

Low Carbon Scenarios in Asia

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National Institute for Environmental Studies

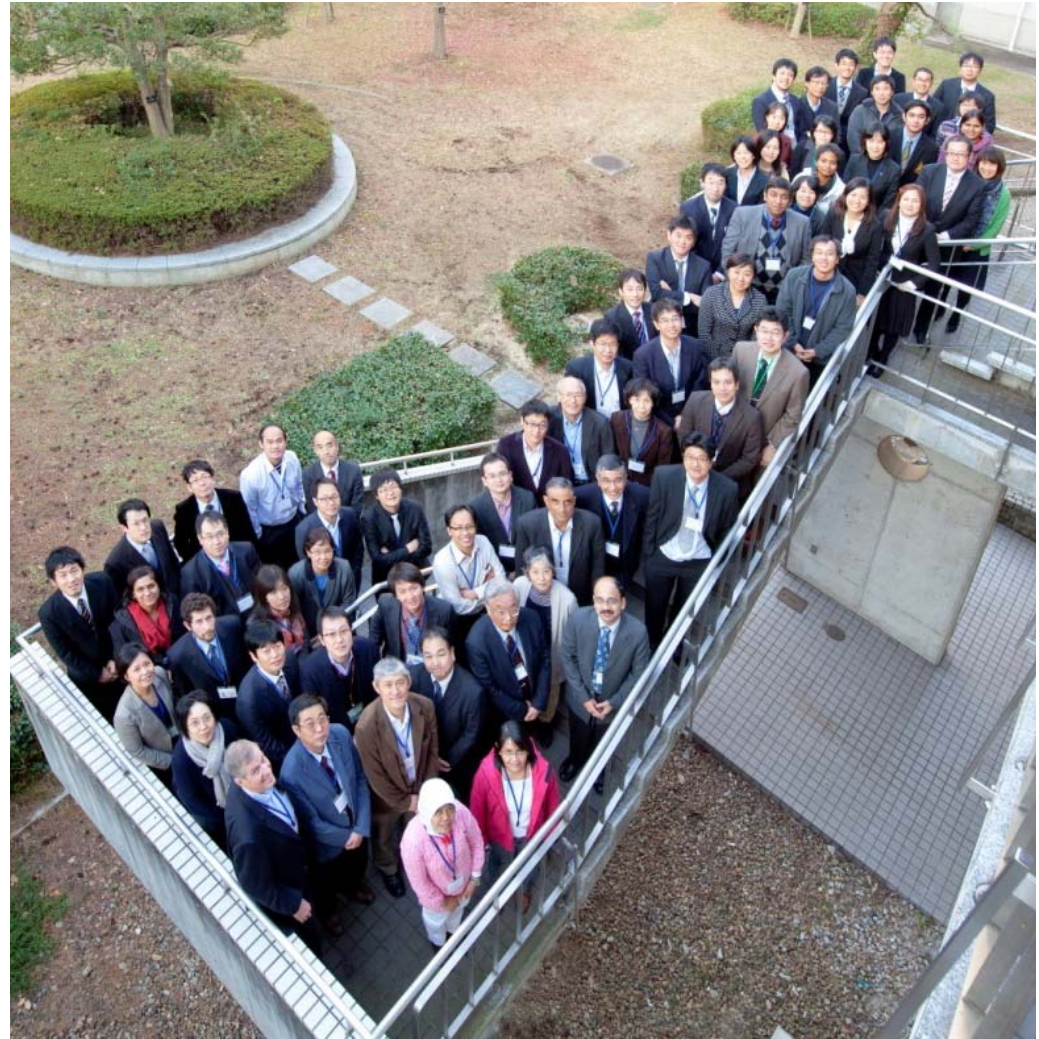
Japan Pavilion Side Event “Pathways toward low carbon societies
in Asia by 2050 and contribution of Japan to their realization:
Quantitative & Qualitative Assessment of LCS using Asia-Pacific
Integrated Model (AIM)”

Wednesday 13 November 2013, 15:00-16:30

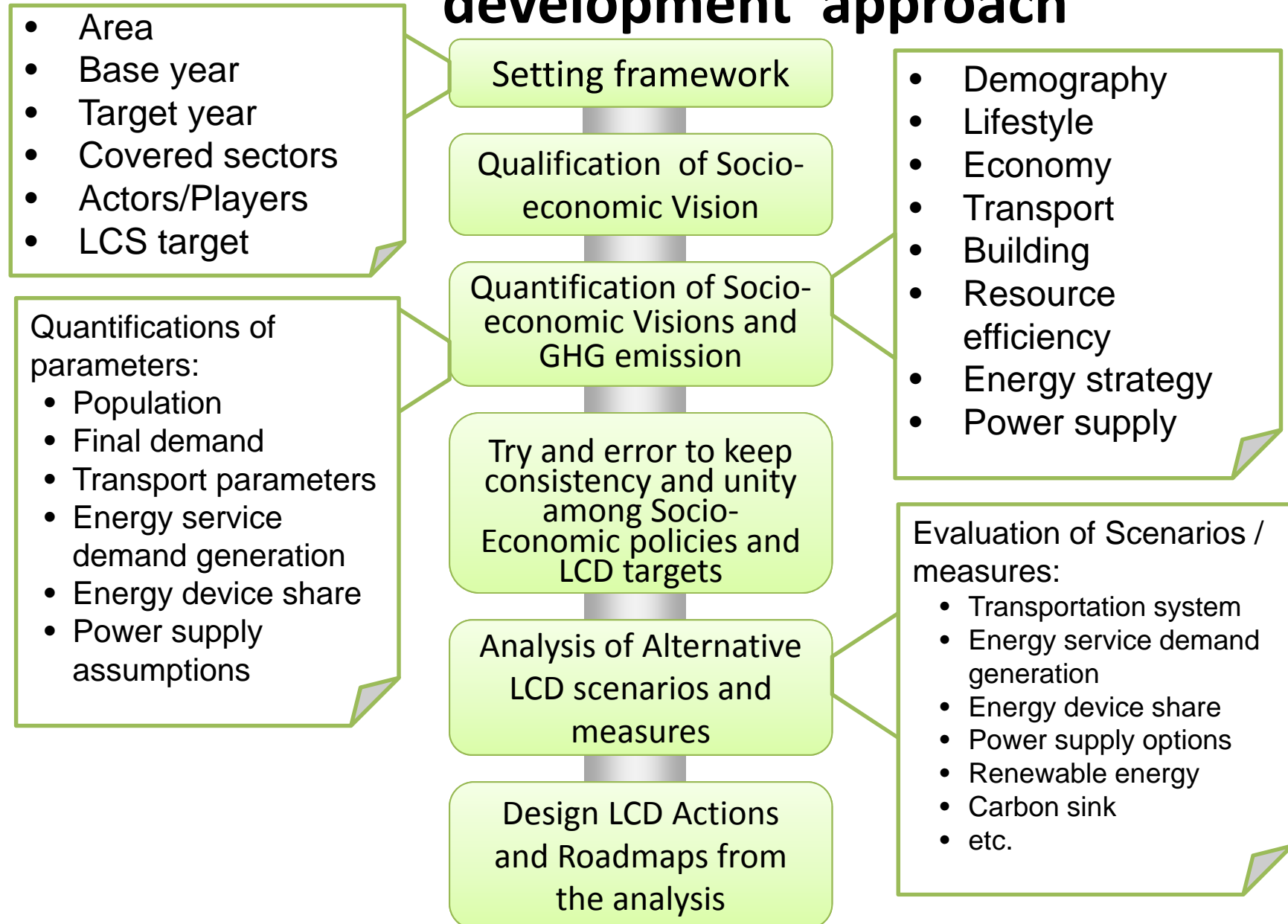
Warsaw

AIM (Asia-Pacific Integrated Model) since 1990

- AIM (Asia-Pacific Integrated Model) is an integrated assessment model to assess mitigation options to reduce GHG emissions and impact/adaptation to avoid severe climate change damages.



