REALIZING THE INDC: THE ROLE OF RENEWABLE ENERGIES IN VIETNAM

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Content of this presentation

1. Introduction
2. Materials and methods
3. Results
4. Discussion
5. Conclusions

   Next activities

1. INTRODUCTION

1. Introduction

- Global scale: PA 2.0°C or even 1.5°C target
- GHG emissions reduction target in Vietnam's INDC (Sep. 2015)
- Latest energy development policy of Vietnam: Renewable Energy Development Strategy (REDS, Nov. 2015)
- Other background: National Green Growth Strategy, Power Development Plan 7, etc.

2. MATERIALS AND METHODS

2. Materials and methods

AIM/CGE[nation] model is used

Scenarios:

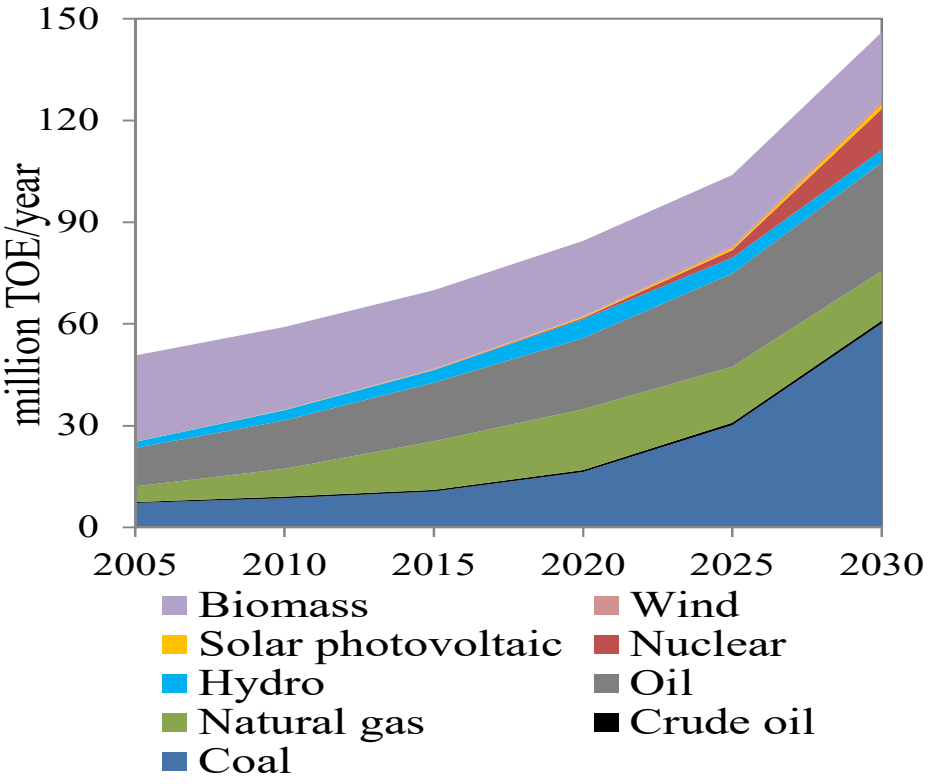
Indicators	BaU	LowRE-LowINDC	LowRE-HighINDC	HighRE-LowINDC	HighRE-HighINDC	AddRE-HighINDC	FreeRE-HighINDC
Socio-economic development (%/year) (Source: SEDP [40])		Period		Population growth		GDP growth	
		2006–2019		1.1		7.0	
		2010–2020		1.0		6.0	
		2021–2030		0.6		6.0	
		2005–2030		0.9		6.2	
Share of renewables in power generation (%)	**Energy**	2020	2030	2020	2030	2030	No exogenous setting of RE share
	Nuclear	2.1	9.6	2.1	10.1	10.1	
	Hydro	18.3	8.8	19.6	9.3	9.3	
	Biomass	0.6	1.0	3.0	6.3	6.3	
	SPV	3.1	3.1	3.5	6.0	12.0	
	Wind	0.7	2.3	1.0	2.7	5.4	
	TOTAL RE	24.8	24.8	29.2	34.4	43.1	
		(Source: NEDS [16], PDP7 [17])		(Source: REDS [15])		(Source: REDS [15] and assumption)	
GHG emissions reduction in 2030 compared to BaU (%) (Source: Vietnam INDC [12])	None	At least 8	25	At least 8	25	25	25

