

# CO<sub>2</sub> EMISSION IS CAUSING GLOBAL WARMING

Extreme weather events increasing

## Rising Sea Levels



**410M**

people could be affected globally by 2100

Triggered by melting polar ice caps

Source: Malaysian government announcements; ASEAN; United States Environment Protection Agency;

## Shifting Weather Patterns



↑  
Frequency

Extreme weather events, such as droughts and floods with **±30%** precipitation patterns potentially shifting

## Ecosystems Strain



Biodiversity loss

Ocean acidification

Increase in pests and invasive species

## Malaysia's CCUS Potential



**140GT**

estimated storage capacity of saline aquifers in Malaysia

Source: Universiti Teknologi Malaysia



**13.3GT**

of CO<sub>2</sub> can be stored in Malaysia's depleted oil and gas fields

Source: Global CCS Institute, 2020

Ocean temperatures are rising

## CCUS Drives New Economic Growth



Additional revenue from economic spillover from CCUS initiative

**21TCF**

High CO<sub>2</sub> Content Gas Field

**2MTPA+**

Blue Hydrogen and Blue Ammonia

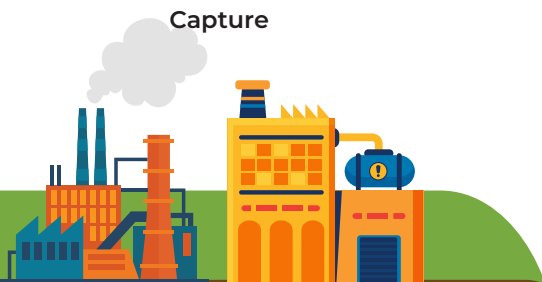
Note: TCF = Trillion Cubic Feet  
MTPA = Million Tonnes per Annum

Source: PETRONAS

## Carbon Capture, Utilisation and Storage (CCUS)

helps industries manage CO<sub>2</sub> emission

Capture



Transportation



Storage



Utilisation



### CCUS is Safe



**<0.001%**

Leakage probability with COP28 urges investment in low-carbon technology like CCUS, with IPCC confirming CO<sub>2</sub> storage safety

### CCUS Reduces the Impact of Climate Change



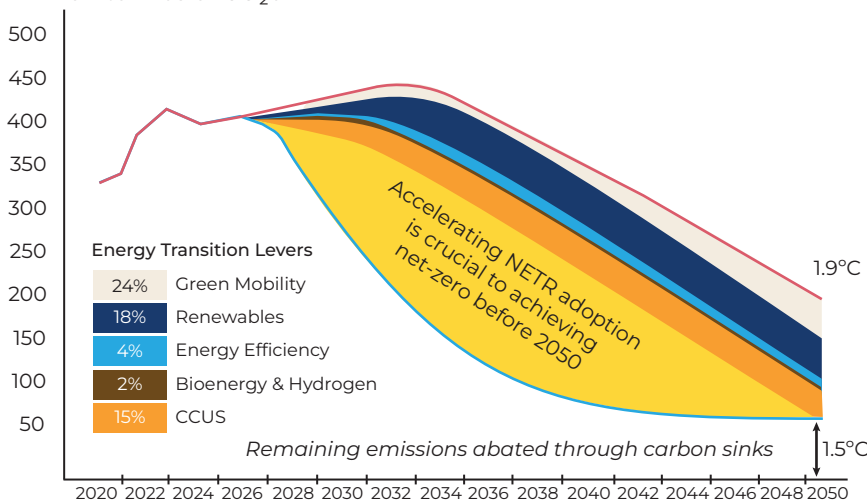
**15%**

of Malaysia's total emission to enable Malaysia to achieve 1.5°C by 2050 alongside green mobility (24%) and renewables (18%)

Source : Rystad Energy Research and Analysis; EnergyDemandCube

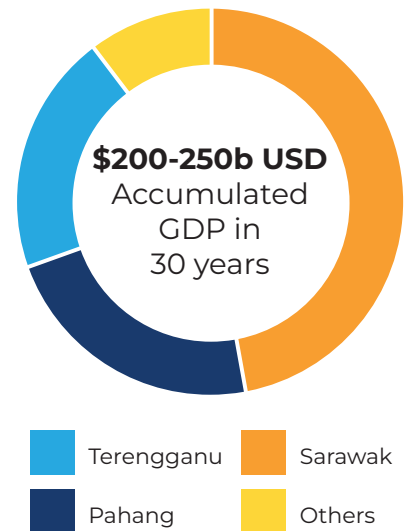
### CCUS is Needed to Help Malaysia Achieve Net-Zero Aspiration by 2050

Malaysia Emissions Forecast<sup>1</sup> with All NETR Levers Implemented  
Million tonnes of CO<sub>2</sub>e



Notes : <sup>1</sup> Does not include emissions removed by forestry; CCUS abatement is based on 55 MTPA captured  
Source : Rystad Energy Research and Analysis; EnergyDemandCube

