Breakout Session 4: INDC

Assessment of INDCs toward 2 degree target and discussion process in Japan

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International Conference of Low Carbon Asia
Positive Action from Asia – Towards COP21 and Beyond
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Double Tree Hotel, Johor Bahru, Malaysia

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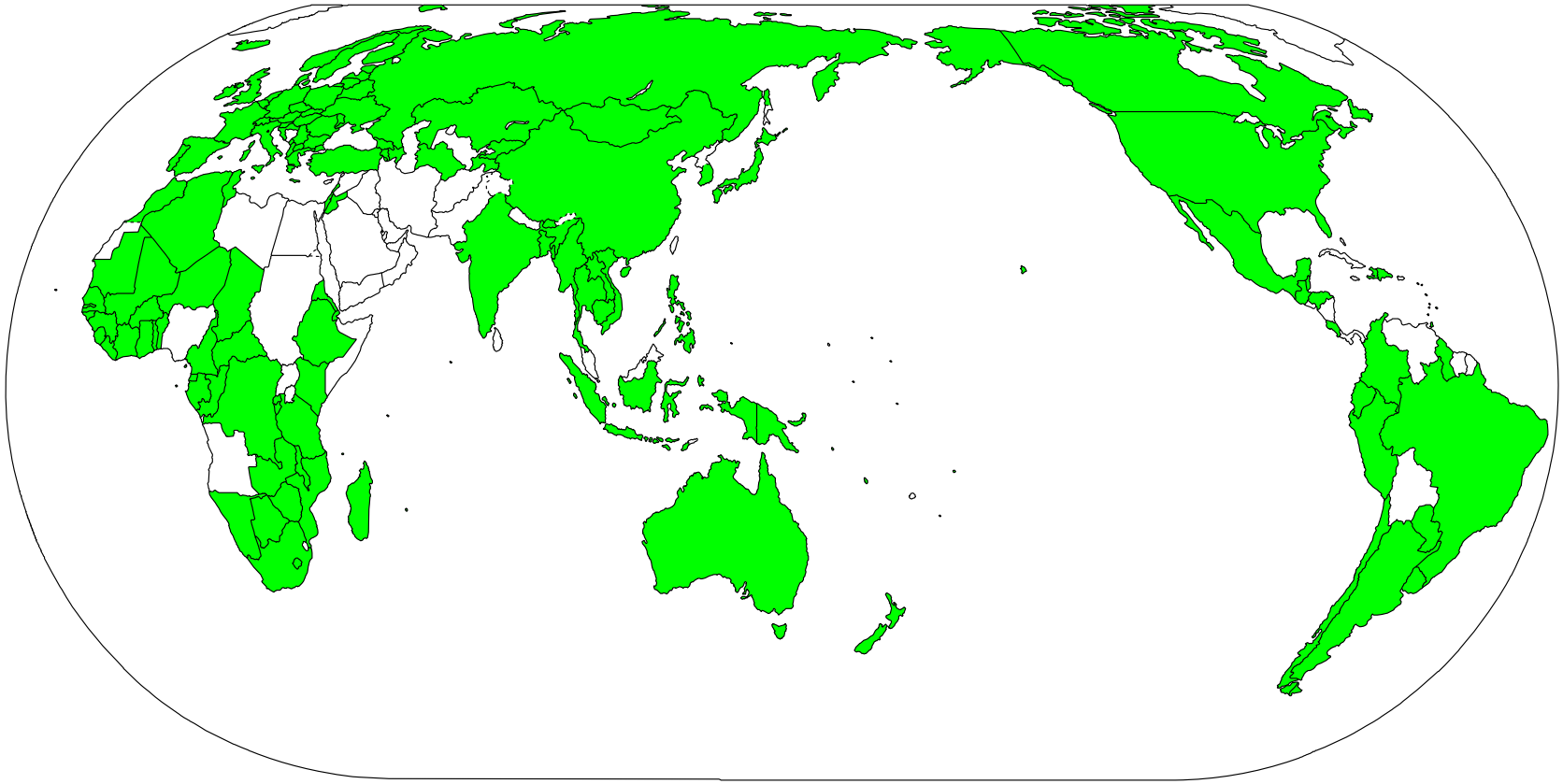
Countries submitting INDCs



As of October 2, 2015

GHG emissions in 2012 from submitted countries cover more than 80% of the total emissions.

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Purposes of this session

(1) Sharing the following information among the speakers and participants

- target
- process
- problems
- roles of researchers and model

(2) Proposal toward the next step/round

(3) What shall we do after COP21?

(4) Messages to policymakers and other stakeholders

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Speakers of this session

- Mr Uy Kamal, National Council for Sustainable Development, Cambodia (skype)
- Dr Bundit Limmeechokchai, SIIT Thammasat Univ., Thailand
- Prof P. R. Shukla, IIMA, India
- Dr Hancheng Dai, NIES, Japan on behalf of Dr Kejun Jiang, ERI, China
- Dr Gary William Theseira, NRE, Malaysia

Schedule

Introduction of this session

Assessment of overall INDCs using AIM/CGE [global]

Country presentation by all speakers

Cambodia / Thailand / Malaysia / India / China

Discussion

a. Domestic action plan to meet the target.

b. Relationship to 2 degree target.

c. collaboration among the Asian countries

- technology
- finance
- policy

Conclusions

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Assessment of INDCs using AIM/CGE[Global]

- Many countries have already submitted their INDCs.
- Some organizations have already assessed the submitted INDCs.
- By COP21 in Paris, the fundamental discussion will be done such as the relationship between INDCs' total commitment and 2℃ target in 2030.

- AIM team also tries to assess the INDCs toward 2℃ target using Global CGE model.
  - Difference of mitigation pathways to achieve 2℃ target?
  - Difference of economic impacts between optimal case and INDC case to achieve 2 ℃ target?

