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Thailand's INDC

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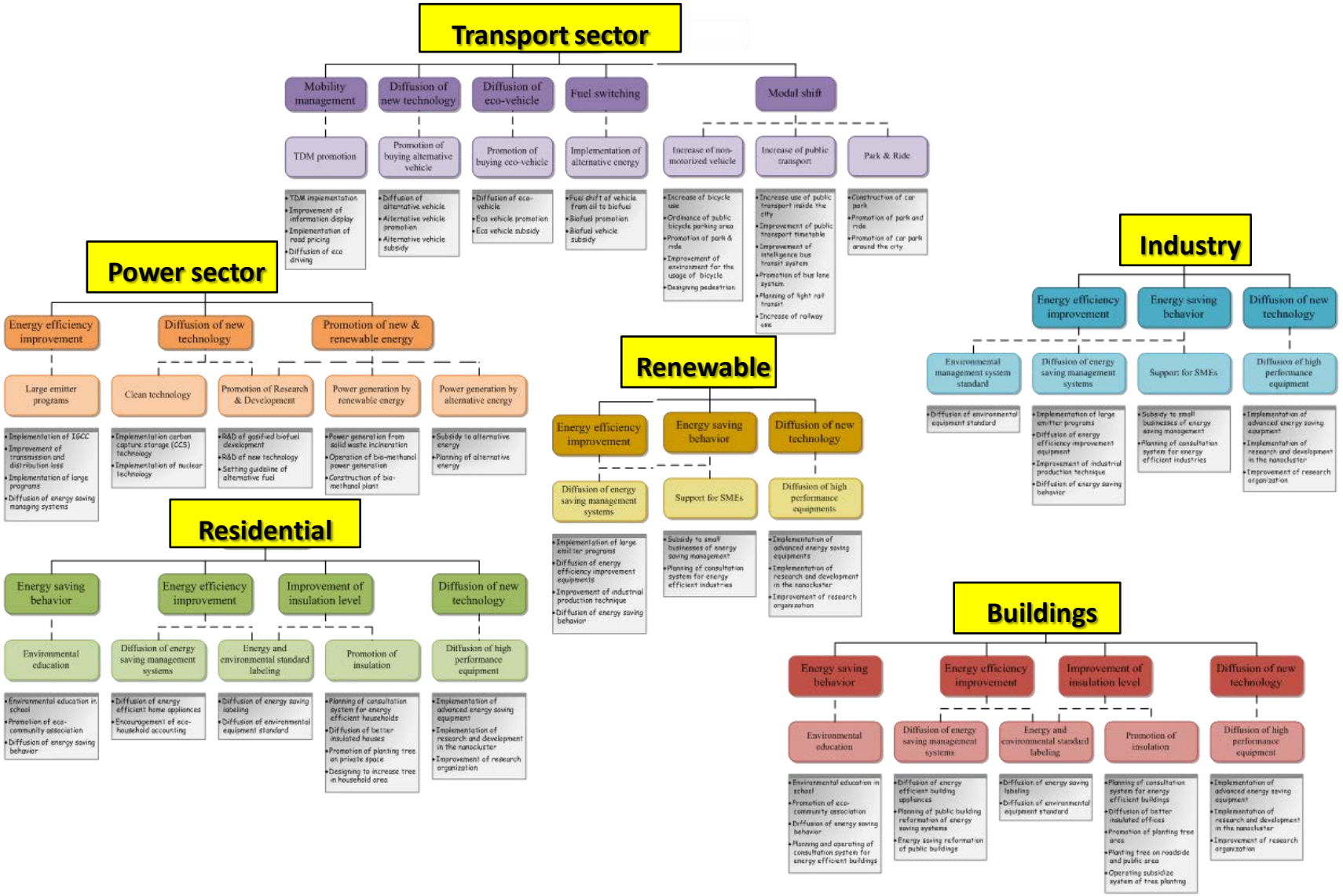
Robust Roadmap to Thailand NAMAs 2020



Thailand's INDC 2030

Thailand's INDC actions are in line with national development plans, and aimed at achieving a reduction in emissions relative to 'business as usual' emissions in 2030, resulting in GHG mitigation, and has an impact that can be measured, reported and verified (MRV).

Thailand is now implementing a national strategy "*Roadmap to Thailand NAMAs 2020*" with clear targets of emission reduction in the range of 20% in 2020 on the basis of domestic resources.

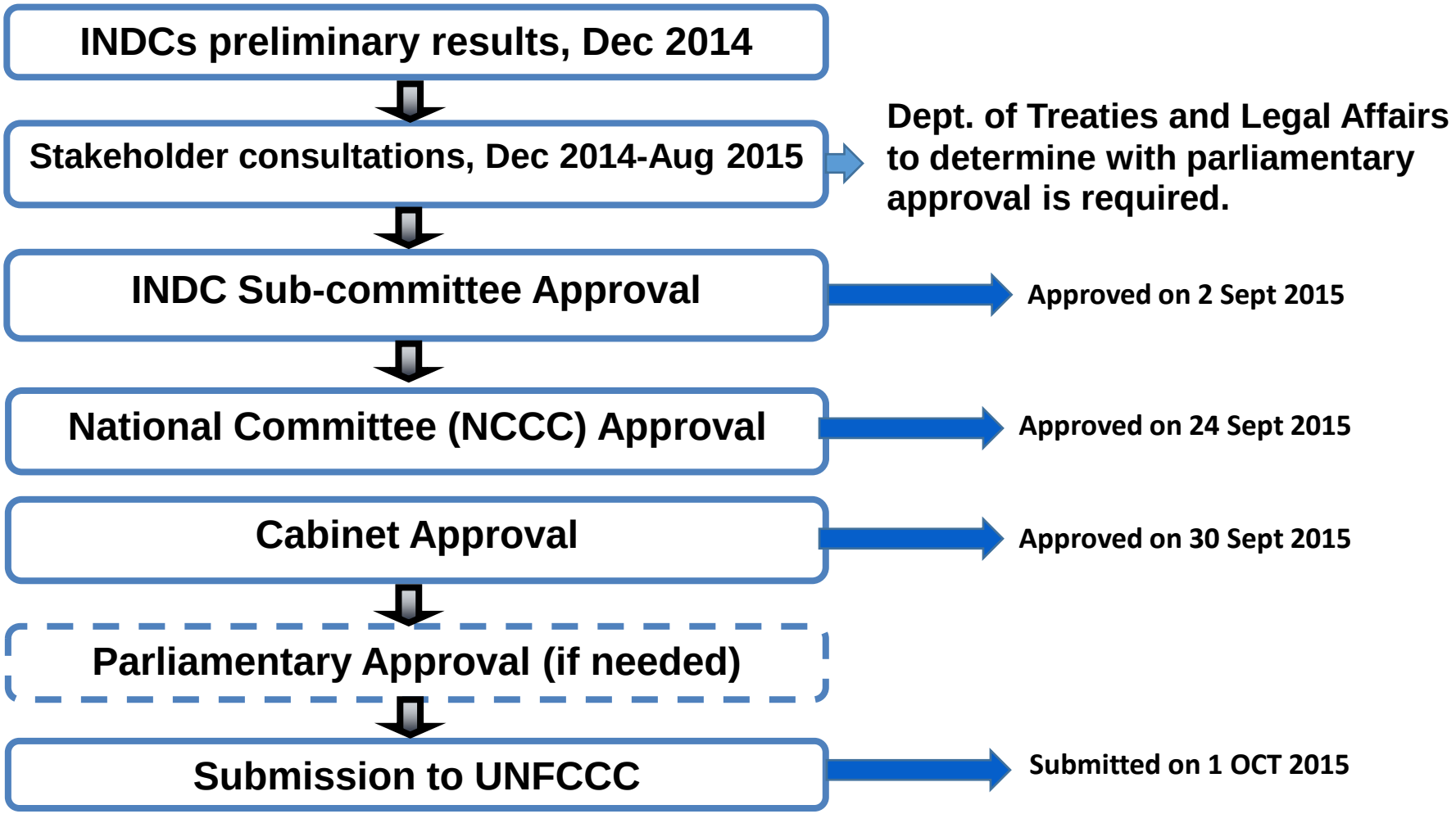
The AIM/Enduse model is again used to construct emission pathways for analysis of "Thailand's INDC 2030".

