



16th AIM International Workshop



Asia LCS scenarios and actions:

How to achieve sustainable low-carbon society

National Institute for Environmental Studies (NIES)

Tsukuba, Japan, February 19-21, 2011



Low-Carbon Society Vision 2030

Thailand



November, 2010



Sirindhorn 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

Asia Low-Carbon Society: LCS scenario in Thailand

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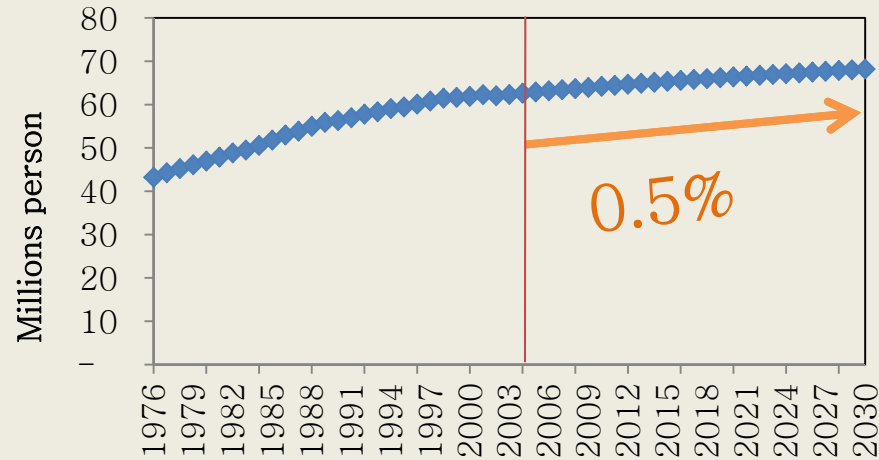
THAILAND “LCS” STUDY OBJECTIVES

- ❑ To propose measures for avoiding climate change, and precursors to zero carbon society and renewable-energy economy.
- ❑ To discuss the possibility of developing a low-carbon society in Thailand.
- ❑ To create awareness among Thailand’s authorities, government, stakeholders, and communities for low-carbon Thailand.

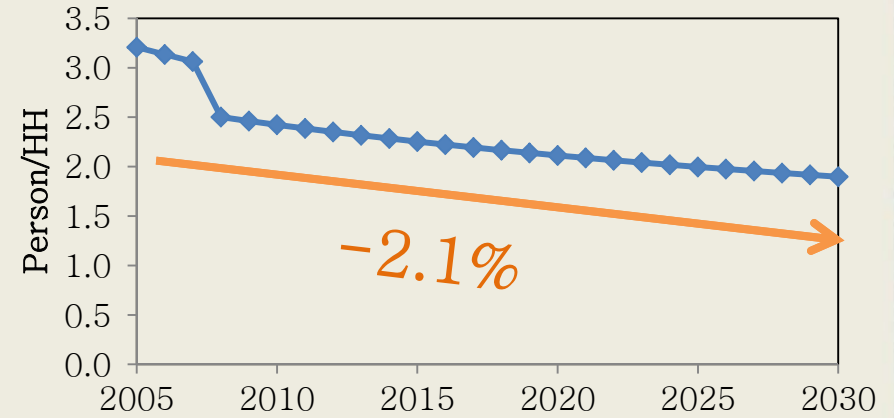


QUANTITATIVE ASSUMPTIONS

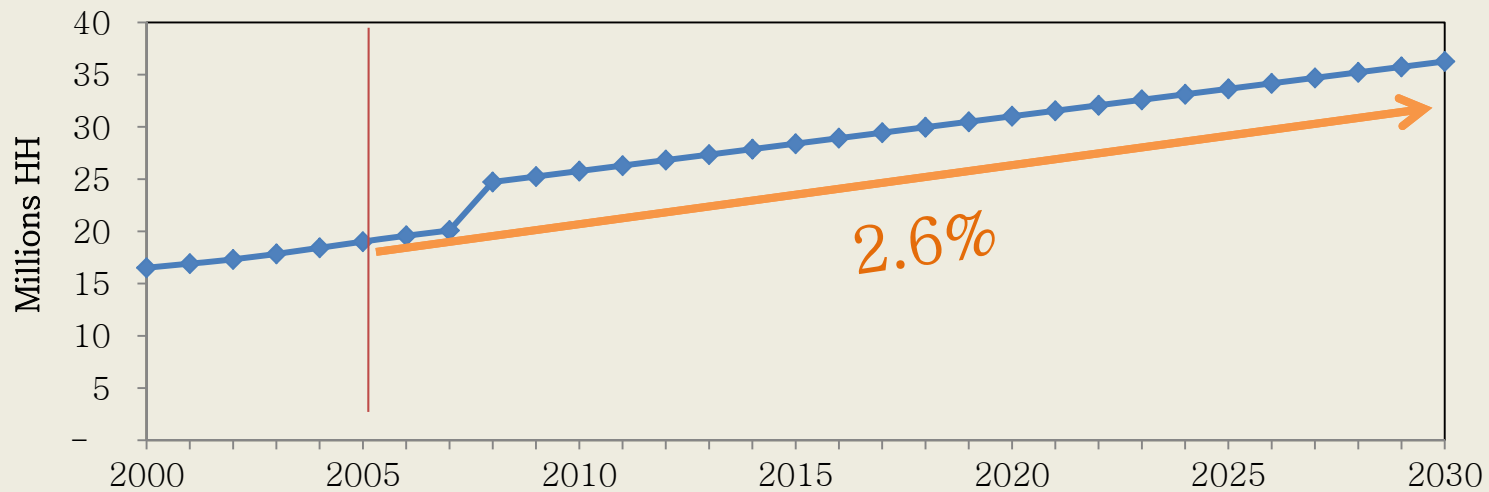
Population



HH size



No. of HH



ESTIMATED SOCIO-ECONOMIC INDICATORS

| | 2005 | | 2030 |
|--|------------|-------------|------------|
| Population | 60,991,000 | 0.49% → | 68,815,004 |
| No. of HH | 19,016,784 | 2.6 % → | 36,265,390 |
| GDP (mil Baht) | 8,016,595 | 5.5- 5.0% → | 30,802,306 |
| Gross output (mil Baht) | 18,755,884 | | 68,456,651 |
| <i>Primary industry (mil Baht)</i> | 1,116,621 | 3.9% → | 2,801,864 |
| <i>Secondary industry (mil Baht)</i> | 11,453,496 | 5.1% → | 38,008,931 |
| <i>Tertiary industry (mil Baht)</i> | 6,185,767 | 6.4% → | 27,645,856 |
| Floor space for commercial (mil m ²) | 88 | | 394 |
| Passenger transport demand (mil p-km) | 191,520 | | 216,088 |
| Freight transport demand (mil t-km) | 188,524 | | 589,859 |

- NESDB
- DOPA

- NESDB

- TTP
- DCA
- DLT

Remarks: Primary industry → Agriculture, Mining, and Construction
 Secondary industry → Textiles, Food & beverage, Chemical, Metallic, Non-metallic, and Others
 Tertiary industry → Service sector

Scenario & CO₂ Countermeasure

- Energy demand in 2030 BAU scenario
- Energy demand in 2030 CM scenario

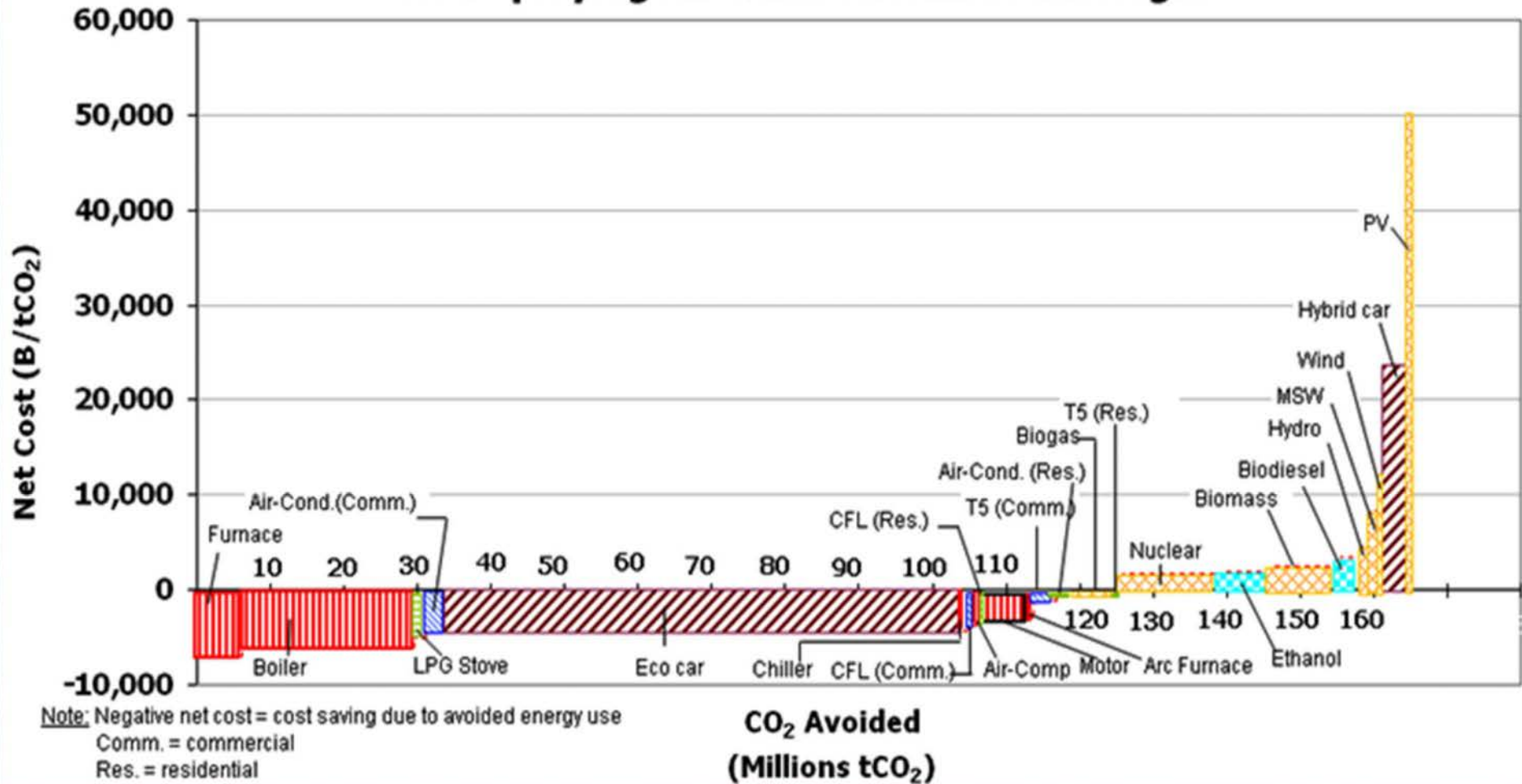
CO₂ Mitigation:

Only cost-effective energy savings of CO₂ mitigation options are considered.

CO₂ mitigation measures in 2030CM must be complied with national constraints.

