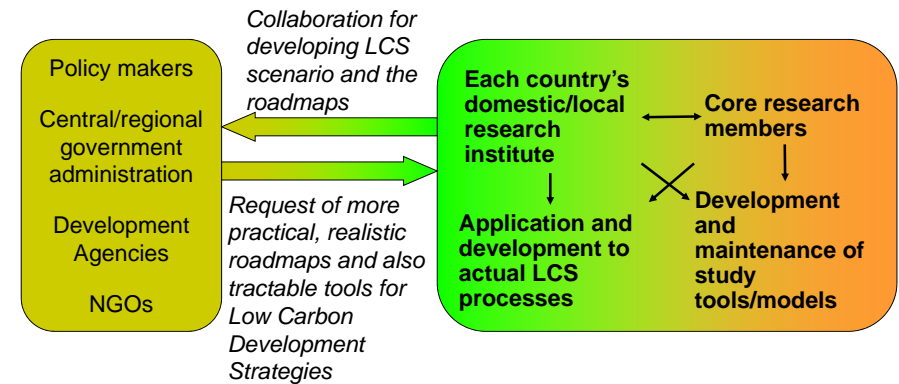
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Asia Low-Carbon Research Project (S-6 of The Environment Research and Technology Development Fund, MOEJ)



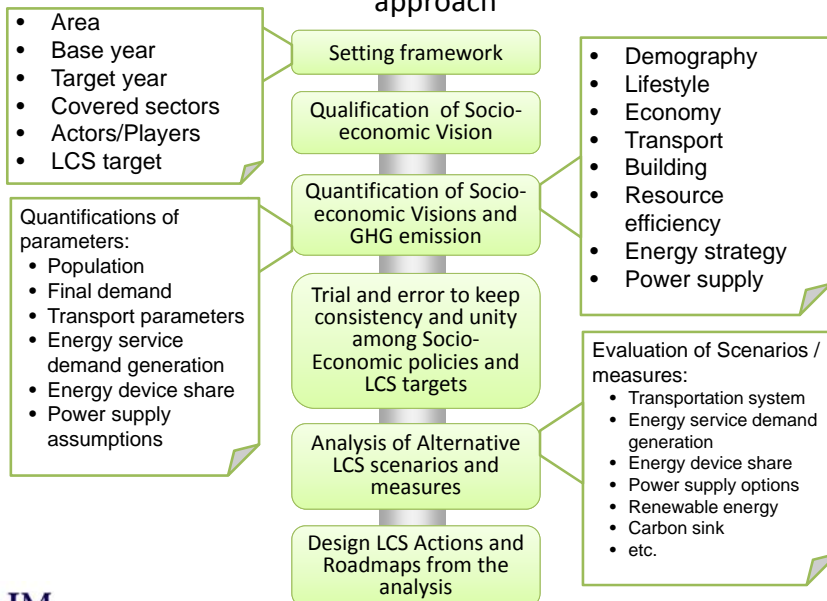
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Collaboration with Asian countries Scenario Approach towards Low Carbon Society in Asia



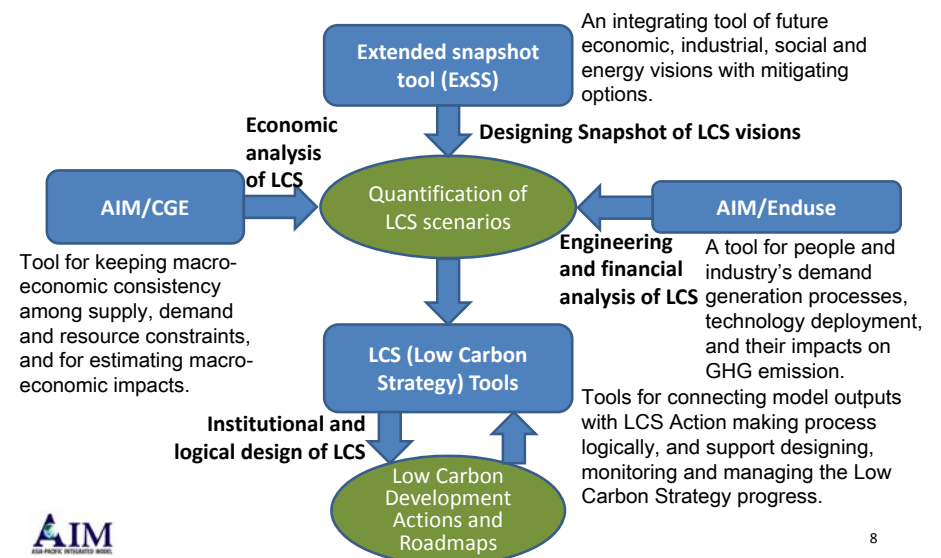
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Overall research procedure of our LC Society Scenario approach