COP20 Lima, 9 December 2014

Minister of MONRE pledged Thailand's NAMA in Lima COP20

"…… Thailand will lower CO_2 emissions in the range of 7-20% in 2020 when compared to the BAU"

Thailand's INDCs Approval Process



Development of BAU in Thailand's INDC

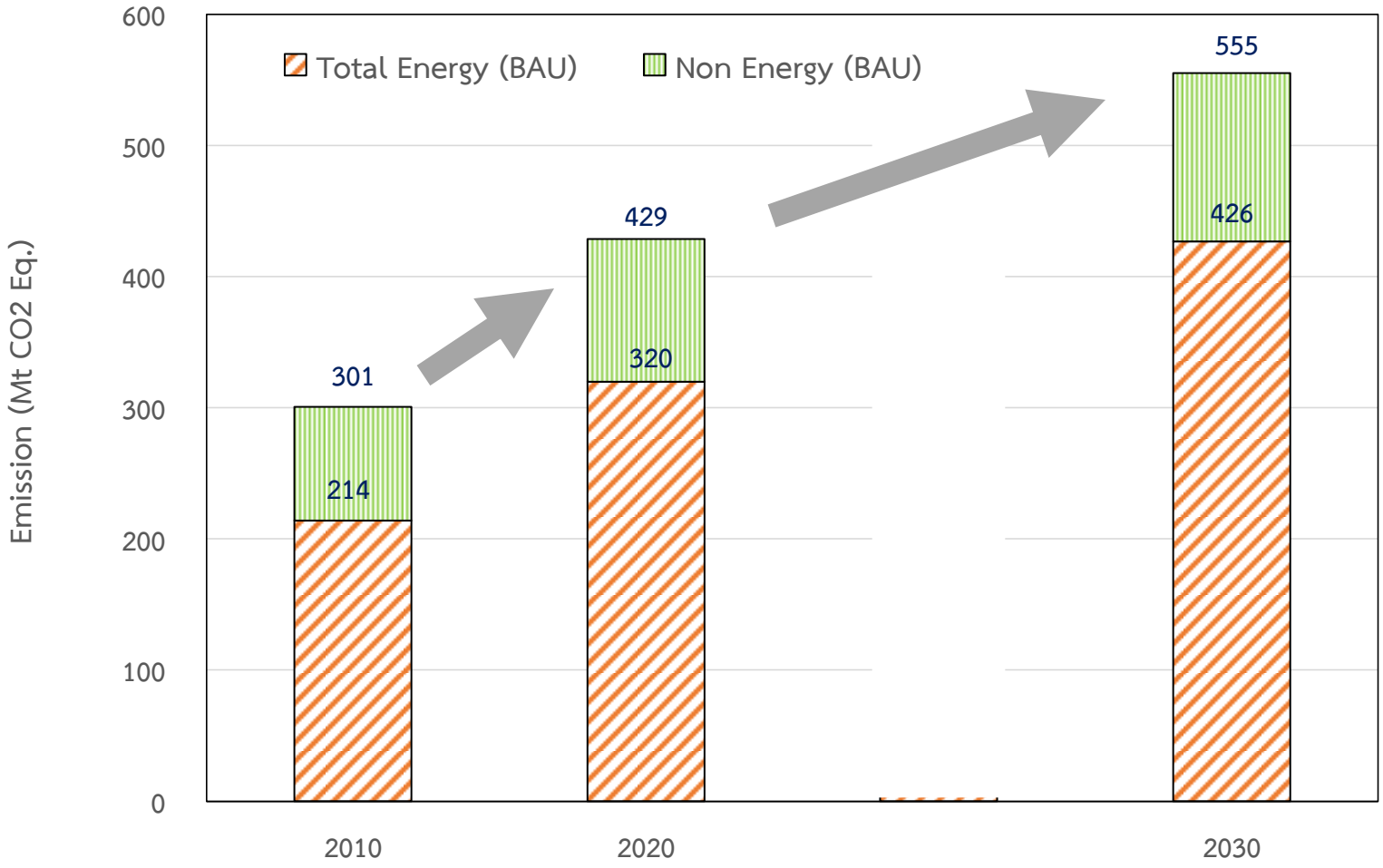
INDC UFI is used to develop Thailand's INDC

Base year	2005
Target year	2030
Sector	Power, transportation, buildings, residential, manufacturing industries, wastes, agriculture, industrial processes
Gases	Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6)
Global Warming Potential	IPCC Fourth Assessment (AR4)
Modeling tool	Asia-Pacific Integrated Model (AIM/Enduse)
Modeling Approach	Bottom-up/End-use approach (by technologies and CO_2 countermeasures)
GDP growth	3.94% p.a. (revised by TH Govt in 2015)
Population growth	0.03% p.a. (revised by TH Govt in 2015)
Energy prices	Oil prices (International Energy Agency, 2015)

