Strategies to Bridge the Gap Between Ideals and Reality:

A Pragmatic Path for Energy Transition

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The Gold Standards of Our Energy System

Paris Agreement

Limit global warming to 1.5°C

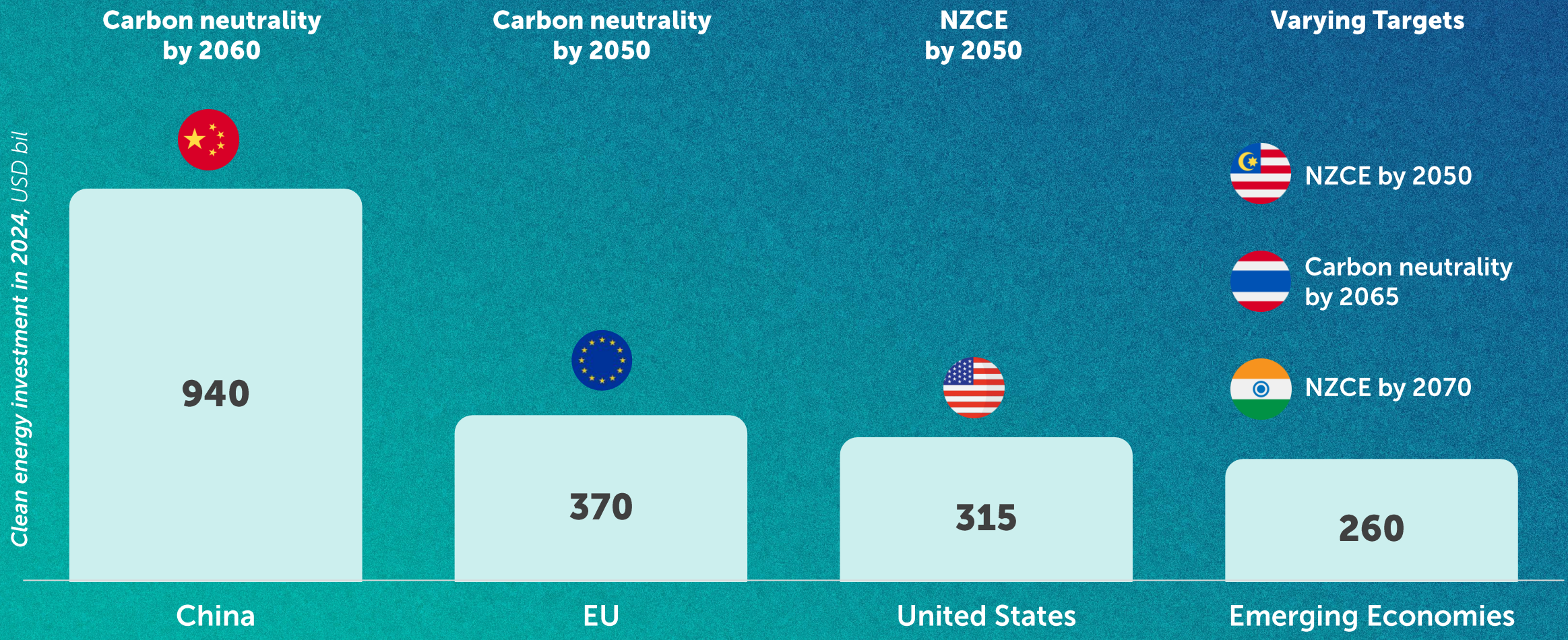
Fossil fuel phase out, whilst meeting growing energy demands

Address Energy Trilemma

3x Renewable energy by 2030

2x Energy Efficiency

Reality #01 | Pace and maturity of energy varies across regions, shaped by unique economic conditions and policy priorities



Source: BloombergNEF, IEA

Reality #02 | Criticality of energy security vs. aspiration to pursue energy sustainability presents an ongoing conflict for many, especially in Asia

Rising Energy Demand in Asia

Southeast Asia (SEA) one of the fastest growing regions in Asia-Pacific and the world, with a GDP of ~ USD 2.4 trillion

Fossil fuels projected to maintain dominant share in energy mix, accounting for ~80% by 2040