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How to combine the tools in order to keep consistency and unity among Socio-Economic policies and LCS actions



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Assumptions of society in 2050

	Advanced Society Scenario (ADV)	Conventional Society Scenario (CNV)
Summary	Accept the new social system, institution, technologies etc. positively and proactively.	Discreet about the new social system, institution, technologies etc., and apprehension about their transition cost.
Economy	Annual growth rate from 2005-2050: 3.27%/year (Global) and 4.16%/year (Asia)	Annual growth rate from 2005-2050: 2.24%/year (Global) and 2.98%/year (Asia)
Population	Total population in 2050: 9.3 billion persons in the World, and 4.6 billion persons in Asia	
Education	Education system will be improved positively. Education period: from 4-12 years in 2005 to 11-14 years in 2050	Education system will be improved normally. Education period: from 4-12 years in 2005 to 8-13 years in 2050
How to use time	Time for working and improving career will be longer.	Time for staying with family and friends will be longer.
Labor	Full employment in 2075	Fixed unemployment rate as of 2009 level
Government	Efficiency will be improved immediately.	Efficiency will be improved gradually.
International Cooperation	Reduction of trade barriers and FDI risks	Gradual improvement in collaborative relationships among Asian countries.
Innovation	High	Medium
Transportation	Increase of demand due to high economic growth	Gradual increase of demand
Land use	More speedy and more efficient land use change	Moderate and careful land use change

10 Actions toward Low Carbon Asia

- NIES and other collaborating universities and institutes have proposed the 10 Actions to halve global greenhouse gas emission in 2050 compared to 1990 level.



Action 1 Urban Transport
Hierarchically Connected Compact Cities



Action 2 Interregional Transport
Mainstreaming Rail and Water in Interregional Transport



Action 3 Resources & Materials
Smart Ways to Use Materials that Realize the Full Potential of Resources



Action 4 Buildings
Energy-Saving Spaces Utilizing Sunlight and Wind



Action 5 Biomass
Local Production and Local Consumption of Biomass



Action 6 Energy System
Low Carbon Energy System Using Local Resources



Action 7 Agriculture & Livestock
Low Emission Agricultural Technologies



Action 8 Forestry & Land Use
Sustainable Forestry Management



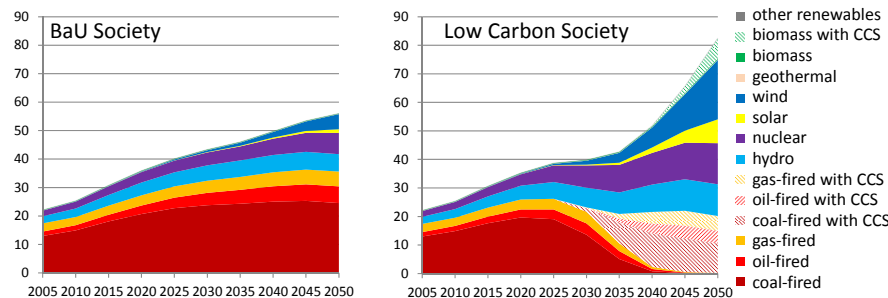
Action 9 Technology & Finance
Technology and Finance to Facilitate Achievement of LCS



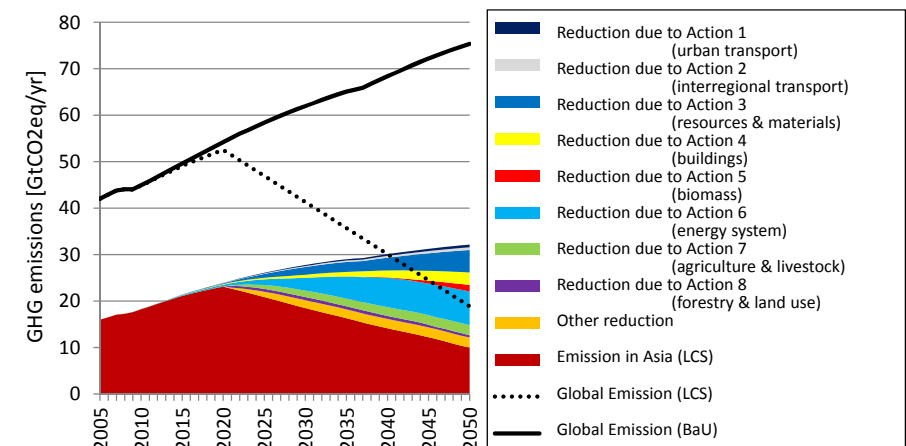
Action 10 Governance
Transparent and Fair Governance that Supports Low Carbon Asia