Development of BAU in Thailand's INDC

Technology database	Updated SIIT Technology Database 2015 for Thailand
Planning processes	• (Central) National Economic and Social Development Plans • (MONRE) Climate Change Master Plan, 2015-2050 • (MOEN) Power Development Plan, 2015-2036 • (MOEN) Thailand Smart Grid Development Master Plan, 2015-2036 • (MOEN) Energy Efficiency Plan, 2015-2036 • (MOEN) Alternative Energy Development Plan, 2015-2036 • (MOT) Rail Transport System Master Plan, 2013-2030 • (MOI) National Industrial Development Master Plan, 2012-2031 • (MONRE) Waste Management Roadmap
Intl market mechanism	Thailand will explore the potentials of bilateral international MBM

Projection of Thailand's Economy-Wide GHG Emissions In the BAU of Thailand's INDC



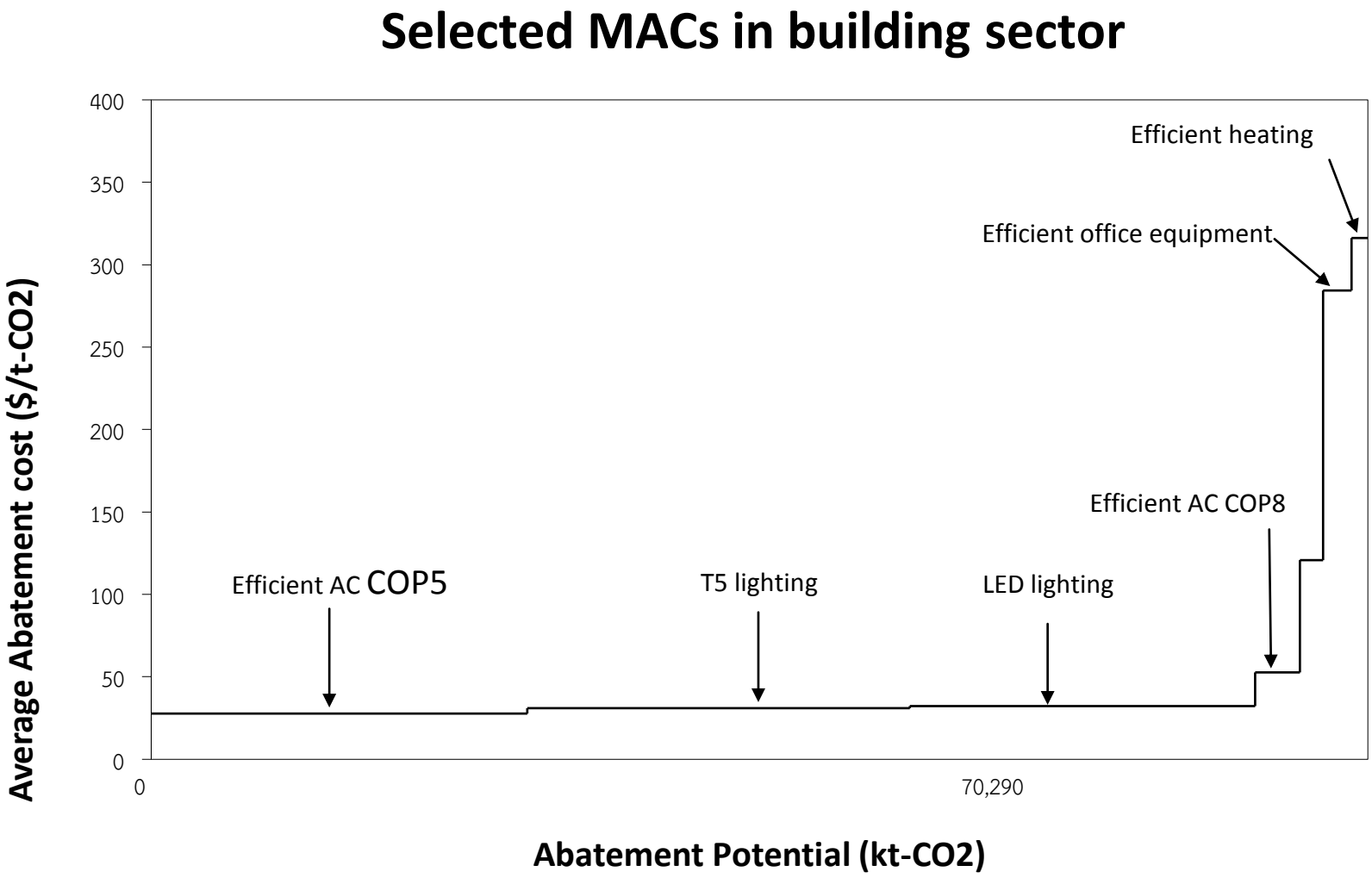
Notes: 1) Non energy emissions include wastes, agriculture and IPPU. LULUCF is excluded.

