Shaping Sarawak's Future: Leading the Charge in Green Hydrogen Development

ASIA PACIFIC GREEN HYDROGEN 2024 CONFERENCE & EXHIBITION

10 - 12 JUNE 2024

BORNEO CONVENTION CENTRE KUCHING, SARAWAK

Tan Sri Datuk Amar (Dr) Haji Abdul Aziz Bin Dato Haji Husain
Chairman
Sarawak Economic Development Corporation (SEDC)

An Event Hosted and Supported by

Ministry of Energy and Environmental Sustainability Sarawak

BUSINESS EVENTS SARAWAK

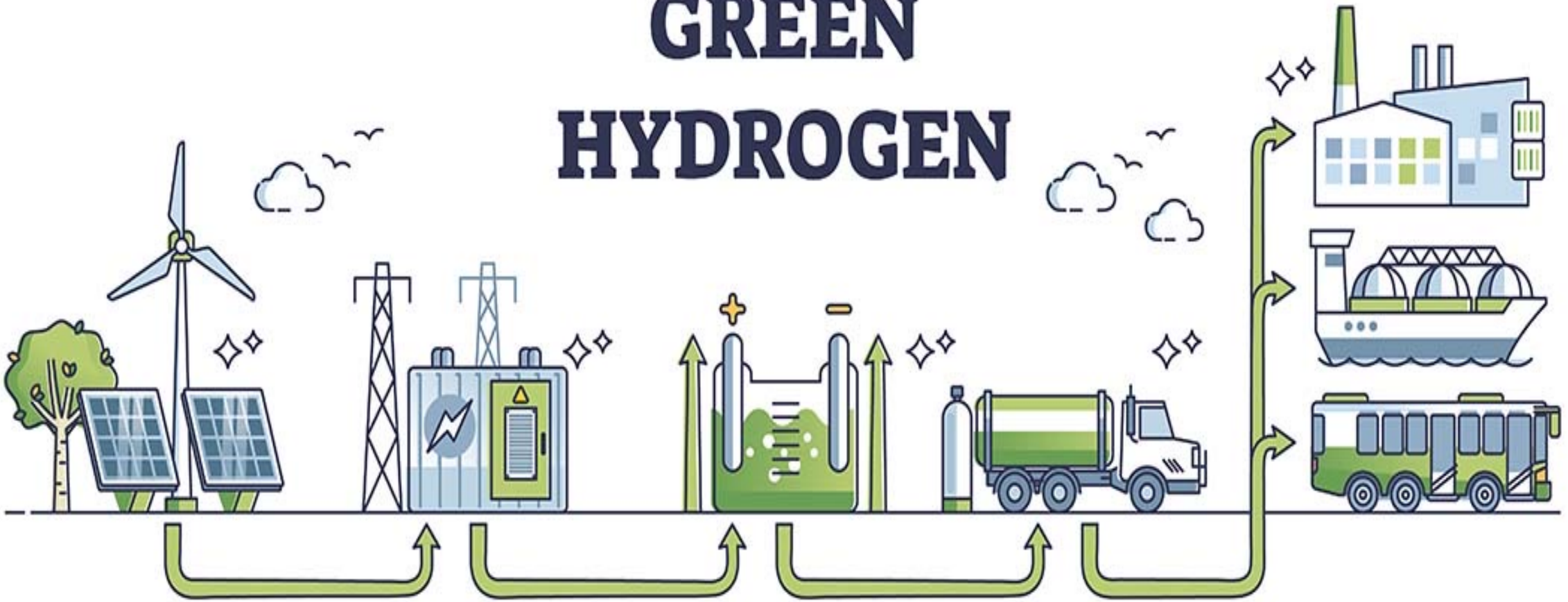
TRIBE LEGACY SARAWAK CAMPAIGN

SARAWAK More To Discover

Organised by

BORNEO BUSINESS CONNECT

GREEN HYDROGEN



Sarawak's Power Generation & Renewable Energy Potential

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- Sarawak total hydropower potential 20,000MW

Hydroelectric dams provides 70% or 3500MW of the total energy to the State.