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Our preliminary assessment of INDCs using AIM/CGE [Global]

- Global computable general equilibrium model with 17 regions, 43 sectors and 23 commodities developed by Dr. Shinichiro Fujimori.
- Emissions from both energy, land use and others can be covered.
- Recursive dynamics up to 2100.
- Gas types: CO2, CH4, N2O, SOx, NOx, CO, BC, OC, VOC, and NH3
- Simple climate model, MAGICC6, is linked to show the future climate condition.
- This model is utilized to assess SSPs (Shared Socio-economic Pathways) to show the future scenarios.
- The detailed model description, please see the following website; http://www.nies.go.jp/social/dp/pdf/2012-01.pdf

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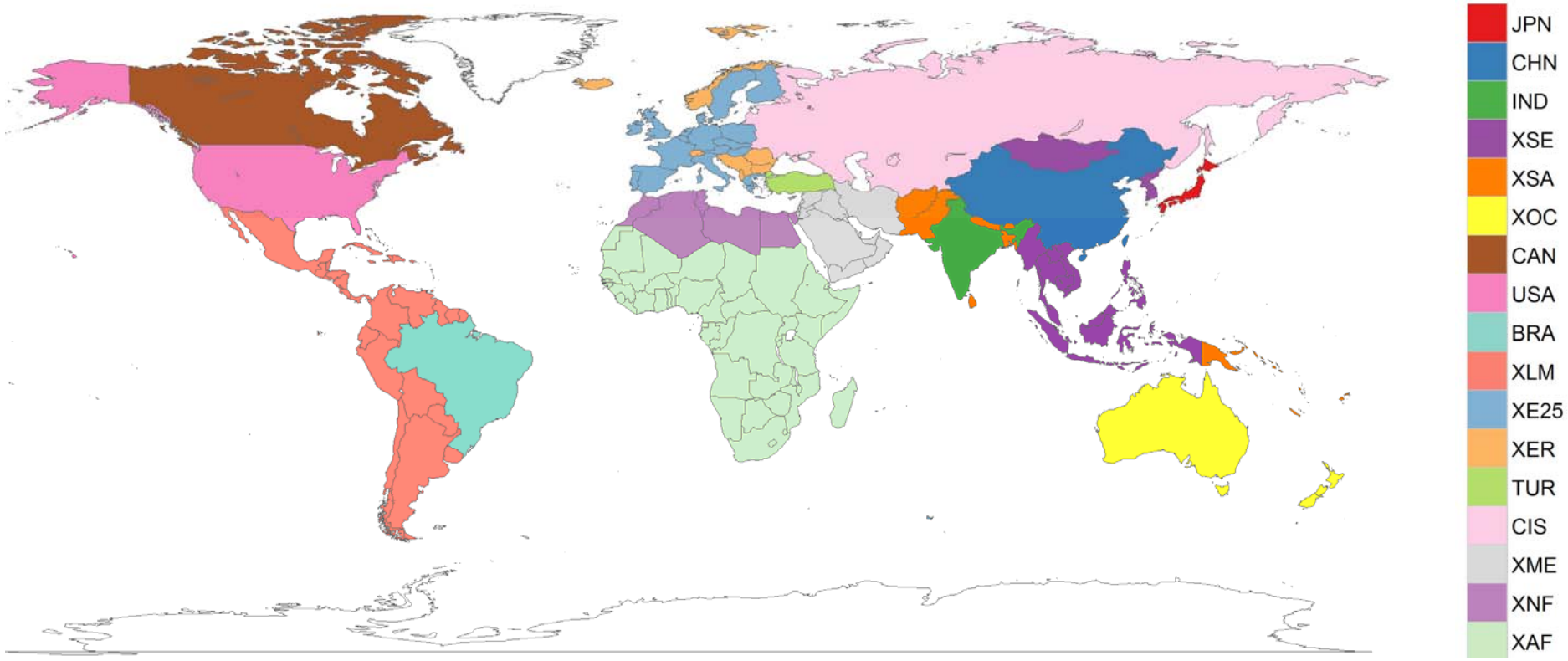
Definition of 17 regions of AIM/CGE [Global]



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Main outputs from AIM/CGE [Global]

- Socio-economic activities
  - GDP
  - Population (exogenous)
- Emissions
  - Kyoto 6 gas
  - Air Pollutants
- Climate
  - Radiative forcing
  - Global mean temperature
- Mitigation costs
  - GDP loss
  - Consumption loss (welfare loss)
- Prices
  - Carbon price
  - Energy prices
  - Agricultural product prices
- Energy
  - Primary energy supply
  - Electricity supply by technologies
  - Final energy demands by sectors
- Agriculture and land use
  - Agricultural products and consumption
  - Land use change

