Transition towards low-carbon societies in Thailand and Asia - Dialogue between policy makers and researchers and cross-sectoral approaches

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Efforts Towards a Lower Carbon Energy System in Thailand

The Joint Graduate School of Energy and Environment (JGSEE) and
CHE Center for Energy Technology and Environment (CEE)
King Mongkut's University Technology Thonburi

CEE PERDO Center For Energy Technology and Environment

KMUTT SIIT-TU KMITNB CMU PSU JGSEE The Joint Graduate School of Energy and Environment

Presentation Outline

1. Current energy and GHG emission situation and future trends
2. Energy and climate security challenges
3. Energy policies and measures related to CO_2 mitigation
4. Lower carbon scenario studies

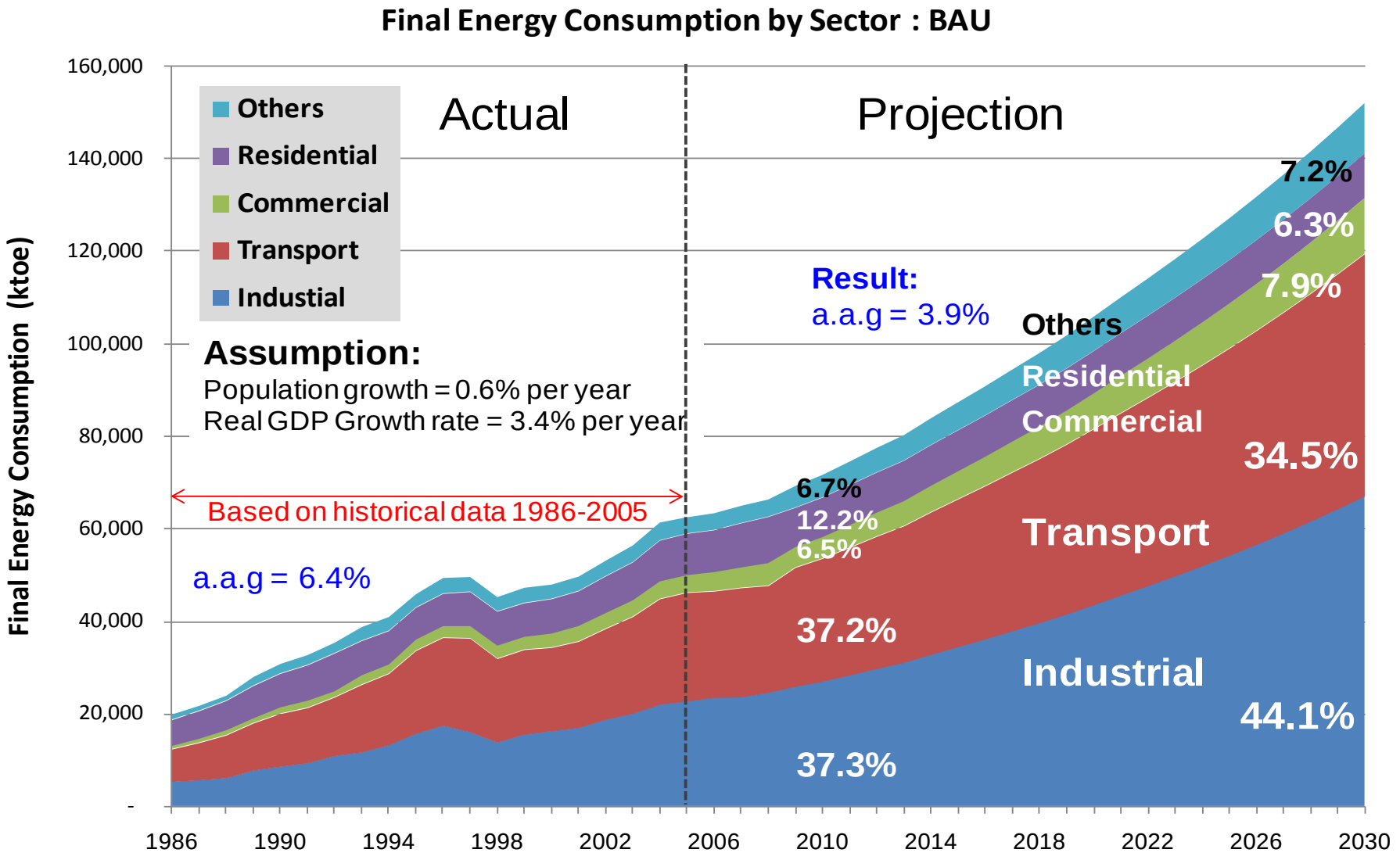
Past, present and future trends (BAU) on final energy consumption