- Batang Ai Dam - 108MW of power
- Murum Dam - 635MW (constant) and 944MW (peak) of power
- Bakun Dam - installed generation capacity of 2,400MW

Under construction is the **Baleh Hydroelectric dam** (1,285MW)

- Solar power – Batang Ai floating solar farm – 50MW (Under construction)
- Development of cascading dams
- Proposed bio-coal power plant – potential of 2,000MW under planning

Bakun Dam

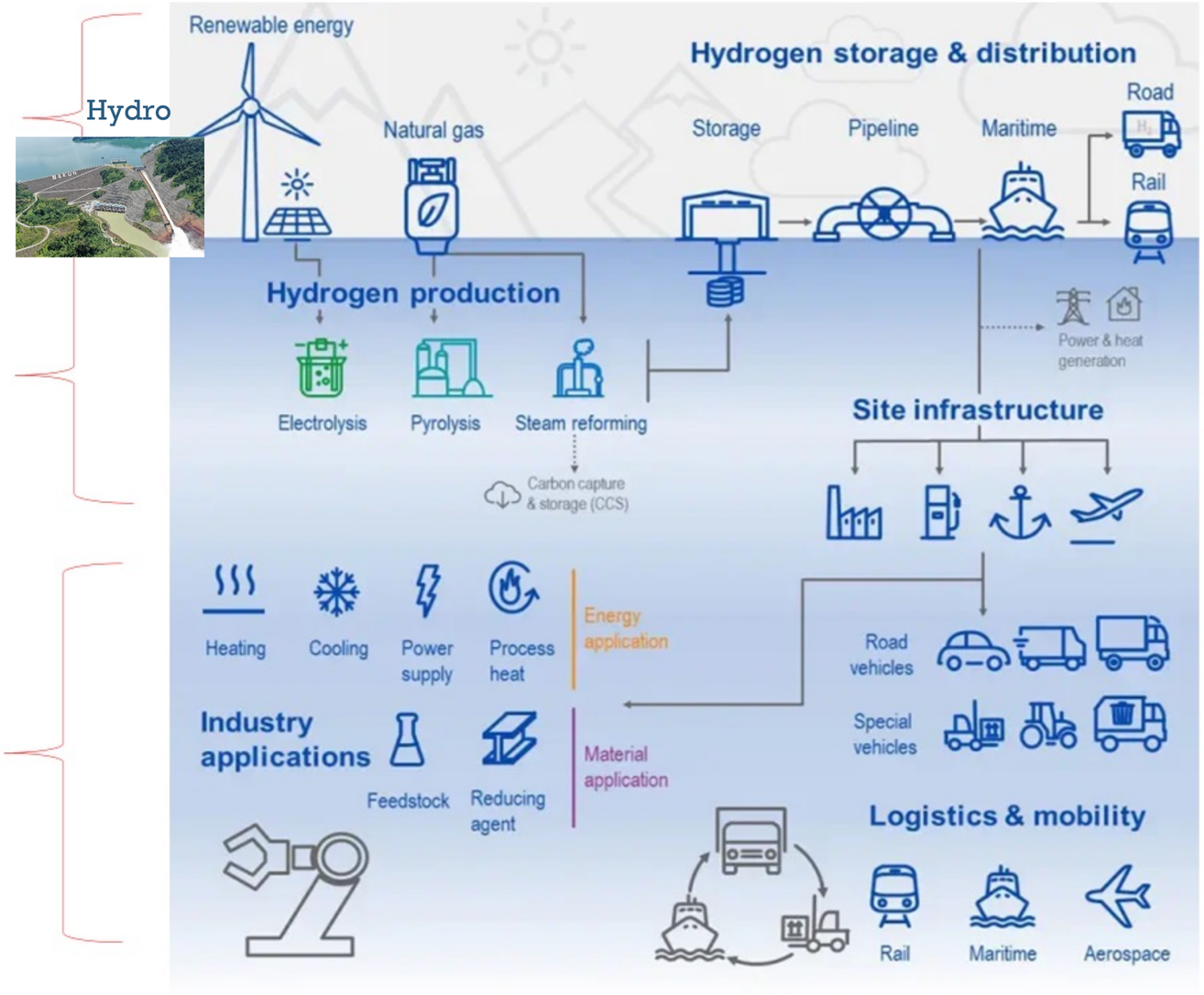
Hydrogen Value Chain

Sarawak Energy

Sarawak Hydrogen Hub

- **Rembus**
- **H2ornbill**
- **H2biscus**

Decarbonizing local industrial players

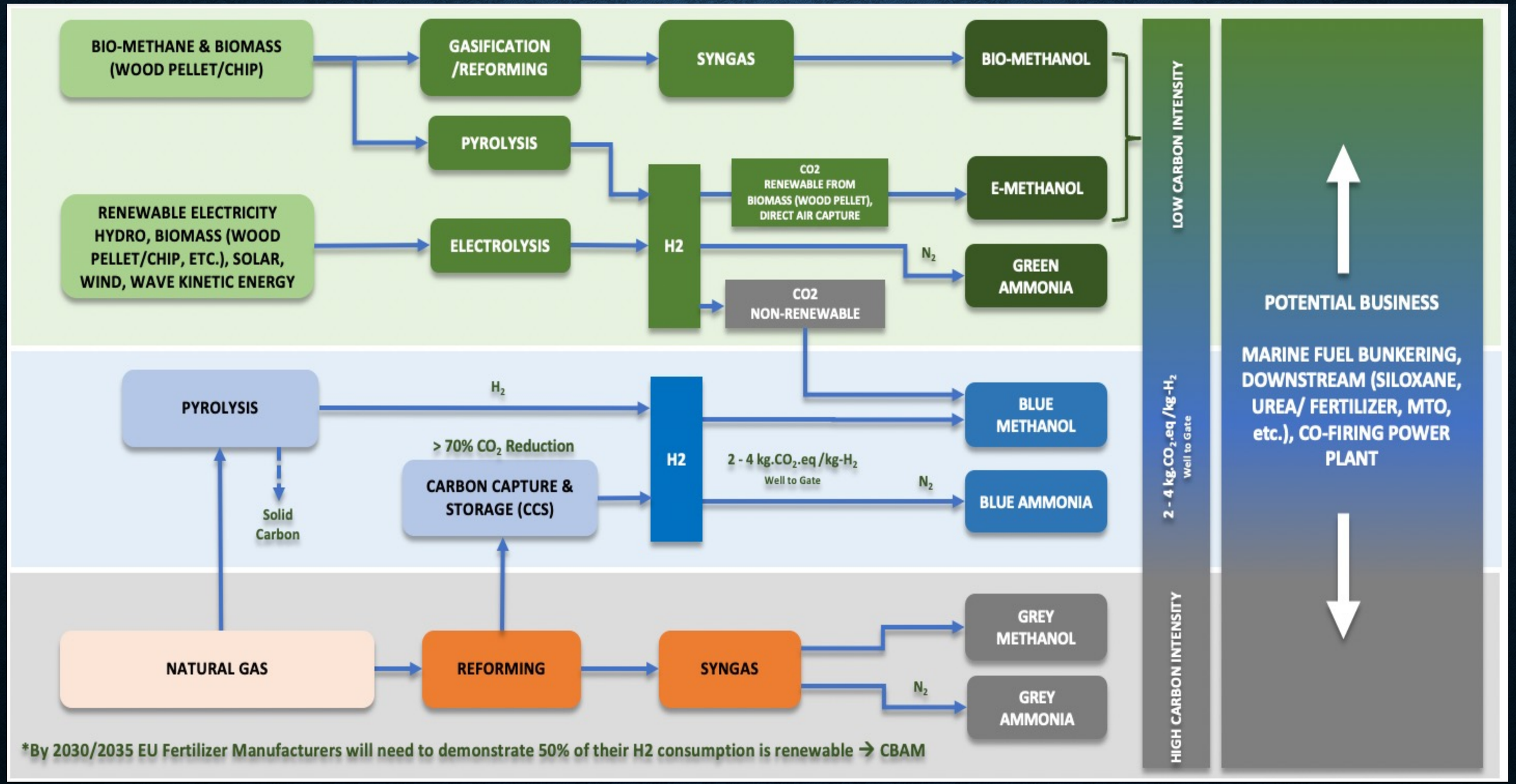


SEDC Energy (SEDCE)

Multifuel Station

Sarawak Metro - (KUTS)

Methanol & Ammonia Production Pathway



Source: (Sarawak Petchem Sdn Bhd, 2024)