Action 6: Low Carbon Energy System Using Local Resources (Energy System)

6.1 Promotion of sustainable local energy systems with renewables	6.1.1 Use of solar and wind power energy
	6.1.2 Use of hydrogen energy
	6.1.3 Incentives for introducing renewable energy
6.2 Creation of smart energy supply and demand systems	6.2.1 Introduction of smart energy systems
	6.2.2 Introduction of demand response systems
	6.2.3 Introduction of power management systems
	6.2.4 Introduction of incentives for managing demand
6.3 Enhanced energy security with collaboration between low carbon energy sources and fossil fuels	6.3.1 Enhancement of the efficiency of power-supply equipment
	6.3.2 Use of carbon capture and storage (CCS) equipment
	6.3.3 Promotion of international cooperation

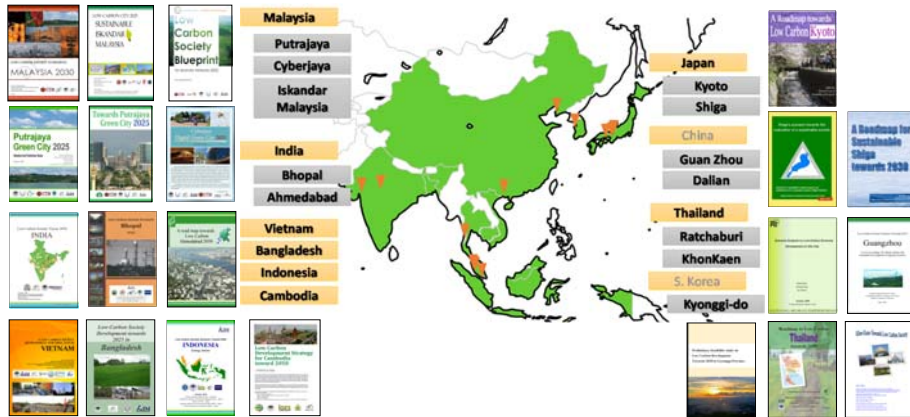


GHG Emissions in Low Carbon Asia



Examples of Brochures introducing Asian Low Carbon Scenarios

Communication and feedbacks of LCS study to real world



How to realize Low Carbon Asia?

- How to implement each action/program?
- In Asian countries, some activities have already been implemented toward the LCS at their own initiatives. Sharing information among countries becomes important in order to realize "leap-frog development"

Training workshop on model at NIES (2013.6.10)

Policy dialogue on mitigation target in Indonesia (2013.10.9)



Researchers introducing their countries' activities at ISAP (2013.7.24)

Activities on INDCs using AIM

- For several countries, we have been discussing the model revisions and simulations with researchers in those countries.
- In order to share the information on INDCs among the countries and make presentations on our results to open to the public, we have several meetings and workshops.
 - at the 20th AIM International Workshop (NIES, Japan; January 23rd, 2015)
 - at the Regional Forum on Climate Change (AIT, July 2nd, 2015)
 - at the 4th LoCARNet (Low Carbon Asia Research Network) Annual Meeting (Johor Bahru, Malaysia, October 12th, 2015)

Contribution to INDCs (1)

- At the 20th AIM International Workshop (NIES, Japan; January 23rd, 2015), session: "Toward COP21 in Paris: INDCs" was .
 - Japan Dr. Junichi Fujino (NIES, Japan)
 - China Dr. Kejun Jiang (ERI, China)
 - India Prof. P. R. Shukla (IIM, India)
 - Korea Prof. Dong Kun Lee (SNU, Korea) and Prof. Tae Yong Jun (KDI, Korea)
 - Thailand Prof. Bundit Limmeechokchai (SIIT, Thailand)
 - Indonesia Prof. Rizaldi Boer (IPB, Indonesia), Prof. Retno Dewi and Prof. Ucock Siagian (ITB, Indonesia)
 - Malaysia Prof. Chin Siong Ho (UTM, Malaysia)
 - Vietnam Dr. Tung Lam (ISPONRE, Vietnam)
 - Nepal Prof. Ram Shrestha (AITM, Nepal)
 - Cambodia Mr. Hak Mao (Ministry of Environment, Cambodia)
 - USA Dr. Jae Edmonds (PNNL, USA)
- http://www-iam.nies.go.jp/aim/aim_workshop/aimws_20/aimws_20_j.html

