

パリ協定気候目標と持続可能開発目標の
同時実現に向けた気候政策の統合分析
Integrated Analyses of Climate Policies for
Simultaneous Realization of the Paris Agreement
and the SDGs

高橋 潔

Kiyoshi TAKAHASHI

国立研究開発法人 国立環境研究所

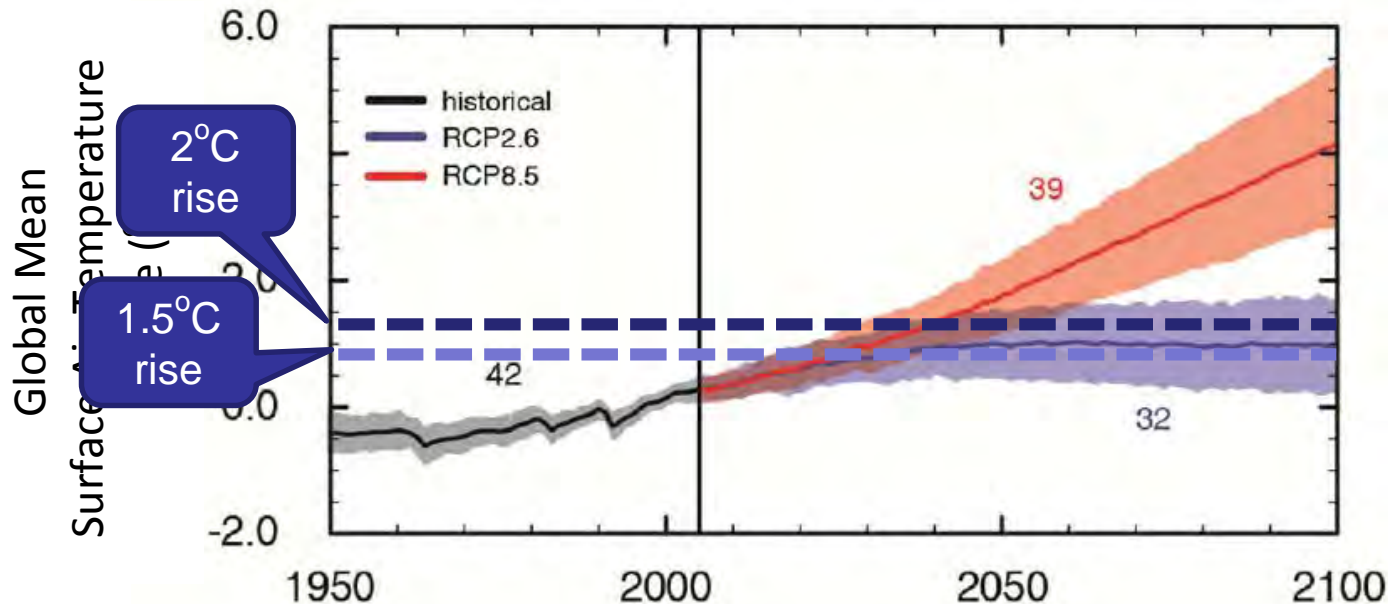
National Institute for Environmental Studies

長期の気候目標

Long-term goal of climate change policy

“... holding the increase in the global average temperature to **well below 2°C** above preindustrial levels and pursuing efforts to limit the temperature increase to **1.5°C** above preindustrial levels”

(Framework Convention on Climate Change COP21 Paris Agreements, 2015)



緩和対策無し
Scenario with no
action
(RCP8.5)

野心的な緩和対策
Scenario that
achieves a
goal of 'below 2°C'
(RCP2.6)

Based on IPCC WG1 AR5

持続可能な開発目標 Sustainable Development Goals



トレードオフ関係? 共便益関係?

Trade-off ? Co-benefit ?

