

2025 The Annual Petroleum Outlook Forum

Panel Discussion

September 28, 2025

Global challenges and risks

To navigating short-term volatility, building long-term sustainability

Short-Term

Strengthening business resilience is essential



Geopolitical Uncertainty



Policy & Regulatory Uncertainty



Economic Instability & Inflationary Pressures

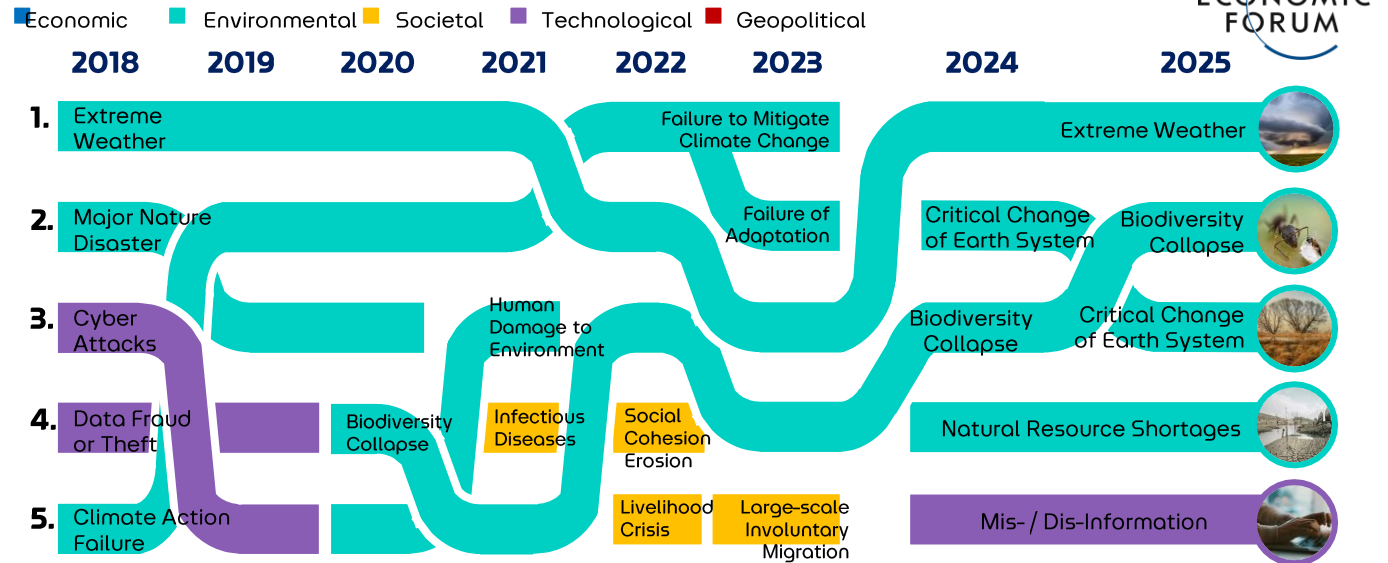


Digital Expansion

Long-Term

Yet, environmental challenges persist—demanding sustainability and decarbonization actions