### CCUS Increases Malaysia's GDP



### CCUS Helps Local Hard-to-Abate Sectors to Address CO<sub>2</sub> Emissions

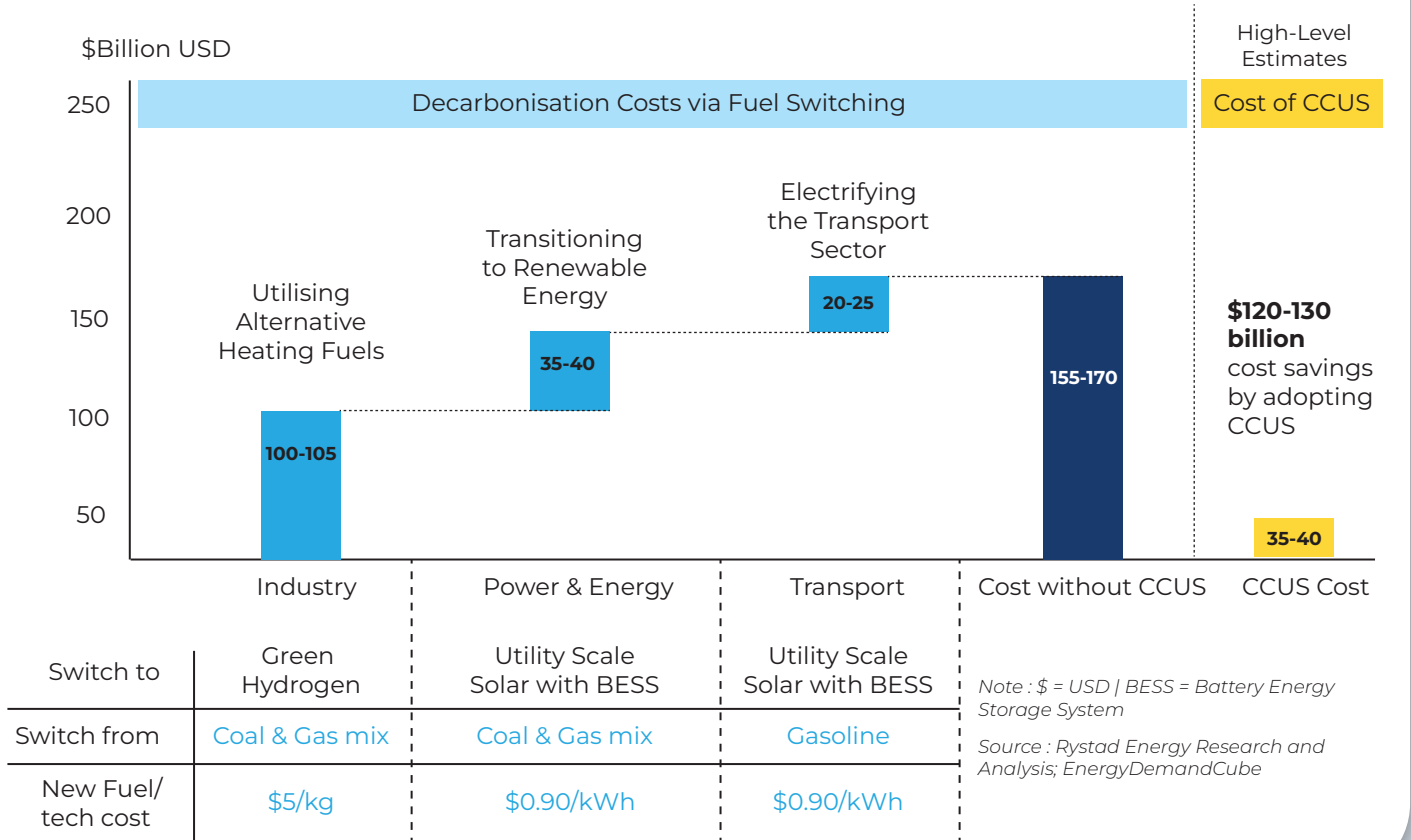


**8%**  
~  
**19%**

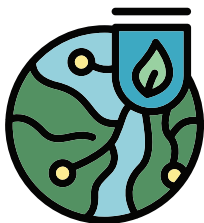
The hard-to-abate sector in Malaysia is expected to contribute between 8% to 19% of CO<sub>2</sub> emission by 2050. CCUS will enable this sector to maintain their competitiveness in the future.

## CCUS Reduces Decarbonisation Costs for Local Hard-to-Abate Sectors

Cumulative Cost Savings from CCUS Adoption (2024 – 2050)



## Managing CCUS Risk Through the Development of Comprehensive Legislation and Regulations and Effective Governance of CCUS Activities in Malaysia



There are 5 risks identified including **environmental degradation** and **CO<sub>2</sub> leakage** at storage sites that can be addressed by a robust and wholesome legislation and standards.

### 5 risks including

- Failure to achieve net-zero emission aspiration targets within the established time frame
- Unplanned development of CCUS infrastructure, which may negatively impact safety, environmental, and socioeconomic aspects
- Difficulties in managing risks and liabilities, such as CO<sub>2</sub> leakage at storage sites
- Impacts from cross-border CO<sub>2</sub> transportation activities, which are concerning and may jeopardise national interests, particularly in relation to reporting of carbon accounting
- Challenges in convincing investors to make final investment decisions