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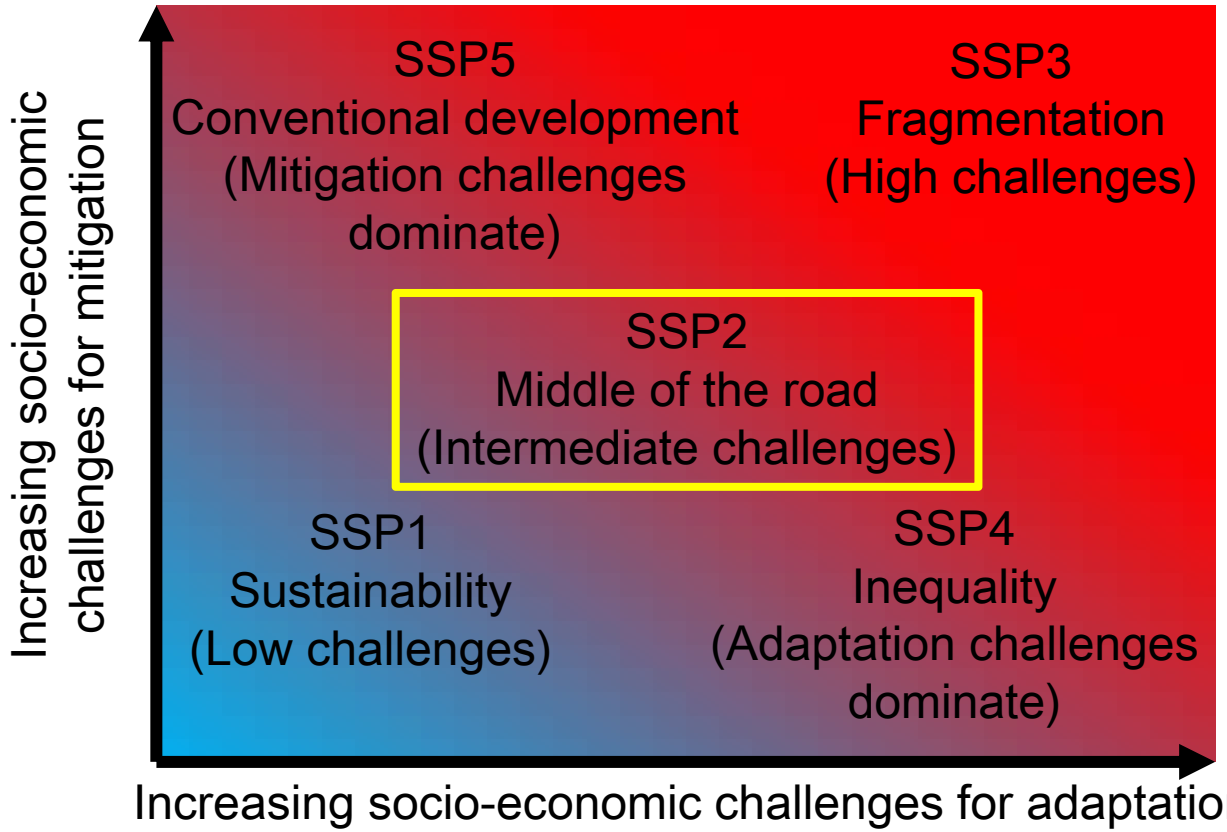
Basic assumptions
Socio-economy up to 2100

- Future changes of population, GDP, technology and preference will follow SSP2 "middle of the road."
  - New scenario sets to assess the future climate change mitigation and adaptation.
  - The basic assumptions of GDP and population are different from the forecasts by each national government.



Source: Brian O'Neill et al. (2012)

Mitigation scenarios

Scenario	Contents
Ref	No climate policy.
2.6W_opt	Mitigation efforts consistent with Copenhagen pledges until 2020 and then the efforts increase to achieve the long term 2°C target.
INDC_2.6W	Copenhagen pledges in 2020, INDCs in 2030, and then implementation of mitigation policies to achieve the 2°C target. (Cumulative GHG emissions during the 21st century will be the same as those in 2.6W_opt.)
INDC_cont	Copenhagen pledges in 2020, INDCs in 2030, followed by the same carbon price for INDC.

* RCP2.6 is the lowest emission scenario among the 4 RCPs (Representative Concentration Pathways). In this analysis, the cumulative emissions during 21st century should be the same with those in RCP2.6.

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Preliminary conclusions from Global results.

Targets proposed in INDCs are meaningful and necessary to develop low carbon society. However, achievement of the 2 ° C target i.e. global mean temperature increase to be below 2 ° C compared to the pre-industrial level will depend on the revision of INDCs and mitigation measures after 2030. Therefore mitigation measures in Asia, where the GHG emissions are expected to increase, become more important.

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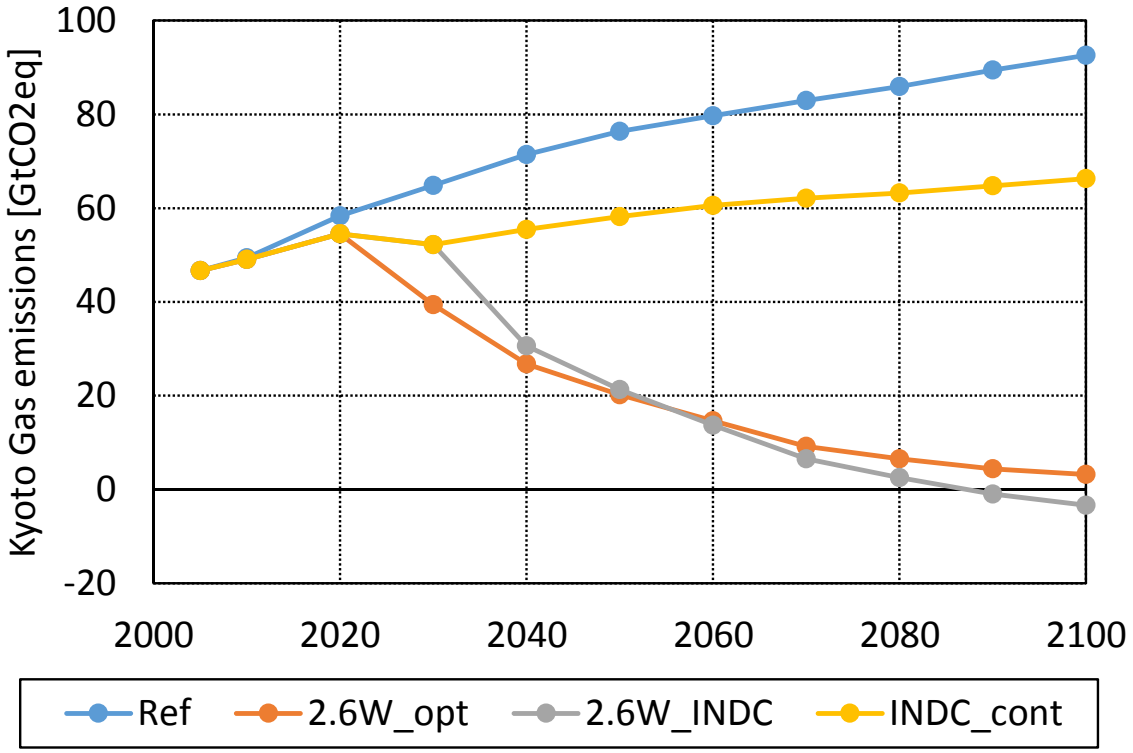
Result 1