3. RESULTS

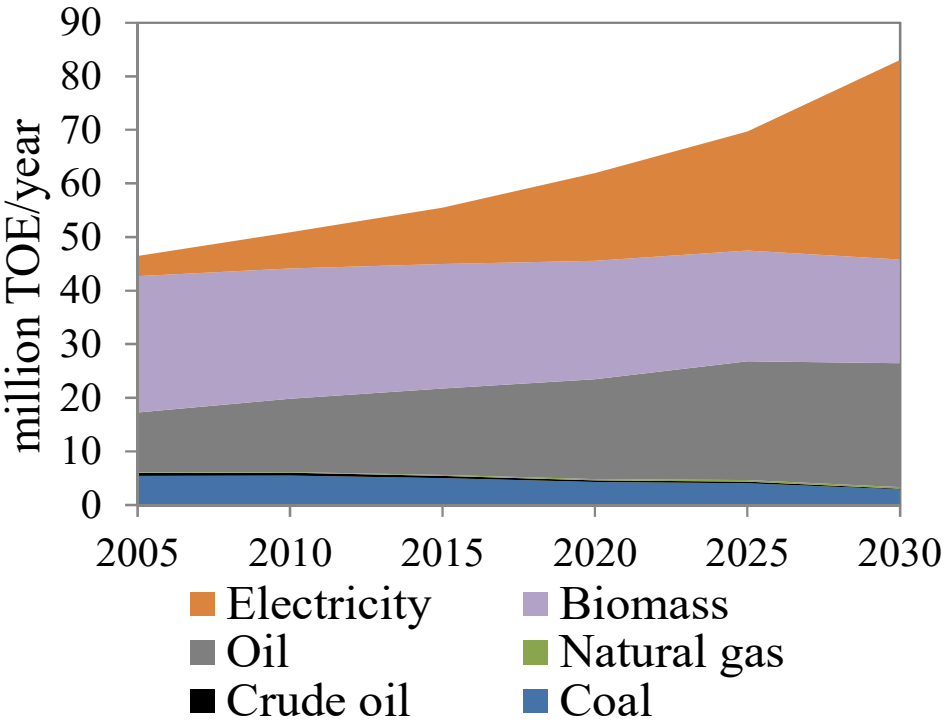
3.1. Outlook for Vietnam in 2030—The Base Scenario