研究プロジェクトの目標

Targets of the project (ERTDF 2-1702)

- 気候目標と持続可能開発目標の統合分析のための地球規模モデル開発と、各目標の同時達成を描く統合シナリオの提示
- 2°C/1.5°C目標に整合的な我が国の緩和政策分析のためのモデル改良と、国内の社会問題との同時解決を描く統合シナリオの提示
- UNFCCCのグローバルストックテイクプロセスや国内のNDC(自主目標)の強化に関する議論への貢献
- Improvement of global (mitigation) models for studying global climate and development targets
- Improvement of national-scale models for studying big cuts of GHGs emissions (incl. negative emissions)
- Development of integrated global scenarios on socio-economic, land-use, GHGs emissions, and sustainability index.
- Proposition of policy/measure roadmaps for the achievement of national mitigation target that is consistent with 2c/1.5c global target.
- Contribution to the global stocktaking process in UNFCCC as well as the discussion about intensification of the NDCs.

研究プロジェクトのフレームワーク

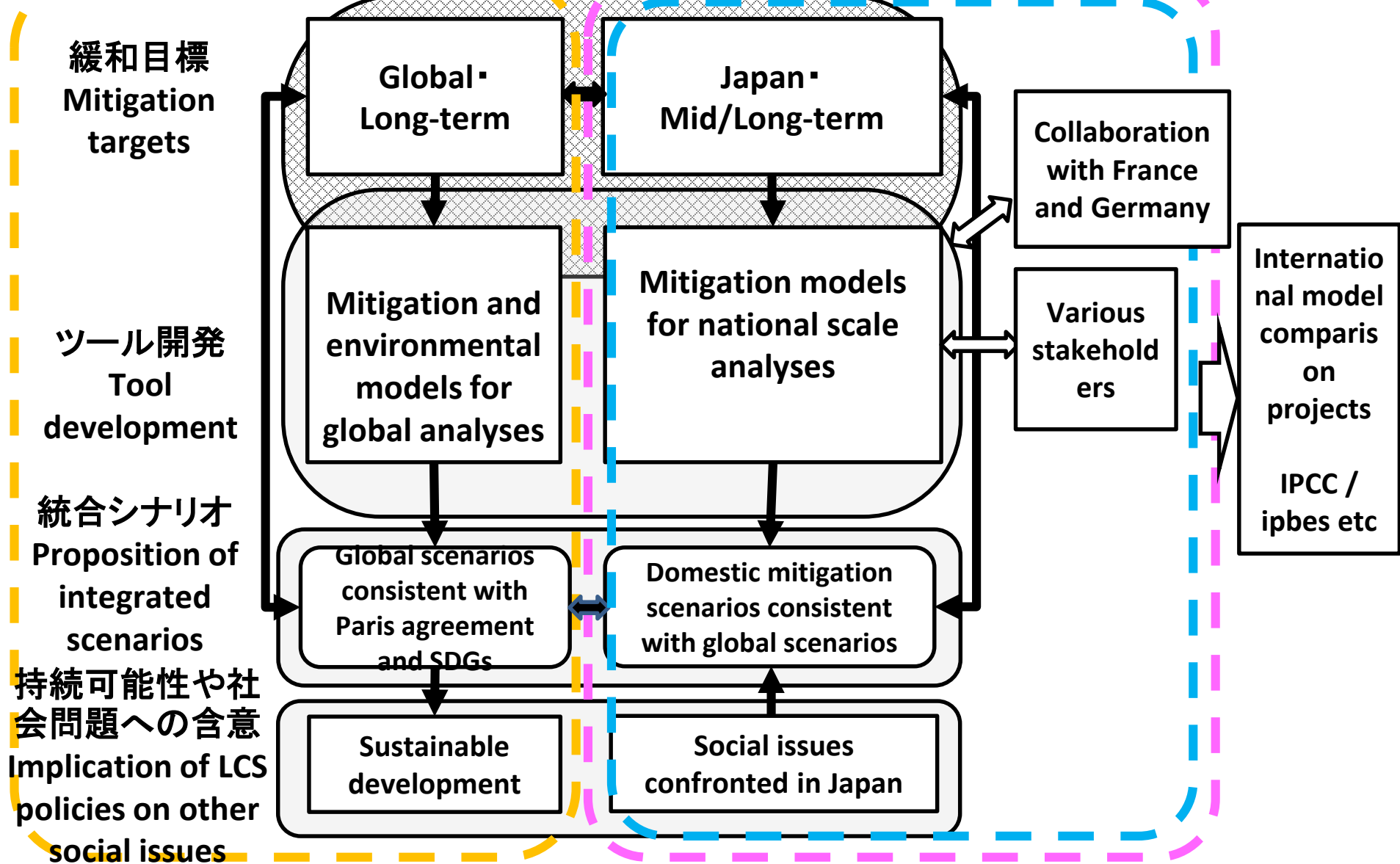