	1986 Reference#1	2005 (Reference#2)	2030
Industrial sector	 100	 431 (100)	 1,277 (296)
Commercial/ residential sector	 100	 200 (100)	 340 (170)
Transport sector	 100	 335 (100)	 748 (223)
All sectors	100	317 (100)	772 (244)
Real GDP (constant 1988)	 100	 307 (100)	 785 (256)

Source: JGSEE 2010

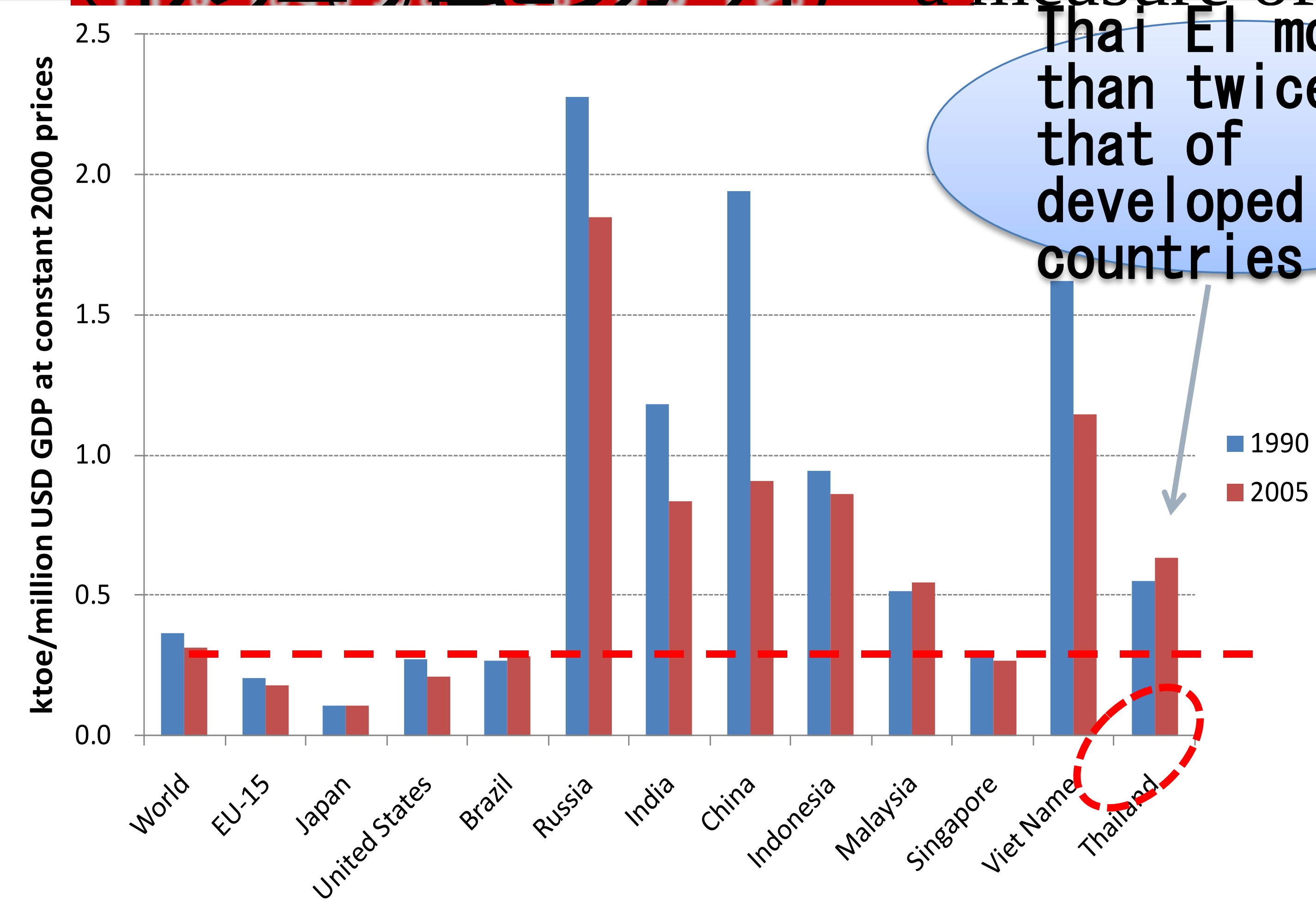
Energy consumption pattern

Source: Actual: DEDE. Projection: JGSEE 2010



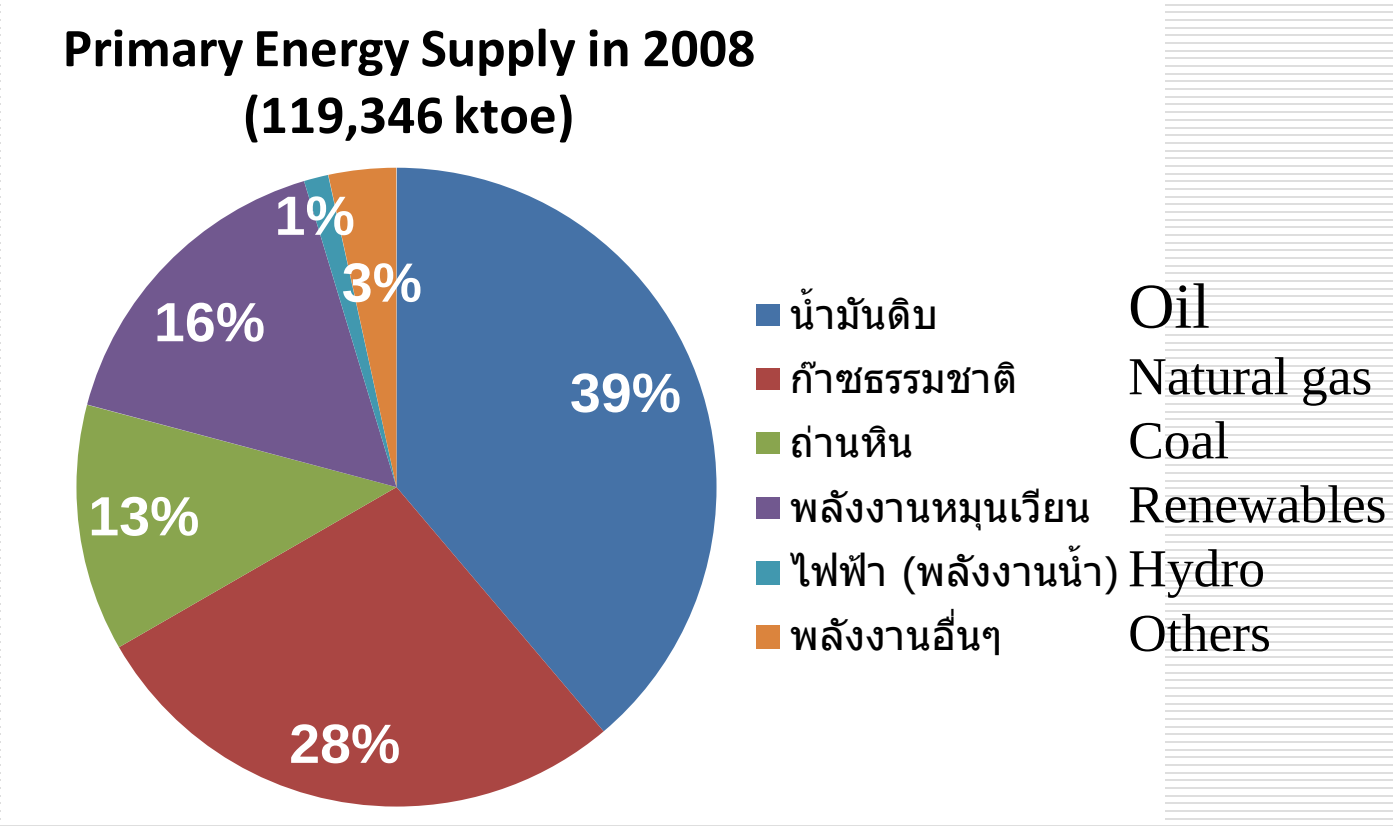
Energy Intensity （Energy consumed per GDP）