Population and GDP increase by 1.2 and 4.5 times

Primary energy supply



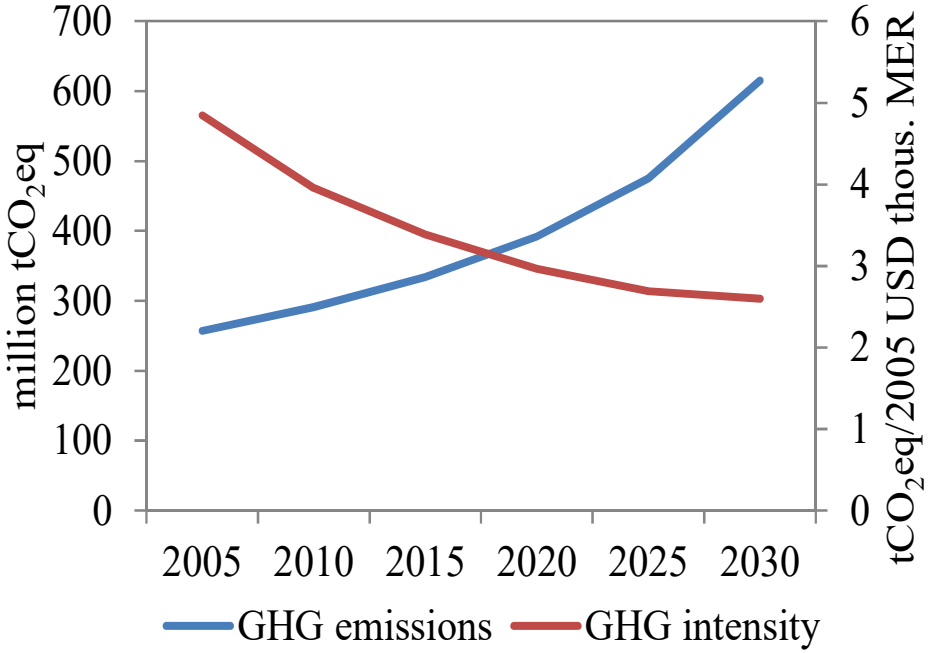
Final energy demand



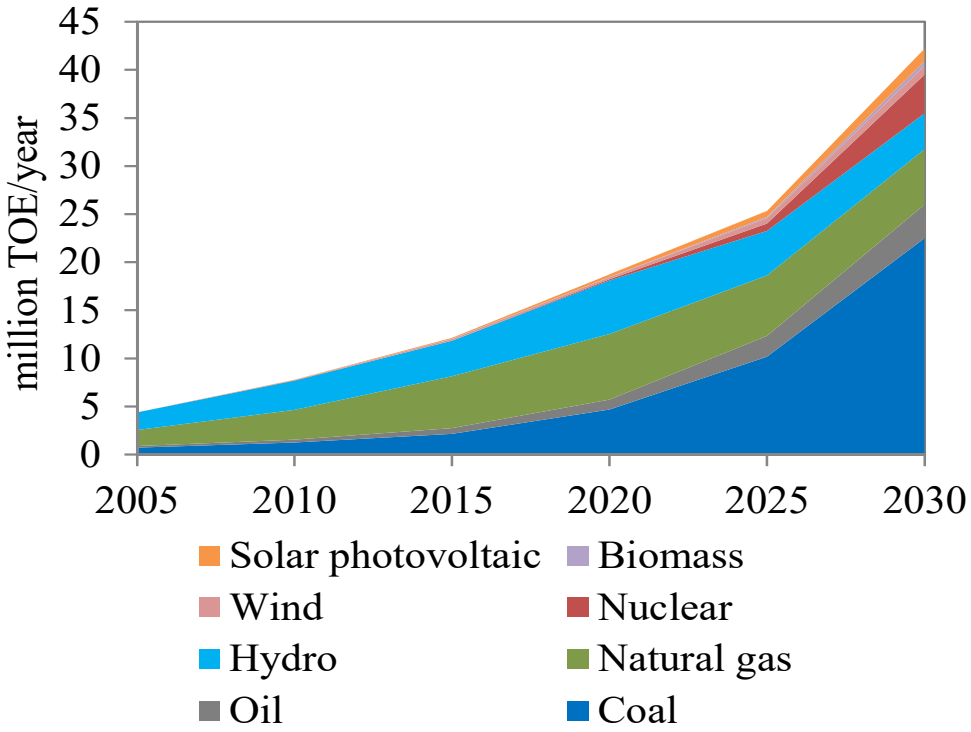
3.1. Outlook for Vietnam in 2030—The Base Scenario