Project Framework of the ERTDF 2-1702

テーマ1: 地球規模の政策分析

テーマ2・3: 日本の緩和政策分析

Theme1: Global climate policy analyses

Theme2・3: Japanese mitigation policy analyses



この研究プロジェクトで新たに取り組むこと

What are we going to do newly in the project?

GHG排出
GHGs emission

炭素価格
C-Price

250\$/tCO₂eq

飢餓リスク人口
Population at risk of hunger (+0.5 bil.)

1.5°C目標の分析
Analyses of 1.5°C target

最新の気候科学の
対策モデルへの反映
Improve of global mitigation model based on the updated climate science

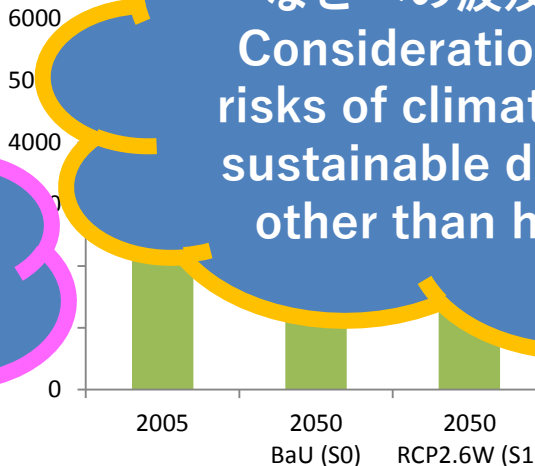
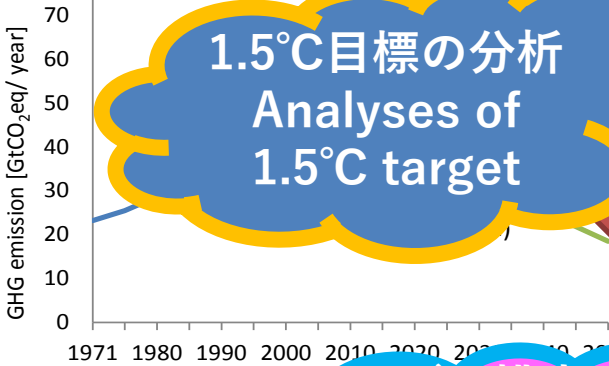
■ マクロ経済影響
Macro economic
■ 土地競合の影響
Land-use conflict
■ 気候影響
Climate impact

日本のゼロ排出
シナリオの構築
Development of "zero emission" scenario for JP

土地利用
Land-use

気候政策の持続可能開発目標
などへの波及効果の分析
Consideration of counter risks of climate policies on sustainable developments other than hunger risks