Development of CMs in Thailand's INDC

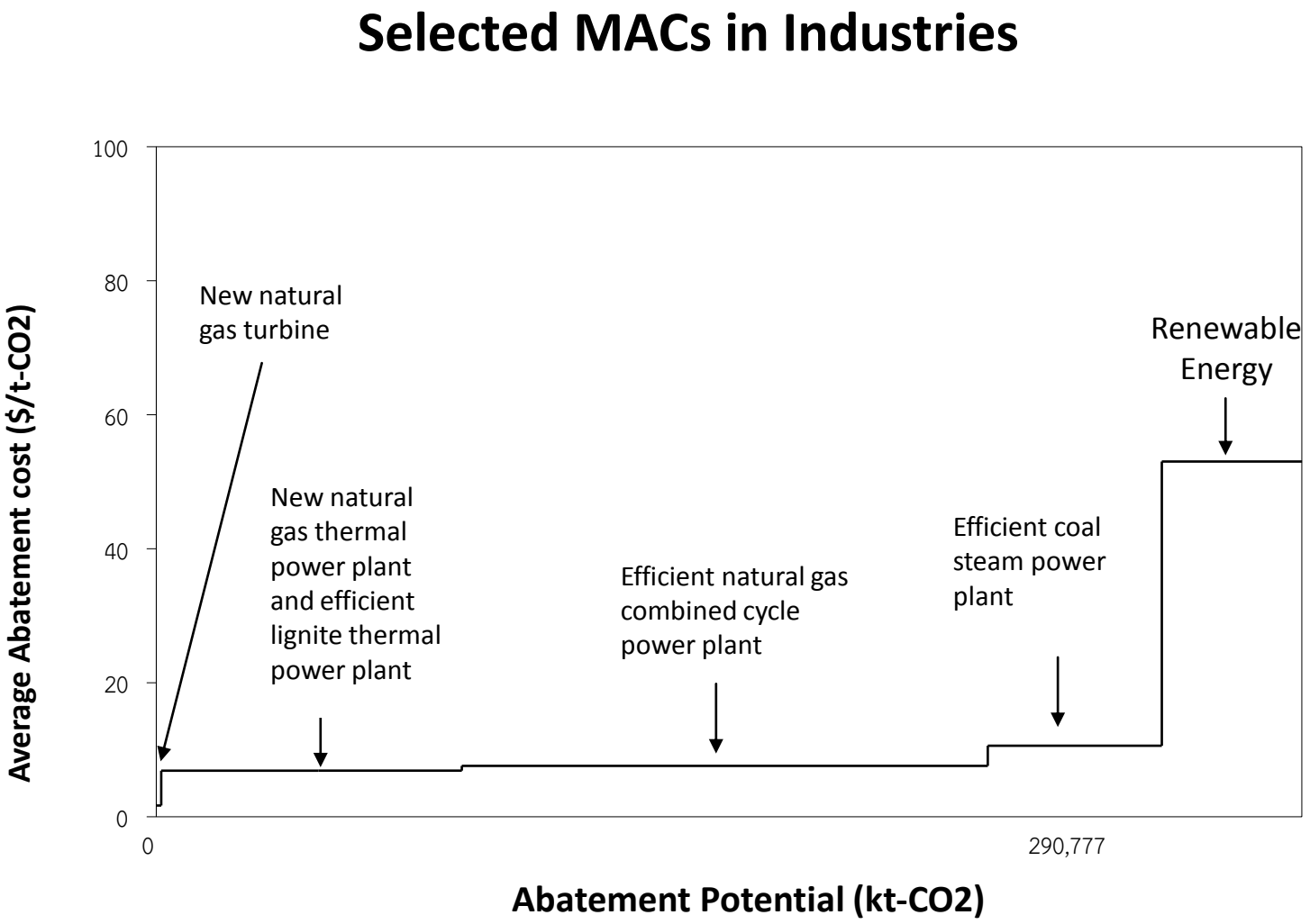
INDC Screening Criteria

- Consistent with National Policies among Ministries
- Technical feasibility of implementation such as CCS
- Feasibility & acceptable MRV
- Social acceptance such as nuclear
- Return on investment: PBP and IRR
- Abatement costs