Population and GDP increase by 1.2 and 4.5 times

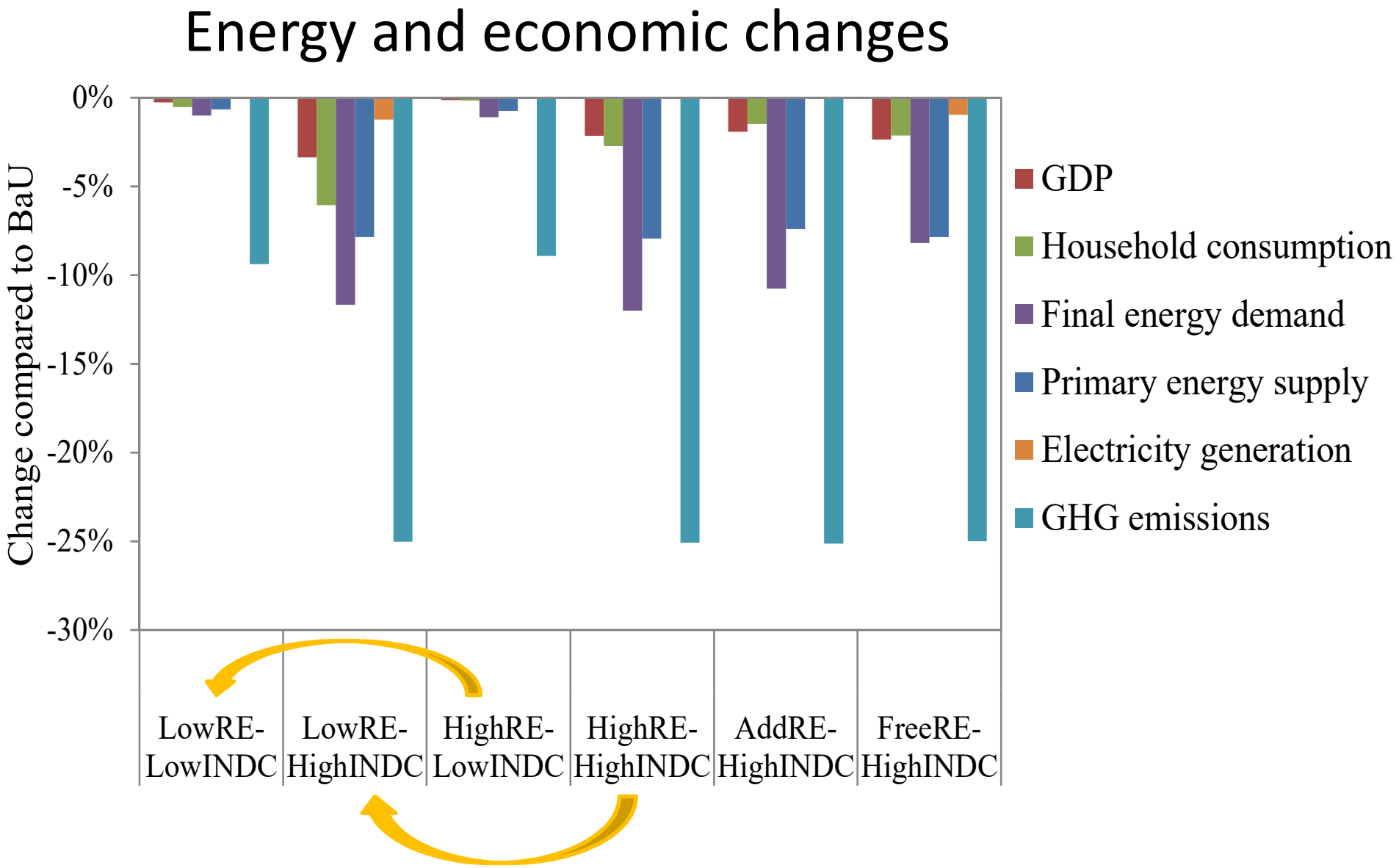
GHG emissions and intensity