– a measure of energy



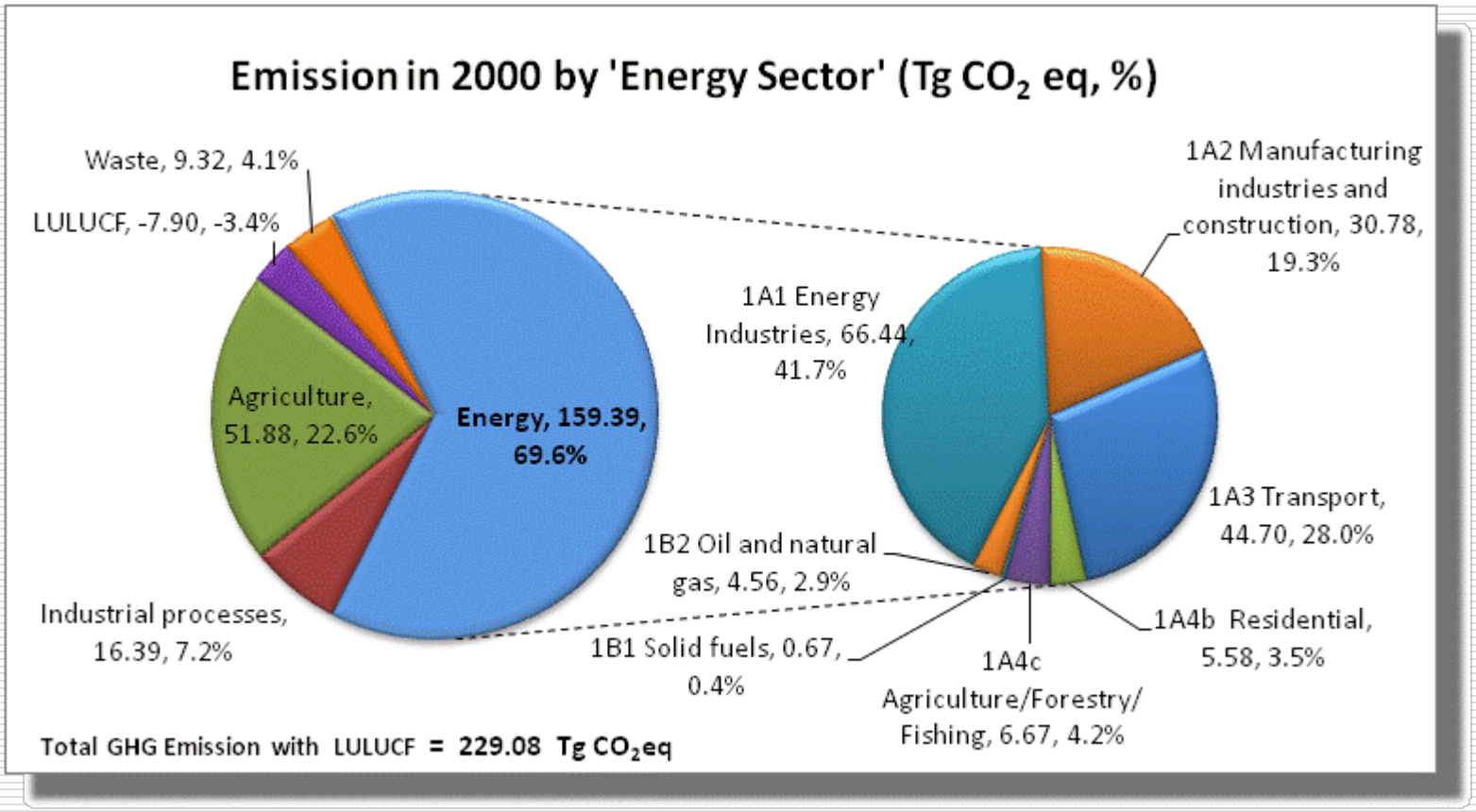
GDP World Resour

Energy Mix 2008



Fossil ~ 80%, RE (traditional) 10%, RE (new) 6%

Energy–related CO_2 emission: 70% of total (2007)



Source: Sirintornthep Towprayoon et al

Key Energy and Climate Security Challenges

Reality – energy consumption and GHG emission will continue to grow with economic development

- Reducing energy intensity
- Reducing import dependence (currently > 50%)
- Mitigating energy price impacts without undue subsidies
- Reducing dependence on natural gas for power generation (currently 70%)
- Reducing reliance on fossil fuels (>80% for energy, and 90% for electricity)
- Increasing access to modern and clean energy in the rural sector

Energy policies and measures related to CO_2 mitigation (1)

- Thailand has not set target for CO_2 reduction
- But has voluntarily introduced mitigation actions through key national energy development plans

Energy policies and measures related to CO_2 mitigation (2)

- Lowering carbon intensity in power generation from 0.47 to 0.37 kgCO_2/kWh by 2030 in the Power Development Plan (PDP2010):
  - Introducing nuclear 11% (5,000 MW)
  - Renewables 6%
  - Hydro (import) 19%

  (*Though share of coal will rise from 19 to 23% to offset reduced share of natural gas from 70 to 40%)*

Energy policies and measures related to CO_2 mitigation (2)

- Introduced Alternative Energy Development Plan (2008 – 2022), with potential CO_2 emission saving of 42 mt in 15 years
- RE targets for 2022
  - Natural gas for vehicles (NGV) 8%
  - Renewables 12% (heat and power, and biofuels)

  (*being revised to raise RE targets for 2030 to offset shortfalls from nuclear)*
  - Measures: Attractive feed-in-premium (adder), soft loans, tax, CDM, etc

Energy policies and measures related to CO_2 mitigation (3)