Overall research procedure of our LC development approach



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

Indonesia Bogor Agri. Univ.
Bandung Institute of Tech.

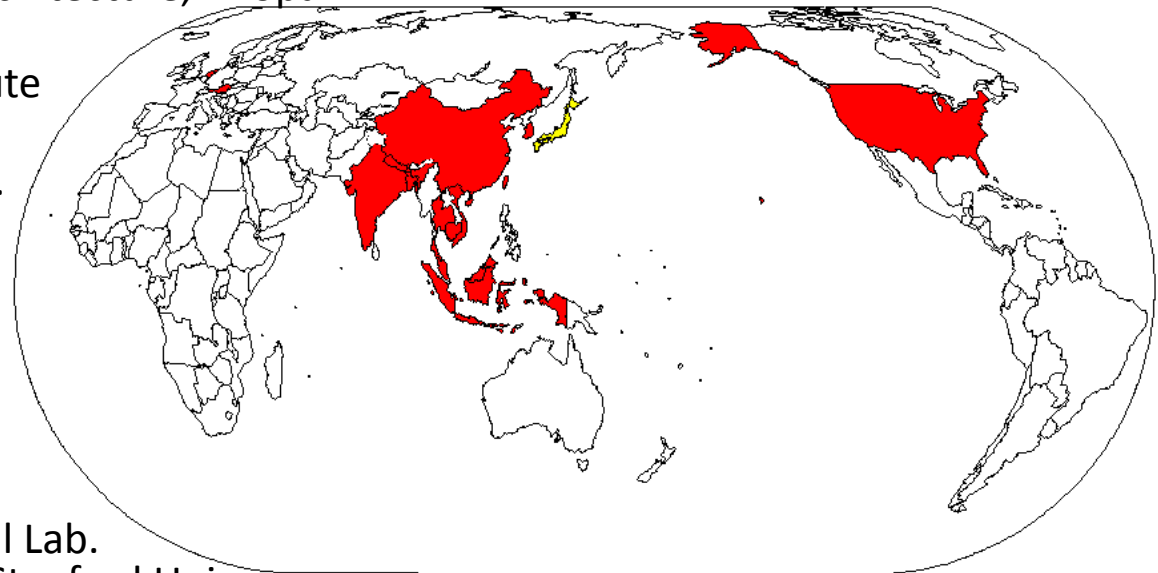
Thailand Asian Institute of Tech.
Thammasat Univ.
King Mongkut's Univ.