Electricity demand in SEA anticipated to double by 2040

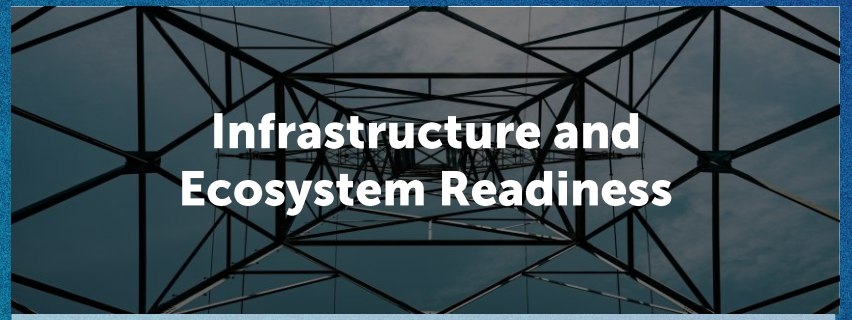
High Costs, Low Affordability

ASEAN requires USD 150 bil p.a. by 2030 for clean energy investments to achieve 1.5°C goal

Only one-fifth of global clean energy investments in EMDE, excluding China

Access to financing and investment risks deter investors

Elevated project costs due to supply chain limitations



Infrastructure and Ecosystem Readiness

Technical hurdles, including grid connectivity and capacity

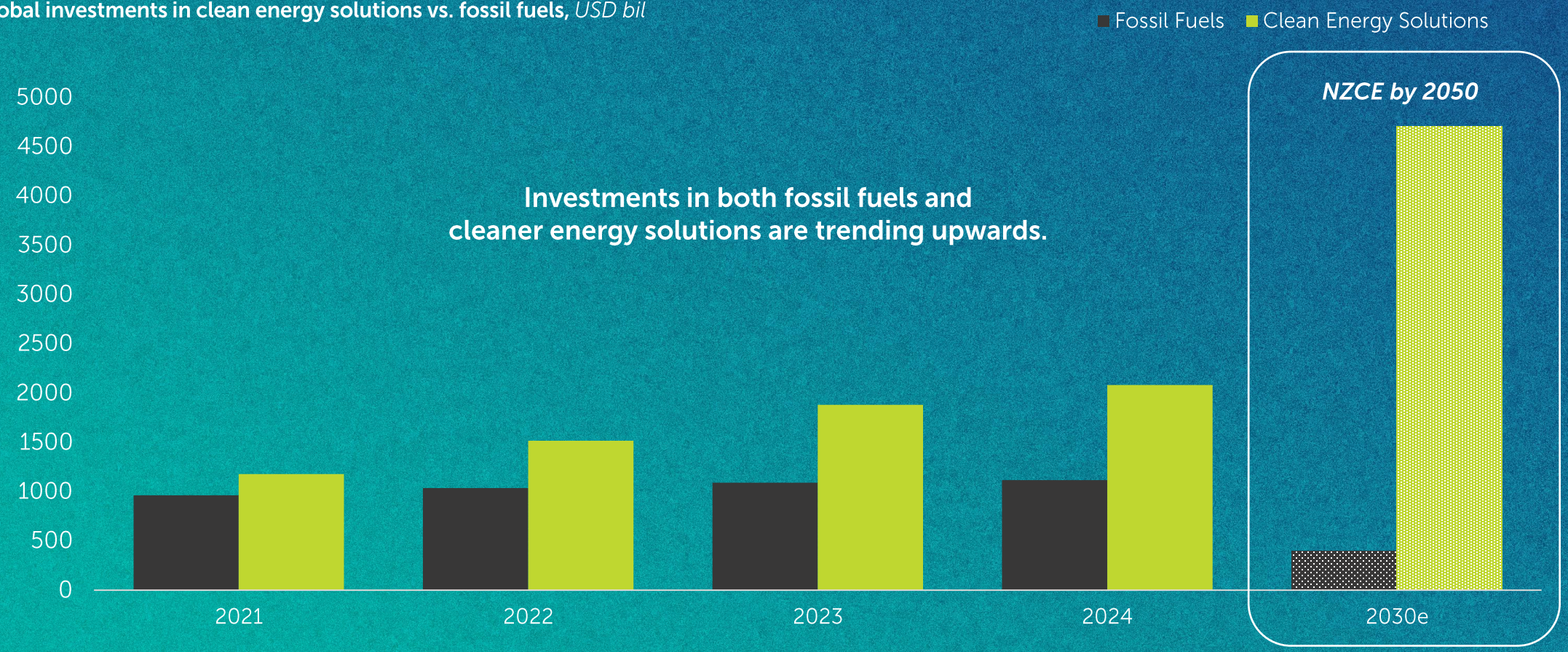
Differences in national regulations & institutional barriers

Role of gas as destination fuel: Infrastructure investments needs and gas market liberalisation