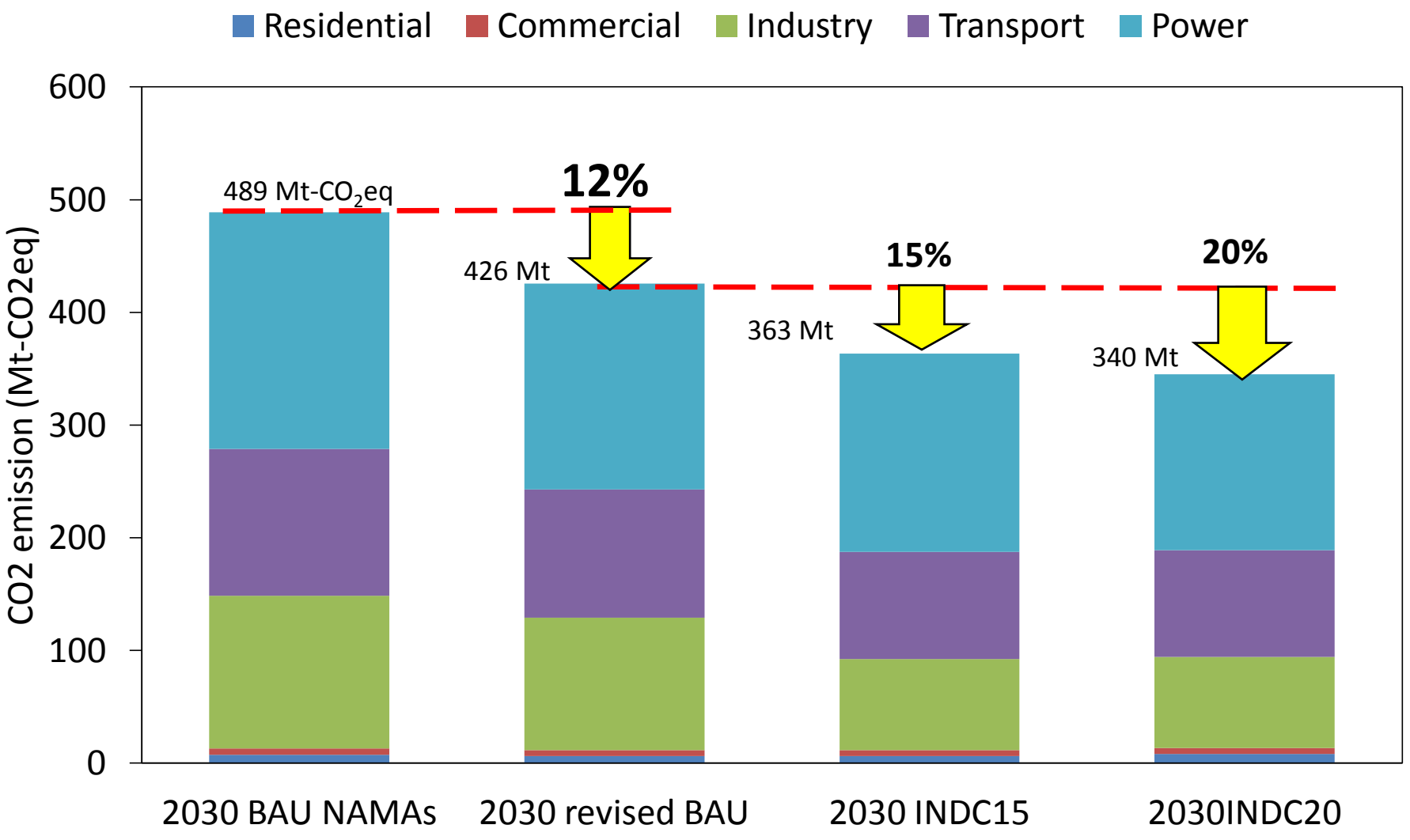
Development of CMs in Thailand's INDC



Development of CMs in Thailand's INDC



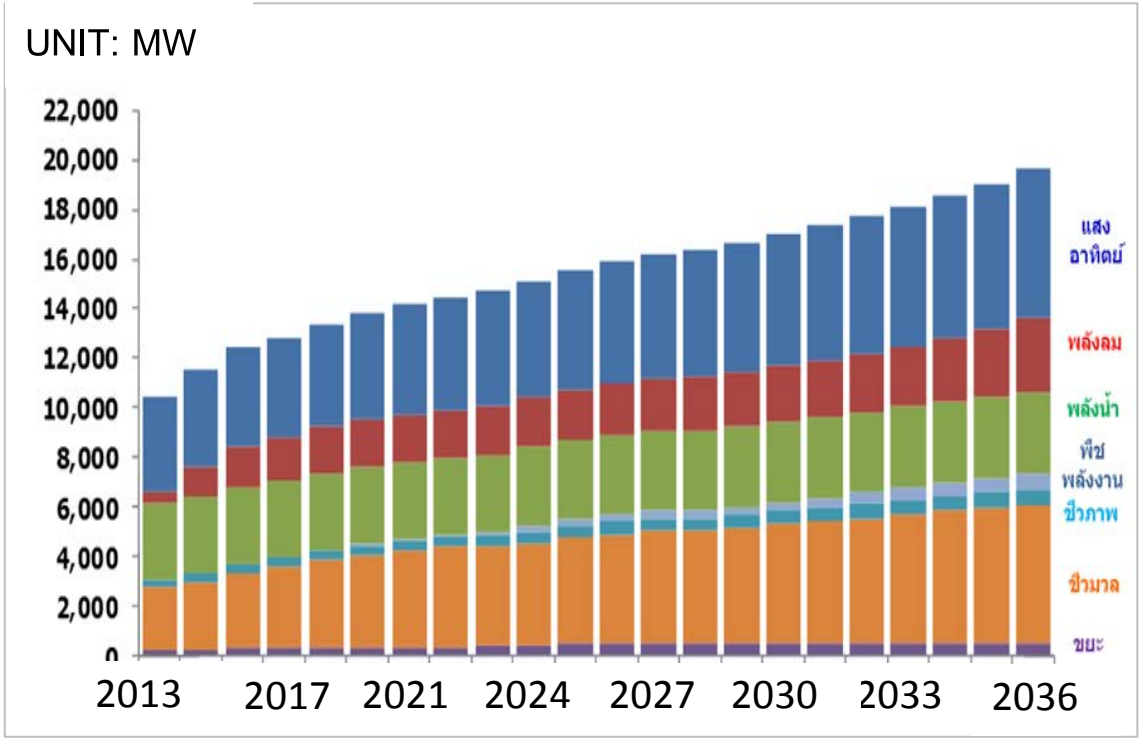
Comparison of CO_2 emissions in 2030



Alternative Energy Development Plan 2015 (AEDP)

Year	Solar PV	Wind	Hydro	Waste	Biomass	Biogas	2nd Gen	TOTAL
2014	1 298	225	3 048	66	2 542	312	-	7 490
2036	**6 000**	**3 000**	**3 282**	**500**	**5 570**	**600**	**680**	**19 634**

Source: AEDP2015 (Sept, 2015)



