World Bank and TGO

Introduction to the Project and Concept

Project: Impacts of carbon pricing instruments on national economy and contribution to NDC – Thailand

Unnada Chewpreecha and
Sophie Heald

14 February 2019

Overview

- Project Background
- Study Objective
- NDC
- CPI
- Carbon tax
- ETS
- Our Analysis
- Project team

cambridge econometrics

Project Background

Within the PMR framework Thailand aims to implement a market based instrument to decrease energy consumption and reduce greenhouse gas emissions from several sectors including energy, industrial processes, transport and waste.

A key consideration for Thailand (as with many governments) is whether a carbon tax or Emissions Trading Scheme (ETS) is the most suitable carbon pricing policy to achieve the Thai NDC and aligning with Thai sustainable development plans.

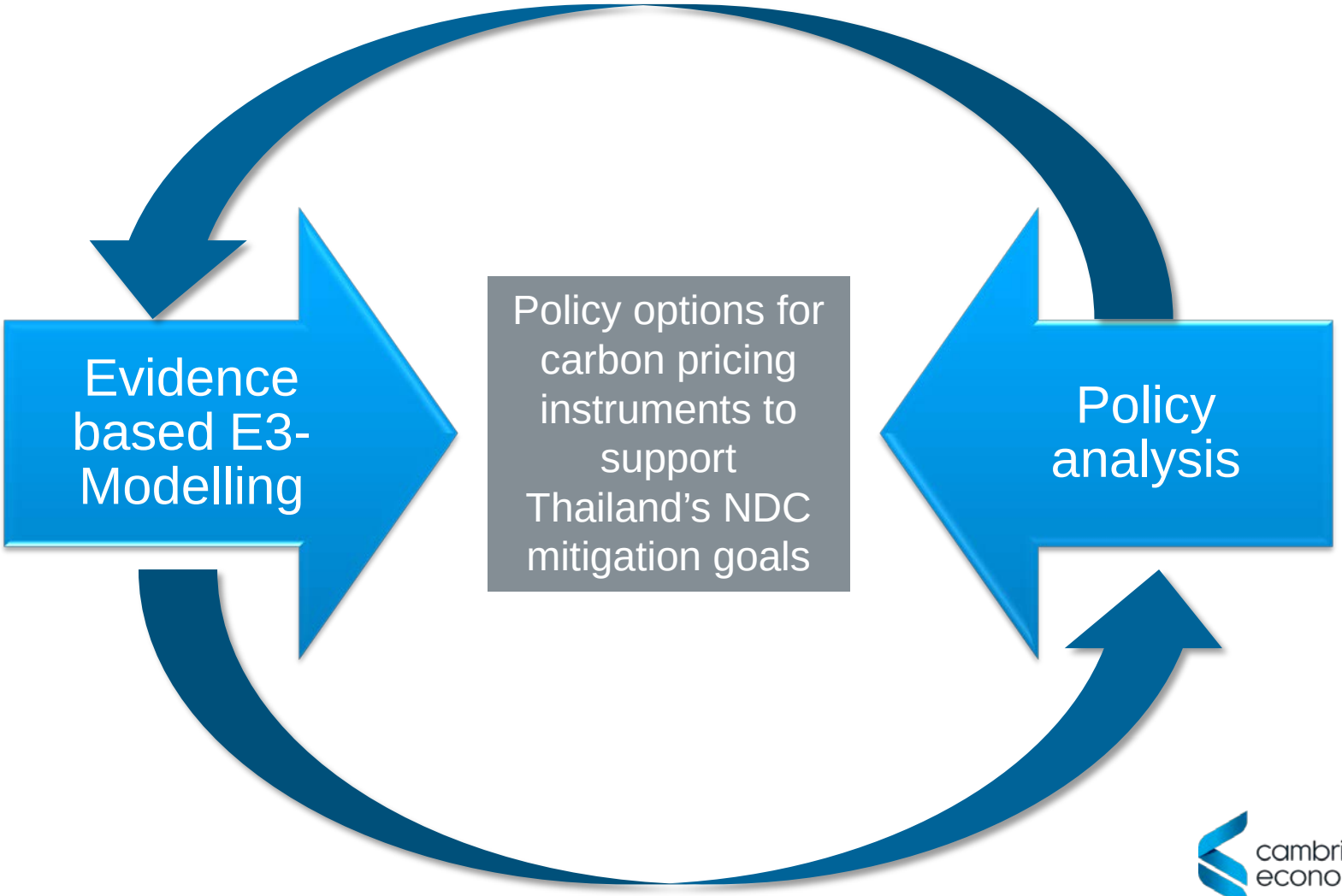
cambridge econometrics

Study Objective

To provide recommendations on the suitable policy options for carbon pricing instruments to support Thailand's NDC mitigation goals, and to evaluate the economic impacts of potential policies on stakeholders.