需要側対策の拡充
Improved consideration of demand side in mitigation analyses



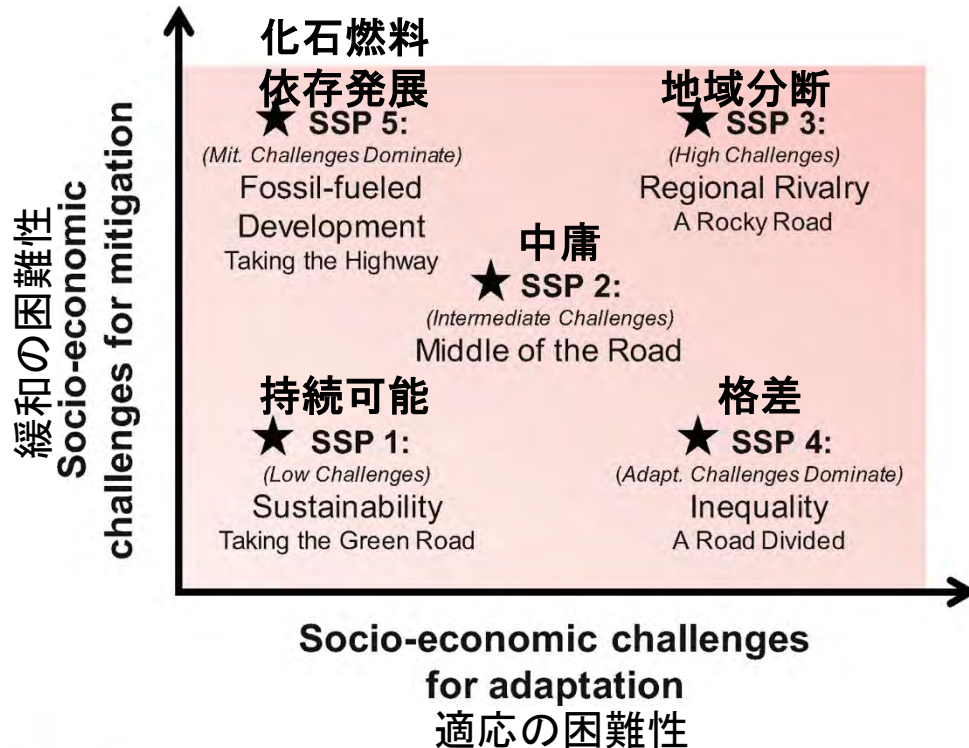
世界的に共通利用される社会経済シナリオ開発への貢献

Contribution to the SSP development process

SSP定量化作業の国際コーディネーションへの参加

Participation to the internationally coordinated SSPs quantification activities

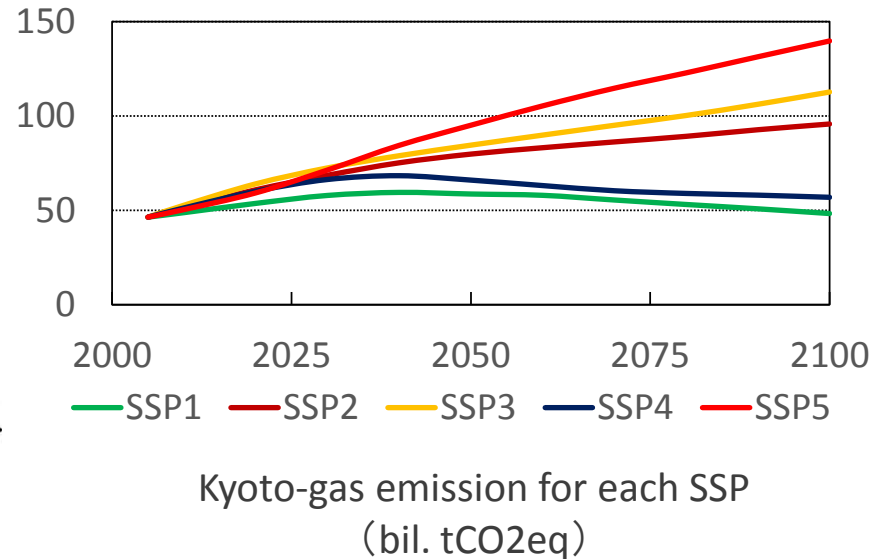
SSPのコンセプト / Concept of the SSP scenarios



SSP(共通社会経済シナリオ)

SSP (Shared Socioeconomic Pathways):

Five alternative futures of societal development characterized by two axis, mitigation challenge and adaptation challenge.