Electricity generation



3.2. Implication of Vietnam's INDC and the Role of RE

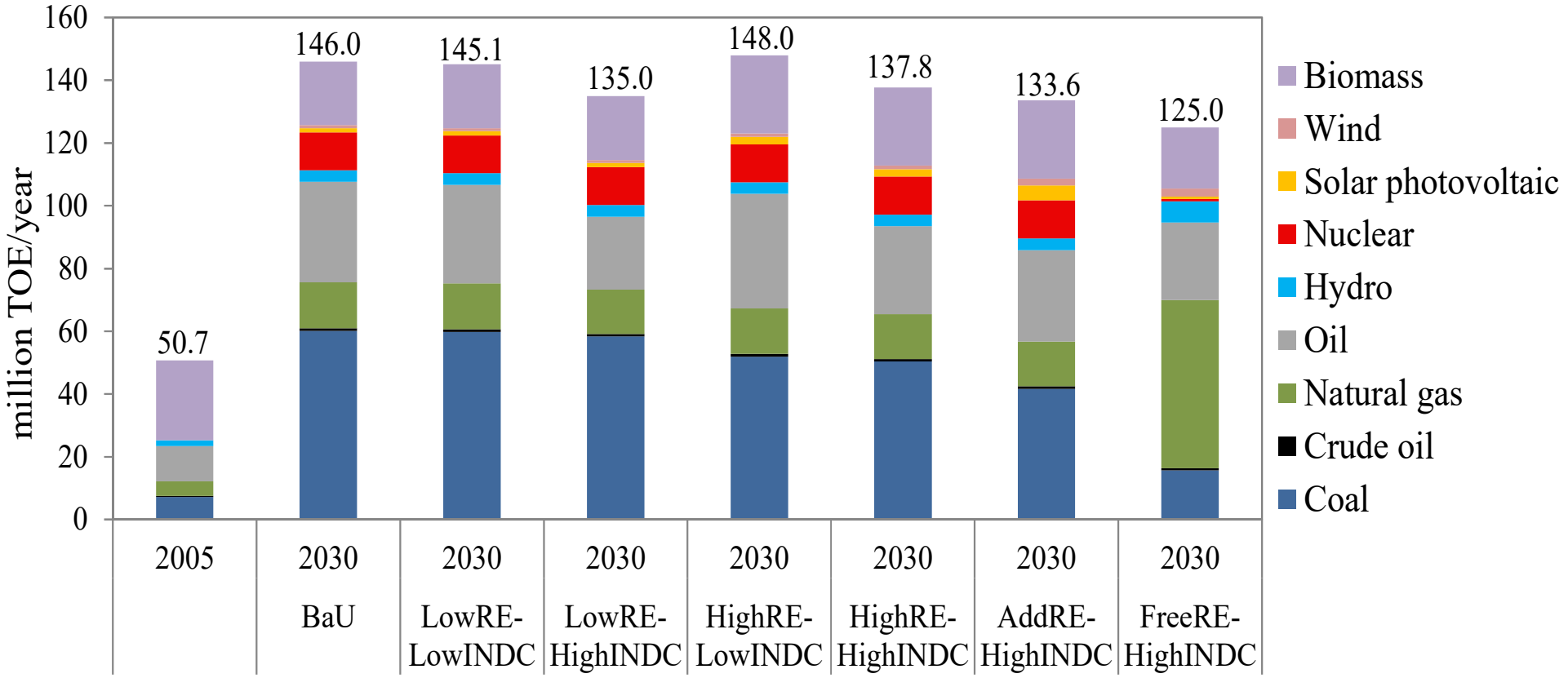