INDC20 in 2030 by AIM/Enduse

Solar PV = 500 MW

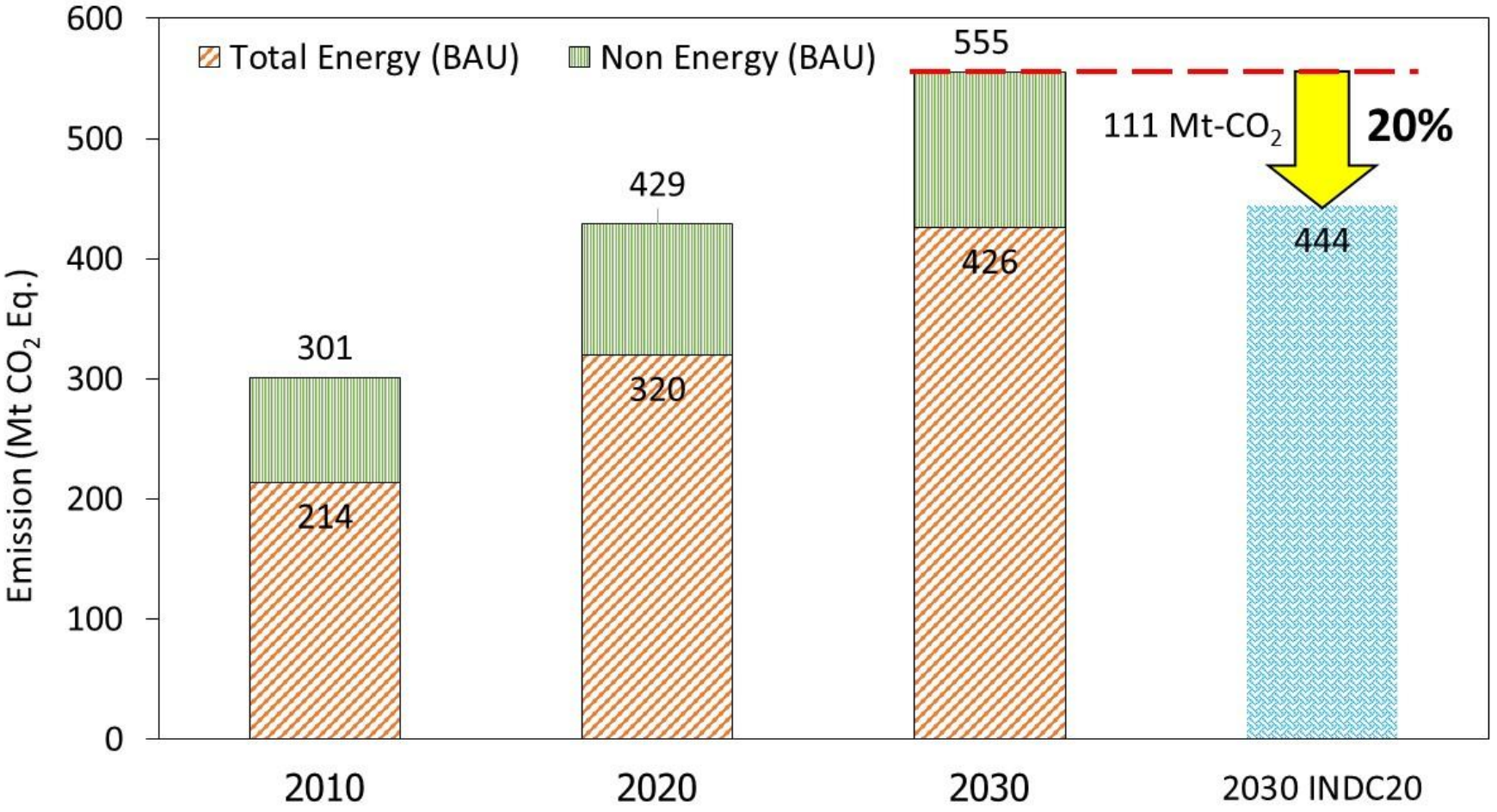
Wind = 300 MW

Hydro = 1 600 MW

Biomass = 3 300 MW

Thailand's Economy-wide GHG Emissions

Thailand's INDC: Ambitious Target of 20-25% in 2030



UN NY, 30 Sept 2015

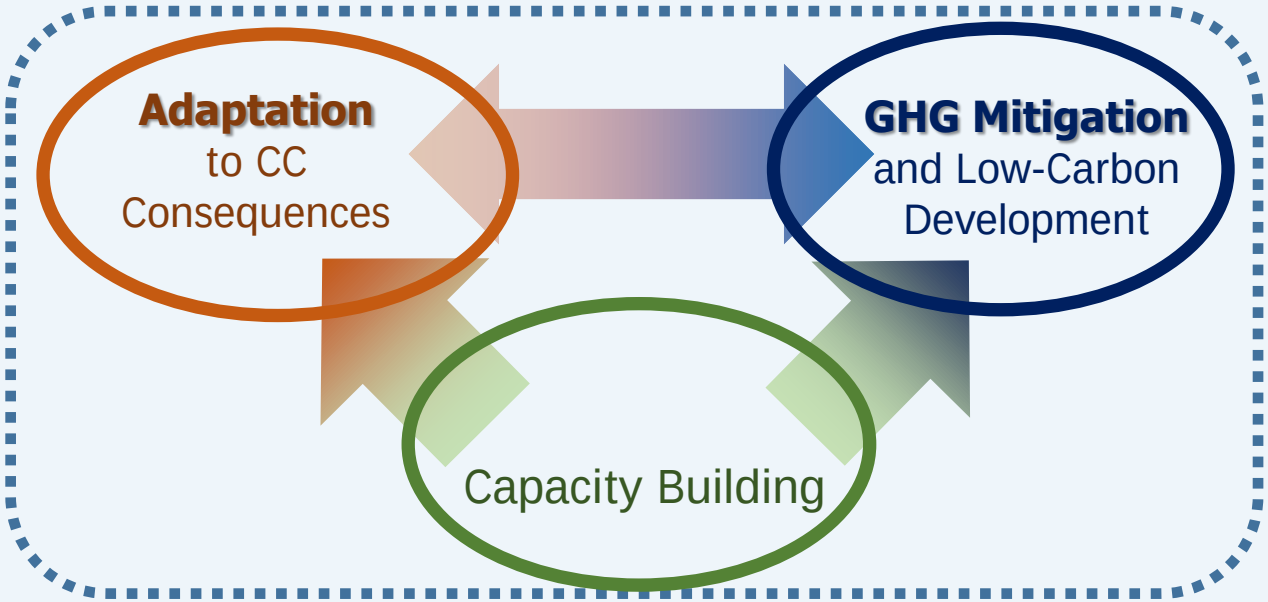
PM applauds 2030 Agenda, pledges work towards a sustainable Thailand including INDC 2030

"…. On Thailand's part, we reaffirm our commitment under the **Intended Nationally Determined Contributions (INDCs)** to reduce our GHG emissions between **20 and 25% by 2030**"…

How Thailand Achieves INDC

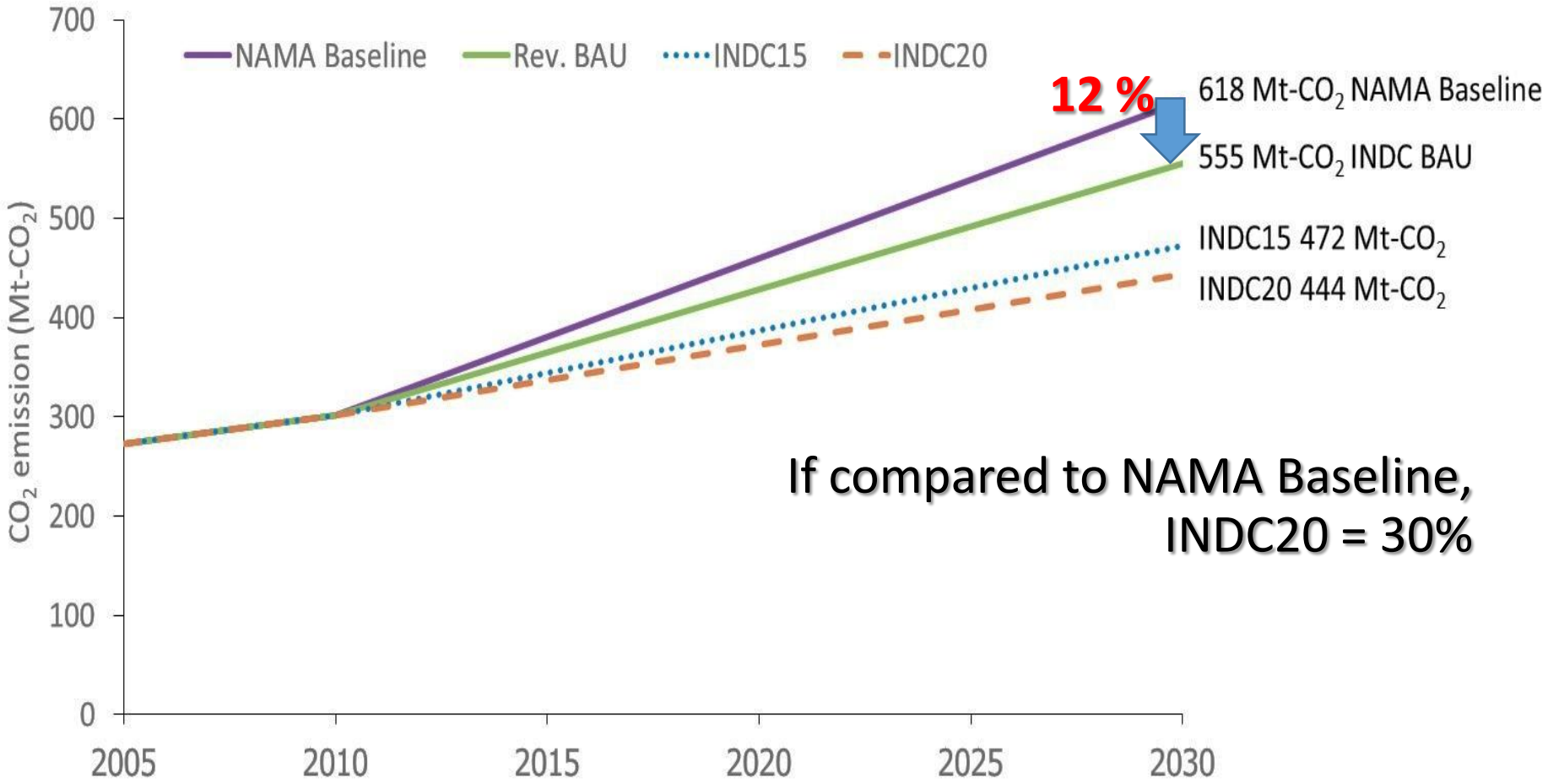
National Economic and Social Development Plan