cambridge econometrics

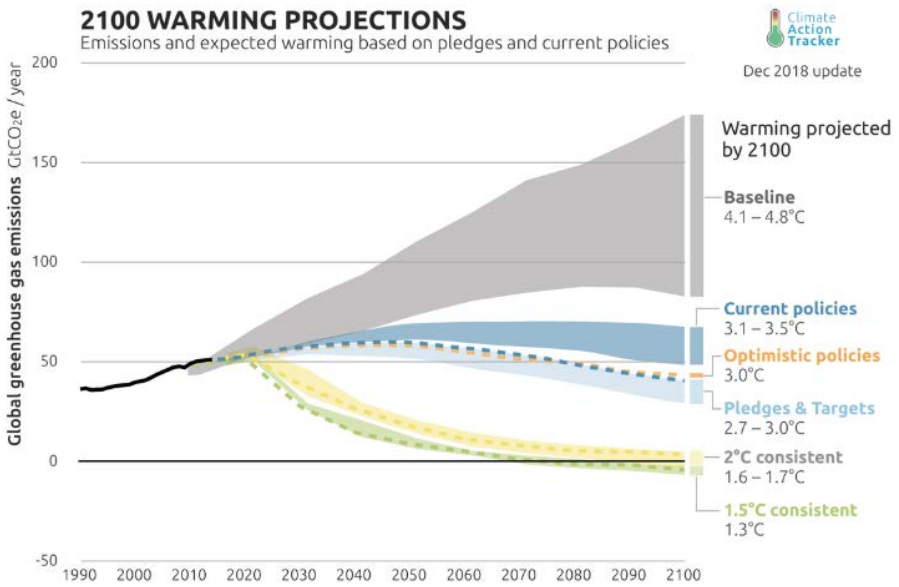
The study's objective will be met by using both evidence based and policy analysis

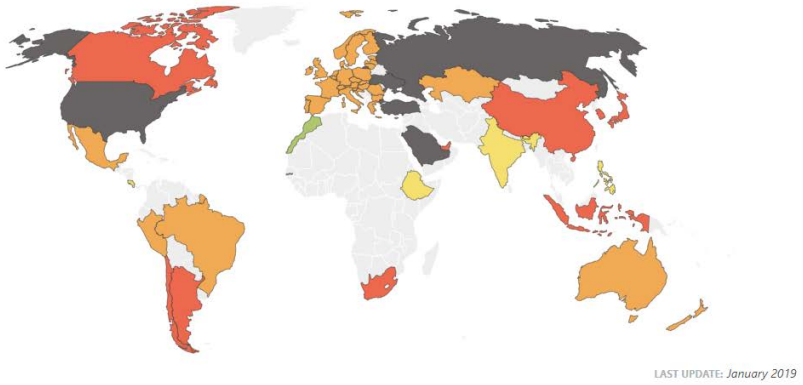


cambridge econometrics

Thailand National Determined Contribution

Global warming context





https://climateactiontracker.org/

cambridge econometrics

National Determined Contribution

- In 2015, 196 Parties came together under the Paris Agreement to transform their development trajectories so that they set the world on a course towards sustainable development, aiming at limiting warming to 1.5 to 2 degrees C above pre-industrial levels.
- Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.