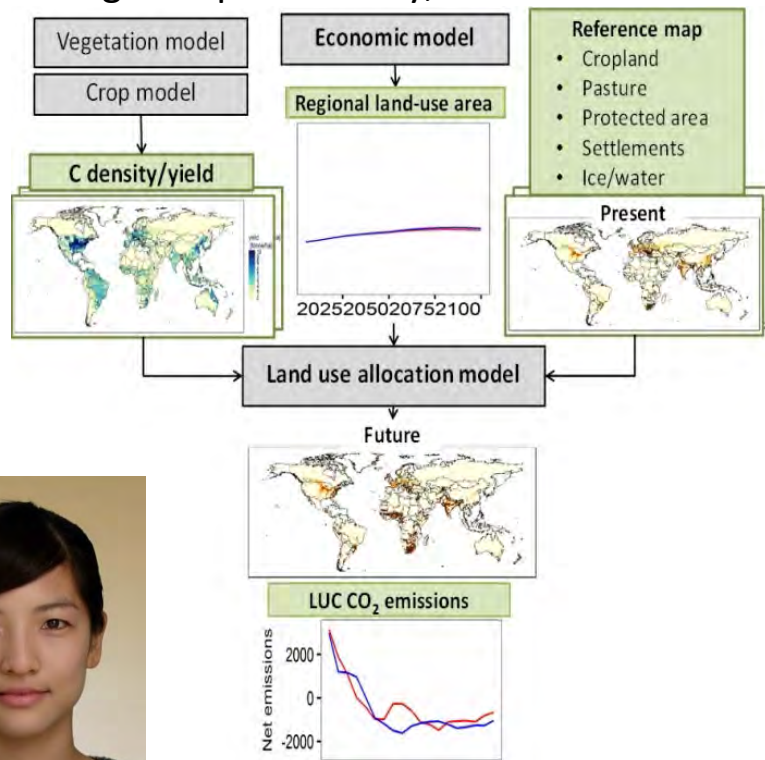
e.g. Riahi et al. (2017) Global Environmental Change, 42, 153-168
 Fujimori et al. (2017) Global Environmental Change, 42, 268-283

AIM/PLUM (土地利用ダウンスケールモデル) の開発

AIM/PLUM (land-use downscaling model)

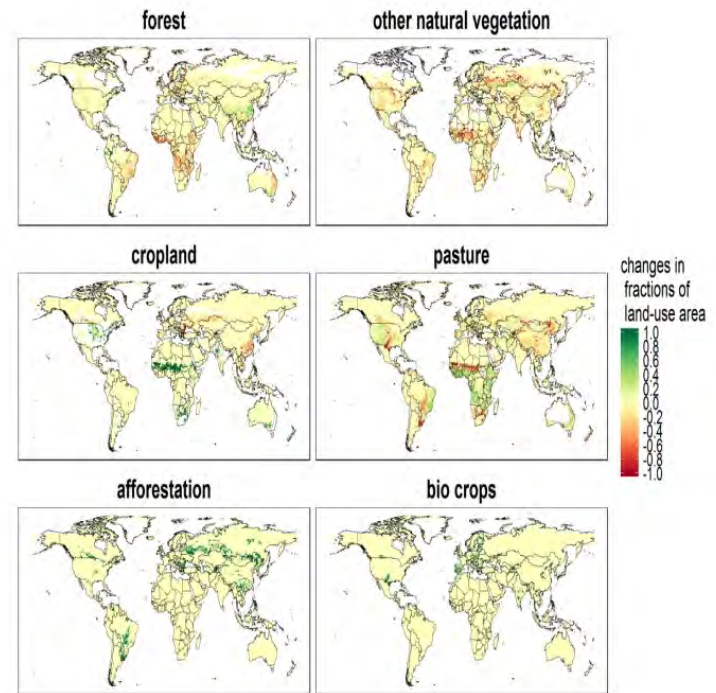
Structure of the AIM/PLUM land-use downscaler

17-region land-use scenario of AIM/CGE is disaggregated to make $0.5^\circ \times 0.5^\circ$ grid scenario considering land productivity, initial land-use etc.



Result: Gridded map of SSPs land-use scenarios

Gridded land-use scenario would be useful for the analyses of various sustainability like food security, water resource, biodiversity.