Source: IEA, WEF, Public Domain, reports and articles

Reality #03 | The world now invests almost twice as much in clean energy as it does in fossil fuels, but not enough to achieve the 1.5°C goal

Global investments in clean energy solutions vs. fossil fuels, *USD bil*



Source: BloombergNEF, IEA

Reality #04 | Cleaner energy solutions need to get to scale, but held back by commercial viability

Portfolio Course Corrections

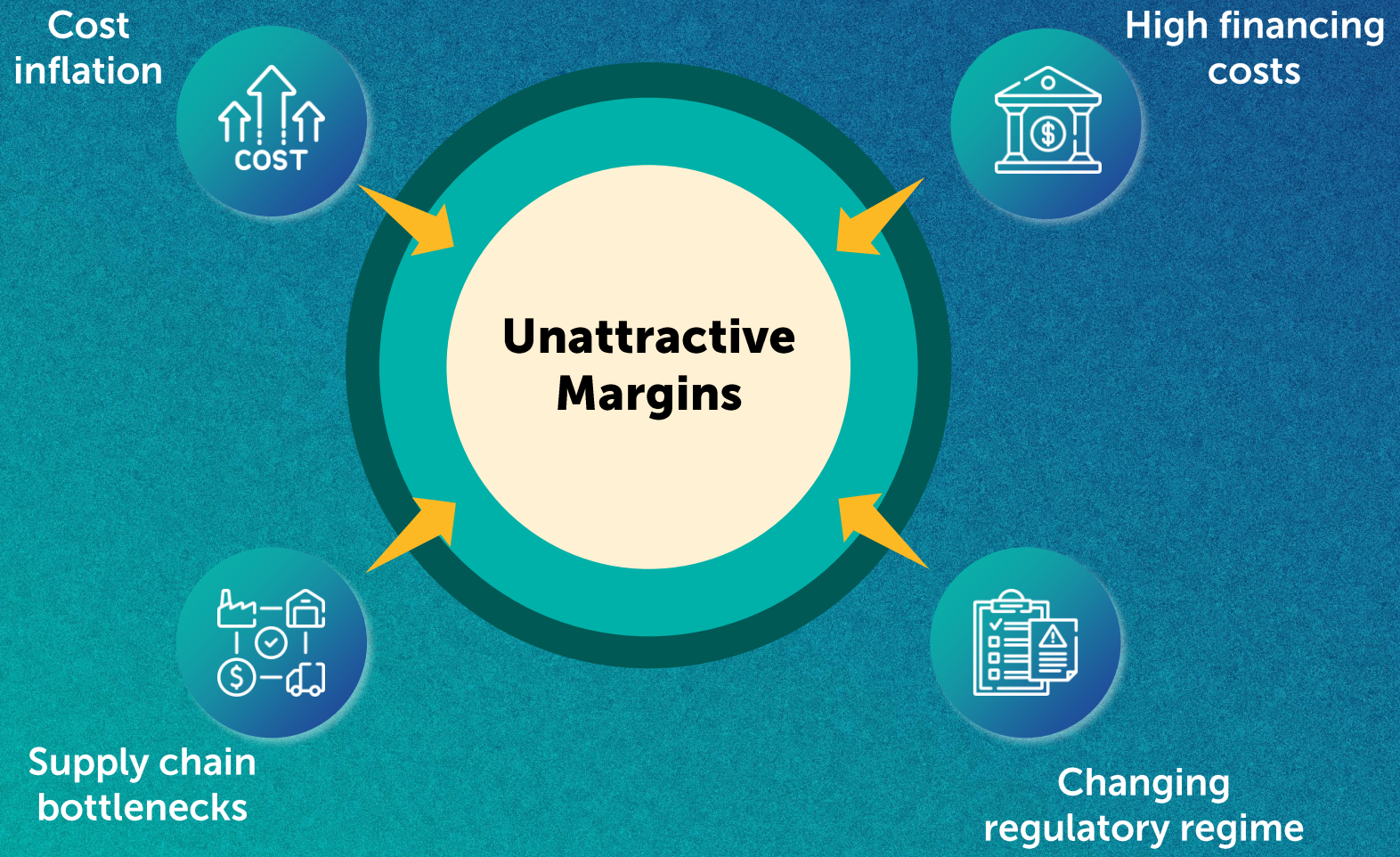
"Peer A, B and C scrapped plans for Hydrogen projects due to lack of demand"

"Peer D paused Biofuel project to assess the most commercial way forward"