Malaysia Univ. of Malaysia

Austria IIASA

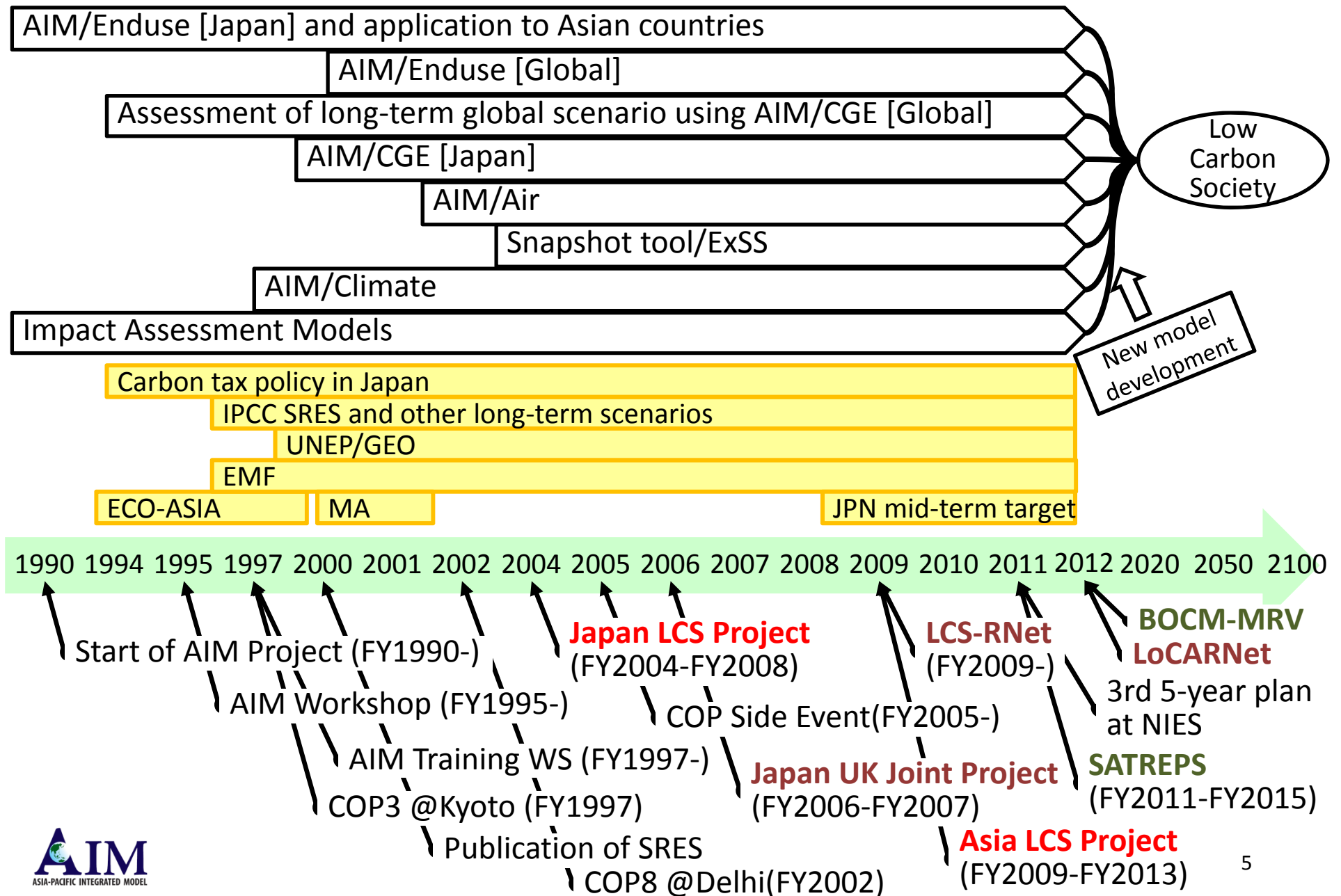
Netherlands PBL

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

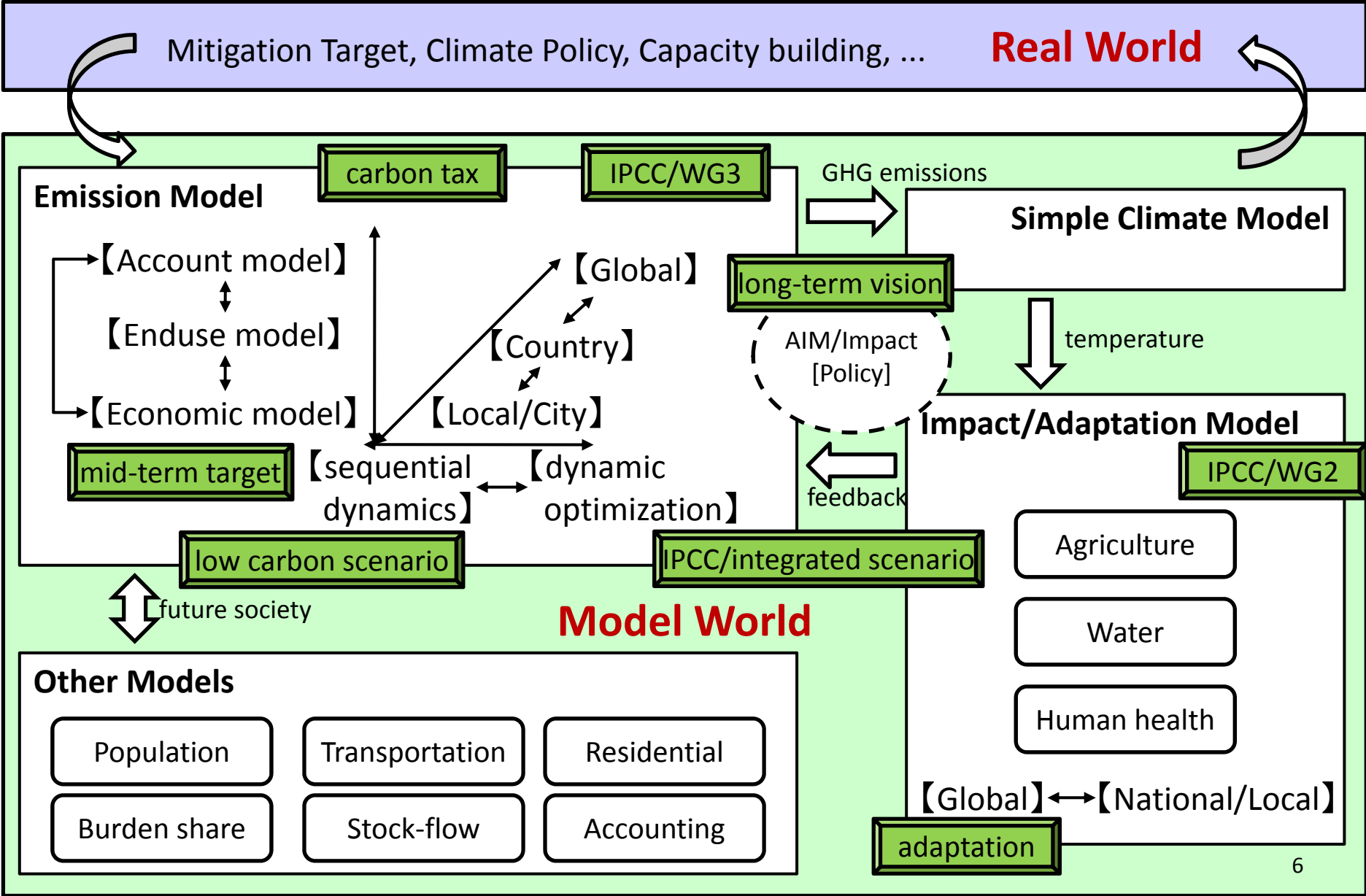


In addition, collaborating with Vietnam, Cambodia, Bangladesh, Nepal, Taiwan, ...

Brief History of AIM and its application



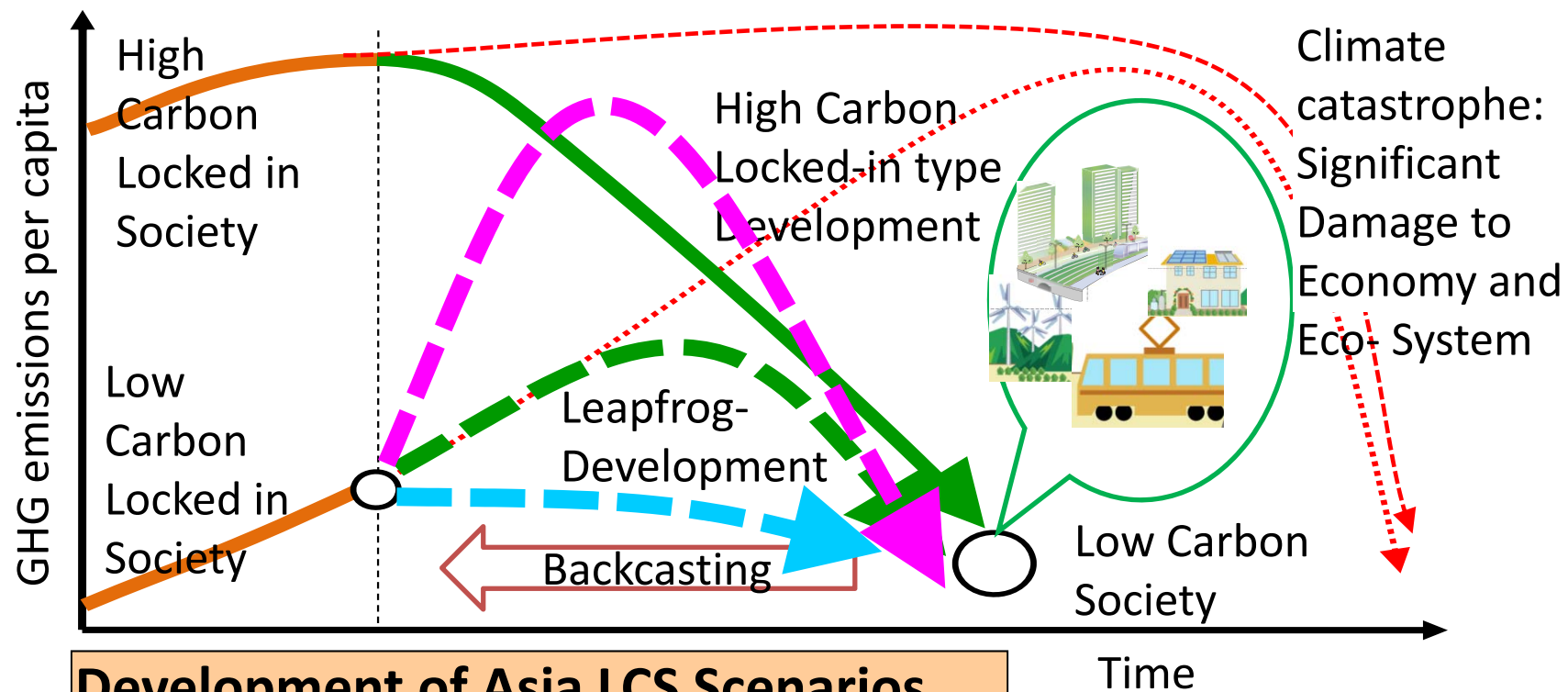
Contents of Present AIM



AIM Models for CC policy assessment in Indonesia

- ExSS (Extended Snap-shot) model
- Enduse model
- CGE (Computable General Equilibrium) model
- AFOLU (Agriculture Forestry and other Land use) model

How to reach to Low Carbon Society in Asia ?



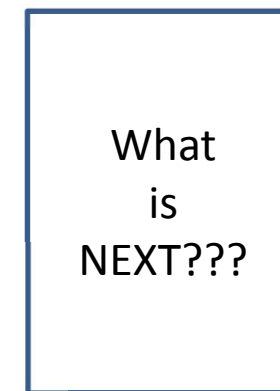
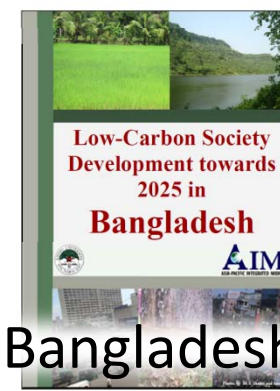
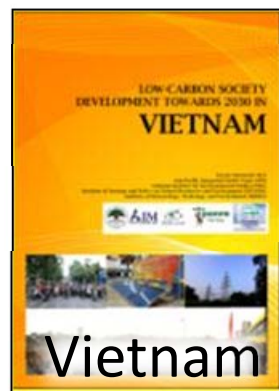
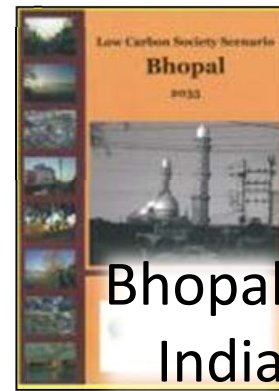
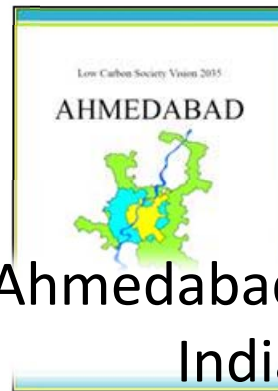
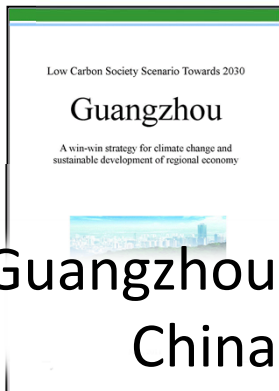
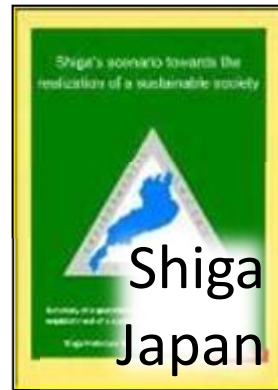
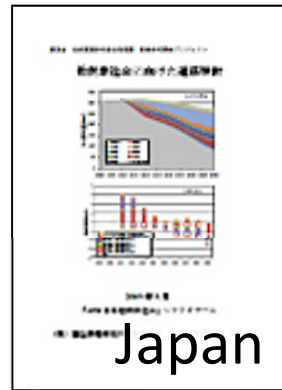
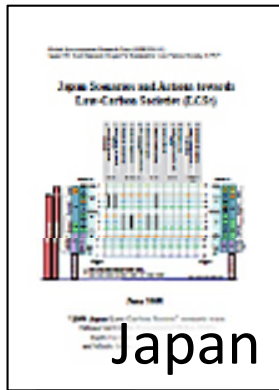
Development of Asia LCS Scenarios