Large Scale Hydrogen Production
Project H2ornbill (Japan) & Project H2biscus (South Korea)

SEDC enters tripartite MoU with Sumitomo Corp & ENEOS for development of Bintulu Hydrogen Plant (October 2020)

FEED Contract Signing Ceremony between SEDC Energy, Samsung Engineering, Lotte Chemical (October 2023)

Use of Hydrogen in Public Transportation System

- **Kuching Urban Transportation System (KUTS)** implemented by Sarawak Metro Sdn Bhd
- **Autonomous Rapid Transit (ART)**
  - Powered by hydrogen fuel cells
  - Guided by virtual tracks
  - Runs on rubber tyres
  - Operates on dedicated lanes
- Hydrogen-powered feeder buses for KUTS will provide “First-Mile & Last-Mile” connectivity for commuters

Use of Hydrogen in Public Transportation System

- **Sarawak Metro Sdn Bhd** – entrusted by the Sarawak Government to transform the public transport system in major urban areas.
- **Kuching Urban Transportation System (KUTS)** – to serve as the backbone of the public transport system in Greater Kuching

Transit Map

KUTS

PHASE 1

Blue Line

- REMBUS TO HIKMAH EXCHANGE
- 15 STATIONS (INCLUDE 1 INTERCHANGE STATION) (1 PROV.)
- 27.6KM

Red Line

- KUCHING SENTRAL TO PENDING
- 7 STATIONS
- 12.3KM

Green Line

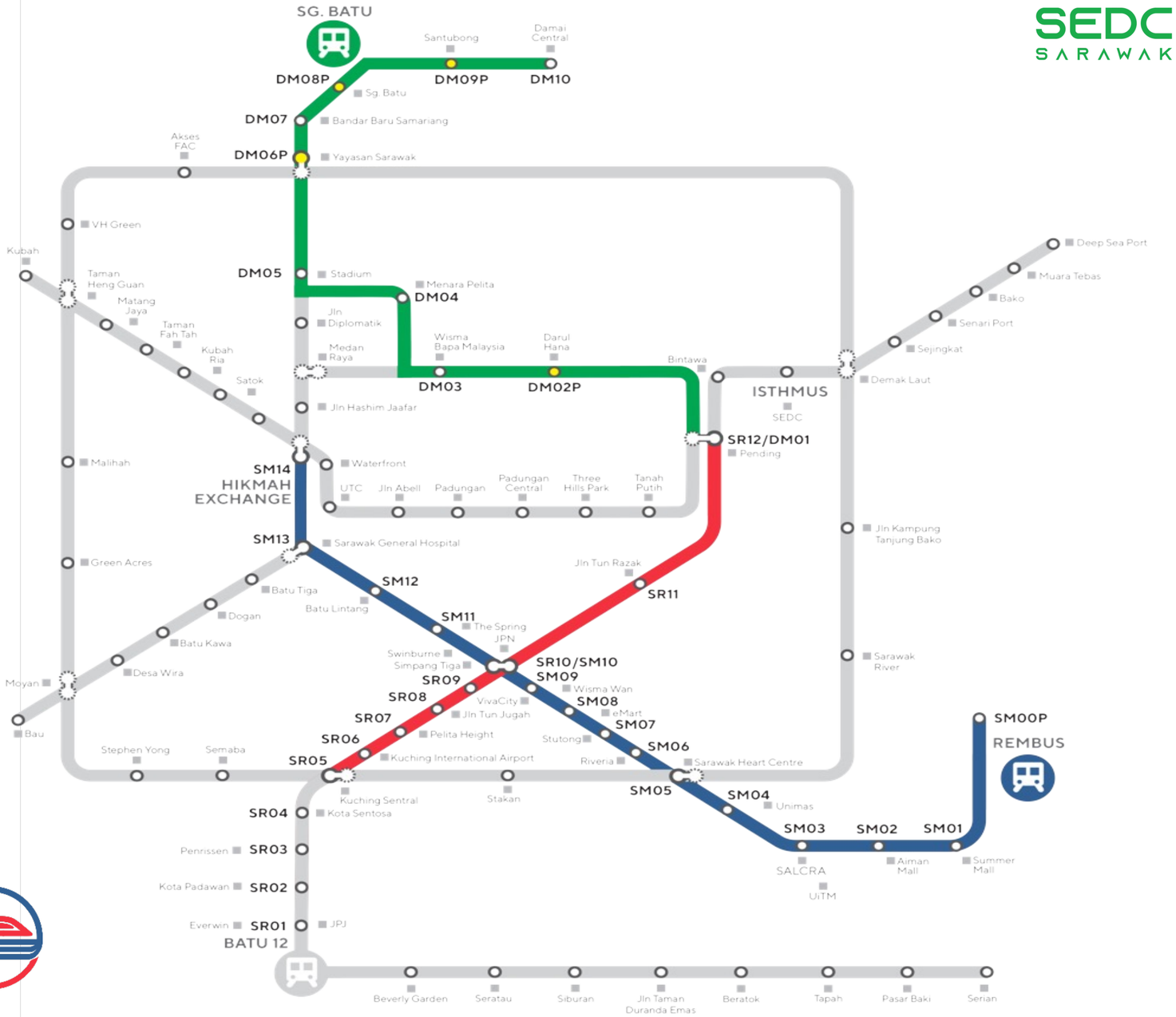
- PENDING TO DAMAI CENTRAL
- 9 STATIONS (4 PROV.)
- 30KM