気候政策と持続可能開発目標の統合的分析に際しては、空間スケールの統合がカギとなる



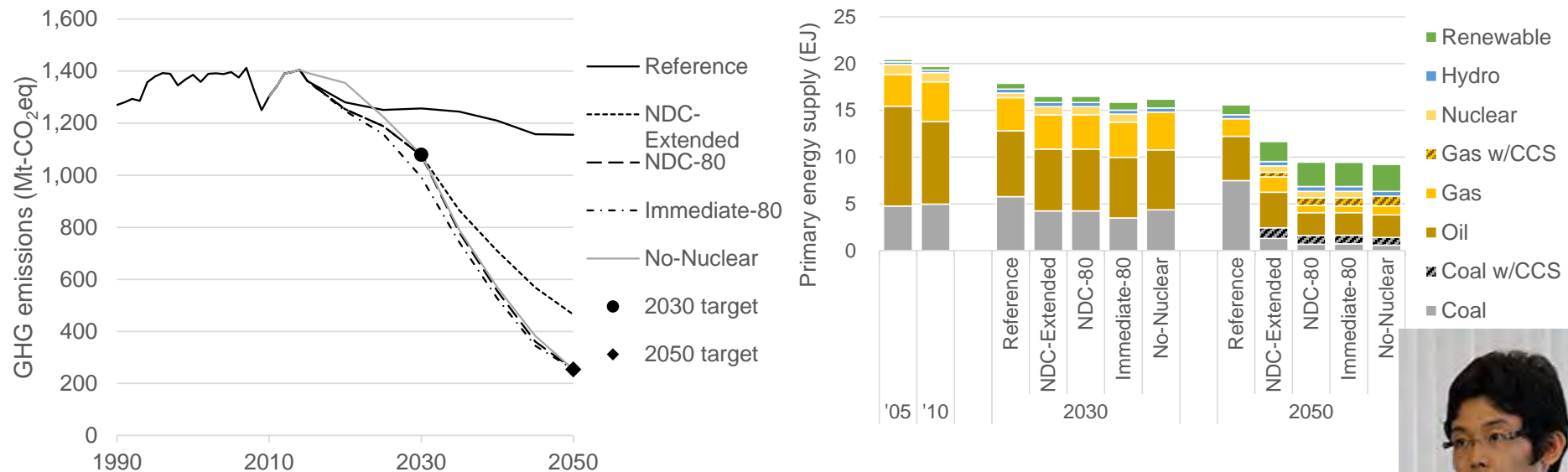
Hasegawa et al. (2017) *Science of the Total Environment*, 580, 787-796

NDC(自国決定貢献) ならびに長期目標の分析

Assessment of NDC and long-term goal in Japan

- In the previous project, we conducted scenario analyses of mitigation policy for 80% reduction goal in 2050 and the NDC in 2030
- In this new project, considering the long-term goal in the Paris Agreement, we will analyze mitigation policy for achieving the **net zero-emission goal**.

GHG emission (left) and primary energy supply (right)
for the 80% reduction scenarios



本研究プロジェクトでは、新たに正味ゼロ排出シナリオの分析に挑戦



アジア諸国の研究者とのモデル開発連携 Capacity building to develop IAM

- Training workshop to develop IAM has been implemented.
 - Photos: Jan. 30-Feb. 1 2017, Thailand
 - Sep. 4-Oct. 13 & Oct. 16-20 2017, NIES, Japan



研究プロジェクトの今後の課題

Future plans

- 全球・アジア／Global and Asia
 - 1.5°C目標の分析／Analyses of mitigation pathways for 1.5 °C goal and its implications on food security for contributing to the IPCC-SR1.5.
 - 気候政策が生態系や大気質にもたらす波及効果の分析／Analyses of implication of climate policies on ecosystem management and air quality problems
- 日本／Japan
 - 正味ゼロ排出分析のためのモデル改良／Improvement of the model for net-zero emission scenario analyses
 - 正味ゼロ排出シナリオの提示とその他社会問題への含意／Provision of net-zero emission scenarios and analyses of their implications on other national societal problems