- (1) Depicting narrative scenarios for LCS
- (2) Quantifying future LCS visions
- (3) Developing robust roadmaps by backcasting

Policy Packages for Asia LCS

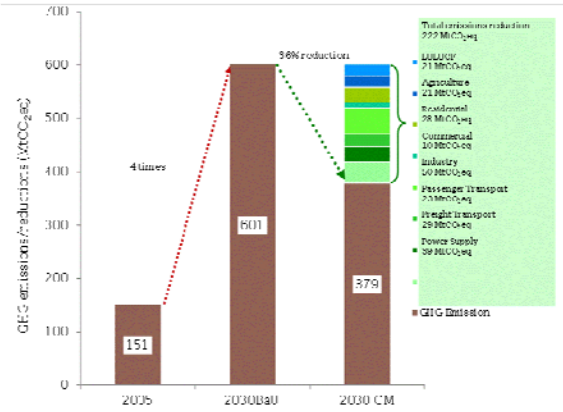
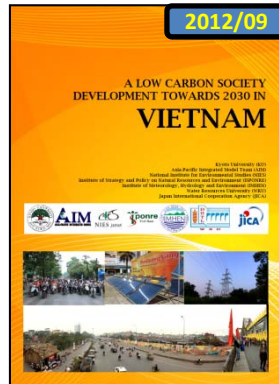
Funded by Ministry of Environment, Japan (GERF, S-6) and NIES

Low-Carbon Society Scenarios in Asia using AIM



<http://2050.nies.go.jp>

Low Carbon Society Development towards 2030 in Vietnam VNM2030

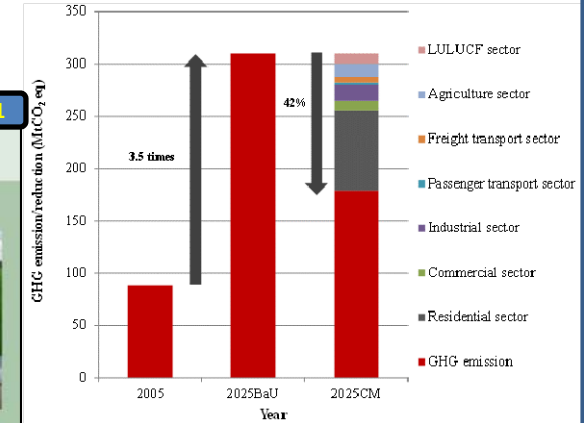
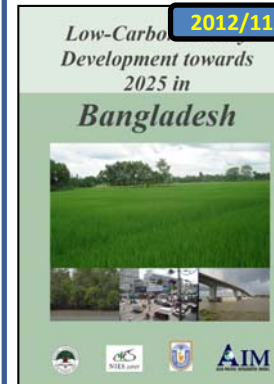


GHG emissions and their reduction by sector

Actions in Low Carbon Society Development in Vietnam, 2030

Actions towards LCS in Vietnam in 2030	GHG mitigations (MtCO ₂ e)
AFOLU sectors	42
Action A1 Livestock Manure Management	3
Action A2 Livestock Enteric Fermentation	3
Action A3 Rice Cultivation Management	12
Action A4 Soil Management	3
Action F Forest and Land Use Management	21
Energy sectors	180
Action E1 Green Building	14
Action E2 Convenient Transport	15
Action E3 Energy Saving Behavior	17
Action E4 Energy Efficiency Improvement	79
Action E5 Fuel Shift in Industry	16
Action E6 Smart Power Plants	39
Total	222

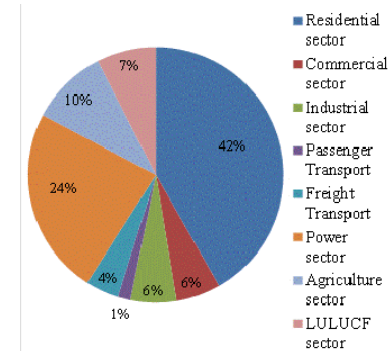
Low Carbon Society Development towards 2025 in Bangladesh BGD2025



GHG emissions and their reduction by sector

Actions in Low Carbon Society Development towards 2025 in Bangladesh

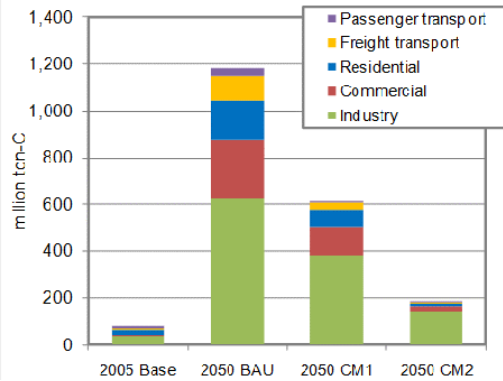
Actions	GHG emission reduction (MtCO ₂ e)	(%)
1. Energy efficiency improvement in residential and commercial sector	59	45%
2. Energy efficiency improvement in industrial sector	5	4%
3. Fuel switch in residential, commercial and industrial sector	6	4%
4. Promotion of energy efficient vehicles (passenger+freight transport)	7	5%
5. Modal shift in passenger transport sector	1	0.4%
6. Fuel switch and reduction of transmission loss in power sector	31	24%
7. Rice field management (Midseason drainage+Off-season incorporation of rice straw+Replace urea with ammonium sulphate) in agriculture sector	5	4%
8. Manure management (Dome digester for cooking fuel and light) in agriculture sector	4	3%
9. Enteric fermentation (Replacement of roughage with concentrated feed)	3	2%
10. Managed soil (High efficiency fertilizer application+Tillage and residue management) in agriculture sector	1	1%
11. Long rotational artificial reforestation + Short rotational participatory woodlot plantation) in LULUCF sector	10	7%
Total GHG emission reduction (MtCO₂e)	131	100%



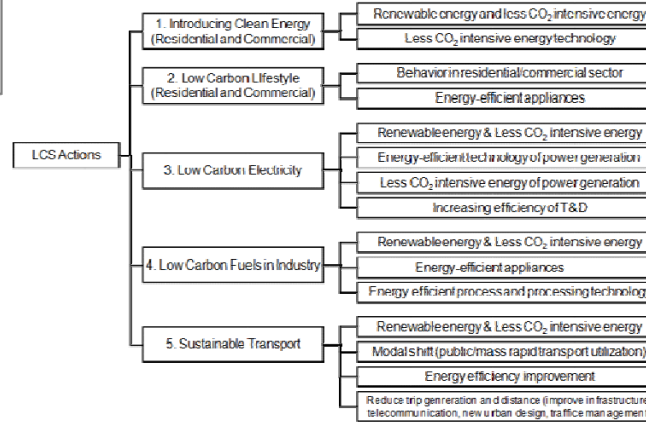
Contribution to emission reduction by sector