Total Length : 69.9km
Total Station : 31 (5 Prov.)
The alignment is mostly at-grade

BLUE LINE
BLUE LINE (PROV. STATION)
RED LINE
GREEN LINE
GREEN LINE (PROV. STATION)
FUTURE LINE
INTERCHANGE STATION
FUTURE INTERCHANGE STATION
DEPOT
LANDMARK

Operated by :

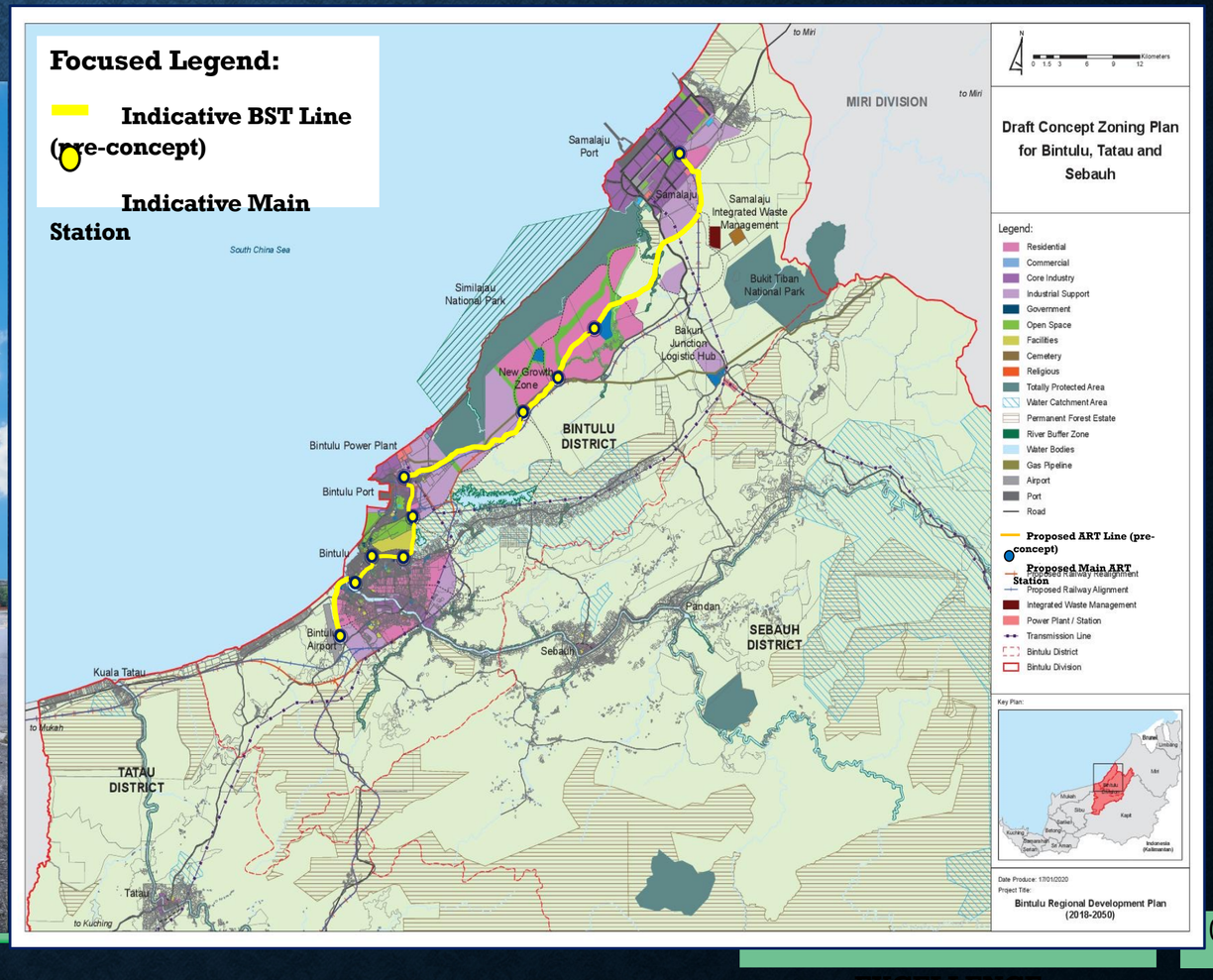
SARAWAK METRO



SEDC SARAWAK

Use of Hydrogen in Public Transportation System

- To implement the ART system that will connect **Bintulu and Samalaju**
- Samalaju and Kidurong Industrial Park in Bintulu will see a significant increase in workforce once the methanol and hydrogen plants are up and running.



- **January 2023: Unveil of Hydrogen powered** Toyota Mirai