- Due to the mitigation efforts consistent with INDC commitments, the global GHG emissions will reduce by 2 GtCO2 in 2030 compared to the emission level in 2020 assuming the fulfillment of Copenhagen pledges. The implementation of INDCs is meaningful toward low carbon society.



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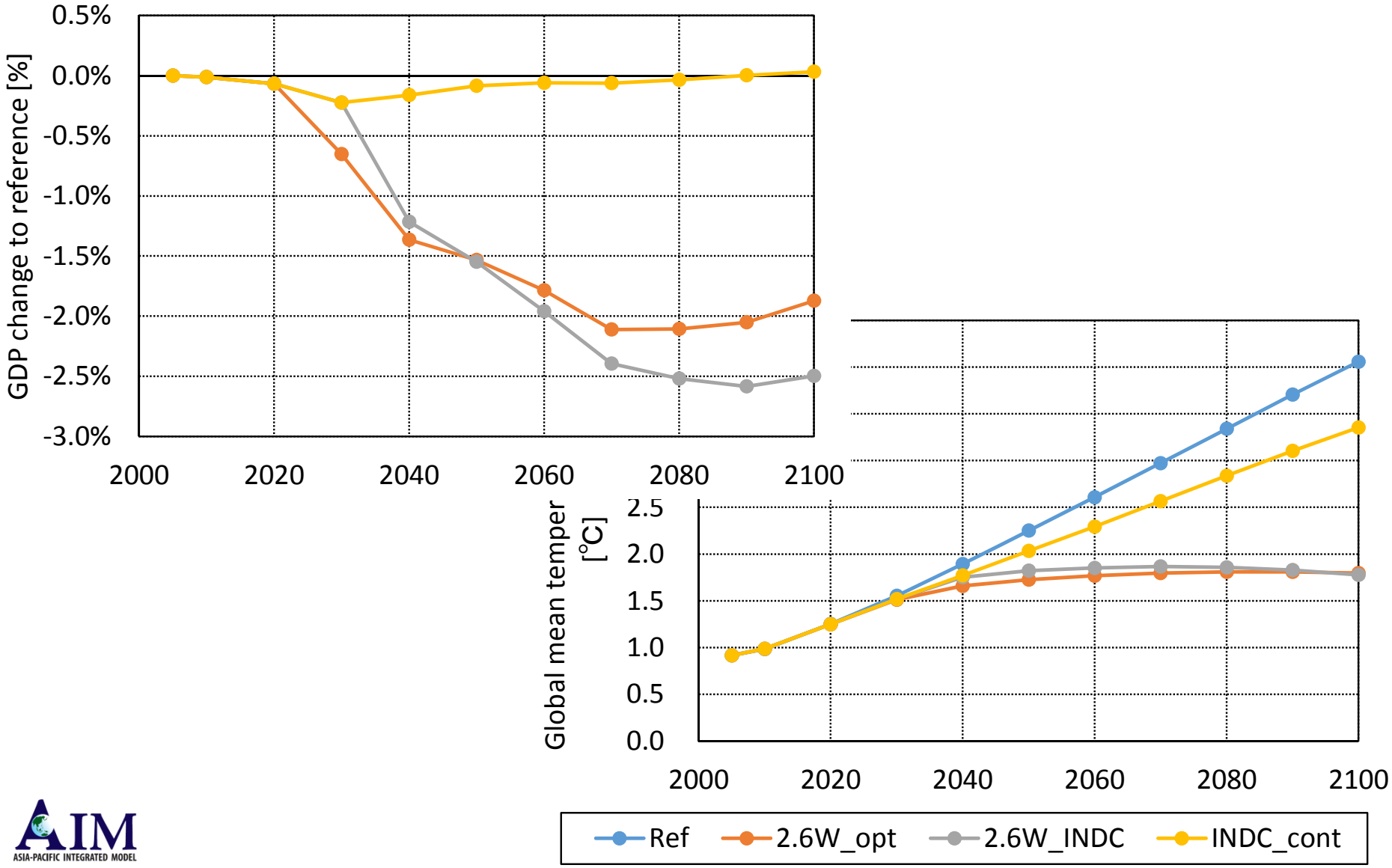
Result 2

- On the other hand, in the INDC_cont case, where GHG reduction efforts will no longer be enforced after INDC, GHG emissions will increase again after 2030. The global GHG emissions in 2030 after the INDC achievement will be 13 GtCO2 more than those in 2.6W_opt, which complies with 2°C target. In this case, the GHG emissions reduction in the latter half of the 21st century in 2.6W_INDC case need to be greater compared to those in 2.6W_opt to achieve the long term 2°C stabilization target.