"Peer E and F exited Offshore Wind projects in selected regions"

"Peer G, H and J scaled back RE plans and focus on increasing oil and gas production"

"Peer K and L reduced low carbon business team as part of portfolio review"



Perennial Debate

Crucial need for a pragmatic path – for a balanced energy mix to meet growing global energy demands, especially in Asia

PETRONAS Energy Transition Strategy

Core Business

More Energy, Less Emissions

New Business

Capturing New Growth Opportunities

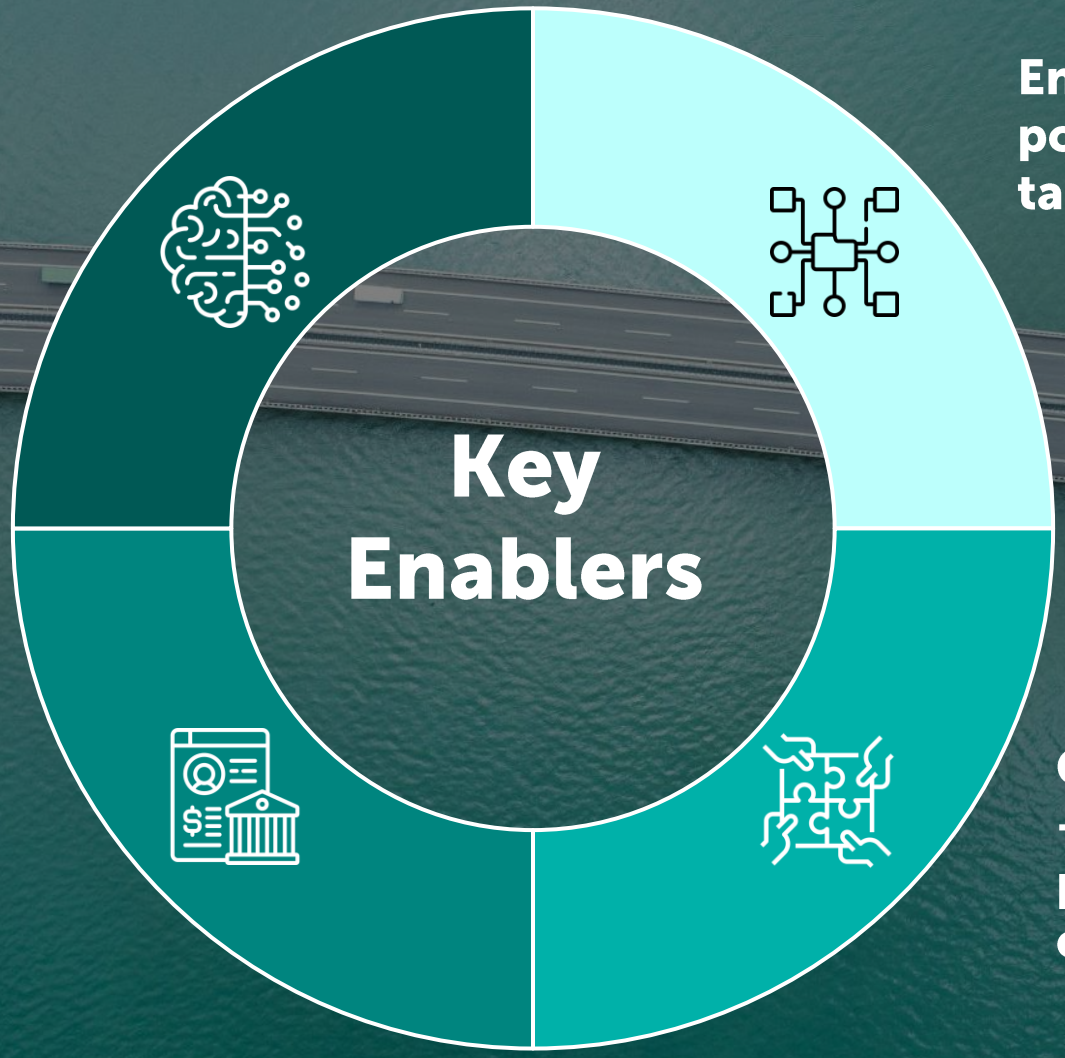
Net Zero Carbon Emissions

Pathway to Net Zero

Energy transition has its complexities, but we cannot afford any inaction - and it cannot progress in isolation

Right Projects, Right People, Right Technology

Enabling sustainability policies and framework in tandem with economic growth



Innovative financing solutions and investment discipline

Cornerstone Partnerships – each with unique value propositions and to defray capital risks