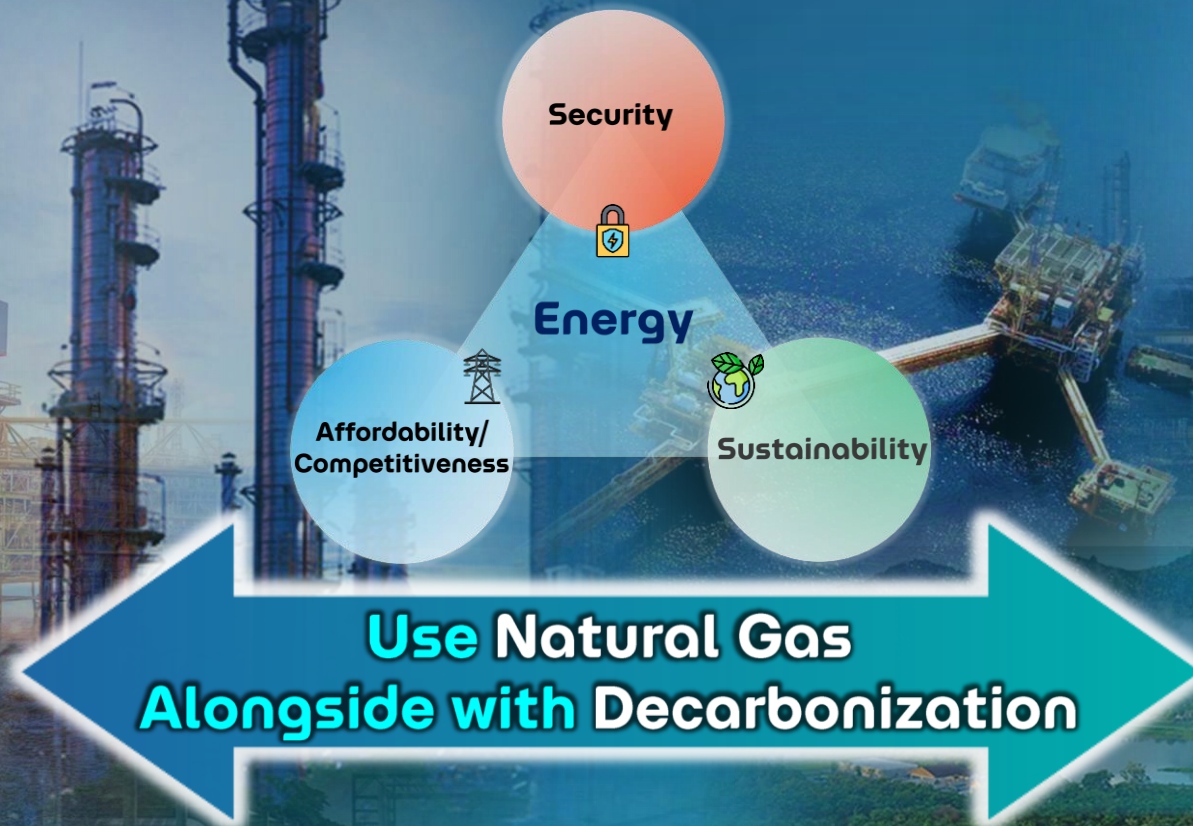
Likelihood of top risks to occur over the next 10 years



The updated NDCs has been submitted in the COP30, Brazil

Balancing energy security, affordability, and sustainability is key to nurturing Thailand's energy transition