Climate Change Master Plan 2015-2050



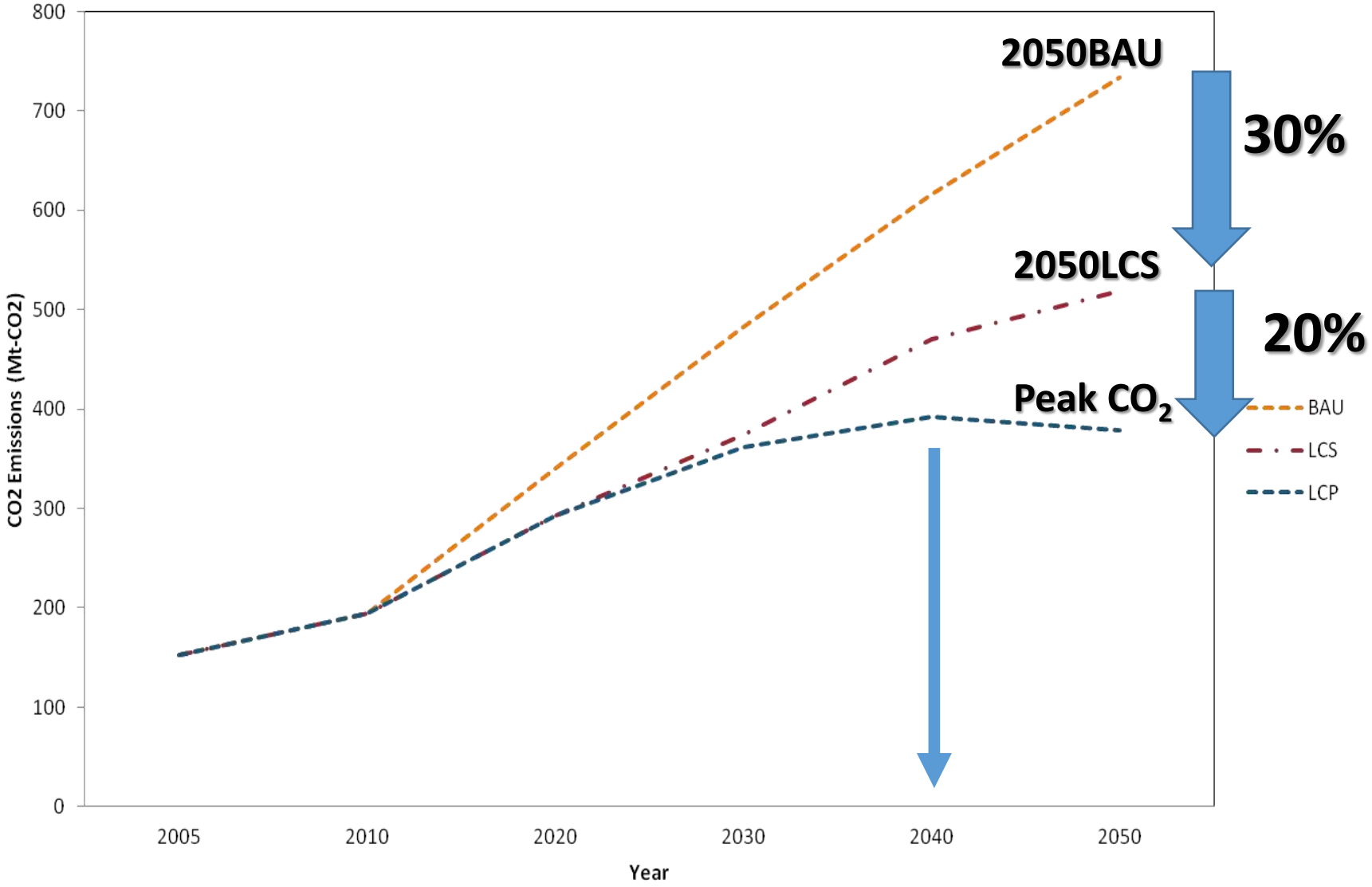
Source: MONRE (2015)

Economy-Wide GHG Mitigation Potential in 2030



Thailand's Post2020 Scenarios

Low Emission Pathway and Peak CO_2 Scenarios



Conclusions

- In 2030 Thailand's INDC will not result in **transformational changes**.
- To achieve the objective, Thailand needs, i) **Institutional Arrangement** ii) **Capacity Building**, iii) sustainable **Feed-in Tariff scheme** for **RE**, iv) enforcement of **EE laws in buildings and industries,** v) **co-funding** of the LCS actions in both **demand side** and **clean supply side** including **low carbon Technology Transfer**.
- The **Peak target** will not be achieved **if it is not planned & implemented in the early stage**.
- In addition, **M R V** of such LCS actions are of necessity.

Selected LCS publication using AIM in FY2015

Journals

1. Sujeetha and Bundit (2015). *Low carbon society scenario analysis of transport sector of an emerging economy—the AIM/Enduse modelling approach*, **Energy Policy**, Vol. 81, June 2015, pp. 199-214.
2. Panida, Kamphol and Bundit (2015). *Alternative energy and CO_2 mitigation in Thai transport sector: an end-use modeling approach and co-benefits analysis*, **Information-An International Interdisciplinary Journal**, Vol. 18, No. 3, March 2015, pp. 941-963.
3. Sujeetha Selvakkumaran; Bundit Limmeechokchai; Toshihiko Masui; Tatsuya Hanaoka; and Yuzuru Matsuoka (2015*). A quantitative analysis of low carbon society (LCS) measures in Thai industrial sector*, **Renewable and Sustainable Energy Reviews**, Vol. 43 (March 2015), pp. 178-195.
4. Artite Pattanapongchai and Bundit Limmeechokchai (2015). *Alternative energy technologies for long-term power generation expansion planning and CO_2 mitigation in Thailand*, **Energy Sources, Part B: Economics, Planning, and Policy**, Vol. 10, No. 3, pp. 271-280.
5. Puttipong Chunark, Panida Thepkhun, Kamphol Promjiraprawat, Pornphimol Winyuchakrit and Bundit Limmeechokchai (2015). *Low Carbon Transportation in Thailand: CO_2 Mitigation Strategy in 2050.* **SpringerPlus**, Vol.4, No.618, pp.1-31.