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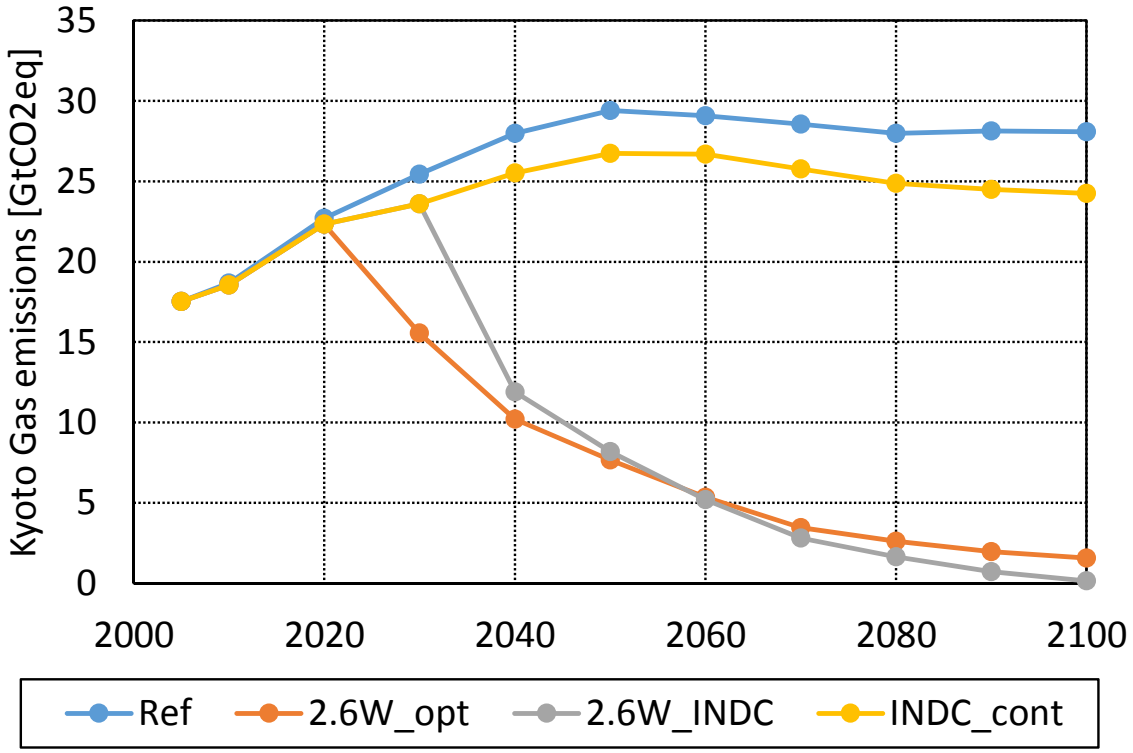
Result 3

- Although the GHG emissions in Asia in 2030 will exceed those in 2020, they will decrease by 2 GtCO2 compared with those in 2030 in Ref case. The more GHG emission reduction in Asia will be required through the measures such as technology transfer.



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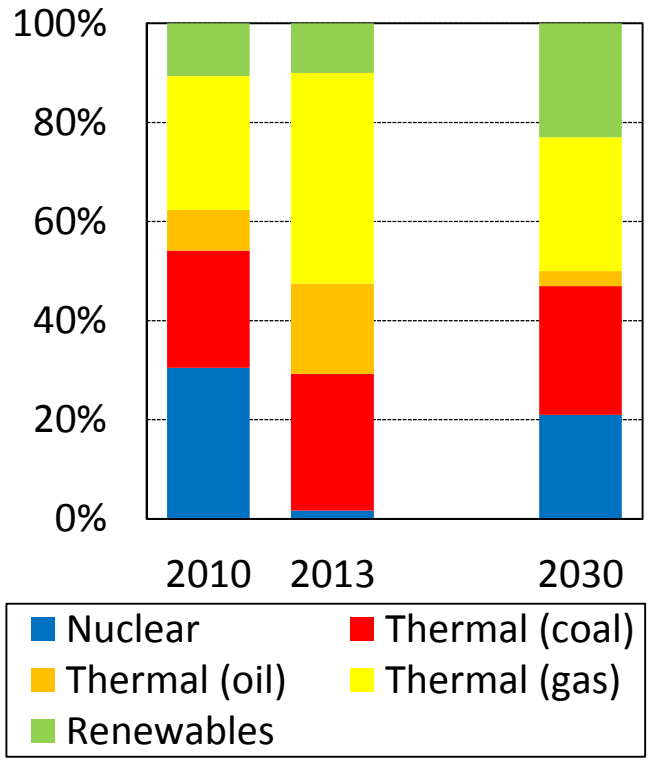
GHG mitigation target in Japan in 2030

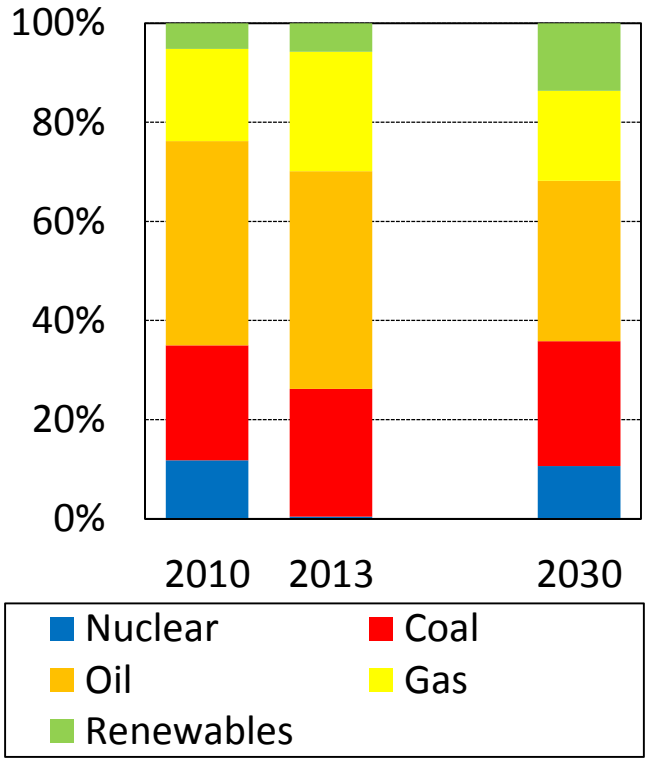
- On April 28, 2015, proposal on energy mix in 2030 was introduced.
- On April 30, 2015, proposal on Japan's INDC was announced.
- On July 17, 2015, Japan's INDC was submitted to UNFCCC.