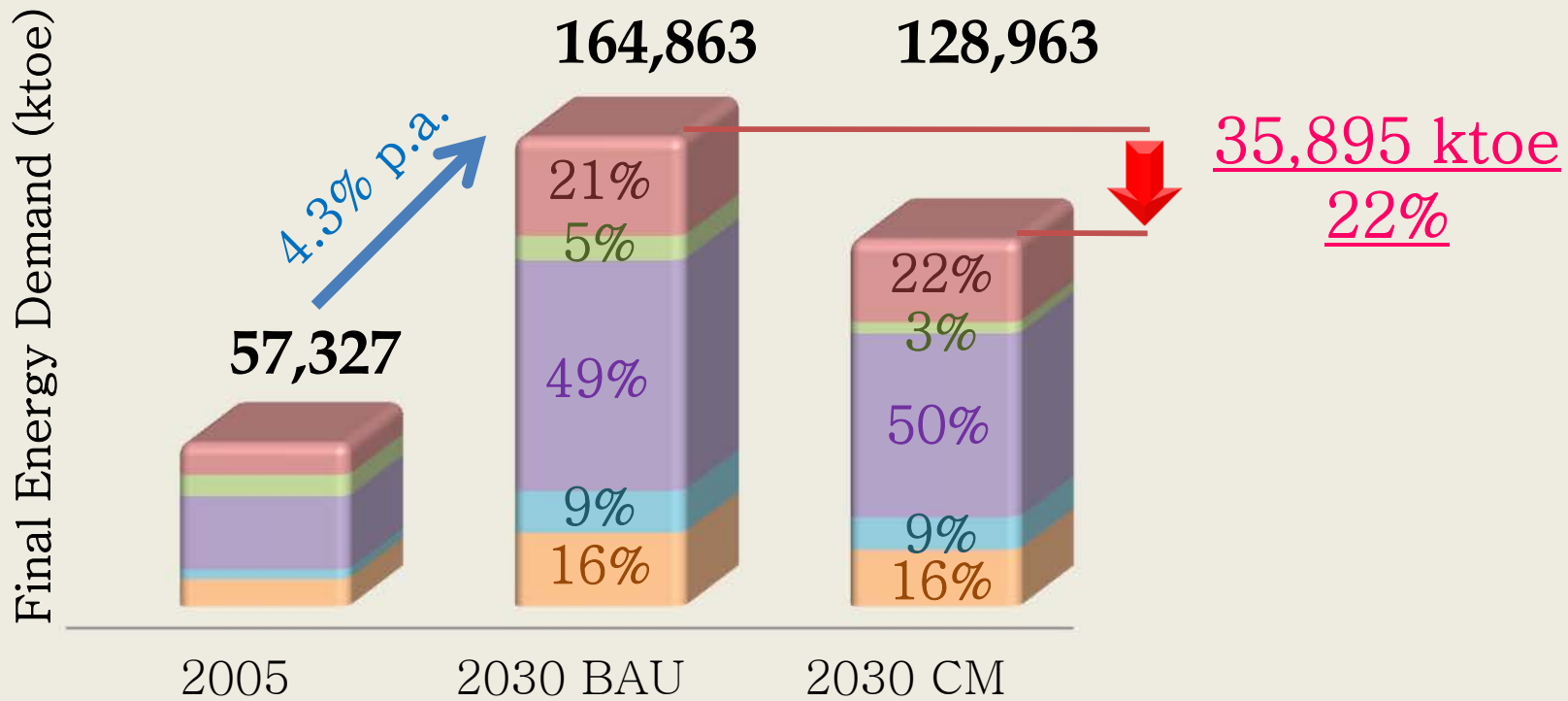
Thailand's RE & EE Technologies

**Net Cost Curve of CO₂ Avoided (2006 - 2030)
for Deploying RE & Efficient EE Technologies**



ENERGY DEMAND

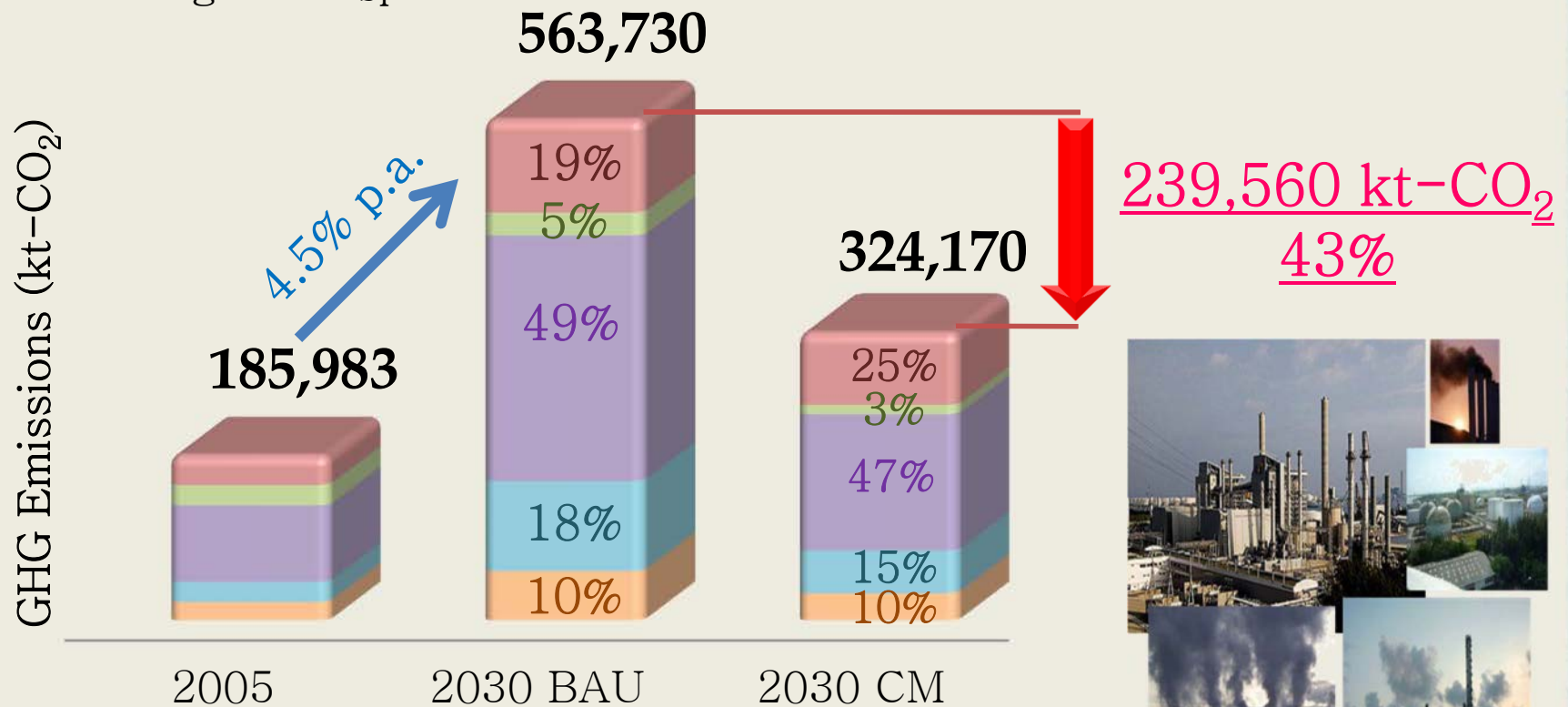
- ▣ Residential
- ▣ Commercial
- ▣ Industry
- ▣ Passenger transport
- ▣ Freight transport



Remarks: BAU is Business as Usual
 CM is Countermeasure

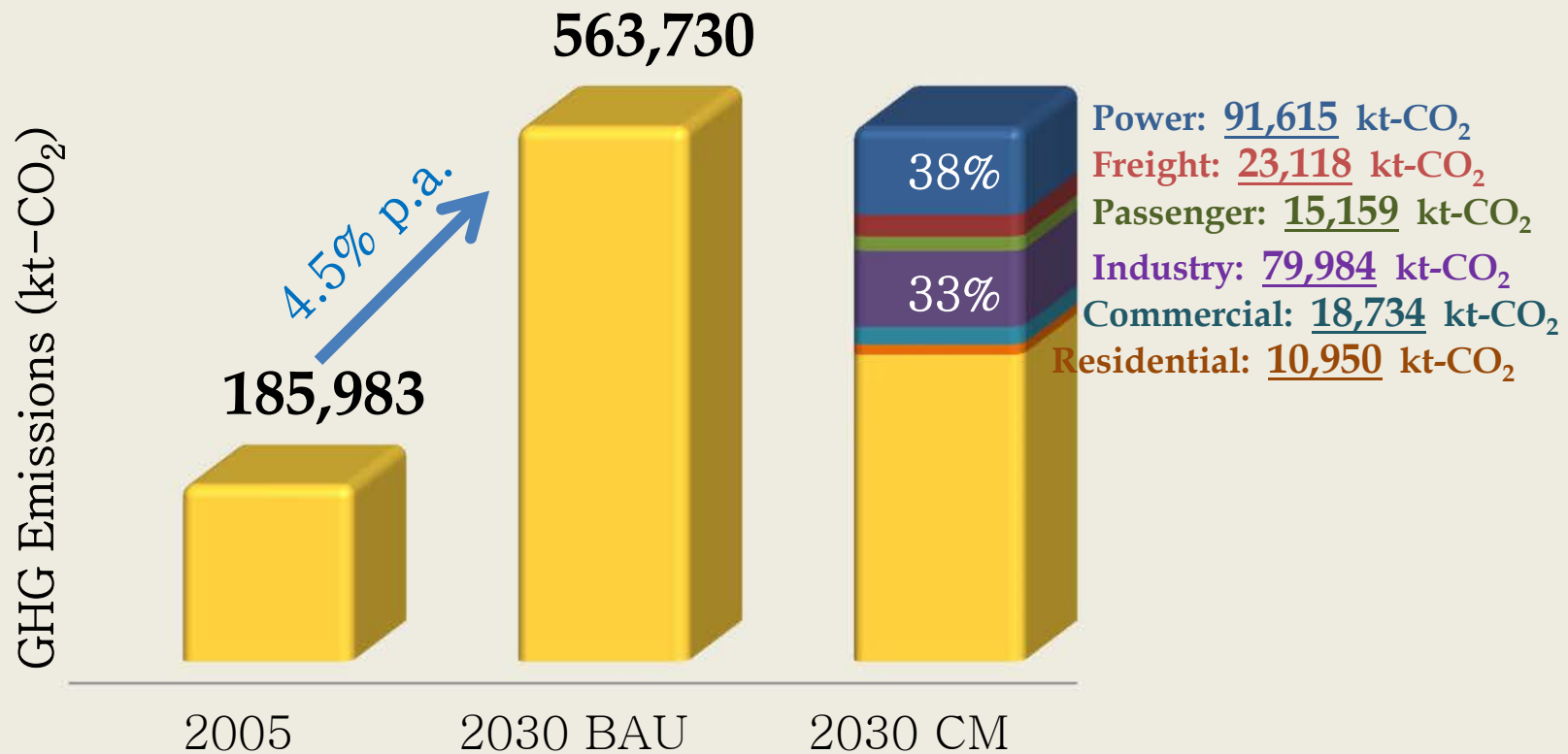
GHG EMISSIONS

- Residential
- Commercial
- Industry
- Passenger transport
- Freight transport



Remarks: BAU is Business as Usual
CM is Countermeasure

GHG EMISSIONS/REDUCTIONS



Remarks: BAU is Business as Usual
CM is Countermeasure

MEASURES

POWER GENERATION

- Efficiency improvement in the Power generation sector
 - T&D loss will improve to be 5%.
 - Technology transfer: New power plant technology will be added such as IGCC and CCGT → Eff. Improve to be 48% and 56%.
 - Fuel switching: Increasing share of RE and NE in PDP 2010.

| Fuel type | Share in 2030 BAU | Share in 2030 CM |
|------------------|-------------------|------------------|
| Natural gas | 71.4 | 39.0 |
| Oil | 6.6 | - |
| Coal | 15.1 | 23.6 |
| Hydro | 4.4 | 20.5 |
| Nuclear | - | 11.2 |
| Renewable energy | 2.5 | 5.7 |



Ref: Thailand's Power Development Plan, PDP 2010.

MEASURES

RESIDENTIAL

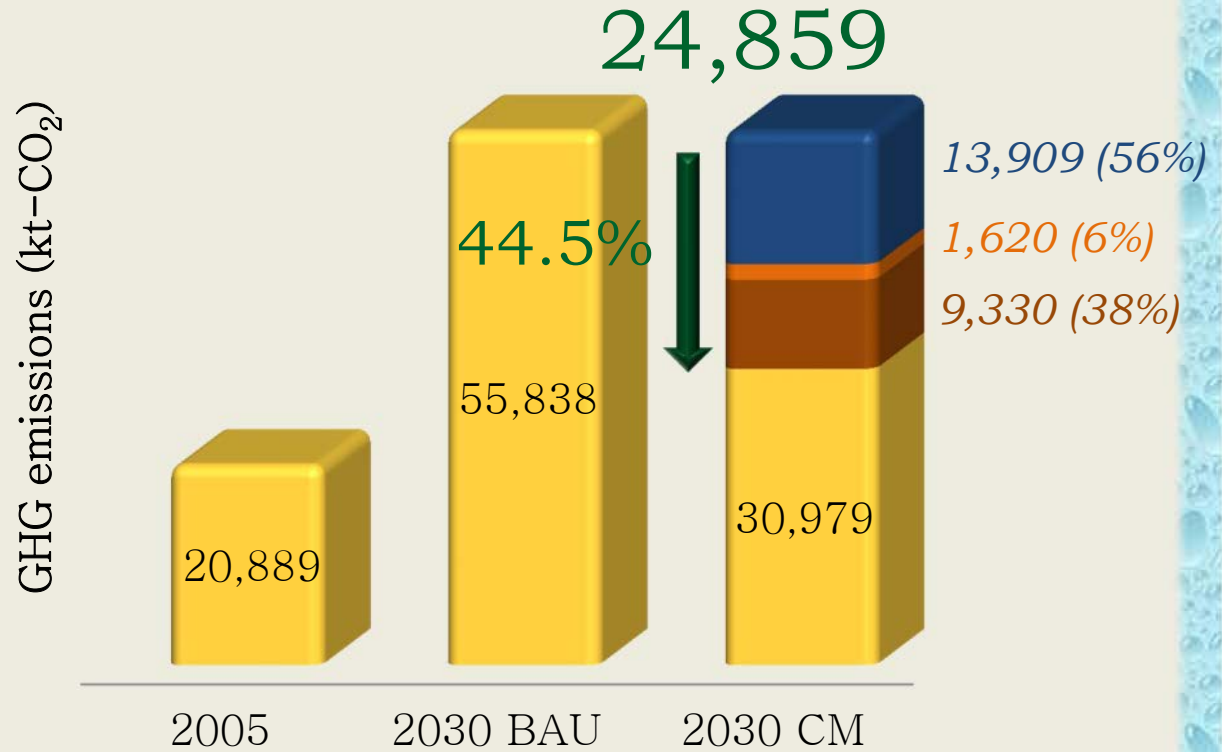
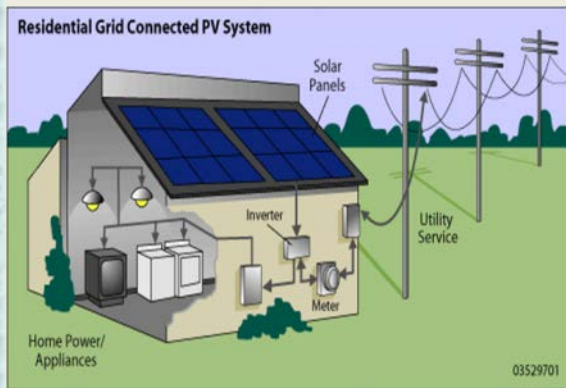
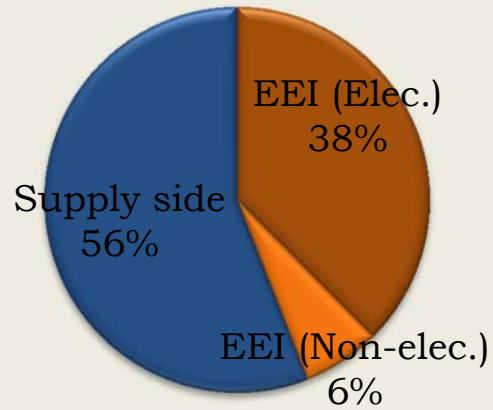
- ❑ Energy efficiency improvement in Households (Electric)
 - *Efficiency improvement by 30%*
 - *Penetration rates up to 100% in 2030*
- ❑ Energy efficiency improvement in Households (Non-electric)
 - *Efficiency improvement*
 - *by 30% in wood stove*
 - *by 5% in LPG stove*
 - *Penetration rates up to 100% in 2030*