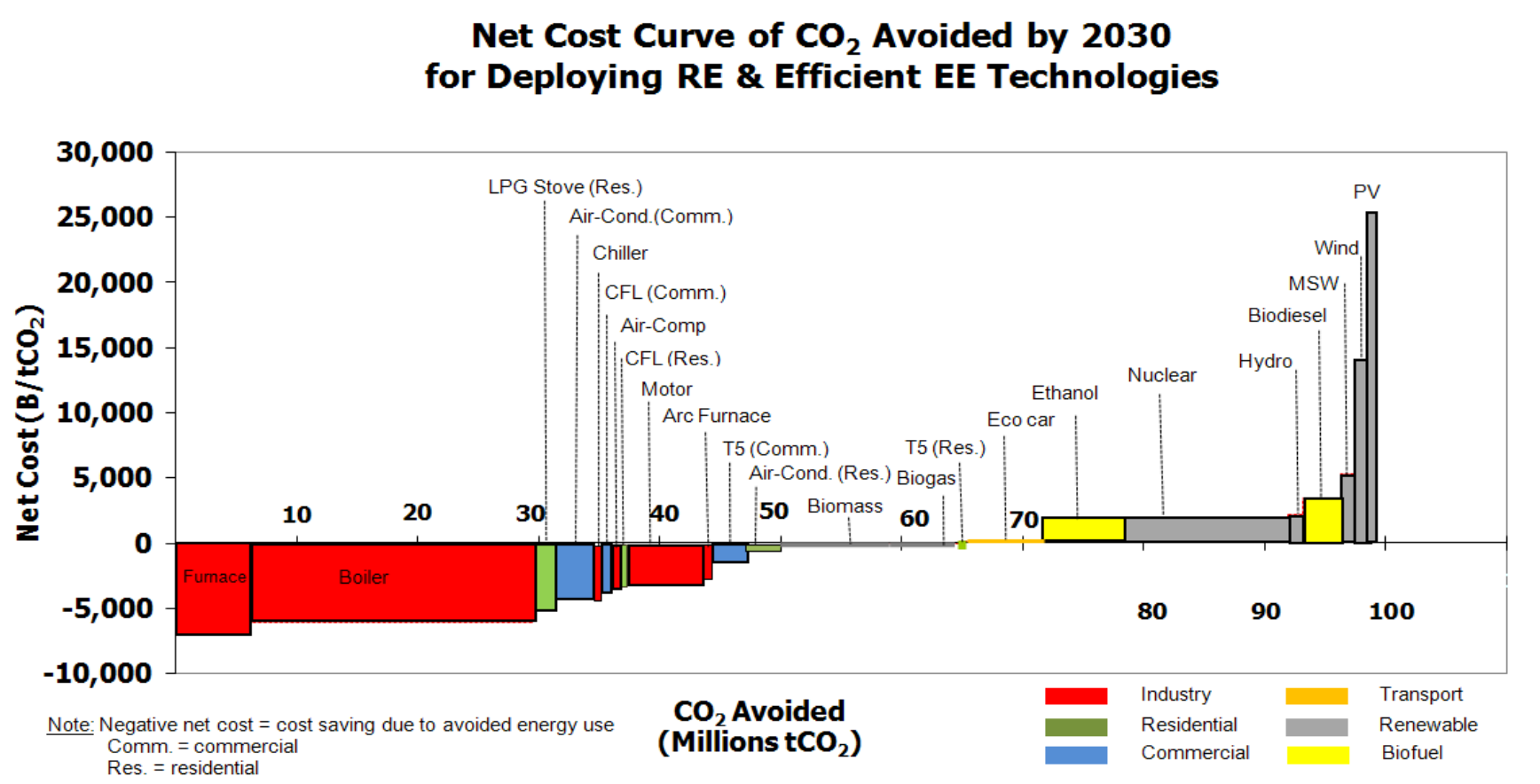
- Developing Energy Efficiency Plan (2011 – 2030) to reduce energy intensity by 25% in 2030 (2005 as base year)
- Potential CO_2 emission saving of about 100 Mt out of 500 Mt (BAU) in 2030 or 20%
- Measures:
  - Mandatory energy management plan and reporting for large industrial and commercial facilities under Energy Conservation Promotion Law (revised 2007)
  - Standards and labels
  - Financial and tax incentives

Estimated Energy Saving Potential

Sector	Relative to BAU in 2030 (Final Energy)		
	Electricity (GWh)	Thermal (ktoe)	Total (ktoe)
Industrial	33,340	10,950	13,790
Commercial	27,420	400	2,740
Residential	18,790	760	2,360
Transport	–	19,880	19,880
Total	79,550	32,000	38,770

Source: JGSEE (2010). Draft Energy Efficiency Plan 2011 -2030

Cost-effectiveness of Energy Efficiency Measures - lowest cost, most rapidly deployed



Source: JGSEE - SIIT (2009). Energy policy 2

Low carbon energy scenarios

- Thailand low-carbon society vision 2030 (Bundit Limmeechokchai, SIIT)
  - Energy-related CO_2 emission to rise from 185 mt/y in 2005 to 560 mt/y in 2030 under BAU scenario
  - Potential CO_2 emission saving of up to 42% from BAU through selected measures in industry, residential and commercial, transportation, power sectors: energy efficiency improvement, fuel switching, alternative and renewable energy

Low carbon energy scenarios (2)

- Thailand climate change mitigation scenario 2050 (*Sirintornthep Towprayoon, Nattapong Chayavato, et al, JGSEE)*
  - Energy-related CO_2 emission to rise from 212 mt/y in 2008 to 1,000 mt/y in 2050 (baseline)
  - Potential CO_2 emission saving of up to 200 mt or 20% from baseline through selected lower-carbon energy technologies in industrial, residential and commercial, transport and power sectors

Thank you for your kind attention

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