Share of power supply

Renewables: 22-24%
PV: 7.0%, Wind: 1.7%,
Biomass: 3.7-4.6%
Hydro: 8.8-9.2%,
Geothermal: 1.0-1.1%
Gas thermal: 27%
Oil thermal: 3%
Coal thermal: 26%
Nuclear: 22-20%

Final energy demand
361 Mil KL (2013)
326 Mil KL (2030)



Share of primary energy supply

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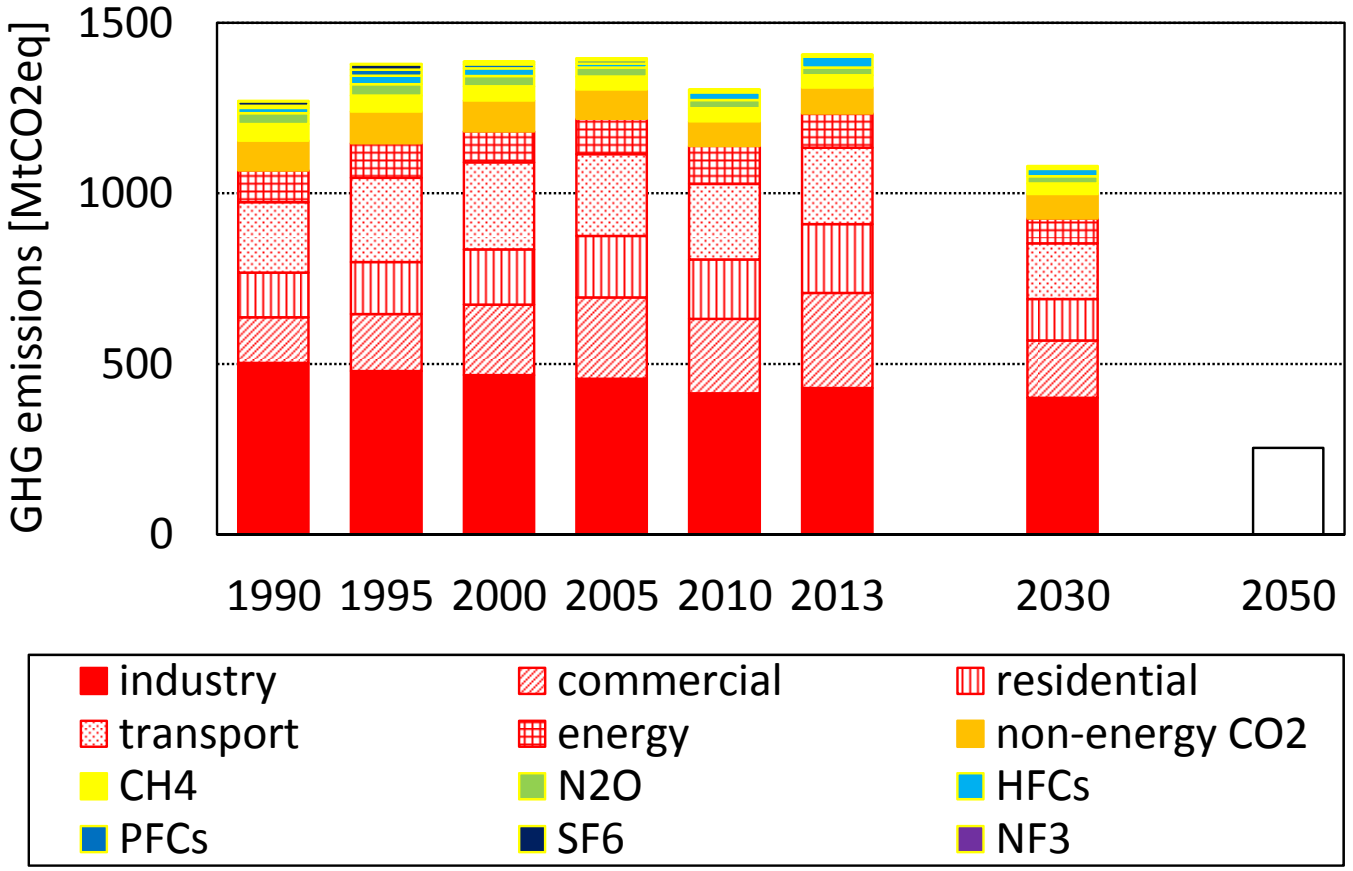
GHG mitigation target in Japan in 2030



GHG emissions in 2030: 10.42 GtCO2eq.

-26.0% compared to 2013.

-25.4% compared to 2005.

-18.0% compared to 1990.