Ref: Thailand Research Fund. 2007. Research Programme on Policy Research for Promoting the Development and Utilization of Renewable Energy and the Improvement of Energy Efficiency in Thailand.

MEASURES

RESIDENTIAL



- EEI (power sector)
- EEI (non electrical app.)
- EEI (electrical app.)
- GHG emissions

MEASURES

COMMERCIAL

- ❑ Energy efficiency improvement in Buildings
 - *Efficiency improvement by 30%*
 - *Penetration rates up to 100% in 2030*

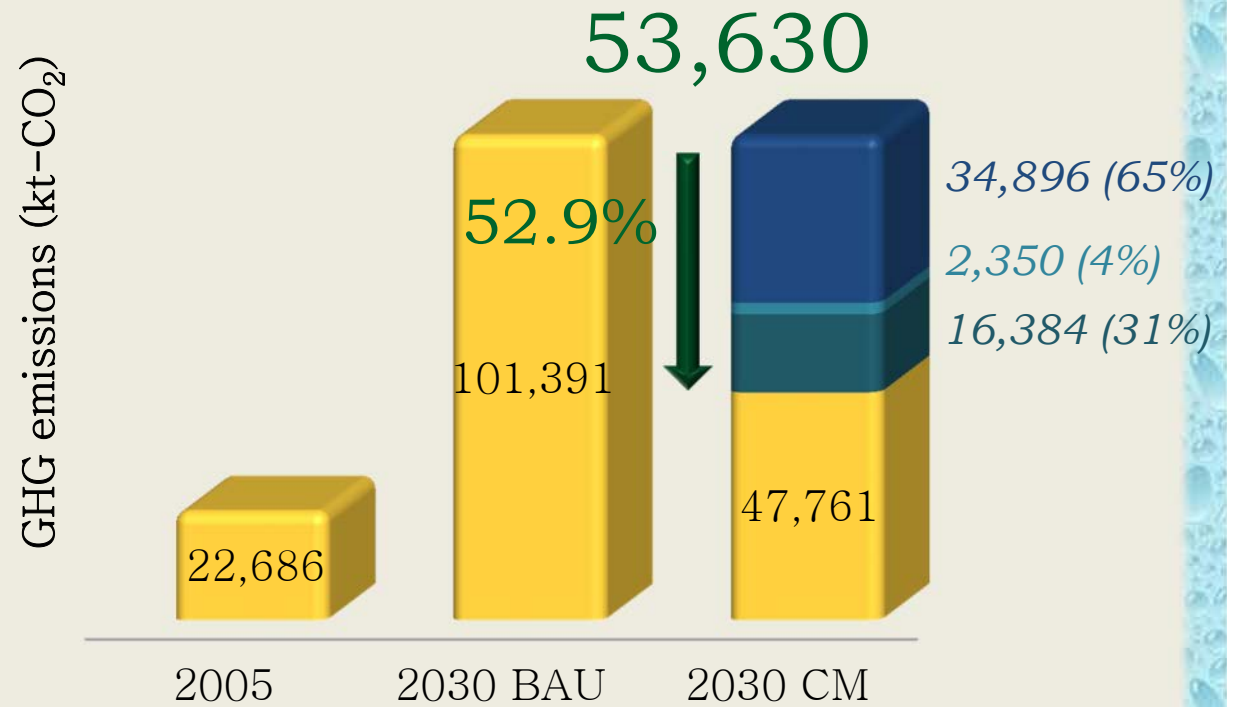
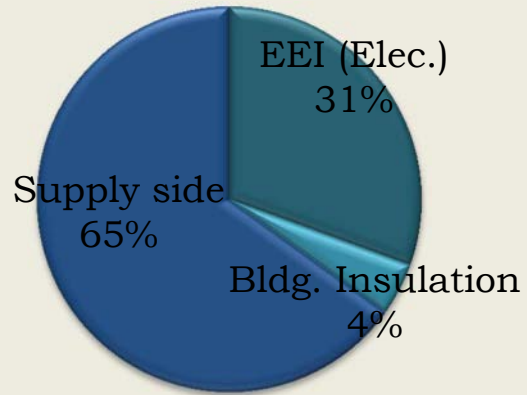
- ❑ Energy efficiency improvement in Buildings (Building Codes)
 - *Building insulation*
 - *Building envelope*
 - *Penetration rates up to 100% in 2030*



Ref: Thailand Research Fund. 2007. Research Programme on Policy Research for Promoting the Development and Utilization of Renewable Energy and the Improvement of Energy Efficiency in Thailand.

MEASURES

COMMERCIAL



- GHG emissions
- EEI (electrical app.)
- Building insulation
- EEI (power sector)

MEASURES

INDUSTRY

□ Energy efficiency improvement in Industry (Electric)

▪ *Efficiency improvement*

| System | Motor | Others | Lighting |
|--------|-------|--------|----------|
| EEI | 10% | 20% | 30% |

▪ *Penetration rates up to 100% in 2030*

□ Energy efficiency improvement in Industry (Non-electric)

▪ *Efficiency improvement by 30%*

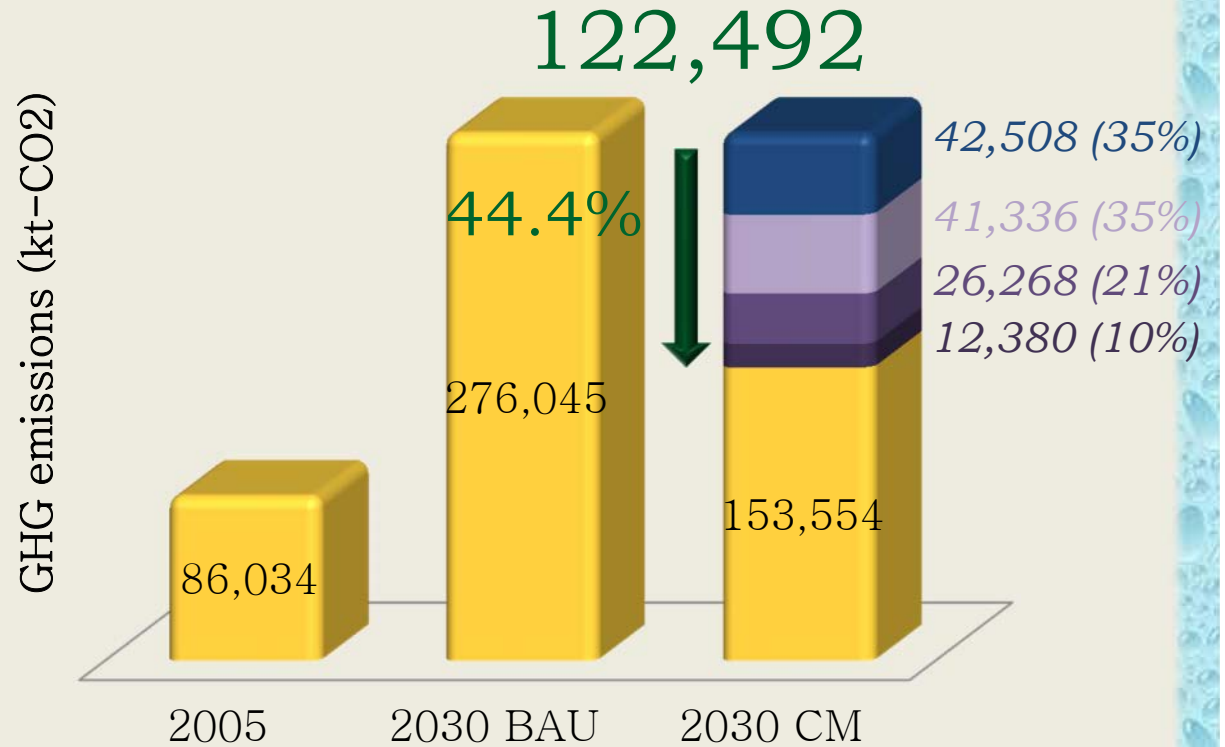
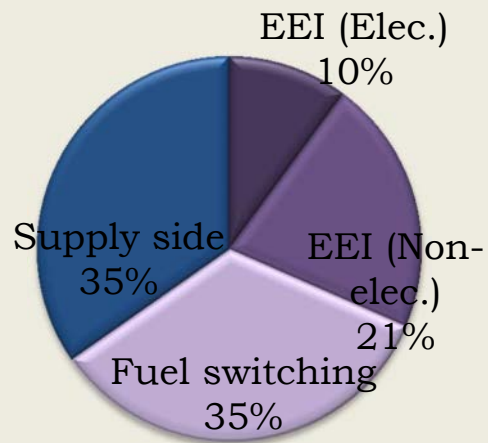
□ Fuel switching in Industry

▪ *Reduce the penetration level in coal and oil by 50%*

▪ *Replace the penetration level remaining in biomass and LPG.*

MEASURES

INDUSTRY



- EEI (power sector)
- EEI (non electrical app.)
- GHG emissions
- Fuel switching
- EEI (electrical app.)

MEASURES

TRANSPORTATION

- Fuel economy improvement (FEI) in Transport sector
 - *Efficiency improvement by 30% in*
 - *Penetration rates up to 100% in 2030*

- Travel demand management (TDM) in Transport sector
 - *Efficiency improvement by 7.38%*
 - *Using (eco-driving, bus priority, and non-motorized transport)*

Ref: Pongthanaisawan, J. 2007. Road transport energy demand analysis and energy saving potentials in Thailand. Asian Journal of Energy and Environment

Kuwattanachai, N. 2009. Hybrid and Electric cars. TRF Newsletter.