Selected LCS publication using AIM in FY2015

Conference Proceedings

- Puttipong Chunark1 and Bundit Limmeechokchai (2015). *Energy Saving Potential and CO2 Mitigation Assessment Using the Asia-Pacific Integrated Model/Enduse in Thailand Energy Sectors.* Proceedings of 2015 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2015 AEDCEE) [CD-ROM], 28-29 May 2015, Bangkok, Thailand
- R. Jayatilaka, Pradeep and Bundit Limmeechokchai (2015). *Scenario based assessment of CO2 mitigation pathways: a case study in Thai transport sector*, Proceedings of 2015 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2015 AEDCEE) [CD-ROM], 28-29 May 2015, Bangkok, Thailand, pp. 281-282.
- Selvakkumaran, Sujeetha and Bundit Limmeechokchai (2015). *Low carbon scenarios for an energy import-dependent Asian country: the case study of Sri Lanka*, Proceedings of 2015 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2015 AEDCEE) [CD-ROM], 28-29 May 2015, Bangkok, Thailand, pp. 275-276.
- Selvakkumaran, Sujeetha; Chontichaprin Nithisuttibuta; and Bundit Limmeechokchai (2015). *Thailand's post-2020 greenhouse gas emissions regime in the energy sector*, Proceedings of 2015 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2015 AEDCEE) [CD-ROM], 28-29 May 2015, Bangkok, Thailand, pp. 273-274.
- Pemika Misila; Bundit Limmeechokchai; and Pornphimol Winyuchakrit (2015). *Roadmap to Thailand's nationally appropriate mitigation actions (NAMAs) 2020*: energy security and co-benefit aspects, Proceedings of 2015 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2015 AEDCEE) [CD-ROM], 28-29 May 2015, Bangkok, Thailand, pp. 141-142.

GEO-6

Asia-Pacific Regional Assessment Report

Asia-Pacific Regional Assessment Report

AP OUTLOOKS
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Section 3: Outlooks, Emerging Issues and Megatrends

The AIM has been used to quantify the pathways to achieve leapfrogging development in Asia with a target of 50 per cent reduction in global greenhouse gas emissions by 2050 from the 1990 level (Figure 3.5.2.1). The transformative pathways need to be delineated by taking into account the circumstances of different countries and concrete counter-measures identified from now to 2050.

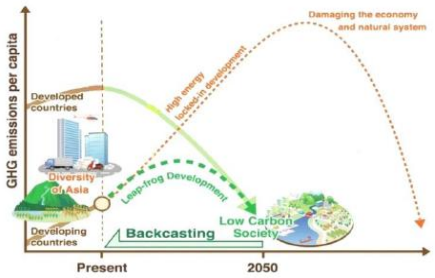

Figure 3.5.2.1 Leapfrog development towards Asia low carbon scenarios (NIES 2014a)

In 2050, global emissions are projected to be 1.8 times the 2005 level, and emissions in Asia will have doubled under the reference scenario. The Asia LCS platform reported that it is feasible to reduce greenhouse gas emissions through low-carbon actions in Asia by 69 per cent compared to the reference scenario in 2050 (NIES 2014b; Figure 3.5.2.2.).

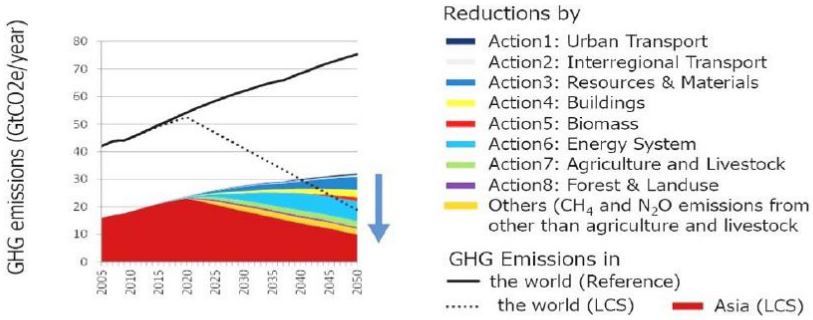

Figure 3.5.2.2 Carbon dioxide reduction potential in Asia low carbon scenarios 2050
Source: NIES 2014b

Greenhouse gas emissions mitigation and national development concepts of low-emission development strategies such as nationally appropriate mitigation actions (NAMAs) and intended nationally determined contributions (INDCs) under the United Nations Framework Convention on Climate Change (UNFCCC) will be the bridges for transformational changes to a low-carbon society (Boos 2014; Lütken 2013). In order to achieve a low-carbon economy by 2050, and avoid locked-in emissions, the region has to plan for its low-emission development pathways in the early stages. One such early climate action is the Carbon and Cities Climate Registry (cCCR) as the global response of local governments to measurable, reportable and verifiable (MRV) climate action. The cCCR is a global mechanism developed for local governments by local governments (Merrill and Chung 2014) that enables them to publicly and regularly report local climate action developments in terms of climate mitigation and adaptation action. The cities which have reported on their climate mitigation and adaptation actions are shown in Figure 3.6.3.1.

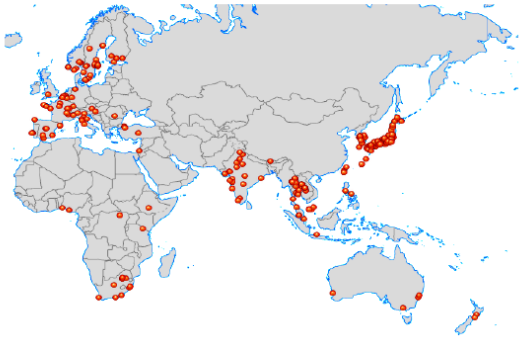

Figure 3.6.3.1. World, reported climate mitigation and adaptation actions in the cCCR
Source: Merrill and Chung 2014

Source: Draft, GEO6 (UNEP, 2015)

JCM, MOE Japan

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Thank You