Contribution to INDCs (2)

- At the Regional Forum on Climate Change (AIT, July 2nd, 2015), the side event: "Mitigation potential and target in ASEAN countries toward 2 degree target" was held.
 - Indonesia: Dr. Ucok Siagian (ITB)
 - Thailand: Dr. Tawatchai Somnam (TGO)
 - Vietnam: Dr. Lam Nguyen (ISPONRE)
 - Cambodia: Mr. Hak Mao (Ministry of Environment)
 - Malaysia: Prof. Chin Siong Ho (UTM)
- <http://www.rfcc2015.ait.asia/SideEvents>



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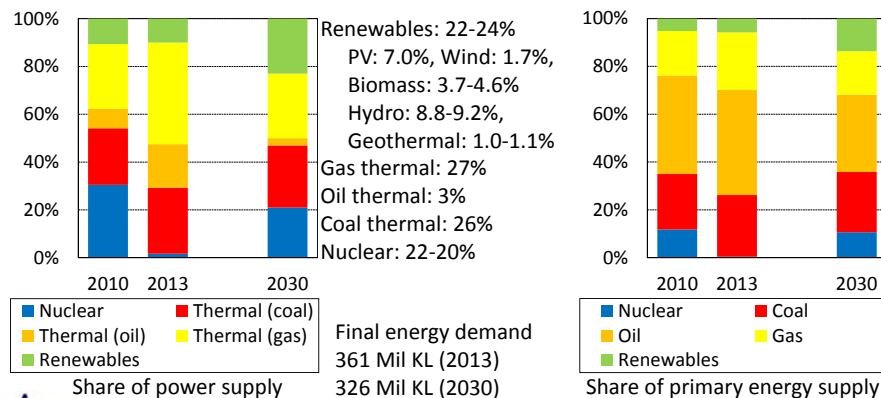
Contribution to INDCs (3)

- At the 4th LoCARNet Annual Meeting (Johor Bahru, Malaysia, October 12th, 2015), the INDC session will be held.
 - Cambodia: Dr Hak Mao, Ministry of Environment
 - Thailand: Dr Bundit Limmeechokchai, SIIT Thammasat Univ.
 - Malaysia: Dr Gary William Theseira, NRE
 - India: Prof P. R. Shukla, IIMA
 - China: Dr Jiang Kejun, ERI
- Speakers are not yet fixed.

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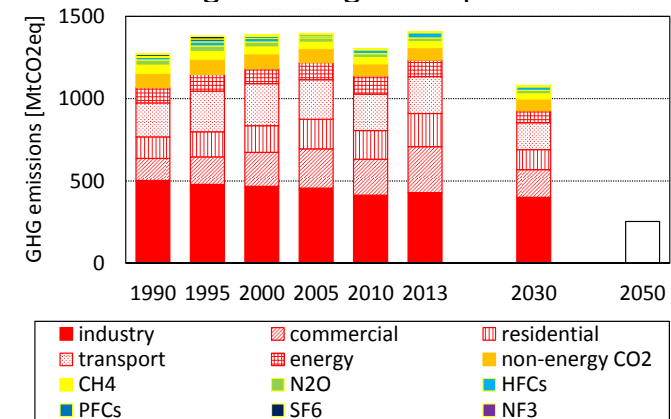
GHG mitigation target in Japan in 2030

- On April 28, 2015, proposal on energy mix in 2030 was introduced.
- On April 30, 2015, proposal on Japan's INDC was announced.
- On July 17, 2015, Japan's INDC was submitted to UNFCCC.



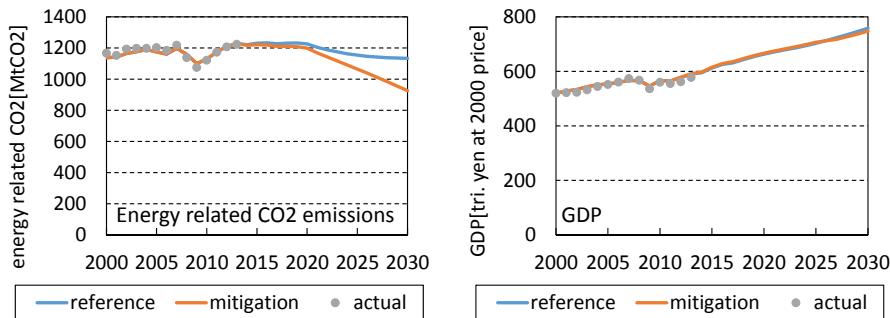
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GHG mitigation target in Japan in 2030



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Assessment of mitigation target using AIM (preliminary results)



- Assessment using CGE model coupled with technology selection.
- GDP loss in 2030 is 1.4% compared to reference case.
- Even in mitigation case, 1.6% of annual GDP growth will be achieved.
- Marginal cost in 2030 is 26,300 JPY/tCO₂.
- By extending the mitigation capacity through deeper penetration of options, the GDP loss in 2030 will be mitigated further.