MEASURES

TRANSPORTATION



❑ Fuel switching in Transport sector

- CNG engines will increase by 20% in 2030
- Hybrid engines can save energy consumption by 30%

❑ Modal shift in Transport sector



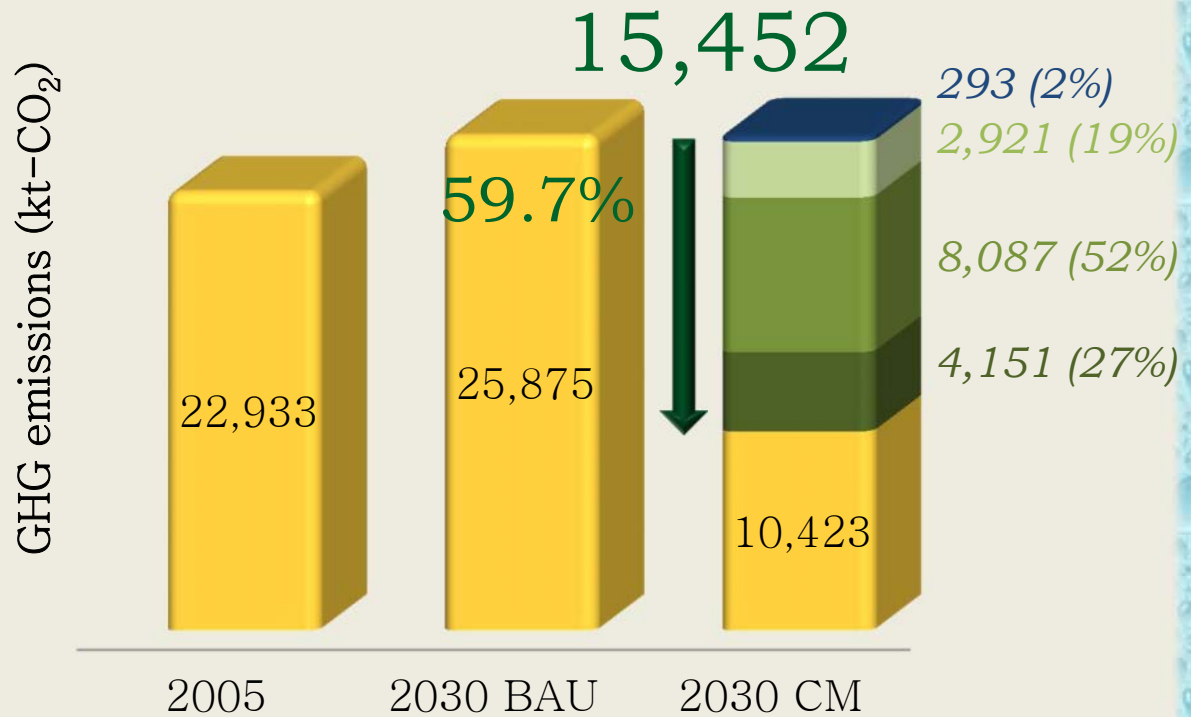
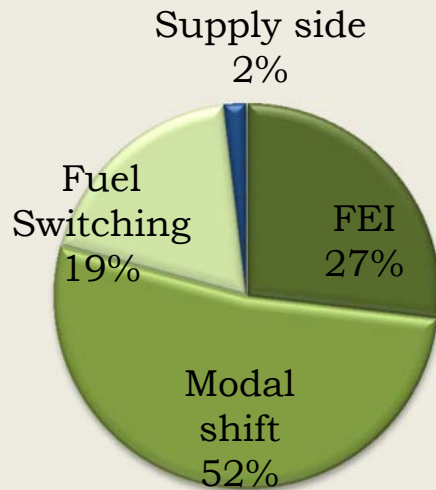
| | | SV | LV | Bus | Motor bike | Bike | Walk | Train | Plane | Ship |
|-----------|------|------|------|------|------------|------|------|-------|-------|------|
| Passenger | 2005 | 24.3 | 6.7 | 42.3 | 14.6 | 0.8 | 10.7 | 0.2 | 0.4 | - |
| | 2030 | 15.0 | 5.0 | 20.0 | 10.0 | 12.8 | 25.0 | 12.0 | 0.2 | - |
| Freight | 2005 | 2.2 | 80.8 | | | | | 2.3 | 0.02 | 14.8 |
| | 2030 | 2.2 | 58.2 | - | - | - | - | 24.9 | 0.02 | 14.8 |

Ref: Pongthanaisawan, J. 2007. Road transport energy demand analysis and energy saving potentials in Thailand. Asian Journal of Energy and Environment

Kuwattanachai, N. 2009. Hybrid and Electric cars. TRF Newsletter.

MEASURES

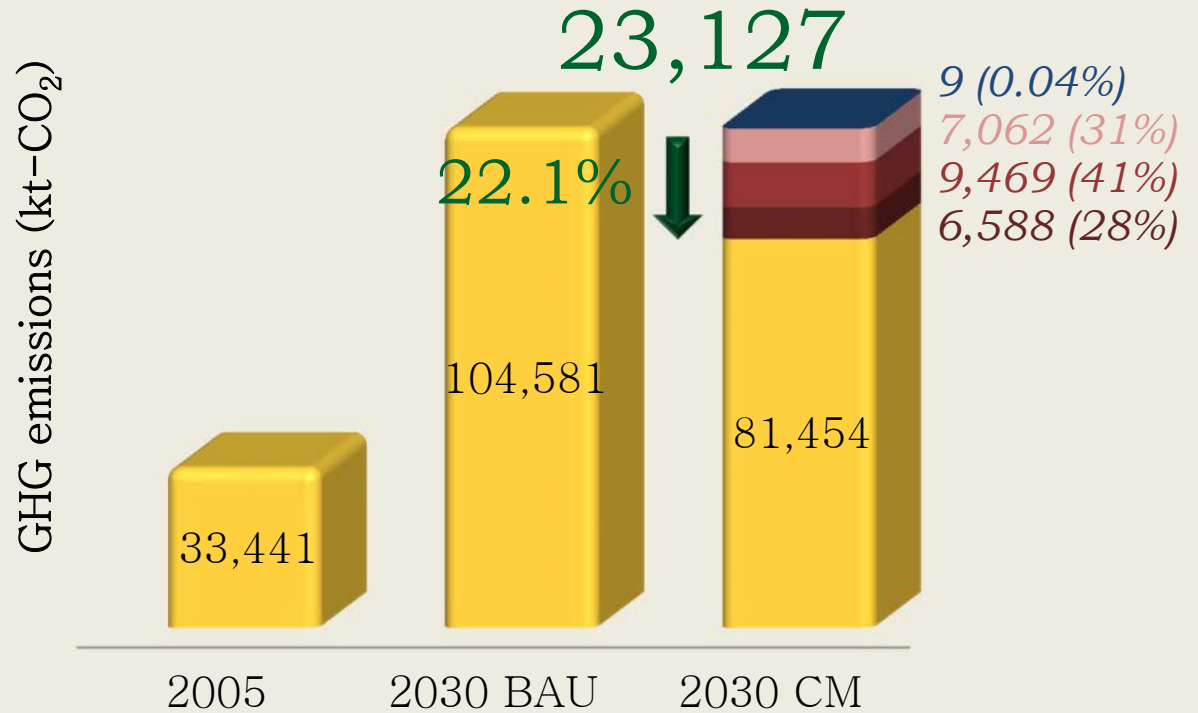
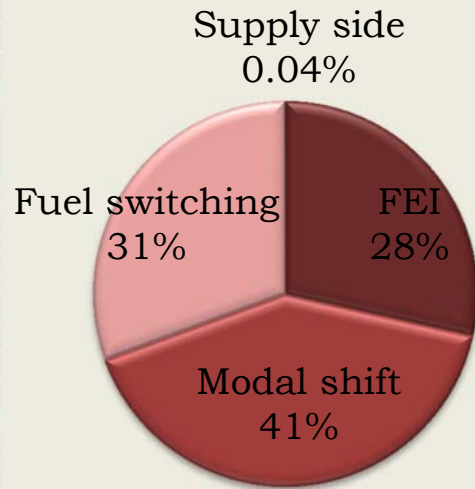
PASSENGER_TRANSPORT



- GHG emissions
- FEI
- Modal shift
- Fuel switching
- EEI (power sector)

MEASURES

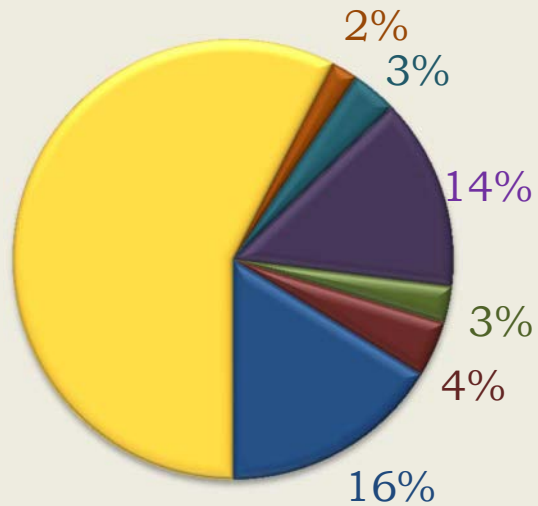
FREIGHT TRANSPORT



- GHG emissions
- FEI
- Modal shift
- Fuel switching
- EEI (power sector)

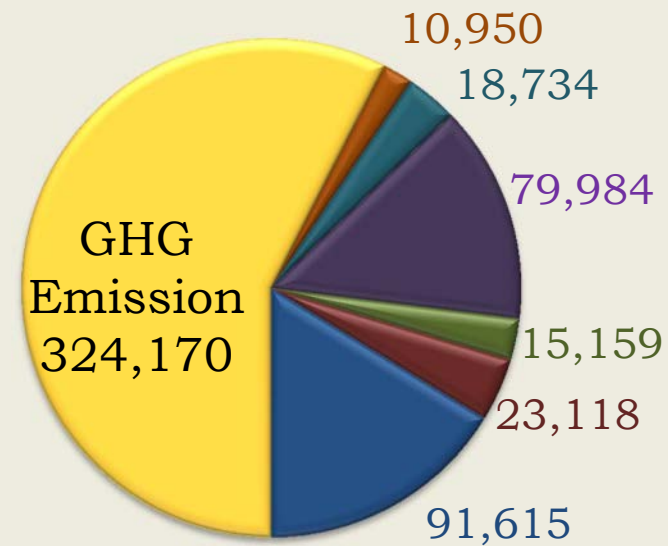
GHG EMISSIONS/REDUCTION

TOTAL



- GHG emissions
- Residential
- Commercial
- Industry
- Passenger transport
- Freight transport
- Power generation

GHG REDUCTION:
239,560 kt-CO₂

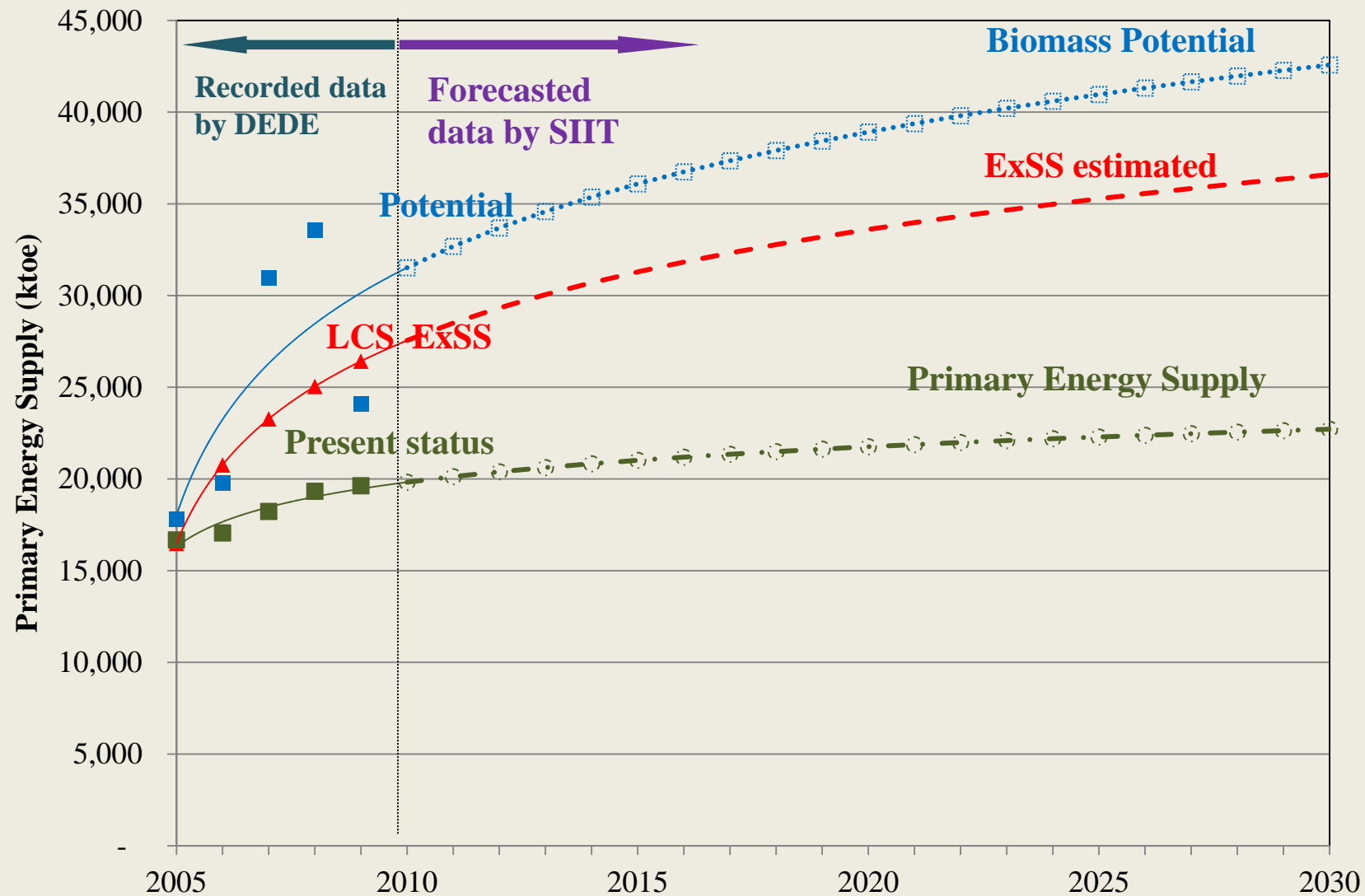


Unit: kt-CO₂

SUMMARY OF GHG MITIGATION MEASURES

| Action | GHG Reduction (kt-CO ₂) | (%) |
|---|-------------------------------------|--------|
| 1. Energy efficiency improvement (EEI) in households | 10,950 | 4.6% |
| - EEI in electric devices | 9,330 | 3.9% |
| - EEI 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% |
| - EEI in electric devices | 12,380 | 5.1% |
| - EEI 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 | |