3.2. Implication of Vietnam's INDC and the Role of RE

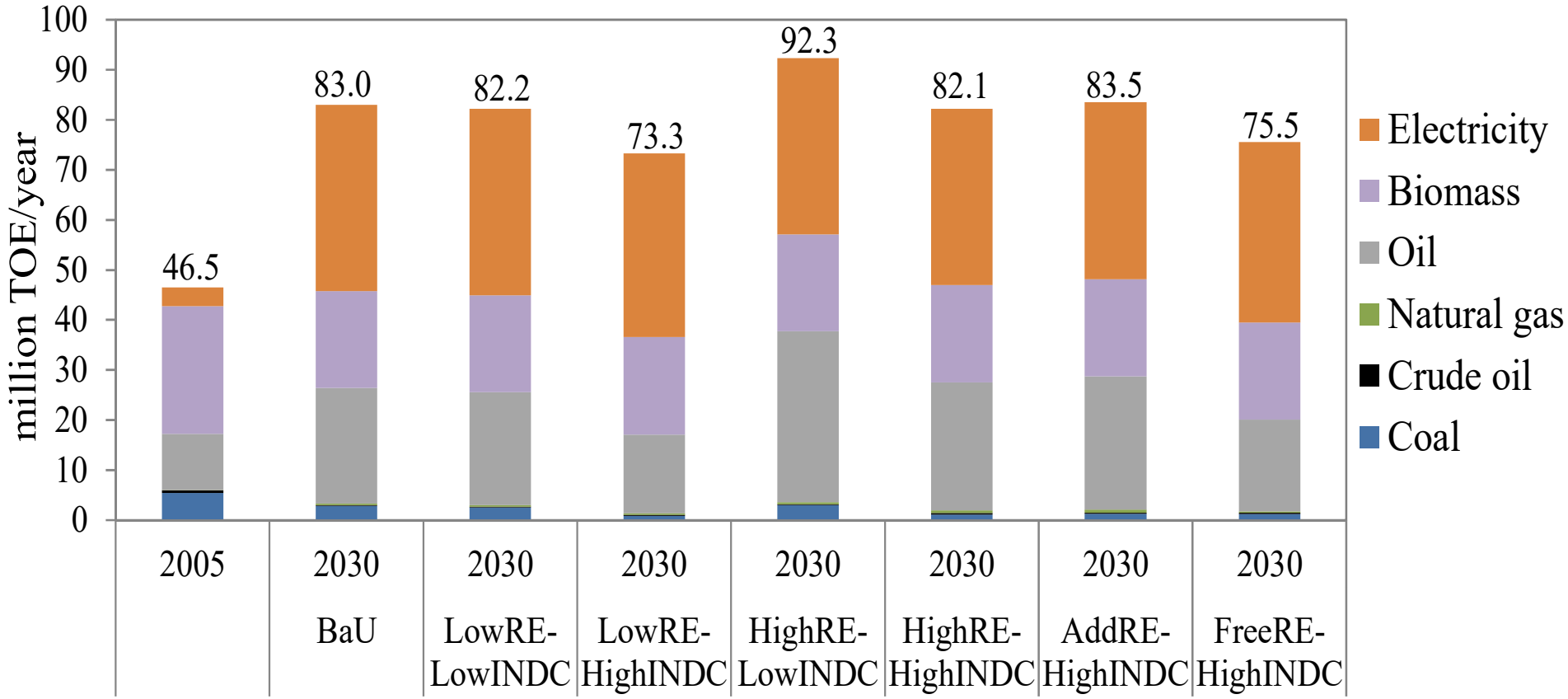
✓ **Total GHG emissions in 2030: 615 $MtCO_2eq$**