Malaysia: National Energy Transition Roadmap (NETR)

Malaysia's Energy Landscape

2%
Annual energy demand growth until 2050

>70%
Total energy supply contributed by fossil fuels by 2050

Aims 70%
Installed electricity generation capacity from RE by 2050

>5GW
Data centre energy consumption expected by 2035

Energy Transition Levers

Optimise

Shift to Renewables

Abate

- **Energy Efficiency**
- **Renewable Energy**
- **Hydrogen**
- **Bioenergy**
- **Green Mobility**
- **Carbon Capture, Utilisation & Storage**

Flagship projects championed by PETRONAS

Biorefinery in Pengerang, Johor, to produce a range of bio-based products, incl. SAF, HVO, ASF and biochemicals.

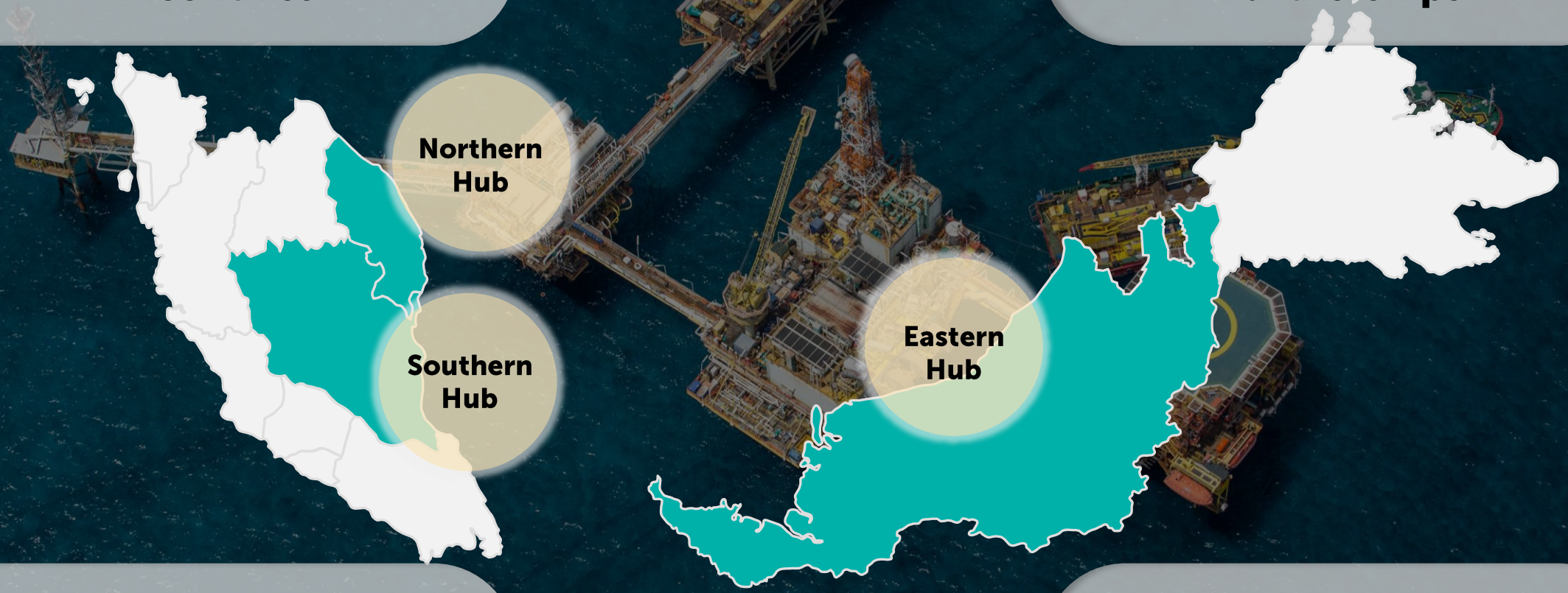
Kasawari CCS where CO_2 will be captured from the gas production field and stored in the depleted fields

Source: National Energy Transition Roadmap, MIDA

Realising Malaysia's CCS Hub

Attractive Incentives

Solid Line-up of Partnerships



Technology & Capability

Supportive Policies / Regulatory Frameworks

Cornerstone Partnerships:
Japan – Regional Collaborator & Facilitator of Asia's Energy Transition

>USD 150 bil Total expenditure on R&D FY2023

Leader in clean energy technologies

Supportive policy & regulatory frameworks

USD 1006 bil in funding via Japan's GX Policy

METI
Ministry of Economy, Trade and Industry

JOGMEC
Japan Organisation for Metals and Energy Security

PETRONAS JOGMEC MoC SC Meeting (28 June 2023) led by Vice President, Technologies of Energy Business Unit Dr Koji Yamamoto

IEE JAPAN

Engagement with Japan METI (26th July 2023) led by Director General Natural Resources and Fuel Department Mr Yuki SADAMITSU. METI had requested to sign MoU on Cross Border Transportation of CO_2 during the 3rd Asia CCUS Networks scheduled on 27th September 2023.