Biomass potential & consistency



RENEWABLE POTENTIALS (MOEN, TH)

| Energy type | Potential | | Existing | | 2008-2011 | | | 2023-2030 | | |
|--------------------------------|---------------|---------------|-----------------|---------------|---------------|--------------|---------------|---------------|--------------|--|
| Electricity | MW | MW | GWh | MW | GWh | ktoe | MW | GWh | ktoe | |
| Solar | 50,000 | 38.6 | 46 | 55 | 66 | 6 | 600 | 720 | 67.2 | |
| Wind | 1,600 | 5.13 | 10 | 115 | 231 | 13 | 960 | 1,934 | 106.8 | |
| Small hydro | 700 | 67 | 293 | 165 | 722 | 43 | 390 | 1,708 | 102 | |
| Biomass | 4,400 | 1,644 | 11,521 | 2,800 | 19,622 | 1,463 | 4,400 | 30,835 | 2,319 | |
| Biogas | 190 | 79.6 | 573 | 60 | 432 | 27 | 144 | 1,036 | 64.8 | |
| Waste | 400 | 5.6 | 44.8 | 78 | 624 | 35 | 192 | 1,536 | 86.4 | |
| Total | 57,290 | 1,840 | 12,487.8 | 3,273 | 21,697 | 1,587 | 6,686 | 37,769 | 2,746 | |
| Thermal | ktoe | ktoe | | | | ktoe | | | ktoe | |
| Solar | 154 | 0.5 | | | | 5 | | | 45.6 | |
| Biomass | 7,400 | 3,071 | | | | 3,660 | | | 7,400 | |
| Biogas | 600 | 201 | | | | 470 | | | 600 | |
| Waste | | 1.09 | | | | 15 | | | 42 | |
| Total | 8,154 | 3,273 | | | | 4,150 | | | 8,088 | |
| Bioenergy | ML/day | ML/day | | ML/day | | ktoe | ML/day | | ktoe | |
| Ethanol | 3.00 | 1.24 | | 3.00 | | 805 | 10.8 | | 2,936 | |
| Biodiesel | 4.20 | 1.56 | | 3.00 | | 950 | 5.40 | | 1,698 | |
| Total | 7.20 | 2.80 | | 6.00 | | 1755 | 16.20 | | 4,634 | |
| Required energy (ktoe) | | 66,248 | | | | 70,300 | | | 112,868 | |
| Required renewable energy | | 4,237 | | | | 7,492 | | | 15,468 | |
| RE share (%) | | 6.4% | | | | 10.6% | | | 13.7% | |
| NGV (M.cu./Day) | | 147 | | 393.0 | | 3,469 | 800 | | 7,064 | |
| Alternative energy used (ktoe) | | | | | | 10,961 | | | 22,532 | |
| AE share (%) | | | | | | 16.6% | | | 19.96% | |

Conclusions on Thailand's LCS Scenario

- The GHG emissions in 2030 BAU scenario without mitigation measures will increase to 563,730 kt-CO₂.
- By adopting CMs in all sectors, GHG emissions can be decreased to 324,170 kt-CO₂ or by 42.5%.
- If those policies are planned in early stage, Thailand will be able to serve as a model for LCS.
- However, to increase more CO₂ mitigation, more CMs & leapfrogging technologies are needed under national appropriate mechanism.

1st Thailand's LCS Scenario 2030 Brochure

Low-Carbon Society Vision 2030
Thailand

April, 2010

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

1st Draft, Apr 2010

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July, 2010

Sirindhorn International Institute of Technology, Thammasat University
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2nd Draft, July 2010

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Kyoto University
Mizuho Information & Research Institute
Asia-Pacific Integrated Model

**FINAL Thailand LCS
November 2010**

1st Thailand's LCS Scenario 2030 Brochure

The 3 versions of Thailand's LCS brochures had been distributed and disseminated in Thailand.

- 1. Thailand Greenhouse gas management Organization (TGO).**
- 2. Climate change focal point of Thailand: ONEP.**
- 3. Bangkok Metropolitan Administration (BMA).**
- 4. Energy Planning and Policy Office (EPPO), MOEN.**
- 5. Department of Alternative Energy Development and Efficiency (DEDE), MOEN.**
- 6. Research Institutes & Universities.**
- 7. NGOs.**
- 8. Privates/Business.**

Note: TGO & MOEN are looking towards 2030, instead of 2022.

1st Thailand's LCS Scenario 2030 Brochure

The 2nd version of Thailand's LCS brochures had been distributed and disseminated during CTC2010 conference, organized by TGO during 19-21 August 2010.



Thailand's LCS scenario development was presented in CTC2010. In addition, 2 papers on Thailand LCS were also presented.

TGO provided one session on LCS Scenario: Methodology, cases of Japan & Thailand



MOU between NIES and SIIT-TU

Low-Carbon Scenario Development in Thailand



Asia LCS scenarios and actions: How to achieve sustainable low-carbon society

Dissemination & ExSS Workshop in Thailand Low-carbon society model capacity building workshop

Bridge simulation scenarios and sustainable LCS policy
implementation using AIM (Asia-Pacific Integrated Model)

Organized by TGO, SIIT-TU, JGSEE, NIES

November 19, 2010. Pullman King Power Hotel, Bangkok



Low-Carbon Society Model Capacity Building Workshop

Objective:

1. To introduce LCS scenario.
2. To operate LCS model. (ExSS tool)
3. To communicate among policy makers, researchers, and business on feasible LCS development.



Prof. Matsuoka



Prof. Ram Shrestha



TGO NIES Kyoto NIES



TGO TGO SIIT-TU



NIES TGO SIIT-TU



TGO Board, Dr Kittu



TGO Local Authority



AIT iGES

Low-Carbon Society Model Capacity Building Workshop



LCS methodology



LCS Thailand, SIIT & AIT



Prof. Ho (MTU)



Mr. Boyd (IRDA)



Dr Savitri (KMUTT)



LCS India, Prof. Aashish



Chair, TGO Board



Dr Kainuma Dr Komi



ExSS Training



ExSS Training



ExSS Training



ExSS Training

Low-Carbon Society Model Capacity Building Workshop



ExSS Training



ExSS Training



**Prof Nishioka (iGES & NIES)
Bridge simulation & LCS Policy**

Bridge simulation & LCS Policy Closing Remarks



Dr Kainuma Dr Sirin (KMUTT)

Thailand's Low-Carbon Society Model Capacity Building Workshop

<http://2050.nies.go.jp/sympo/101119/>

Low-Carbon Society Scenarios towards 2050



Proceeding of LCS

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Project

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Report

Symposium

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日本語

Low-carbon society model capacity building workshop

bridge simulation scenarios and sustainable LCS policy implementation using AIM (Asia-Pacific Integrated Model)

November 19 (Fri) 2010

Pullman King Power Hotel, Bangkok

Organized by TGO, SIIT-TU, JGSEE, NIES



Low-Carbon Society Model Capacity Building Workshop - Bridge Simulation Scenarios and Sustainable LCS Policy Implementation using AIM (Asia-Pacific Integrated Model) -

| | |
|-----------|---|
| Time | 9:00-16:30, November 19 (Fri), 2010 |
| Venue | Pullman King Power Hotel, Bangkok, Thailand. |
| Language | English-Thai Simultaneous translation is available. |
| Organizer | TGO, SIIT-TU, JGSEE and NIES |

Objectives

- 1) Introduce LCS scenario making process to stakeholders for better understanding how to use simulation studies for policy formulation and implementation
- 2) Learn to operate LCS simulation model (simple version) and assess the CO2 reduction possibilities effected by change of driving forces (population, GDP etc.) and countermeasures (energy savings in buildings and industries, modal shift in transportation etc.)
- 3) Communicate between policymakers, business, researchers to discuss how to develop feasible LCS scenarios and policy options

Workshop Proceedings

All presentations and discussions are summarized in a proceedings.

[Download the Proceedings](#) (PDF:17MB)



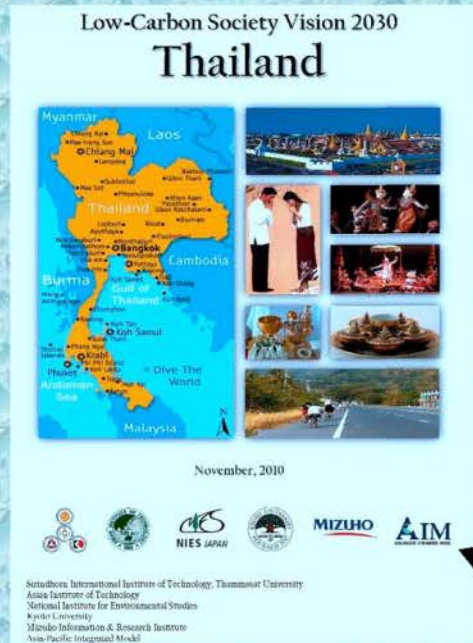
[Click to see original photo \(1.5MB\)](#)



LOW-CARBON ASIA SCENARIOS and ACTIONS

AIM
ASIA-PACIFIC INTEGRATED MODEL

Thailand's LCS Brochure in the TGO Homepage is available at http://www.tgo.or.th/index.php?option=com_content&task=view&id=441&Itemid=2



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องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)

THAILAND GREENHOUSE GAS MANAGEMENT ORGANIZATION (PUBLIC ORGANIZATION)

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- การนำค่าธรรมเนียมโครงการ CDM (LoA) --> New!
- สถานภาพโครงการ CDM
- รายชื่อที่ปรึกษาโครงการ CDM และ DOE
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การศึกษา Low-Carbon Society Vision 2030 Thailand

การศึกษา Low-Carbon Society Vision 2030 Thailand
November, 2010

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

Executive summary

This report aims to discuss the possibility of developing a Thailand's low-carbon society. The methodology involves (i) development of current GHG emissions inventory, and (ii) quantification of socio-economic activity level in 2030 according to available information from Thailand's office of the national economic and social development board.

According to the proposed development, the amount of GHG emission increase is estimated based on (i) 2030 BAU (business-as-usual) without mitigation measures, and (ii) 2030 with counter mitigation measures (CM) assumptions of employed technologies as well as the potential to reduce the GHG emissions by low-carbon measures available during 2005-2030. Only selected GHG mitigation options, which have been found to be cost effective, are included in the 2030 CM scenario. The main findings are as follows:

- 1) The annual greenhouse gas (GHG) emissions of Thailand in the base year of 2005 are 185,983 kilo-ton (kt) of CO₂.
- 2) Under the scenario without mitigation measures (that is, the 2030 BAU scenario), the GHG emissions would increase to 563,730 kt-CO₂, that is, 3.0 times higher than the emission in the base year 2005.
- 3) By adopting the selected feasible GHG mitigation measures available by 2030, the GHG emissions can be decreased approximately by 42.5% to 324,170 kt-CO₂ (see Figure 1).

In 2005, the per capita emission of Thailand was about 3.1 t-CO₂/year. In 2030, it is estimated to increase to 8.2 t-CO₂/year, and 4.7 t-CO₂/year without and with counter-measures, respectively.

In order to mitigate the emission to a lower level, several comprehensive measures such as diffusion of low-carbon technologies in the residential sector, energy efficient buildings, energy efficient industry and fuel switching, and fuel substitution in the transport sector and electricity generation sector are needed.

Figure 1: GHG emissions and mitigation by low-carbon technologies

However, a comprehensive policy to accomplish the implementation of the GHG mitigation measures is also required. Figure 2 shows recommended policies and related GHG mitigation options in the residential, commercial, industrial, transport, and power generation sectors. If those policies are planned from the early stage, Thailand will be able to develop not only as a premier growth center but also serve as a model for LCS.

In addition, the higher mitigation target could be achieved by a combination of initiatives on both supply and demand sides. On the supply side, renewable energy technologies and renewable power generation would play a crucial role, while on the demand side, energy efficient devices and fuel switching could play a key role.

| | 2005 | 2030 | 2030/2005 |
|--|------------|------------|-----------|
| Population (persons) | 60,991,000 | 68,815,004 | 1.1 |
| No. of households | 19,016,784 | 36,265,390 | 1.9 |
| GDP (million Baht) | 8,016,595 | 30,802,346 | 3.8 |
| GDP per capita (Baht/capita) | 131,439 | 447,610 | 3.4 |
| Gross output (million Baht) | 18,755,884 | 68,456,651 | 3.7 |
| Floor space for commercial (million m ²) | 88 | 394 | 4.5 |
| Passenger transport demand (million p-km) | 191,520 | 216,088 | 1.1 |
| Freight transport demand (million t-km) | 188,534 | 589,859 | 3.1 |

Residential and Commercial

- Building insulation
- Energy Efficient Lighting
- Green purchasing policy
- Energy performance standard of equipment and renovation of buildings

Electricity Generation

- Subsidy to investment in energy efficient equipment
- Promotion of technology transfer
- Promotion of renewable energy
- Fuel switching
- Promote area supply and transmission line

Transportation

- Environmental performance standard of vehicles
- Tax rate adjustment to energy efficient vehicles
- Promotion of petrol gas and hybrid cars
- Promotion of renewable energy
- Promotion of mass transit system

Industry

- Subsidy to investment in energy efficient equipment
- Promotion of technology transfer
- Promotion of renewable energy
- Promotion of chemical and renewable energy

Figure 2: Policy package for Thailand's low-carbon society

download
[การศึกษา Low-Carbon Society Vision 2030 Thailand](#)

2nd Thailand's Low-Carbon Society Scenario

- Improved analysis of 2030CM to 2050CM scenario using ExSS tool.
- 2nd LCS 2050CM Scenario brochure using AIM/EndUse for the power sector with carbon tax.
- AIM/CGE for 2050 CM Scenario.