Design of Indonesia's 5 actions and Thailand's 9 actions towards LC society, focused on Energy sector

Low Carbon Society Scenario toward 2050, Indonesia, Energy sector IDN2050

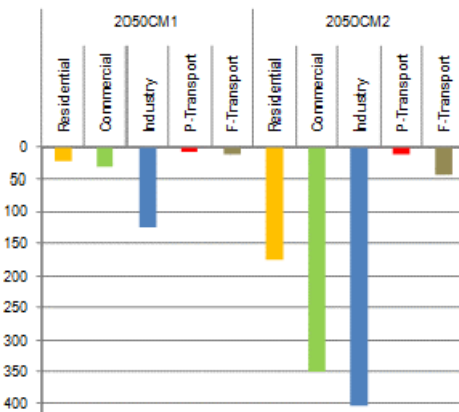


GHG emissions and their reduction by sector

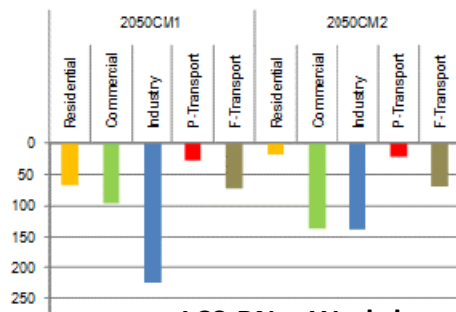


Actions in Low Carbon Society Scenario toward 2050, Indonesia, Energy sector

Emission reduction in supply side

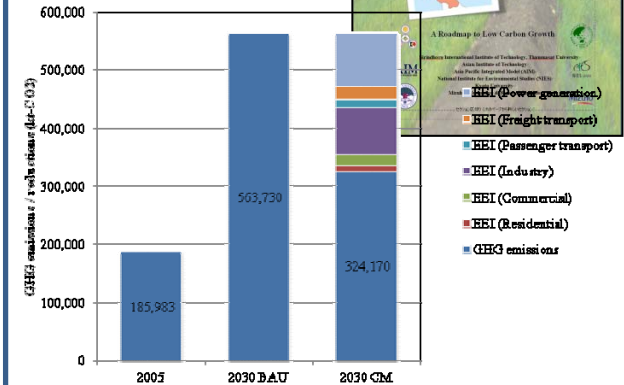
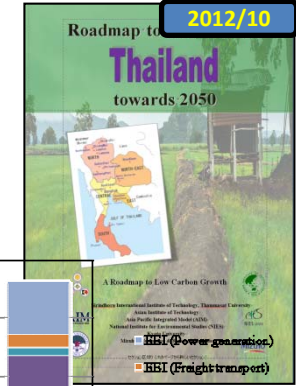


Emission reduction in demand side



LCS-RNet Workshop, 2013

Low Carbon Thailand towards 2050 THA2030



GHG emissions and their reduction by sector

Actions in Low Carbon Thailand towards 2050

Action	GHG Reduction (kt-CO ₂)	(%)
1. Energy efficiency improvement (EE) in households	10,950	4.6%
- EE in electric devices	9,330	3.9%
- EE in non-electric devices	1,620	0.7%
2. Energy efficiency improvement in buildings	16,384	6.8%
3. Building codes	2,350	1.0%
4. Energy efficiency improvement in industries	38,648	16.1%
- EE in electric devices	12,380	5.1%
- EE in non-electric devices	26,268	11.0%
5. Fuel switching in industry	41,336	17.3%
6. Fuel economy improvement in transportation	10,739	4.5%
- Passenger transport	4,151	1.7%
- Freight transport	6,588	2.8%
7. Fuel switching in transportation	9,983	4.2%
- Passenger transport	2,921	1.2%
- Freight transport	7,062	3.0%
8. Modal shift in transportation	17,556	7.3%
- Passenger transport	8,087	3.3%
- Freight transport	9,469	4.0%
9. Efficiency improvement and fuel switching in the power sector	91,614	38.2%
Total GHG mitigation in 2030	239,560	100.0%
Total GHG emissions in the 2030 BAU scenario	563,730 kt-CO₂	
Total GHG emissions in the 2030 CM scenario	324,170 kt-CO₂	

AIM (Asia-Pacific Integrated Model): Provides Capacity Building for researchers and Policy Makers

- Support researchers, national and local government policy makers to **develop their country- and locally-tailored LCS scenarios and roadmaps** through AIM training workshop since 1994 and policy dialogue



2013 AIM Training Workshop for young researchers in Asia



Vietnam LCS WS,
April, 2013



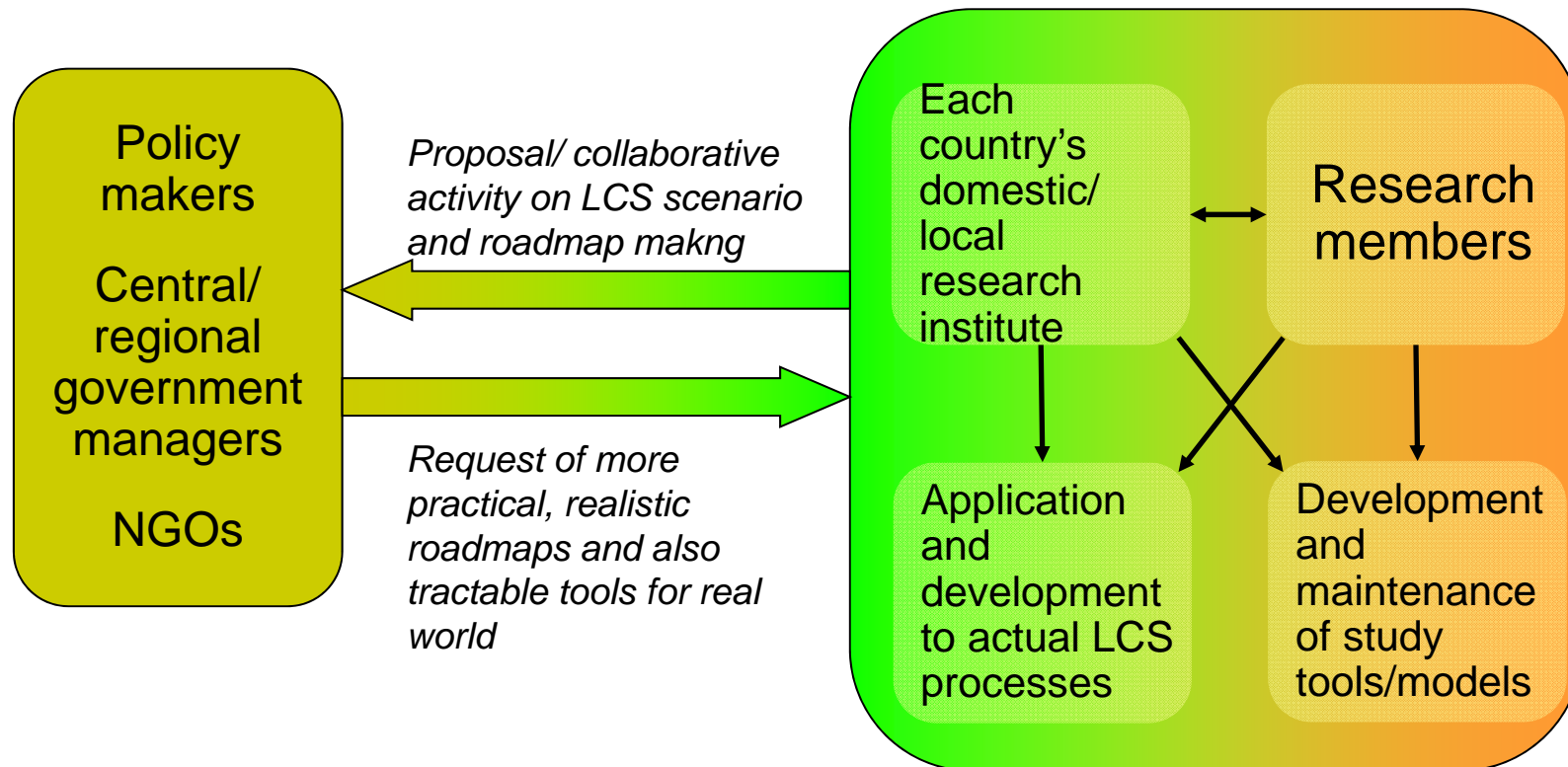
Cambodia LCS WS,
April, 2013



JICA Training Course for
6 countries in Asia & Pacific
Island Countries

Our AIM approach

“How to deploy LCS study to real world?”