- Toyota supplied four units of Toyota Mirai to SEDC Energy and one unit to the Premier of Sarawak as part of Toyota's introduction of their latest automotive technology and innovation.

Official handing over of Toyota Mirai to YAB Premier (January 2023)

Collaboration & Community Awareness

- Collaboration and engagements between industry leaders, policymakers and communities are imperative.
- Raising awareness is about green hydrogen technology and development.

CREATION OF INFRASTRUCTURE FOR HYDROGEN MOBILITY

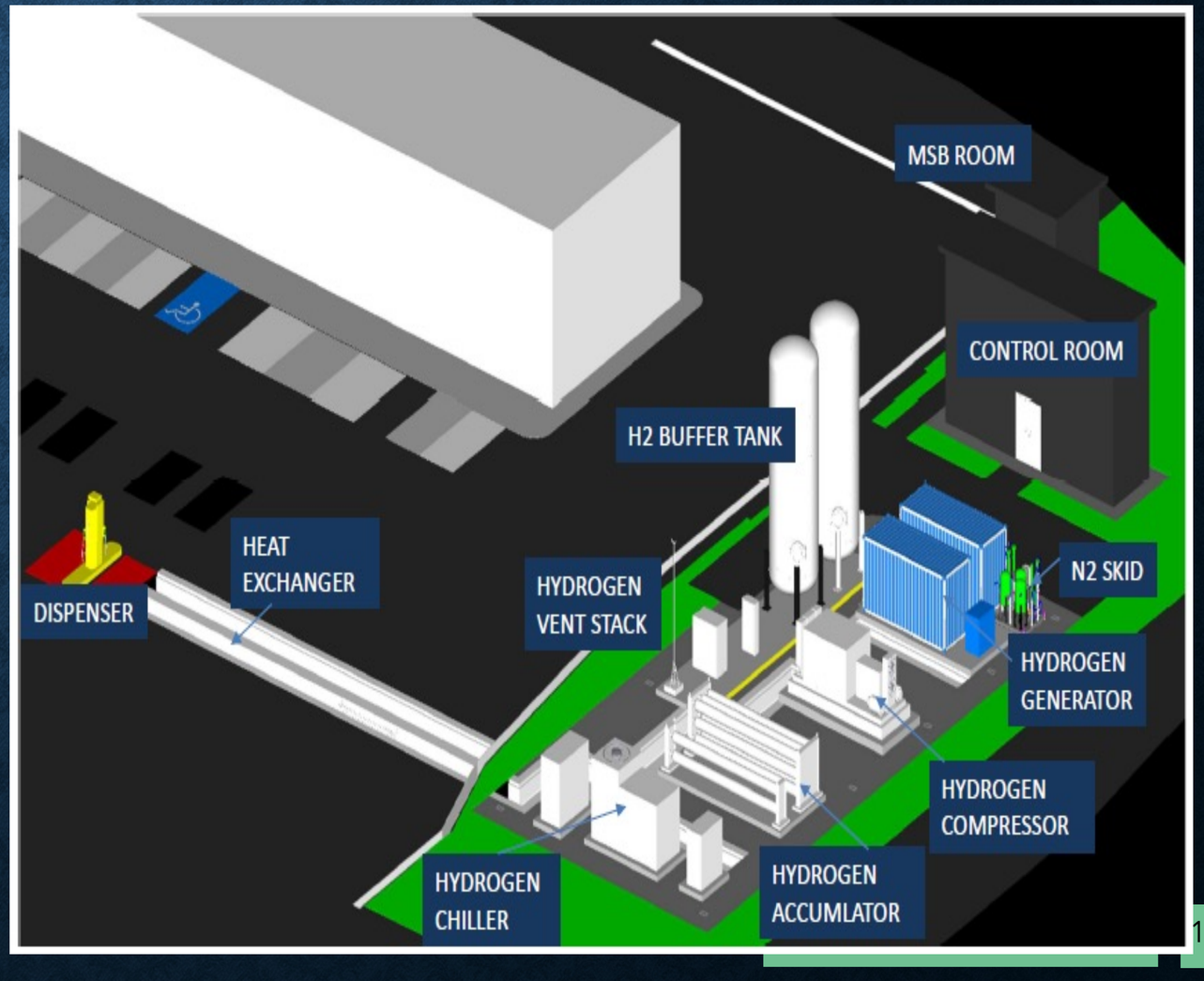
- Six flagship Petros stations planned across Sarawak.
- Smaller stations will be equipped with EV charging & conventional fuels