cambridge econometrics

Thailand National Determined Contribution

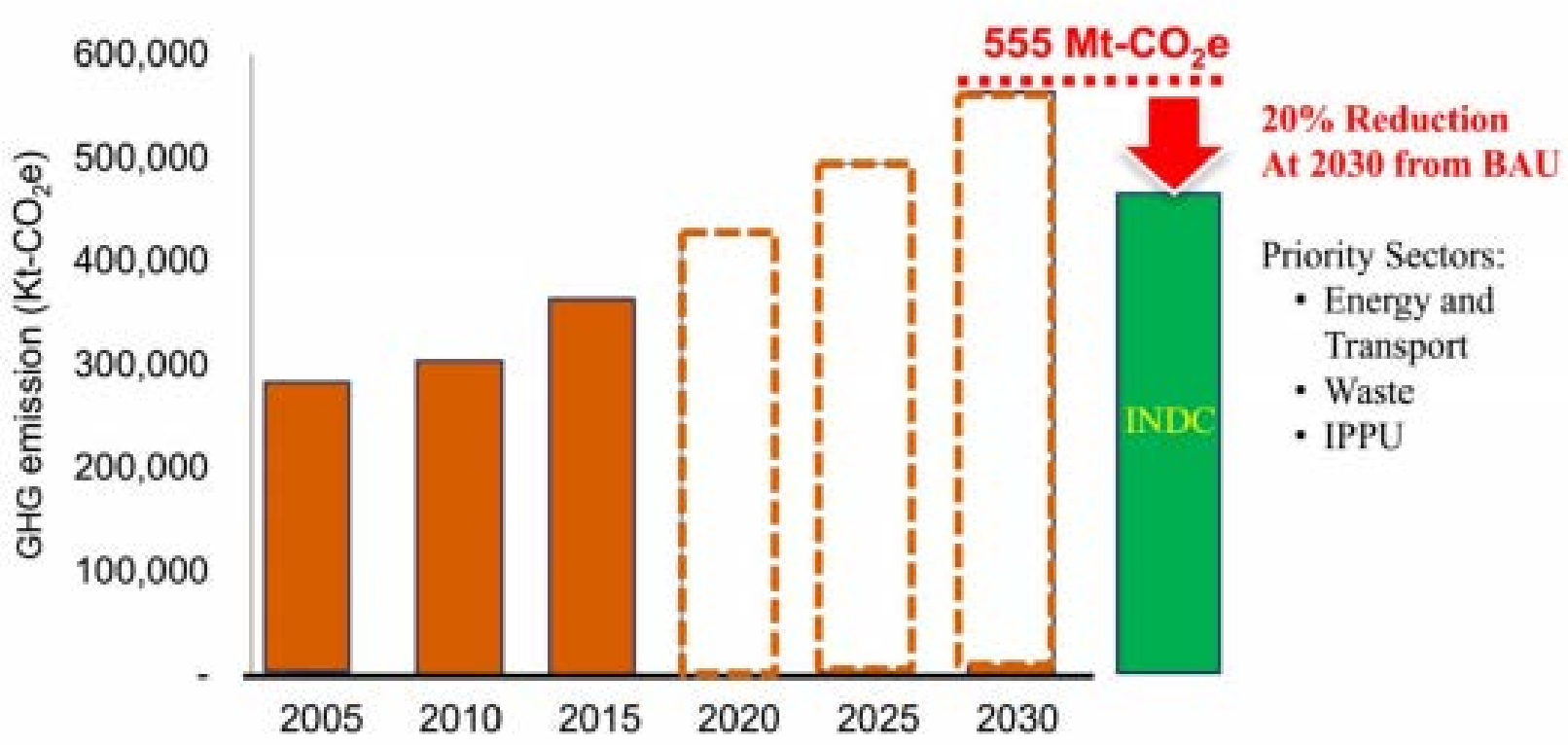


Fig.2 Thailand's NDC
(Source: ONEP, 2017)

cambridge econometrics

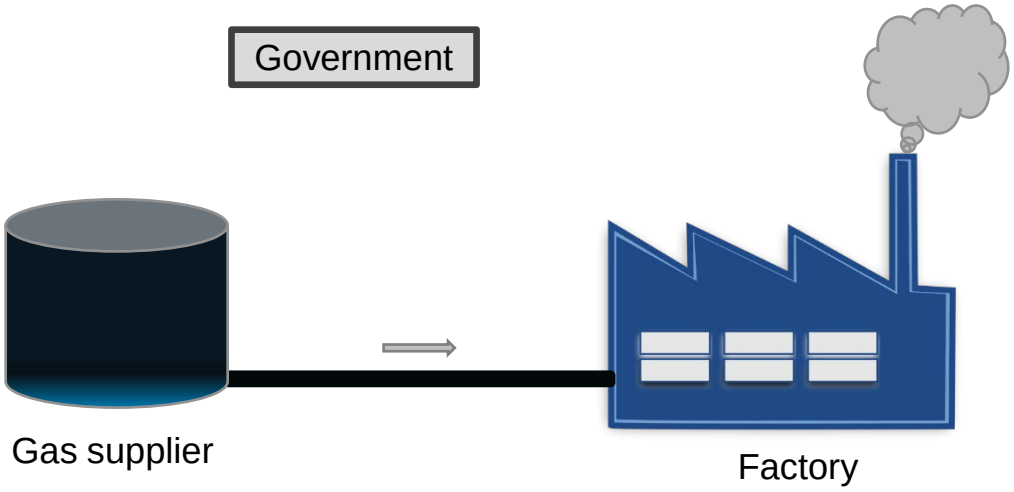
Carbon Pricing Mechanism (CPI)