Low-Carbon Society Vision 2030 Thailand



November, 2010



Srinakharinwirot International Institute of Technology, Thammasat University
Asian Institute of Technology
National Institute for Environmental Studies
Kyoto University
Mizuho Information & Research Institute
Asia-Pacific Integrated Model

1st LCS Scenario by AIM/ExSS

Roadmap to Low Carbon Thailand towards 2050



A Roadmap to Low Carbon Growth

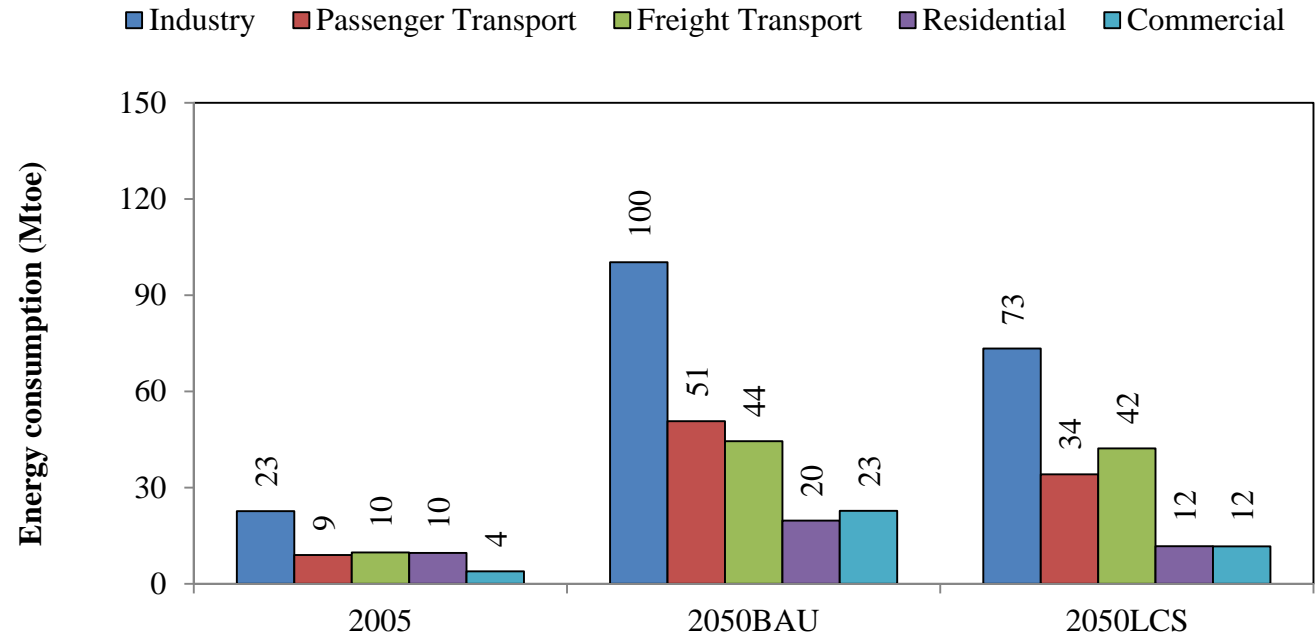


Srinakharinwirot International Institute of Technology, Thammasat University
Asian Institute of Technology
Asia Pacific Integrated Model (AIM)
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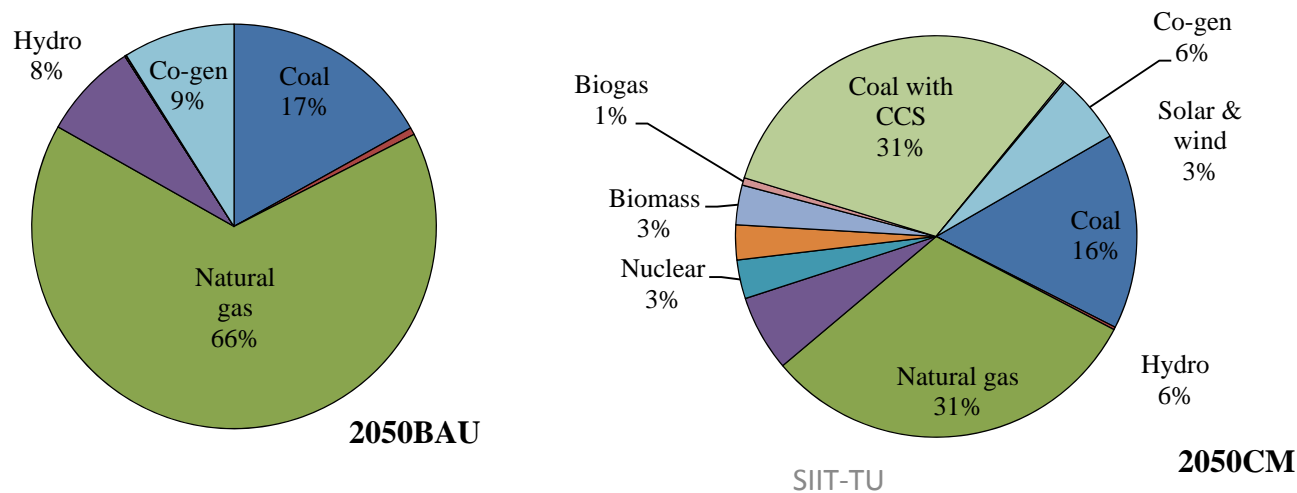
February, 2013