Low Carbon Society Scenario Toward 2050

Thailand



DRAFT



Sirindhorn International Institute of Technology, Thammasat University

Asian Institute of Technology



Asia Pacific Integrated Model (AIM) Team

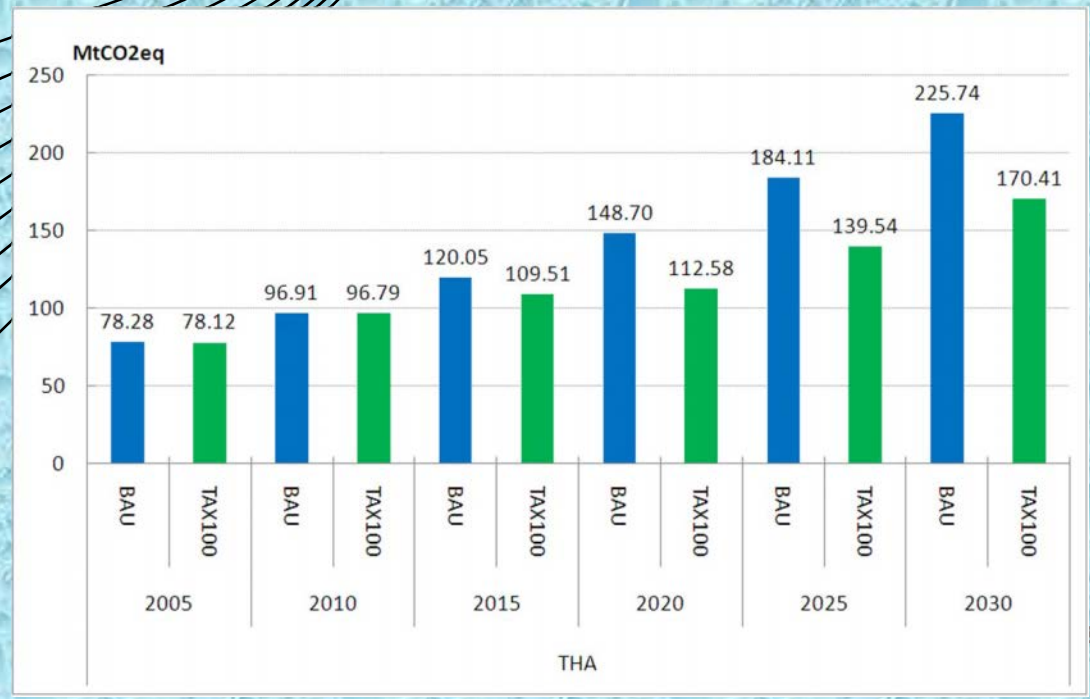
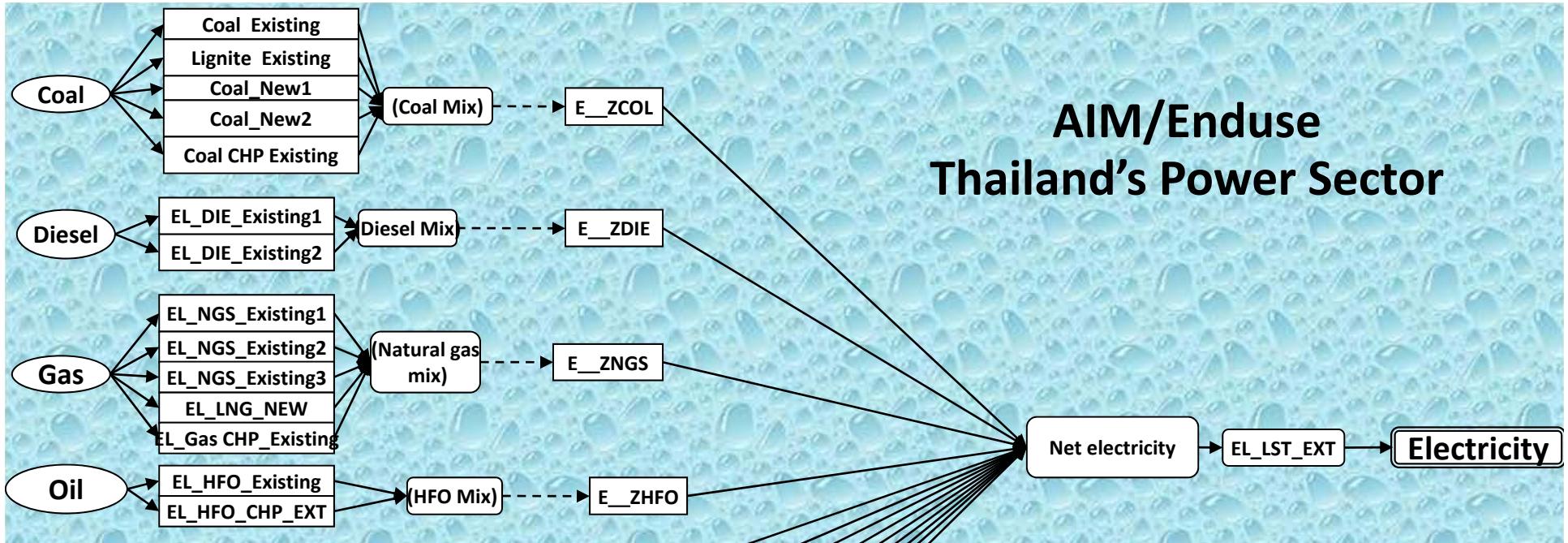
National Institute for Environmental Studies (NIES)



Kyoto University

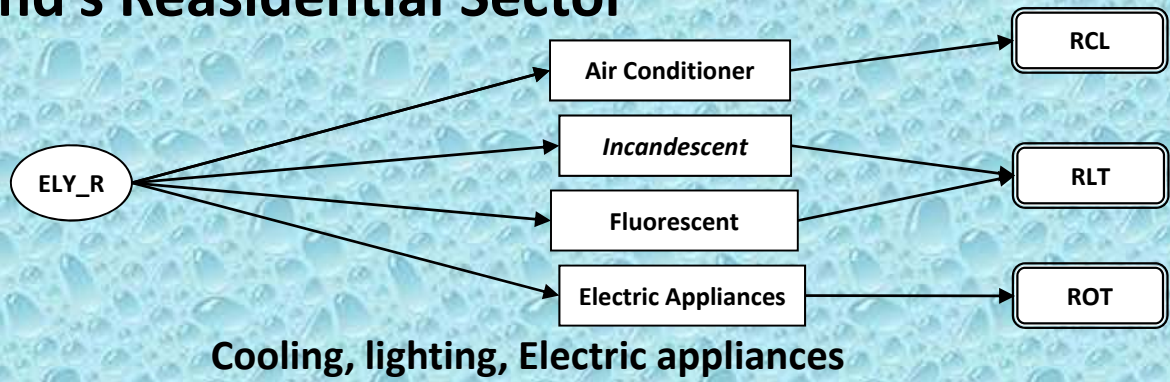


AIM/Enduse Thailand's Power Sector



Energy Device Service/Energy Device Service/Energy Service/Energy Device Service/Energy

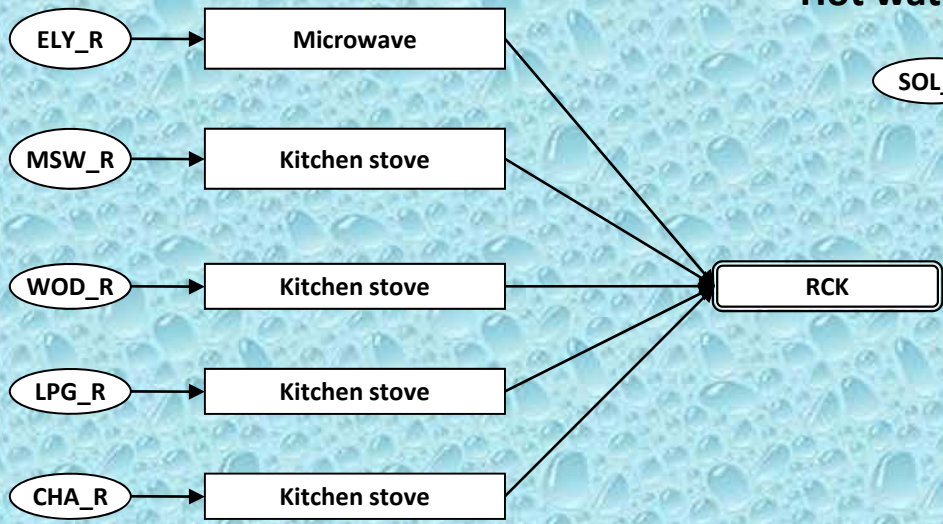
AIM/Enduse Thailand's Residential Sector



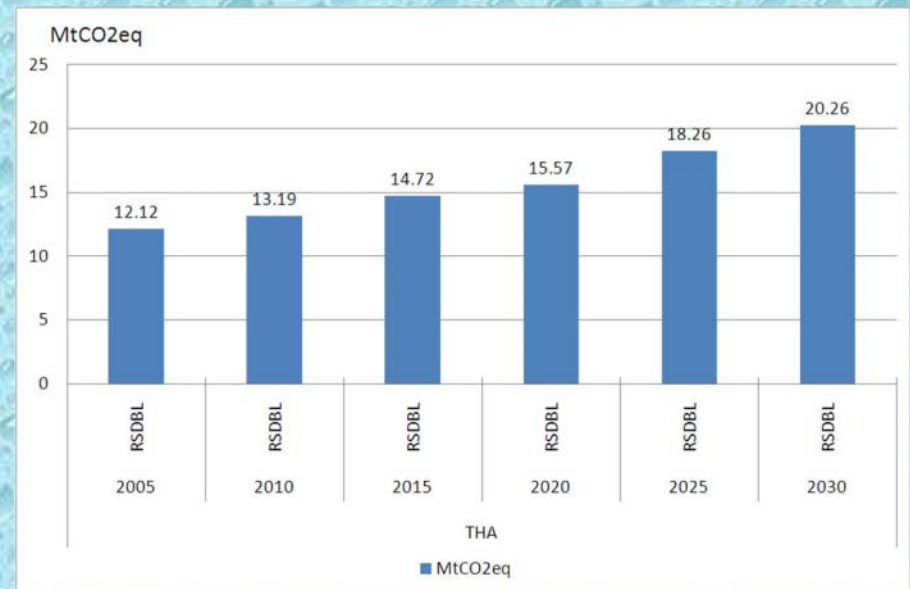
Cooling, lighting, Electric appliances



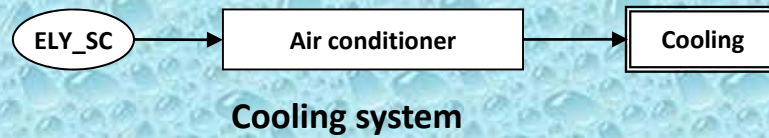
Hot water



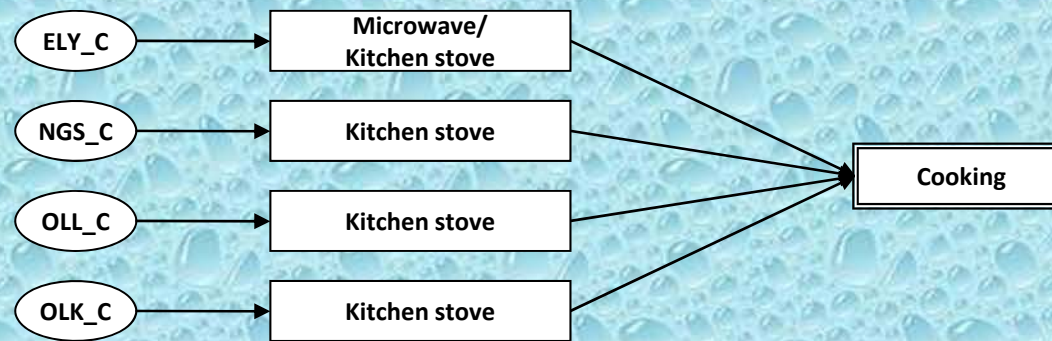
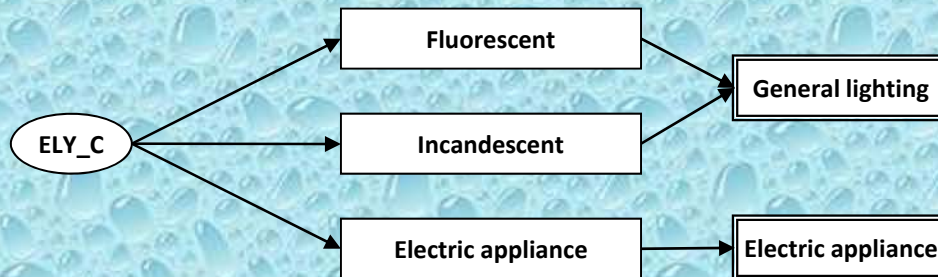
Cooking