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Preliminary results (as of April 8, 2015) for Japan's INDC using AIM

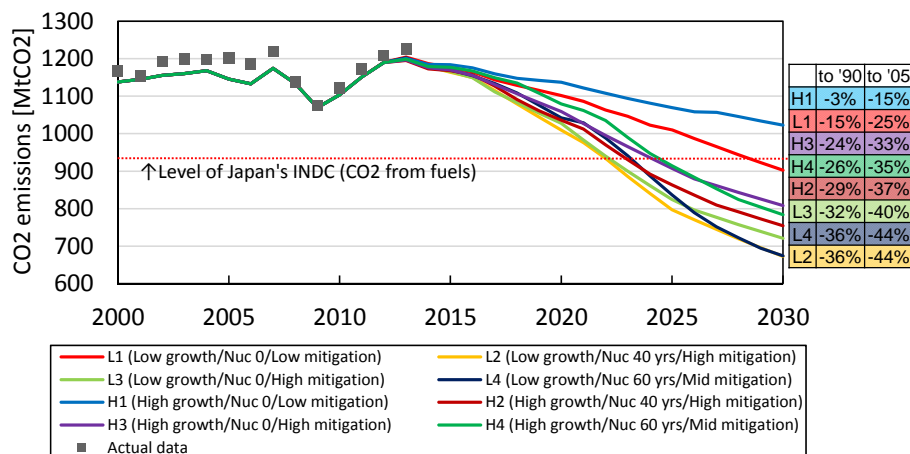
- The Japan's INDC was discussed at the Joint Committee under MOE and METI by the end of April 2015.
- In this PPT, based on CGE model coupled with simple technology selection, the CO₂ emission reduction potential in Japan by 2030 is introduced.
- Introduction of energy saving technologies is based on the previous discussion in 2012.

Scenarios	Low economic growth 0.9%pa (2010-2030)	High economic growth 1.6%pa (2010-2030)
Nuclear 0/Low GHG mitigation actions	L1	H1
Nuclear 40yrs/ High GHG mitigation	L2	H2
Nuclear 0/High GHG mitigation	L3	H3
Nuclear 60yrs/ Mid GHG mitigation	L4	H4



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Preliminary results (as of April 8, 2015) for Japan's INDC using AIM CO₂ emissions from energy use

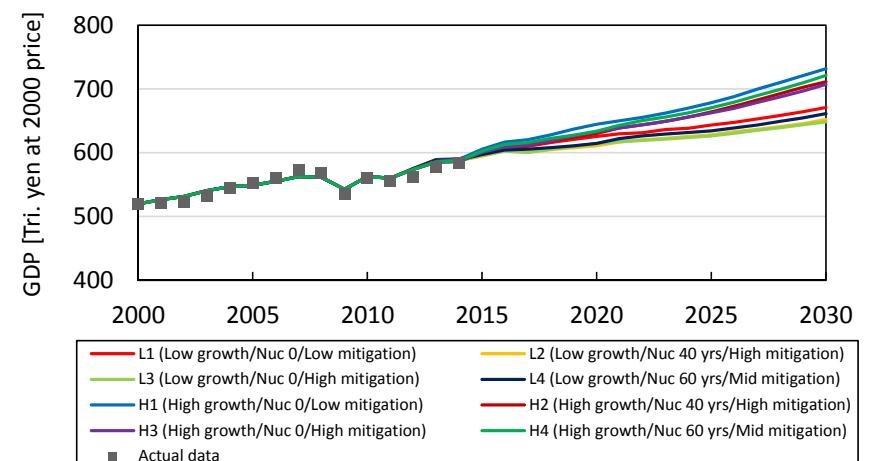


Level of GHG mitigation actions will have larger influence on CO₂ emissions than the nuclear operations.



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Preliminary results (as of April 8, 2015) for Japan's INDC using AIM GDP



GHG mitigation actions will loose the accelerator pedal of economic growth, but we will be able to keep growth.



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