Engagement with Japan JOGMEC (26th July 2023) led by Director General Hydrogen & CCS Project Department Mr MIYOSHI Keisuke.

Right Projects, Right People, Right Technology

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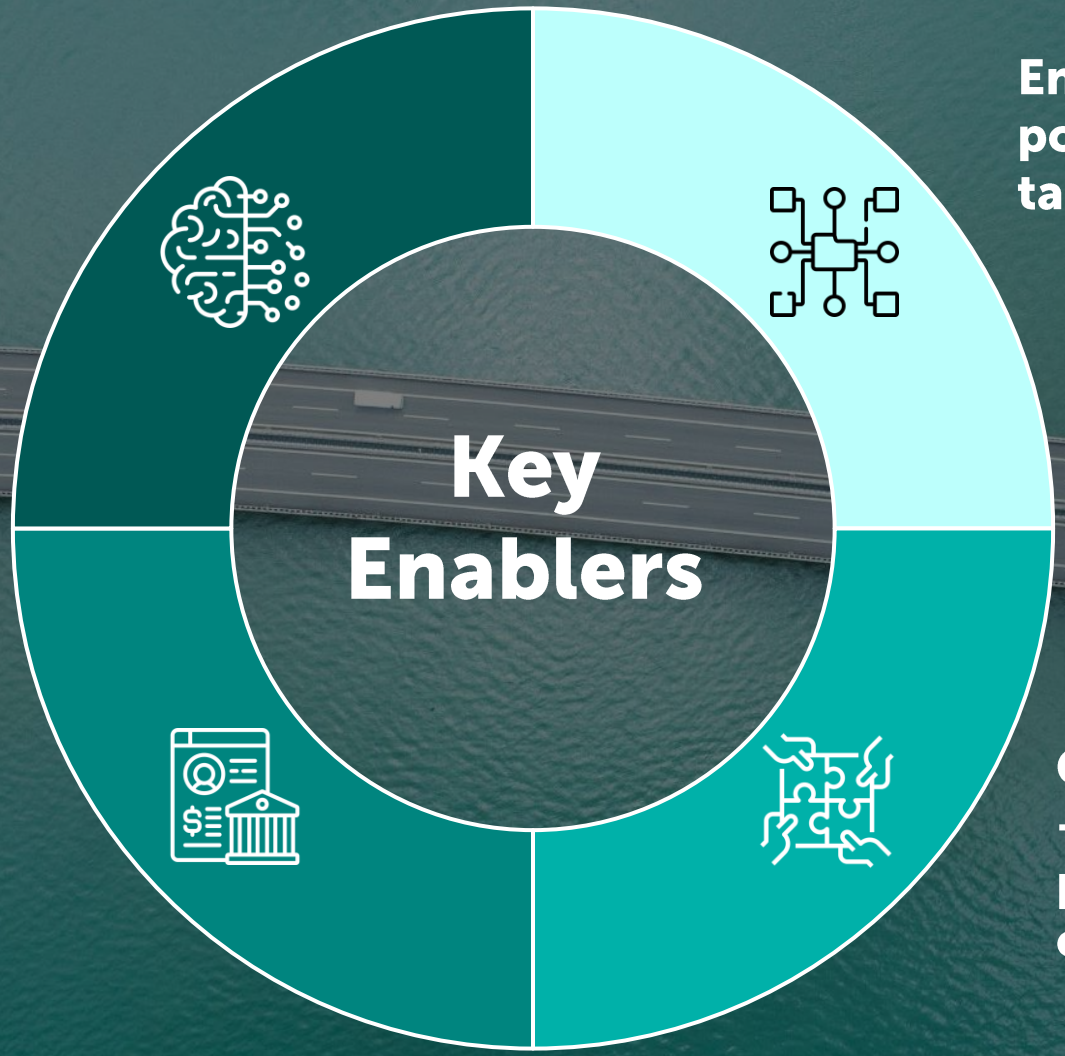

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Passionate About Progress