AIM/Enduse Thailand's Commercial Sector

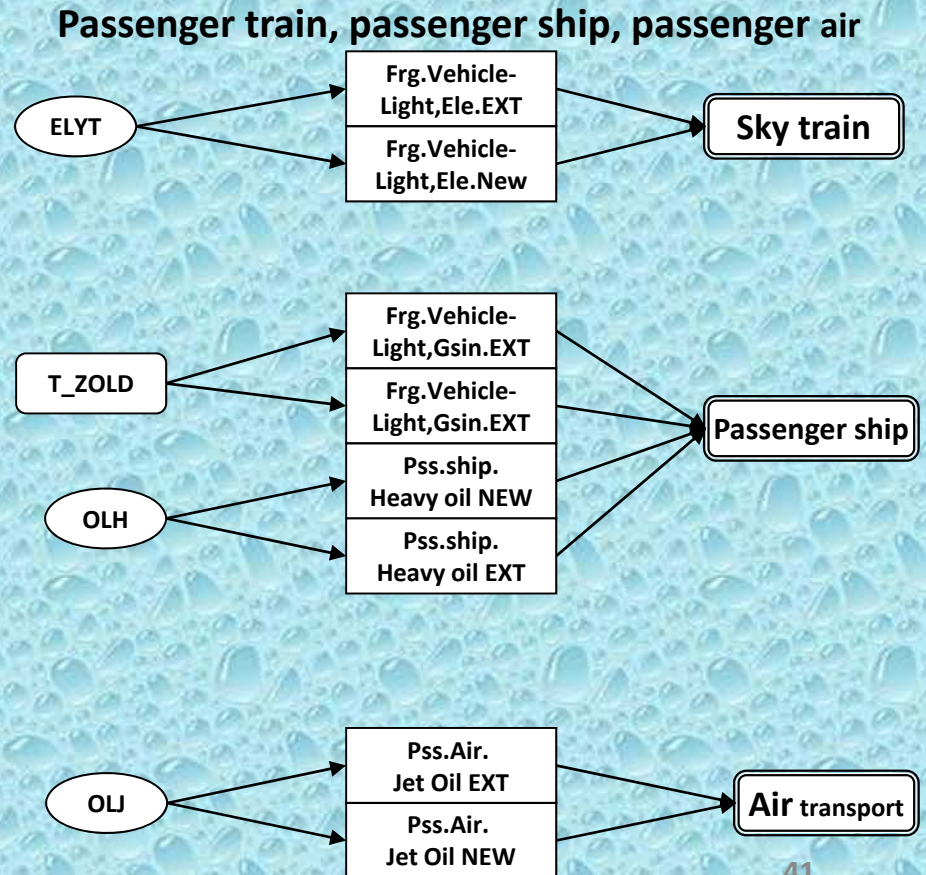
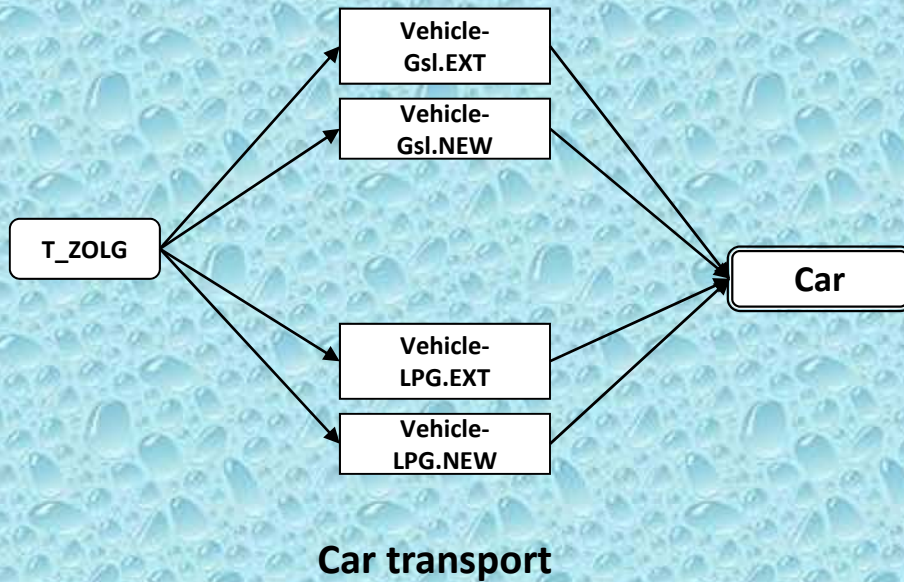
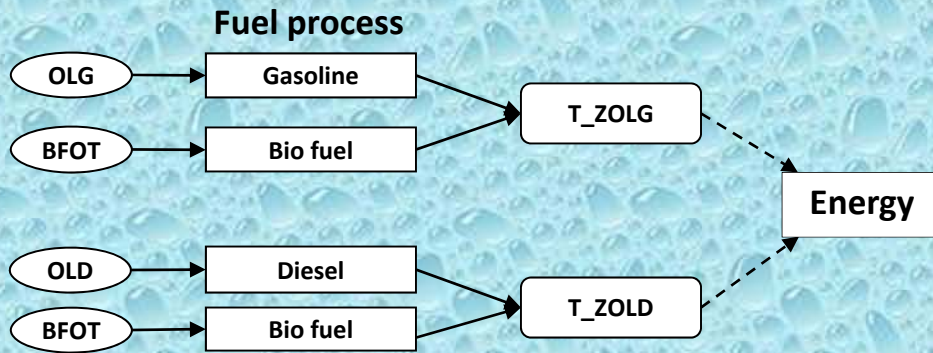


General lighting and electric appliance

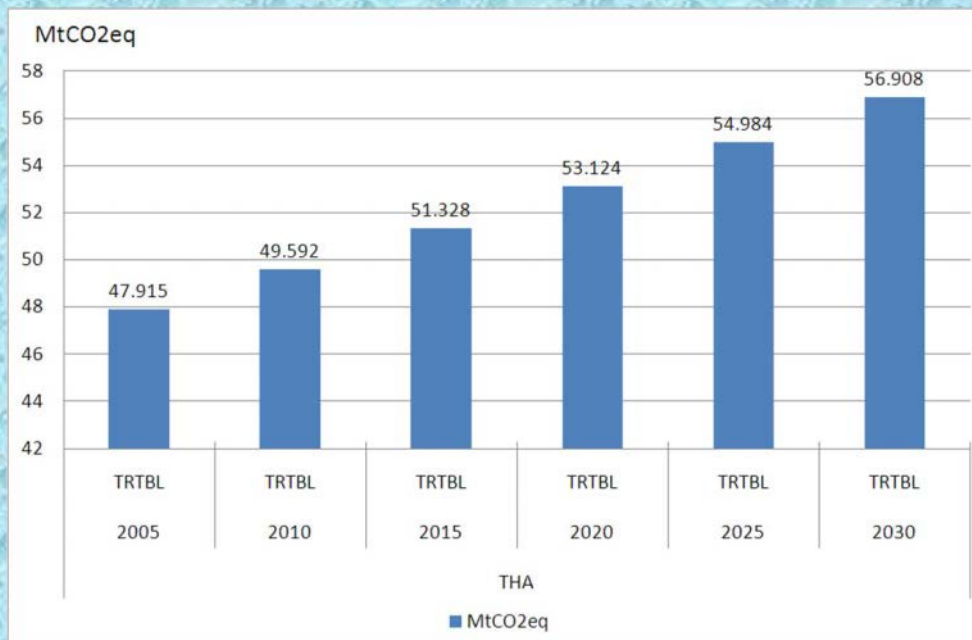
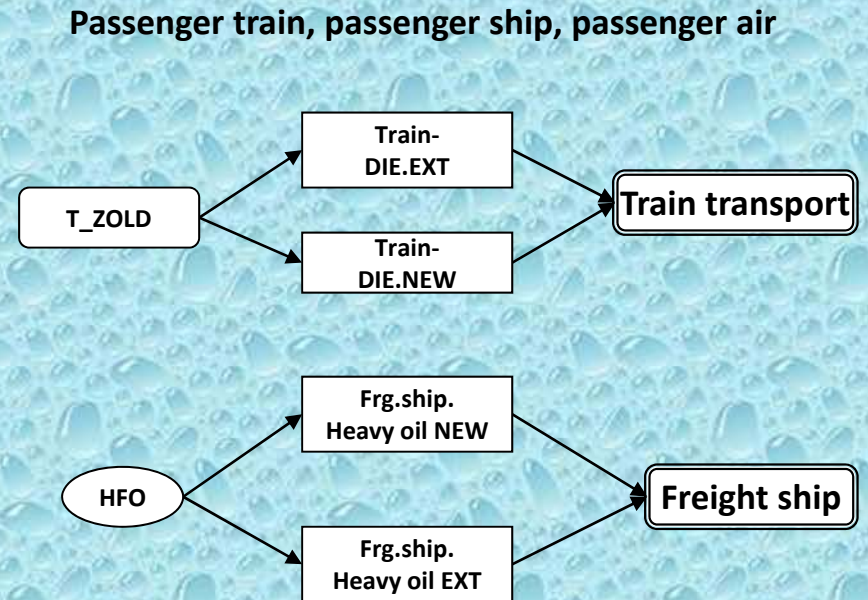
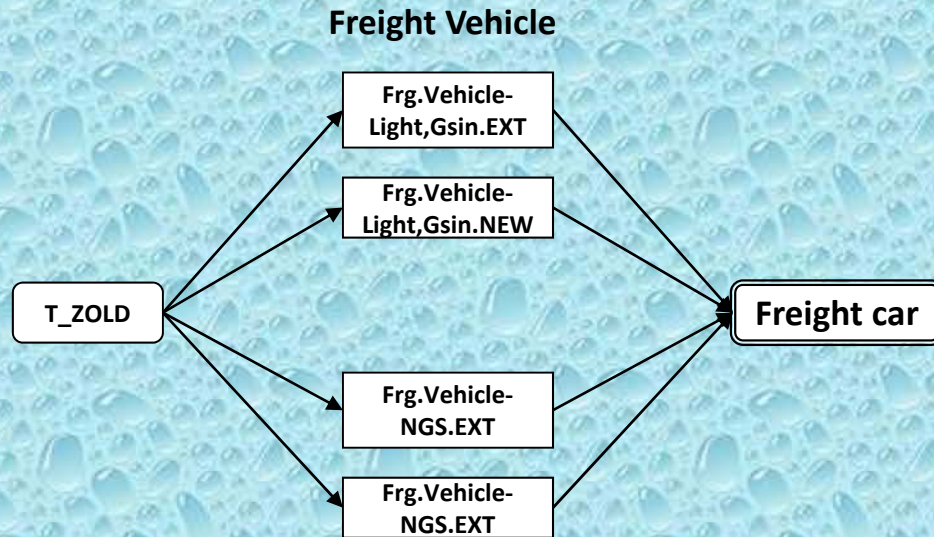