- Putting a price on carbon to capture externalities from carbon emissions
  - crop damage
  - health impacts
  - flooding etc.
- A price on carbon helps shift the burden for the damage back to those who are responsible for it, and who can reduce it. "polluters pay"
- There are two main types of carbon pricing
  - emissions trading systems (ETS)
  - carbon taxes.
- Examples of non-CPI policies
  - energy efficiency
  - regulations

cambridge econometrics

Carbon Tax

Carbon taxes: How can they function?



A **carbon tax** directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. It is different from an ETS in that the emission reduction outcome of a carbon tax is not pre-defined but the carbon price is. (WB)

Carbon tax options:

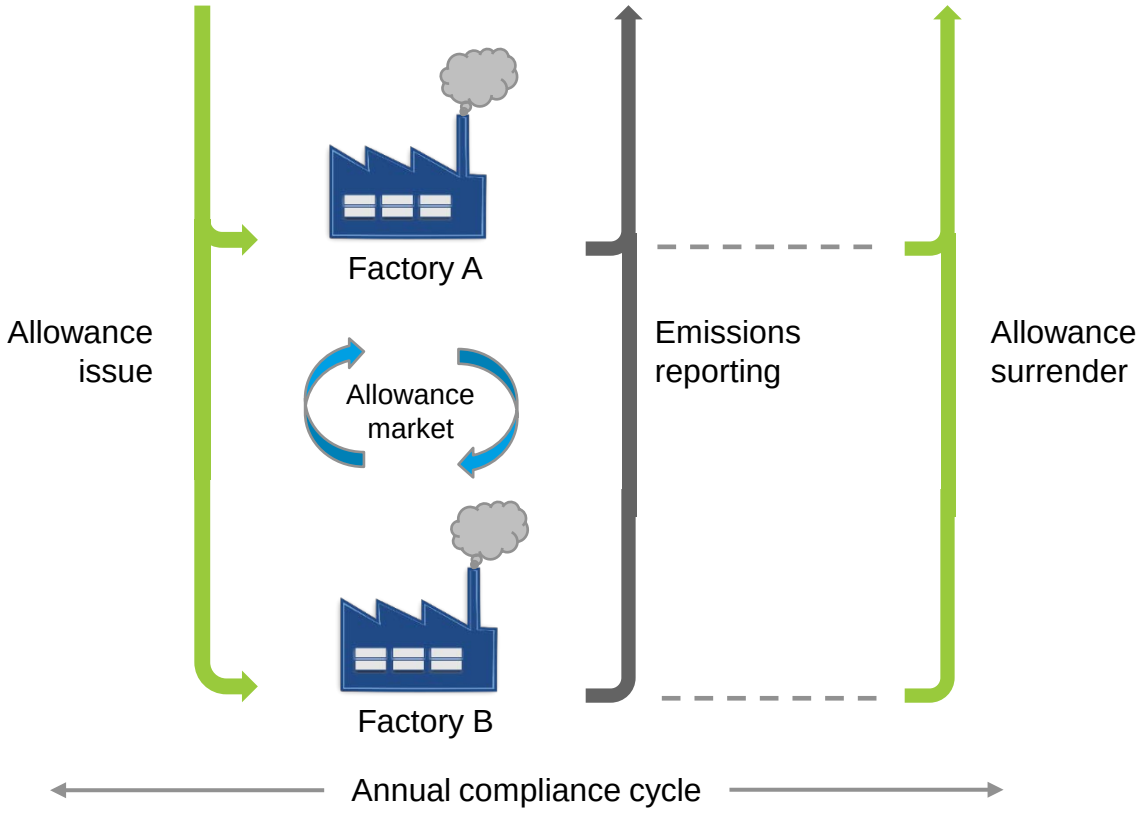
1. Factory accounts for annual gas supplies and pays tax rate to Government
2. Gas supplier levies carbon tax on each bill to factory, and pays these revenue to Government
3. Government charges tax to gas supplier for amount of gas supplied to factory

RICARDO

cambridge econometrics

Emission Trading Scheme (ETS)