GHG emissions in 2050: 80% reduction (by the 4th Environment Basic Plan)

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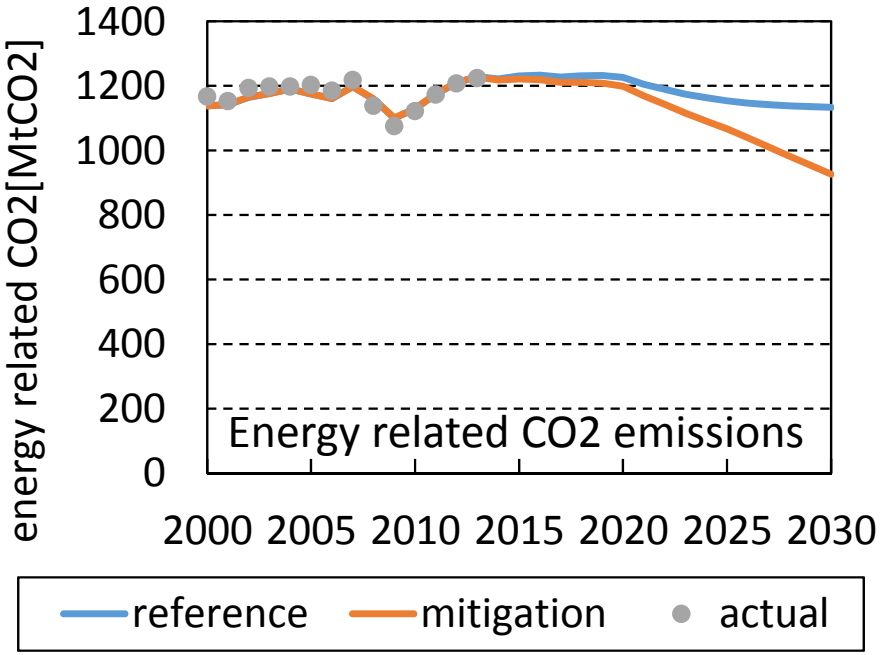
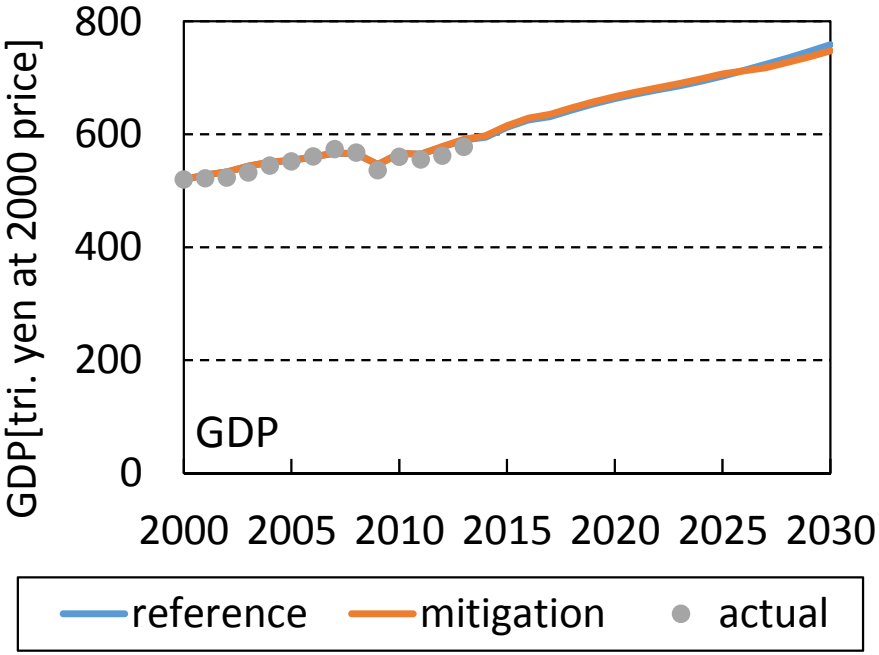
Assessment of mitigation target using AIM (preliminary results)





- 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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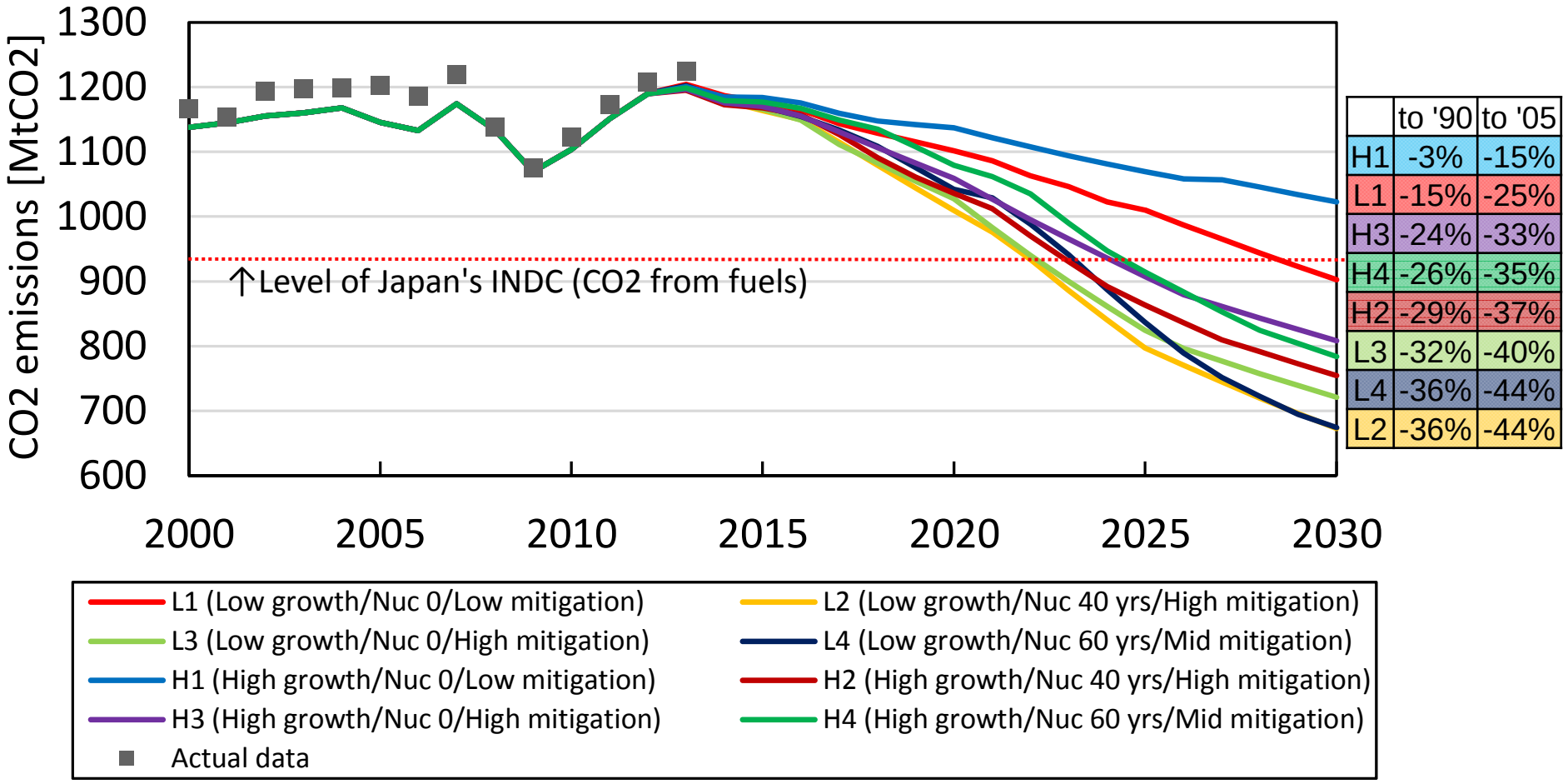
CO2 emissions from energy use