2nd LCS Roadmap by AIM/Enduse

Roadmap to Low Carbon Thailand

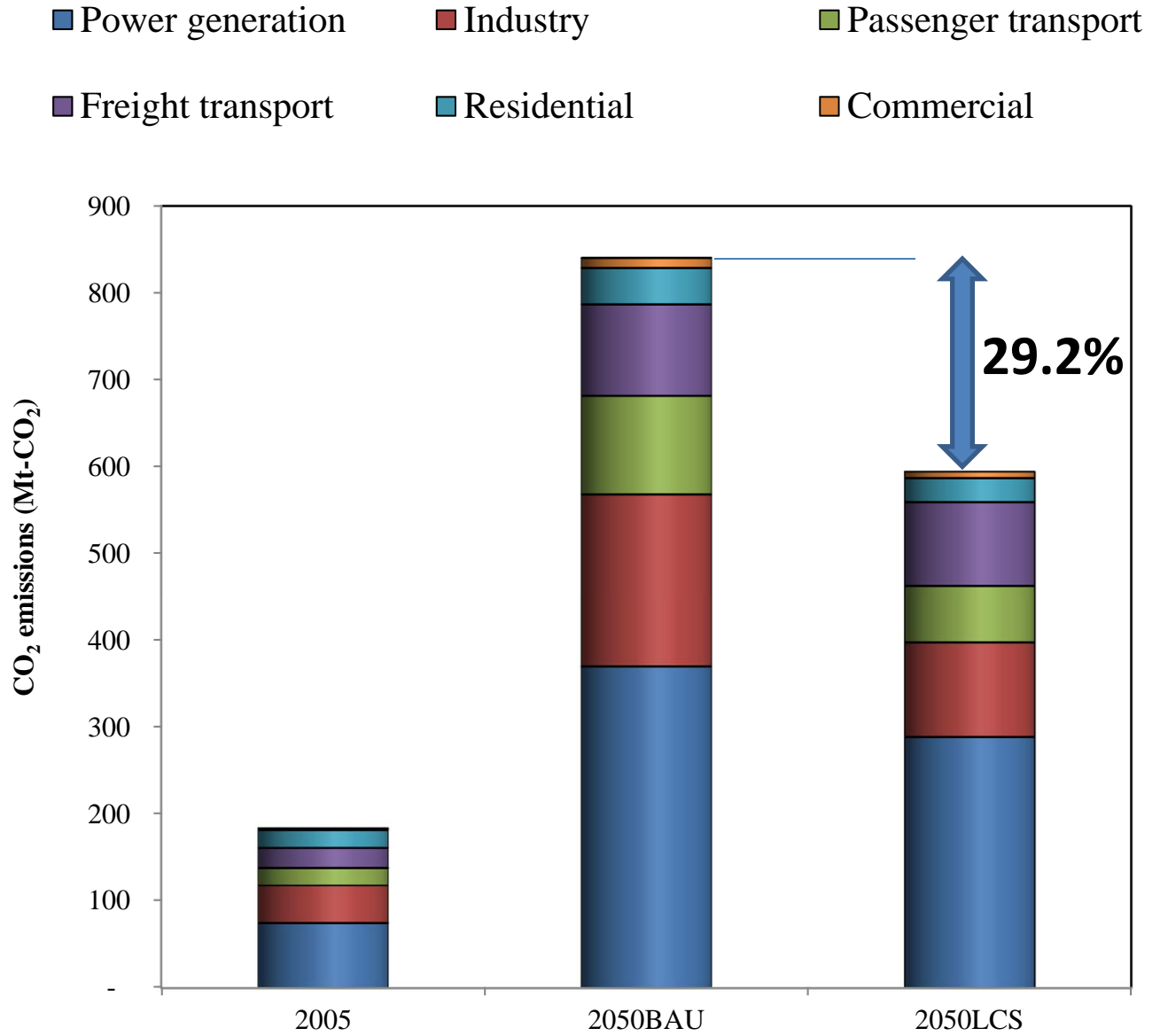


**Final
Energy
Demand**



**Primary
Energy
Demand
by fuel
type in
2050**

GHG Emissions in 2050 (LCS)



What are LCS Actions in Thailand?

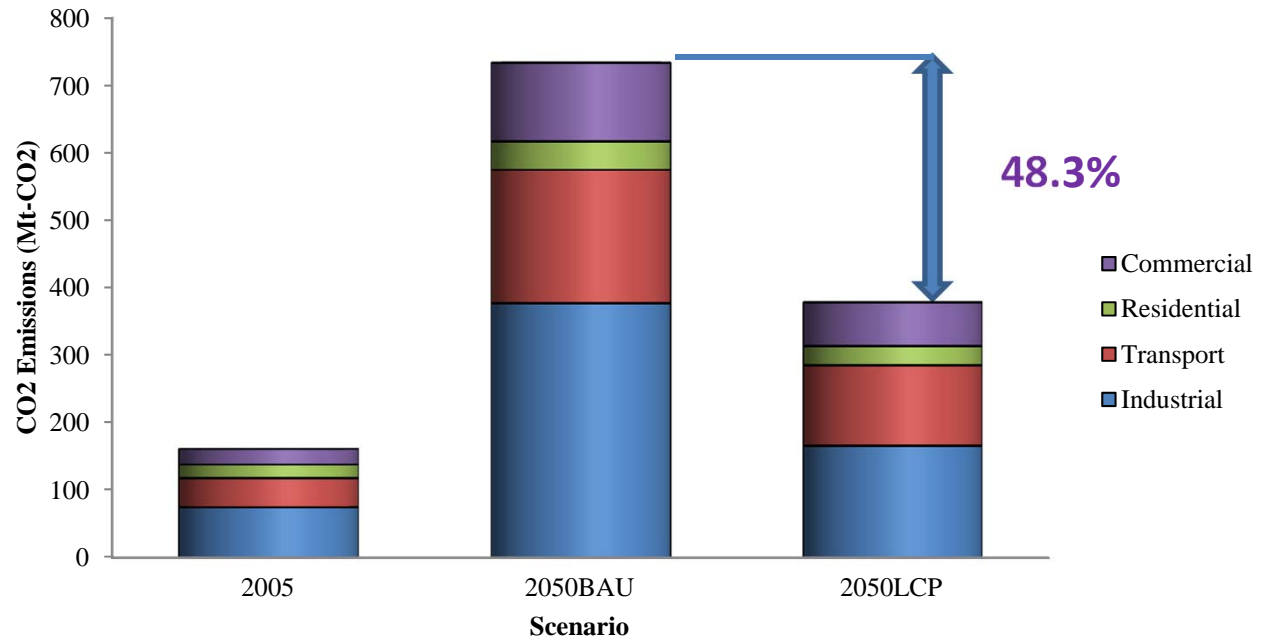
- **LCS Actions include both supply-side and demand-side actions such as increasing the use of carbon capture storage (CCS) in power generation and industries, more utilization of bio-fuels, renewable energy (RE), promoting modal shift in transportation, and increasing energy efficiency (EE) in buildings and industries.**

Thailand LCS scenario for 2°C Target

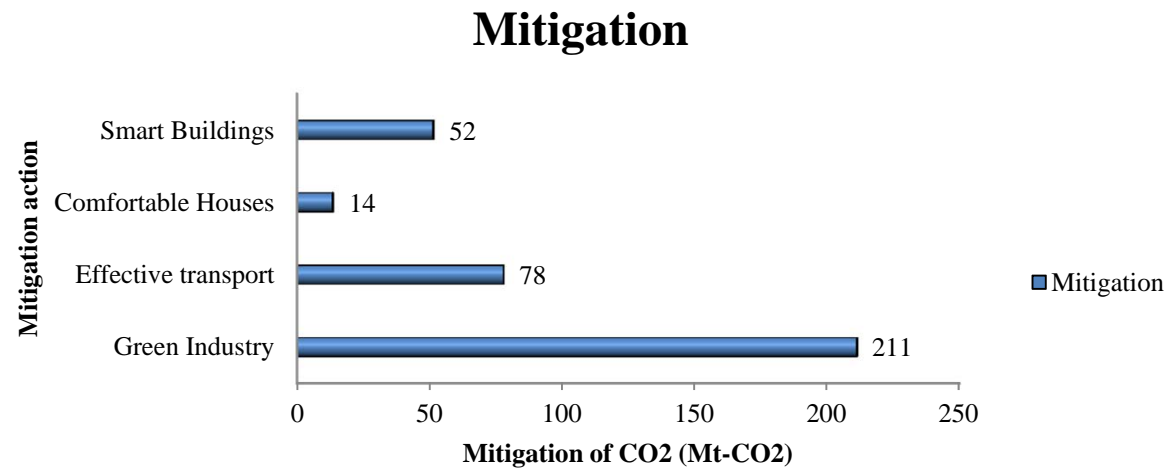
What are LCS Actions in the Peak Scenario ?