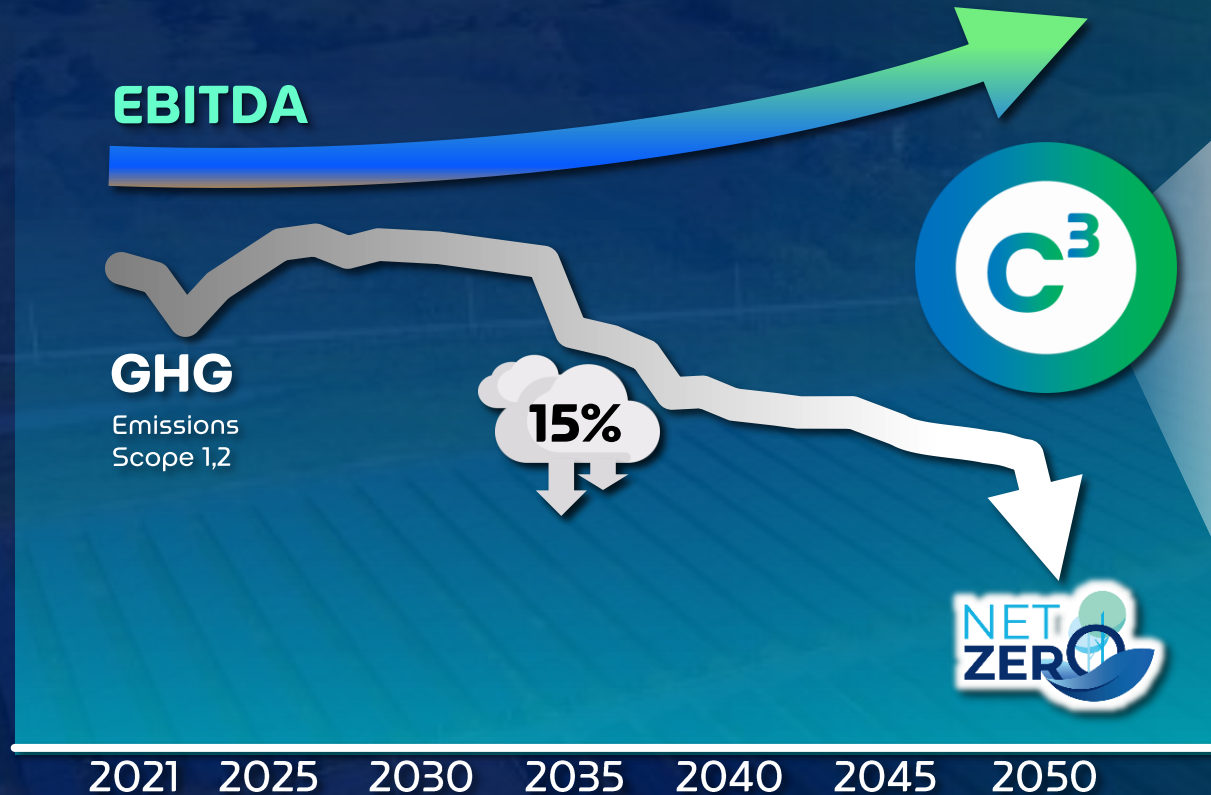
- E&P
- Power Plant
- Industry



- CCS
- Hydrogen
- Reforestation

Renewable Energy is important
but further development is needed due to limitations

PTT Group strives to balance business growth with our Net Zero commitment, ensuring energy security and long-term sustainability for the nation



- Proactively Managing Risks
- Capturing Full Upside
- Driving Climate Adaptation