Scenarios	GHG emissions reduction target (%)	GHG emissions ($MtCO_2eq$)	GDP loss (%)	Welfare loss (%)	Carbon price ($/$tCO_2$ eq)
LowRE-LowINDC	8	50	0.3	0.5	4.3
LowRE-HighINDC	25	156	3.4	6.0	89.2
HighRE-LowINDC	8	50	0.1	0.2	3.6
HighRE-HighINDC	25	156	2.1	2.7	77.6
AddRE-HighINDC	25	156	1.9	1.5	65.8
FreeRE-HighINDC	25	156	2.4	2.1	47.5

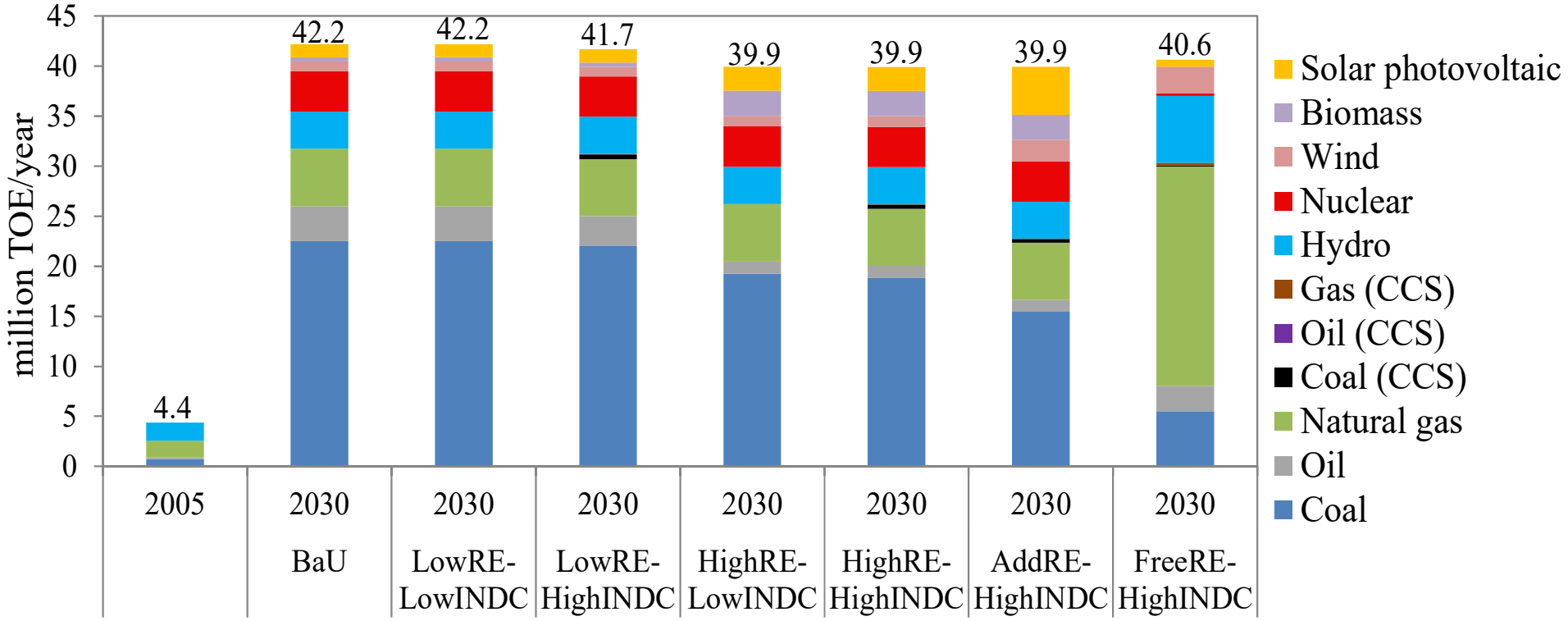
3.2.1. Change in Primary Energy Supply



3.2.2. Change in Final Energy Demand



3.2.3. Change in Electricity Generation



4. DISCUSSION

4.1 Result's implications (1)

1. The more **stringent the GHG emissions reduction target** that a country commits to, the more **challenges** will be faced by the **energy system** and **economy** of the country

→ An appropriate energy policy, with strong deployment of renewable energies, could lessen the challenges and make climate change policy more feasible

4.1 Result's implications (2)

2. The rapid increase in **electricity demand** could be met when the contribution of **renewable energies** in the power generation mix was significantly increased

→ achieve energy security and maintain the 7.0% economic growth target in the next period for Vietnam

4.1 Result's implications (3)

3. **Reduction in economic development** due to the reduction of GHG emissions. This cost should not be interpreted independently

→ Reduce the **costs of climate impacts**: increased flooding, agricultural damage, reduction in investment for climate change adaptation and resilience, the cost of resource losses, health benefits associated with the reduction in air pollution

4.1 Result's implications (4)

4. The **price-based selection** of an energy option might allow the energy system to choose the cheapest energy sources

→ It might not encourage the deployment of REs in the primary energy supply as well as the power generation option

→ early investment in low-carbon infrastructure is important in order to avoid carbon lock-in

4.2 Limitations (1)

- **CCS is still at the pilot project stage** and its potential in Vietnam is still being evaluated due to political and financial barriers.

- It might be impossible for Vietnamese policymakers to **implement the carbon tax** in the country, because there is no such market for carbon in Vietnam yet.

4.2 Limitations (2)

- It might be perceived that the **final coal consumption** for energy production is small. This is due to the settings:
  - **The base year coal consumption for power generation is small** → keep the same in the future assumption
  - **Large amounts of heavy industrial goods are imported in the base year** → keep the same in the future assumption
  - **The power generation assumption shows a strong increase in the future**

5. CONCLUSIONS

5. Conclusions

- **Goal**: clarify the mitigation cost of **INDC emissions** given the alternative renewable energy policies and assess the renewable policy consistency with the climate policy in Vietnam

- **Implication**: mitigation costs would be dramatically reduced and it would be **less challenging** for Vietnam to achieve the most stringent GHG emissions reduction target if the country started to utilize the **highest potential of renewable energies** as early as possible

Next activities

- Support MONRE to assess the INDC (if Dr. Lam recommends me!!!)
- Take into account the latest energy policy and the GHG emission reduction target for 2050
- Look for research supports from other countries for climate change adaptation, risk assessment and mitigation for Vietnam
- Is it the time to apply other AIM models to Vietnam???

Thank you very much!

energies

MDPI

Article

Realizing the Intended Nationally Determined Contribution: The Role of Renewable Energies in Vietnam

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