Overview of emissions trading



An **ETS** – sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions. The cap helps ensure that the required emission reductions will take place to keep the emitters (in aggregate) within their pre-allocated carbon budget. (WB)

cambridge econometrics

Some important carbon tax & emissions trading comparisons

Key issue	Carbon tax	ETS
Targets	• Carbon price based on intended abatement	• Emission cap
Markets		• Complex market structures
MRV (Measurement, Reporting and Verification)	• Simple if upstream • Complex if based on carbon footprint	• Generally complex
Flexibility	• Potentially offsetting	• Project credits / offsets. • Banking and borrowing
Cost impacts	• Thresholds • Rebates • Revenue recycle	• Free allocation • Cost compensation measures
Investment signals	• Based on politically set tax rates	• Long term emissions targets
Certainly	• Price certainty	• Emission certainty

cambridge econometrics

Our Analysis

Run ID	Description	Sectoral coverage	Off-setting	Revenue use	Global energy price	Cap level	Free allocation	Tax rate
BAU	Baseline in NDC roadmap	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NDC	BAU + full achievement of unconditional NDC (uNDC)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ETS runs								
ETS core	Core case	Medium	No	N/A	Central	Consistent with NDC unconditional	100%	n/a
ETS 2	ETS core but will full auctioning	Medium	No	Revenue used to offset other taxation	Central	Consistent with NDC unconditional	0%	n/a
ETS 3	ETS small scope	Small	No	N/A	Central	Consistent with NDC unconditional	100%	n/a
ETS 4	ETS large scope	Large	No	N/A	Central	Consistent with NDC unconditional	100%	n/a
ETS 5	Offsetting	Medium	Yes	N/A	Central	Consistent with NDC unconditional but adjusted for offset volume	100%	n/a
ETS 6	Energy prices	Medium	No	N/A	Low	Consistent with NDC unconditional	100%	n/a
ETS 7	ETS ambition	Medium	No	N/A	Central	Consistent with cap required to achieve NDC unconditional throughout Thai economy	100%	n/a
Carbon tax runs								
CT core	Core case	Medium	No	Revenue used to offset other taxation	Central	n/a	n/a	Single rate to meet NDC outcomes for CT sectors
CT 2	CT large scope	Large	No	Revenue used to offset other taxation	Central	n/a	n/a	Single rate to meet NDC outcomes for CT sectors
CT 3	CT very large scope	Very large	No	Revenue used to offset other taxation	Central	n/a	n/a	Single rate to meet NDC outcomes for CT sectors
CT 4	CT rate	Medium	No	Revenue used to offset other taxation	Central	n/a	n/a	Single rate consistent with NDC conditional for CT sectors
CT 5	Revenue investment	Medium	No	Revs invested in emission reduction program	Central	n/a	n/a	Single rate to meet NDC outcomes for CT sectors
CT 6	Revenue offsets other taxation	Medium	No	Revenues retained by treasury	Central	n/a	n/a	Single rate to meet NDC outcomes for CT sectors

Our Analysis

Instrument	Sector coverage	Revenue recycling	Offsetting option (For ETS)	Scenario	Carbon tax rate
ETS	Small	0%	0%	TH-ETS1	-
			10%	TH-ETS2	-
			15%	TH-ETS3	-
		25%	0%	TH-ETS4	-
			10%	TH-ETS5	-
			15%	TH-ETS6	-
		50%	0%	TH-ETS7	-
			10%	TH-ETS8	-
			15%	TH-ETS9	-
Carbon Tax	Very large	0%	-	TH-CT1	Standard
		25%	-	TH-CT2	
		50%	-	TH-CT3	
		0%	-	TH-CT4	Low
		0%	-	TH-CT5	High (NDC)
		0%	-	TH-CT6	Flat (NDC)
		25%	-	TH-CT7	
		50%	-	TH-CT8	
		0%	-	TH-CT9	Gradual (NDC)
		25%	-	TH-CT10	
		50%	-	TH-CT11	
Hybrid	ETS – Small Carbon Tax – remaining sectors	0%	0%	TH-HB1	Standard
			10%	TH-HB2	
			15%	TH-HB3	
		25%	0%	TH-HB4	
			10%	TH-HB5	
			15%	TH-HB6	
		50%	0%	TH-HB7	
			10%	TH-HB8	
			15%	TH-HB9	

cambridge econometrics

Team Overview

Cambridge Econometrics (team leader)
- develop E3-Thailand
- CPI scenario analysis to provide macroeconomic impacts
- provide model training courses

Ricardo E&E
- analysis of climate and energy policy design in Thailand
- develop policy recommendations for Thailand
- lead on capacity building

Creagy
- complimentary insights to the local policy, plan and programme analysis
- organising capacity building events and providing local contacts