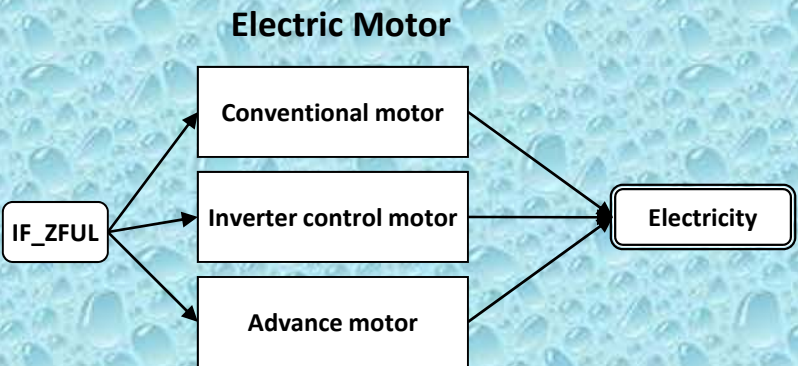
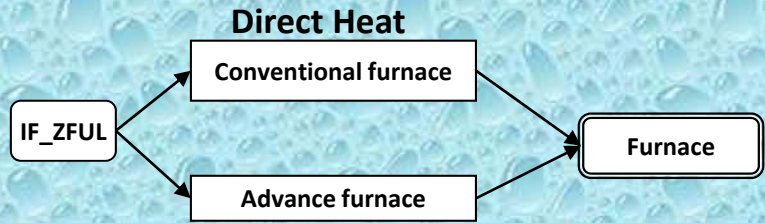
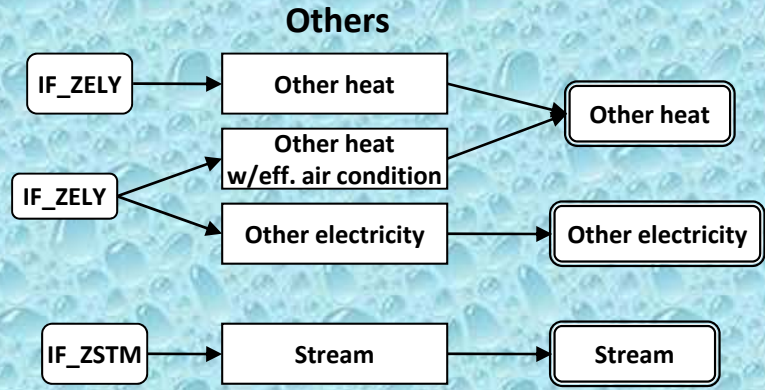
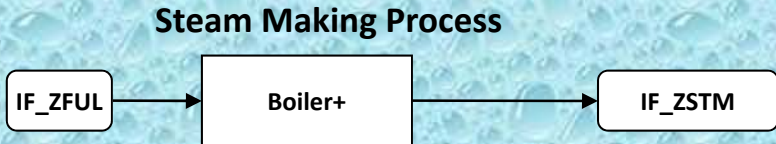
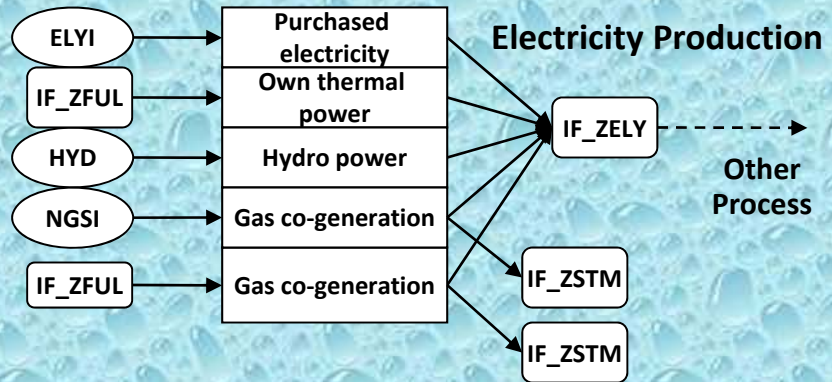
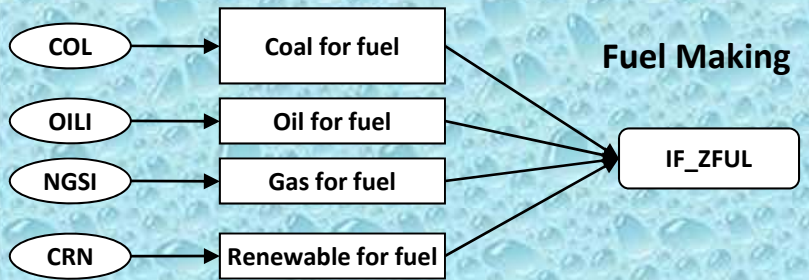
Cooking

AIM/Enduse Thailand's TransportSector (T-1)

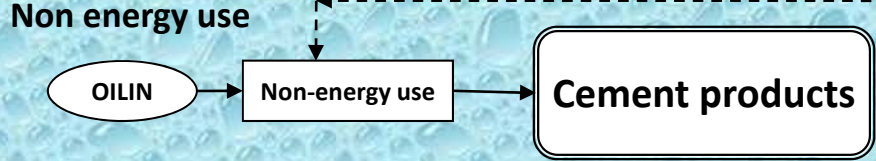
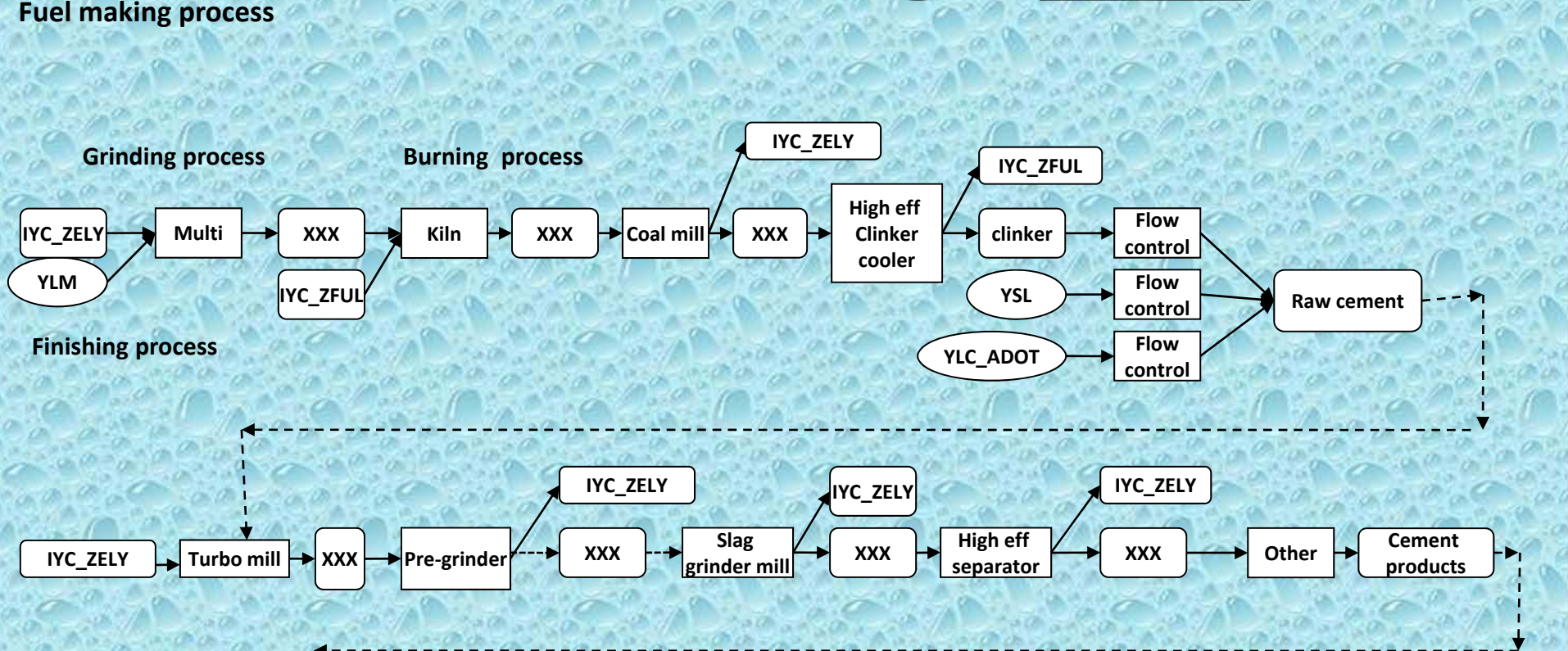
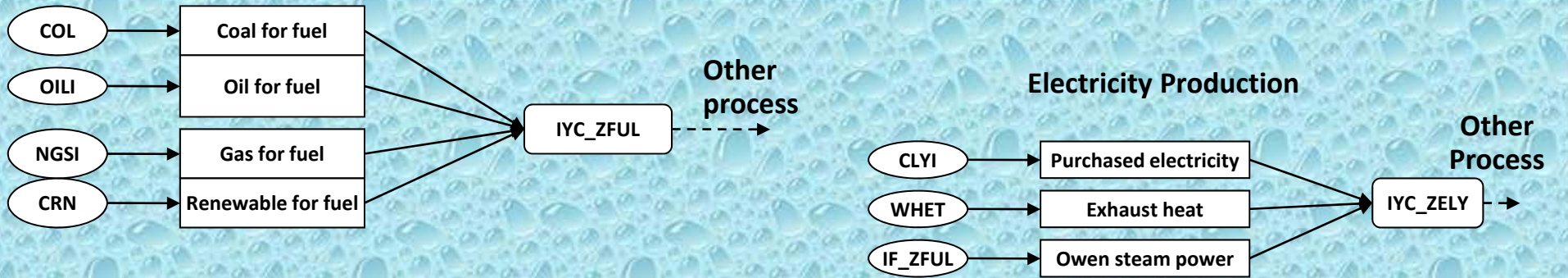


AIM/Enduse Thailand's Transport Sector (T-2)



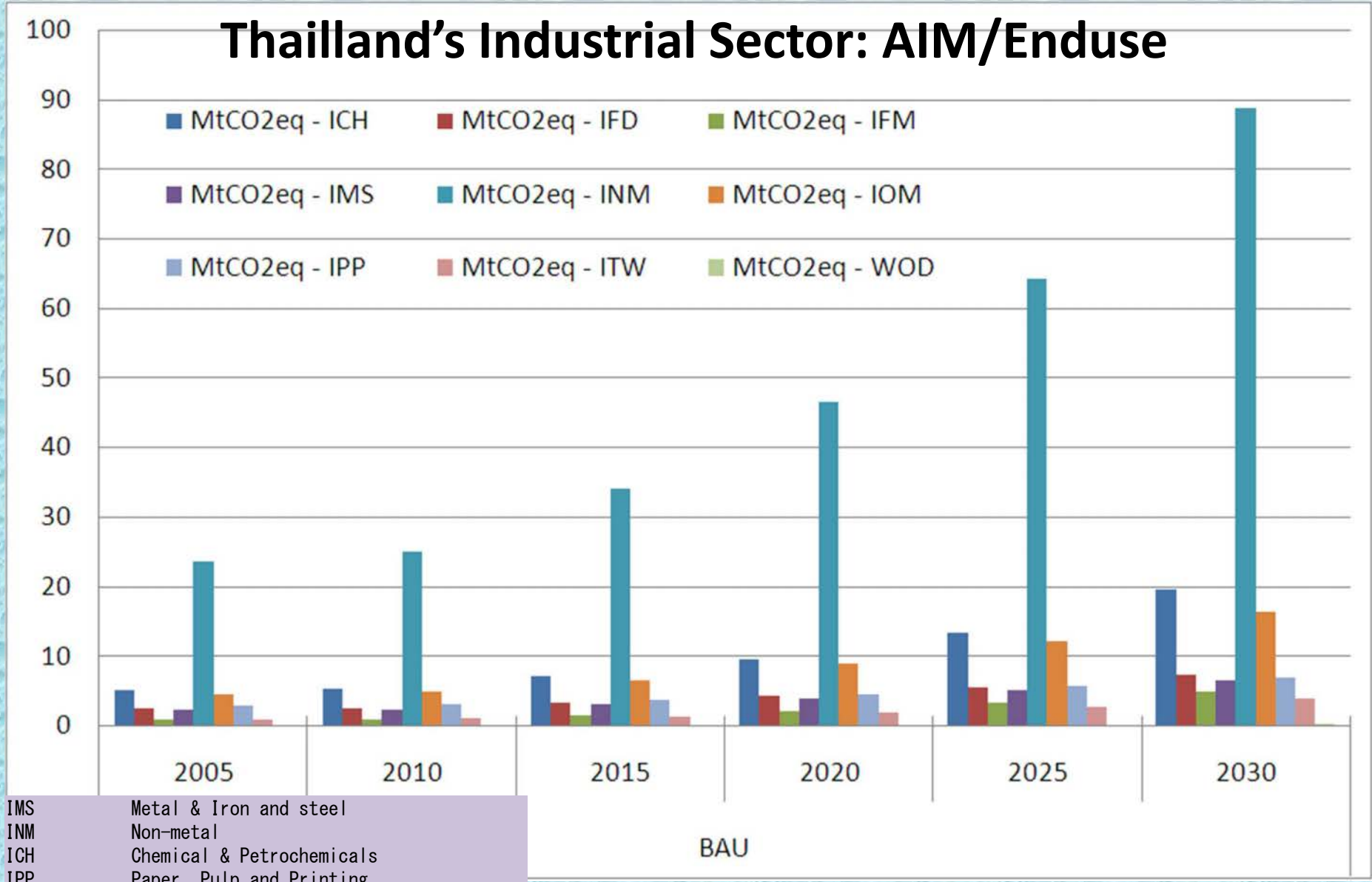


AIM/Enduse Thailand's Industrial Sector (Food Industry)



AIM/Enduse
Thailand's Industrial Sector
(Cement Industry)

Thailand's Industrial Sector: AIM/Enduse



| | |
|-----|---------------------------------------|
| IMS | Metal & Iron and steel |
| INM | Non-metal |
| ICH | Chemical & Petrochemicals |
| IPP | Paper, Pulp and Printing |
| IFD | Food Product, Beverage and Tobacco |
| ITW | Textiles, Wearing Apparel and Leather |
| IFM | Frabricated metals & Machinery |
| IOM | Other Manufacturing |
| WOD | Wood and wood product |

BAU

S-6, MOEJ



どうもありがとう
THANK YOU