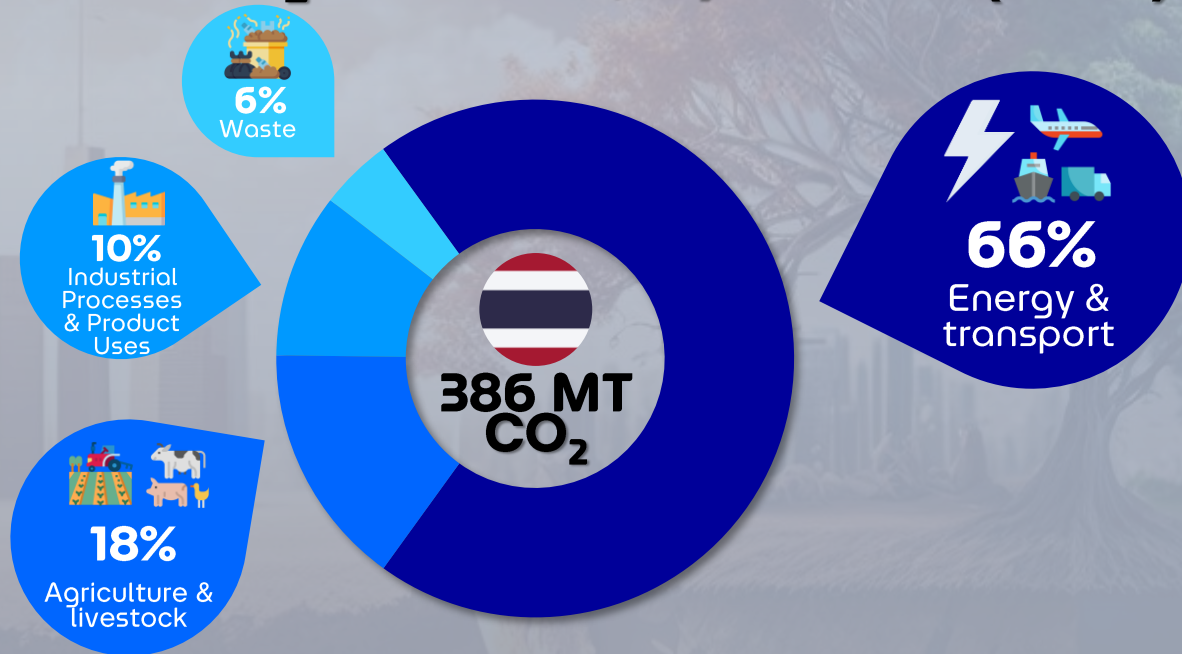
*Also support offsetting

Execution with Clarity and the Flexibility to Respond to Signposts



Thailand moving toward Net Zero target, the key sector to focus is Energy and Transport

Thailand CO₂ emission, by source (2022)



accounts for
of Thailand
CO₂ emission



Thailand accelerating Net Zero target
to be achieved 15 years earlier



**Net Zero
Emissions**

From **2065**

To **2050**

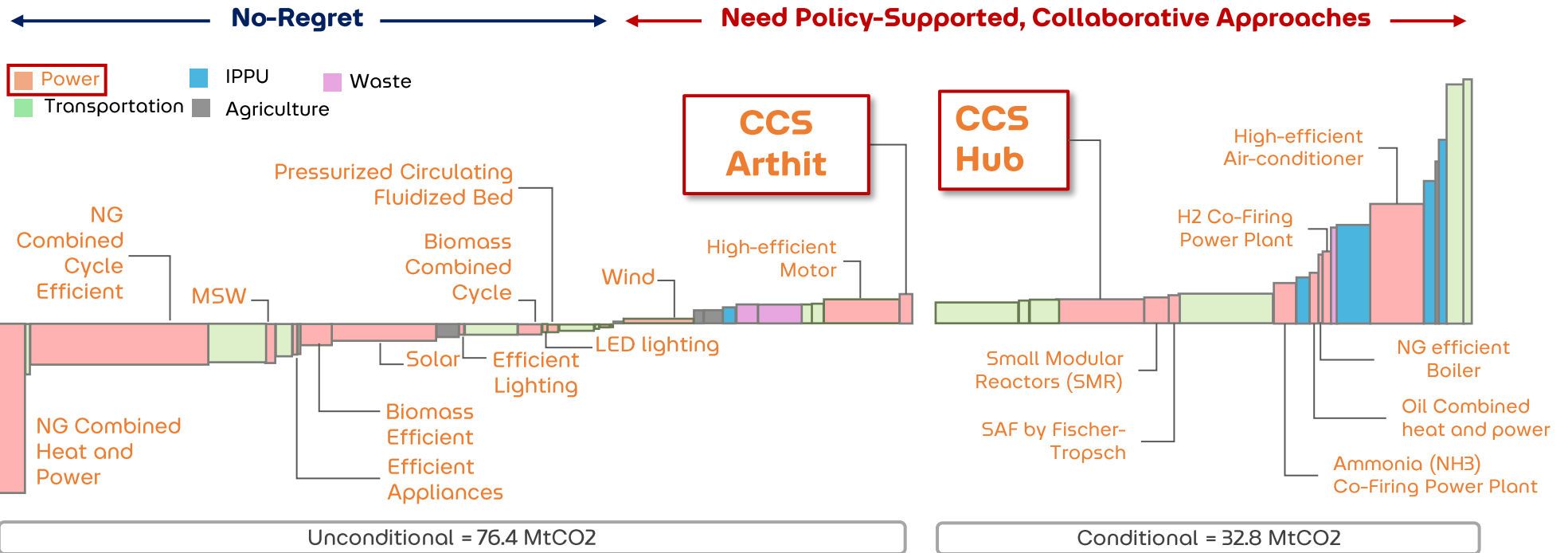
(Re-submit NZ 2050 in COP30)