- **LCS Actions include both supply-side and demand-side actions such as increasing the use of carbon capture storage (CCS) in power generation and industries, more utilization of bio-fuels, renewable energy (RE), promoting modal shift in transportation, and increasing energy efficiency (EE) in buildings and industries.**

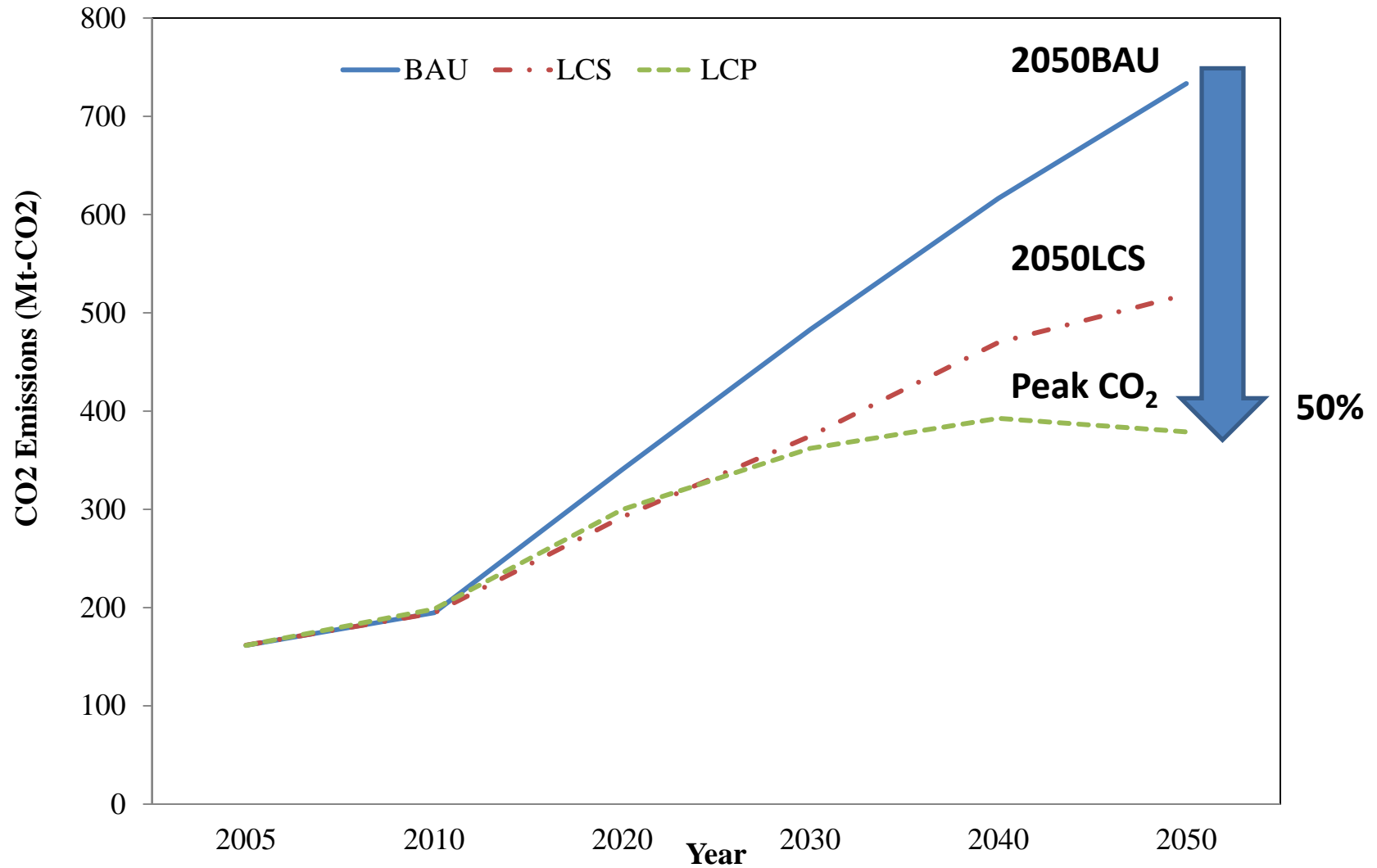
GHG Emissions in 2050 (Peak CO₂)



GHG Mitigation by 2050 (Peak CO₂)

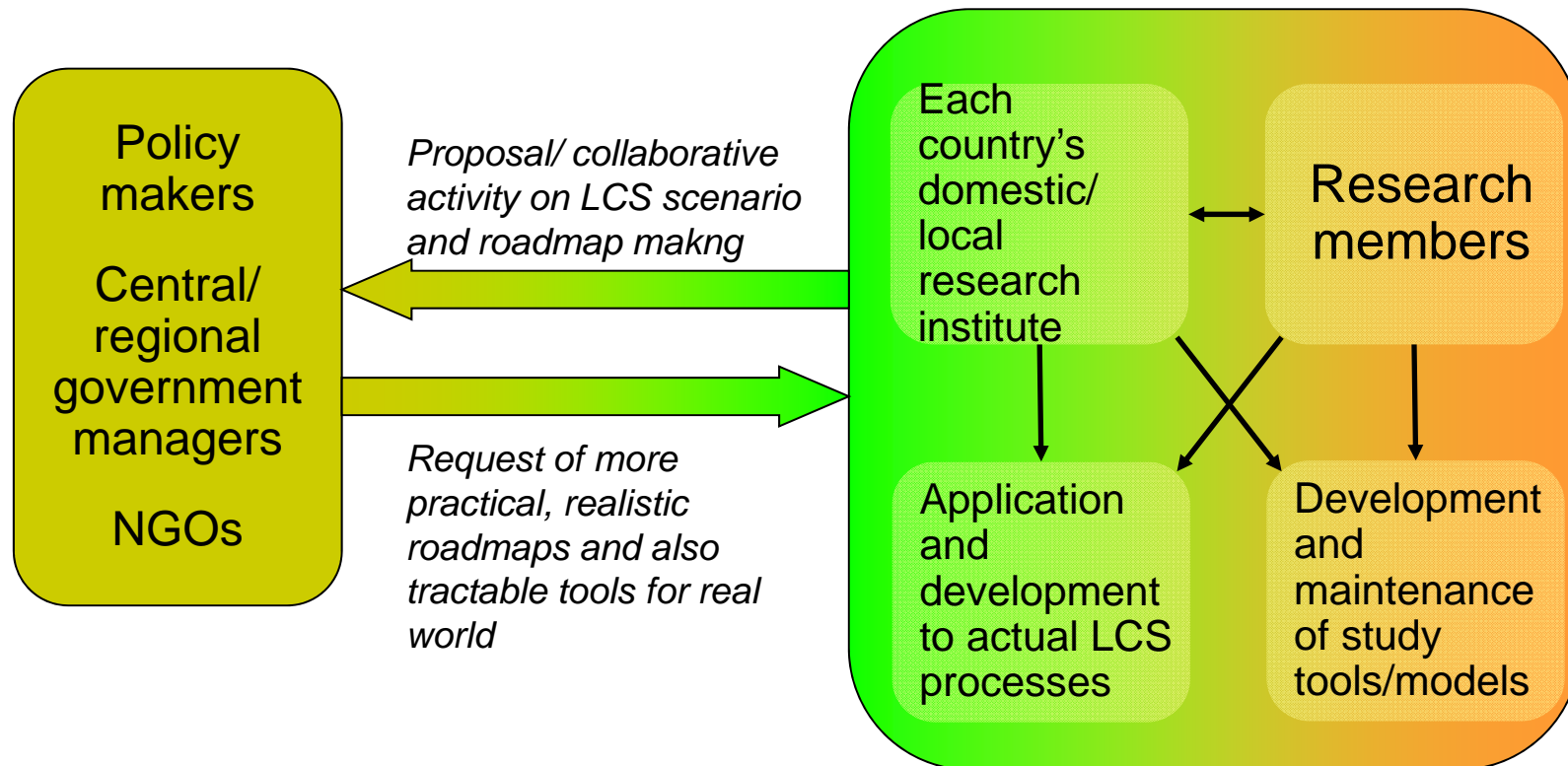


Total GHG Emissions 2005-2050 (Peak CO₂)



Our AIM approach

“How to deploy LCS study to real world?”



Drivers/paths for LCS in Cambodia

12 Strategies	4 Policies
Sustainable forest management	Green environment
Sustainable waste management	
Green agriculture	Harmonization of green economy, society and culture
Green transport	
Green energy	
Green tourism	
Green human resource development	
Green financial mobilization	
Green technology and investment	
Green Merchant Marine and sustainable coastal zone development and management	Blue economy
Low carbon infrastructure	Eco-village
Green building	

AIM is...

- model simulation to provide LCS (Low Carbon Society) scenarios to support low carbon policy making
- human resource development platform and network of simulation modelers in Asia and the world



Sustainable
Low-Carbon Asia
comes from
design,
imagination
and
co-working...

Let's work together!

Asia LCS



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