Official launching of the first Petros Multifuel Refuelling Station Darul Hana by YAB Premier (April 2022)

Creation of Infrastructure for Hydrogen Mobility

- October 2023: Installation of PEM electrolyzer at PETROS Darul Hana
- Capable of producing 150kg of H2 per day.

***Commissioning in Progress**



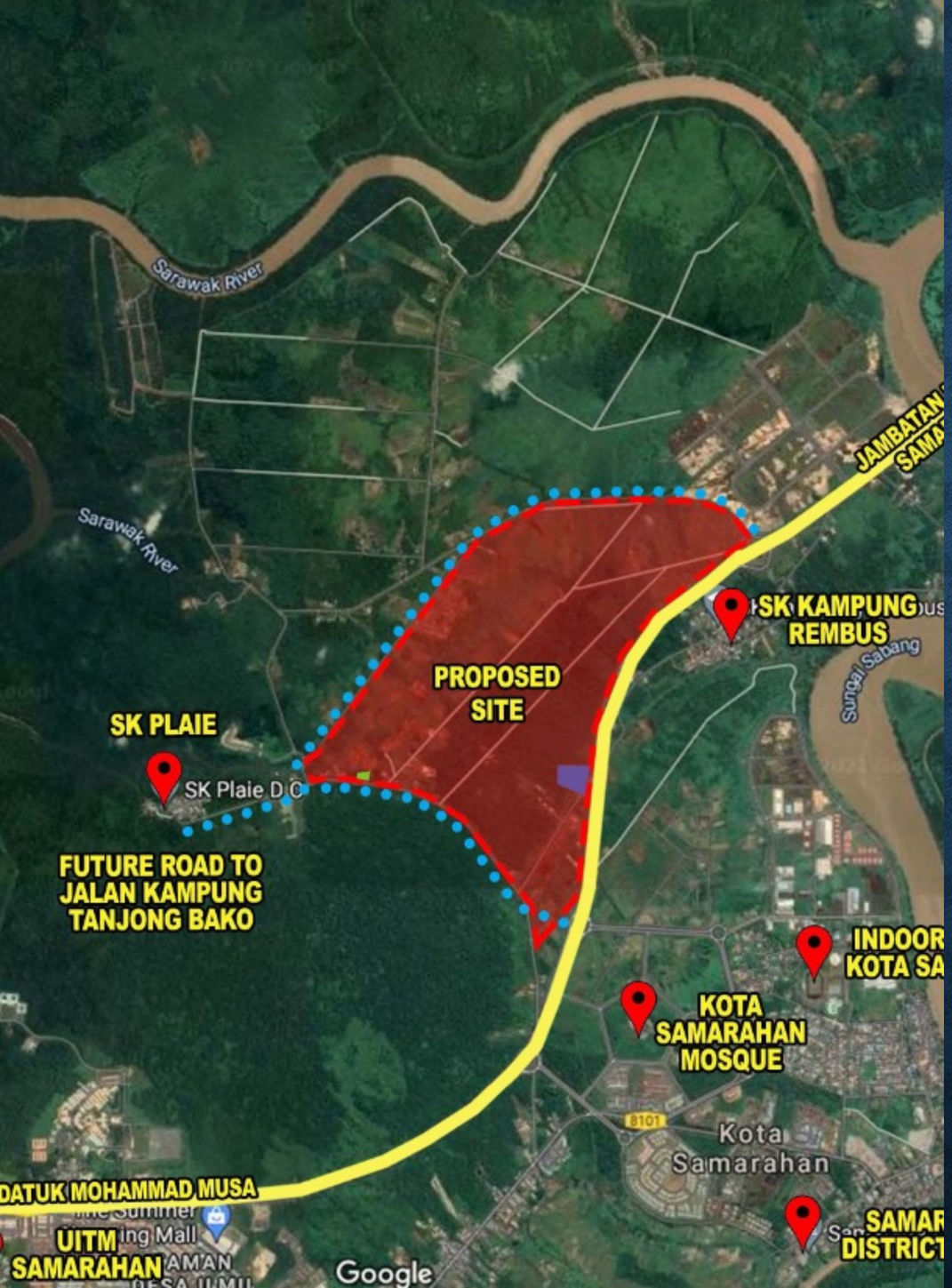
- SEDC Energy launched the first Dealer Owned, Dealer Operated (DODO) Multifuel Station in Daro, (March 2023) and this is the first venture in a town setting.


PETROS Multifuel Stations
- Conventional Fuels
- EV charging
- Hydrogen Refuelling
Legend
PETROS MFS
LABUAN FEDERAL TERRITORY
PETROS MFS PERMYJAYA MIRI
Brunei
Miri
Tawau
PETROS MFS BINTULU
Bintulu
Tarakan
NORTH KALIMANTAN
Tanjung Selor
PETROS MFS SIBU
Sibu
PETROS MFS MJC BATU KAWAH
PETROS MFS DARUL HANA
SARAWAK
PETROS MFS TEMUDOK SRI AMAN
Google Earth
Borneo
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
N
300 km

Creation of Infrastructure for Hydrogen Mobility

- **Rembus Hydrogen Production Plant**

Artist Impression



REMBUS HYDROGEN PLANT

Hydrogen to support Sarawak's public transportation system

- Kuching City Transportation System (KUTS)
- Autonomous Rapid Transit (ART)

- **Location: Rembus, Samarahan**
- **Timeline: 2025**
- **Key components:**

- Minimum **5 tonnes** of H2/day

- PEM Electrolyzers
- Compressed H2 Mobile Storage
- Other related equipment (BOP, electrical components, auxiliary systems, etc.)
- Distribution systems

Production of Electrolyser

- **Production of electrolysers** to meet the growing demands for hydrogen.
- Sarawak Electrolyser Assembly – Distribution Facility (SEA-DF), with a capacity of 50 MW per year will first meet the local demand in Sarawak.

Official launching of Sarawak Electrolyser Assembly - Distribution Facility (SEA-DF) by YAB Premier (June 2024)

Site Visit at the SEA-DF (June 2024)

CHALLENGES

- Extensive energy requirement needed to produce green hydrogen, leading to high energy cost.
- Working closely with our stakeholders to lower the cost of hydrogen production and to ensure our investments are competitively priced

Electrolyser at Petros Multifuel Station Darul Hana

H2 Refuelling Station at Petros Darul Hana

Summary

- *Will help drive key environmental, social and economic benefits by* ***achieving net zero carbon emission target by 2050***
- ***Prospering Sarawak Today for Tomorrow***