Thailand's Pathway for Energy Sector Decarbonization: No-Regret Actions and Policy-Supported, Collaborative Approaches

NDC 3.0:
MACC*

Marginal abatement cost
(USD/tCO₂eq)

Total**
109.2 MtCO₂



Key enablers to drive effective execution



Operational policy unlock



Incentive instrument



Demand & Market

Global Success Cases Confirm the Importance of Multi-Stakeholder Collaboration and Regulatory Unlocks

Key Lessons for Advancing Thailand's Energy Transition

| | | UK | Malaysia | Norway | USA | Implication to Thailand |
|-----------------------|------------------------------|---|--|---|---|--|
| Category ¹ | | Established one-stop governance entity | | Leveraging existing entity | | |
| | Policy Maker | <p>Department for Energy Security & Net Zero (DESNZ)</p> <p><2 yrs to approve</p> | <p>Ministry of Economy</p> <p>MyCCUS oversees, bill passed in 2025</p> | <p>Ministry of climate and environment</p> | <p>Environmental Protection Agency</p> <p>Multi-layered approvals, could take up to 7 years</p> | <p>Seek to have One Entity to responsible as Champion</p> |
| | Government Incentive | <ul style="list-style-type: none"> \$30bn funding CfD - emitter & RAB – T&S Co.² | <ul style="list-style-type: none"> Developing tax incentives | <ul style="list-style-type: none"> Direct funding to projects | <ul style="list-style-type: none"> IRA45Q - Tax credits \$85/t Funding³ for study/permit | <p>Set up Govt. funding and mechanism with clarity for CCS developer</p> |
| | CO ₂ Cross-border | Developing | Developing | Bilateral agreements existed | Developing | <p>Seek for bilateral/ multi-lateral to be competitive sink for cross-border CO₂</p> |
| | Carbon Market | <ul style="list-style-type: none"> UK ETS⁴ of \$40-50/t | Carbon tax ⁵ in 2026 | EU ETS of \$70-90/t | ETS only in selected state | <p>Carbon pricing can be a driven for emission target</p> |

1. International Energy Agency, standard for CCS; 2. Contract for Difference and Regulated Asset Base; 3. US Executive Order in Jan called for pause of funds; 4. developing UK-EU ETS to create more stable carbon market, and avoid CBAM; 5. targeting the iron, steel and energy sectors



4 Crucial Collaboration Factors to Effectively Drive Thailand's Decarbonization and Energy Transition



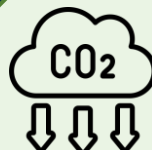
I. Technology

- Technology transfer
- Capacity building



II. Financial Instrument

- Incentive: BOI, tax exemption, Grants/subsidies, tax credits
- Support: Int'l green finance
- Mandatory: ETS, Carbon Tax



III. Policy & Regulatory Unlock

- Integrated plans: NDC, PDP
- Policy Unlock: Seismic survey, TPA/Direct PPA
- Central government agency



IV. Demand

- Domestic: Private sector, End users
- International: G2G / Article 6

1 Eastern Thailand CCS Hub

>5 MTPA, FID 2031 / COD in 2034

Convey CO₂ to the central collection station

Potential Demand



EEC area:

- Chonburi
- Rayong

Capture CO₂ from emission sources

Emitters

Onshore terminal

Jetty for unloading and conversion

Shipping for Cross-border

Potential to support CO₂ transportation & storage

Provides an opportunity for the country to position itself as a regional hub

Offshore storage in the Gulf of Thailand
up to ~10 MTPA during the initial phase

CO₂ transportation via ship or subsea pipeline
determined by the scale and geographical location of emission sources

LCO₂ ship

Offshore pipeline

Kra Basin

Arthit

GDP increase

18_{bn}

THB per year

create job opportunities

11,000 positions

save GHG emission

>6 MtCO₂ per year

For Visualisation Purposes

--- Onshore Pipe (km) --- Offshore Pipe (km) --- Shipping (km)

2 Arthit CCS Project

1 MTPA

FID 2025 / COD in 2028



Thank you