	to '90	to '05
H1	-3%	-15%
L1	-15%	-25%
H3	-24%	-33%
H4	-26%	-35%
H2	-29%	-37%
L3	-32%	-40%
L4	-36%	-44%
L2	-36%	-44%

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

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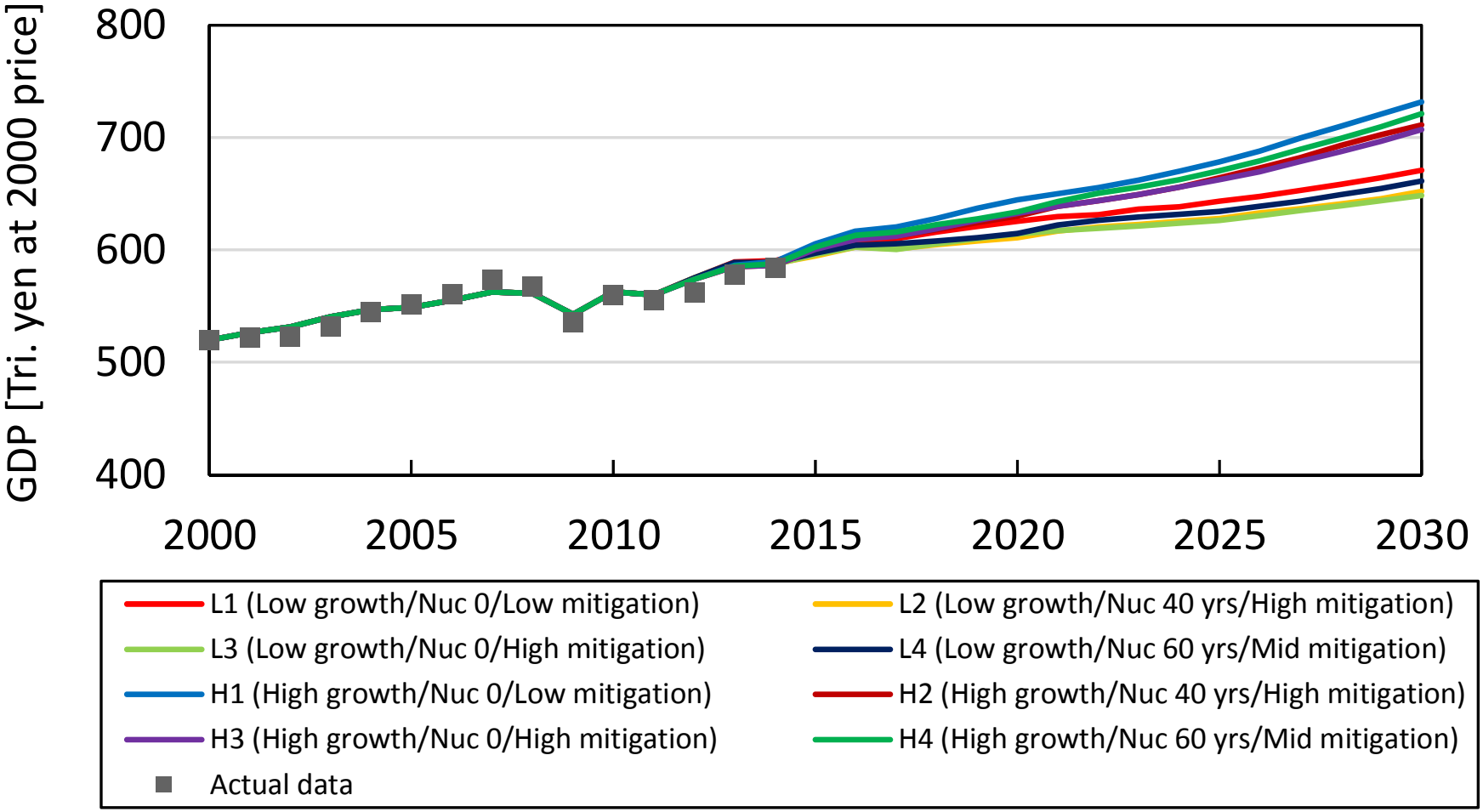
GDP



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

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