4th IEA INTERNATIONAL CCS REGULATORY NETWORK MEETING
9 – 10 MAY 2012, PARIS, FRANCE

CURRENT STATUS ON CARBON CAPTURE AND STORAGE INITIATIVES IN MALAYSIA

by
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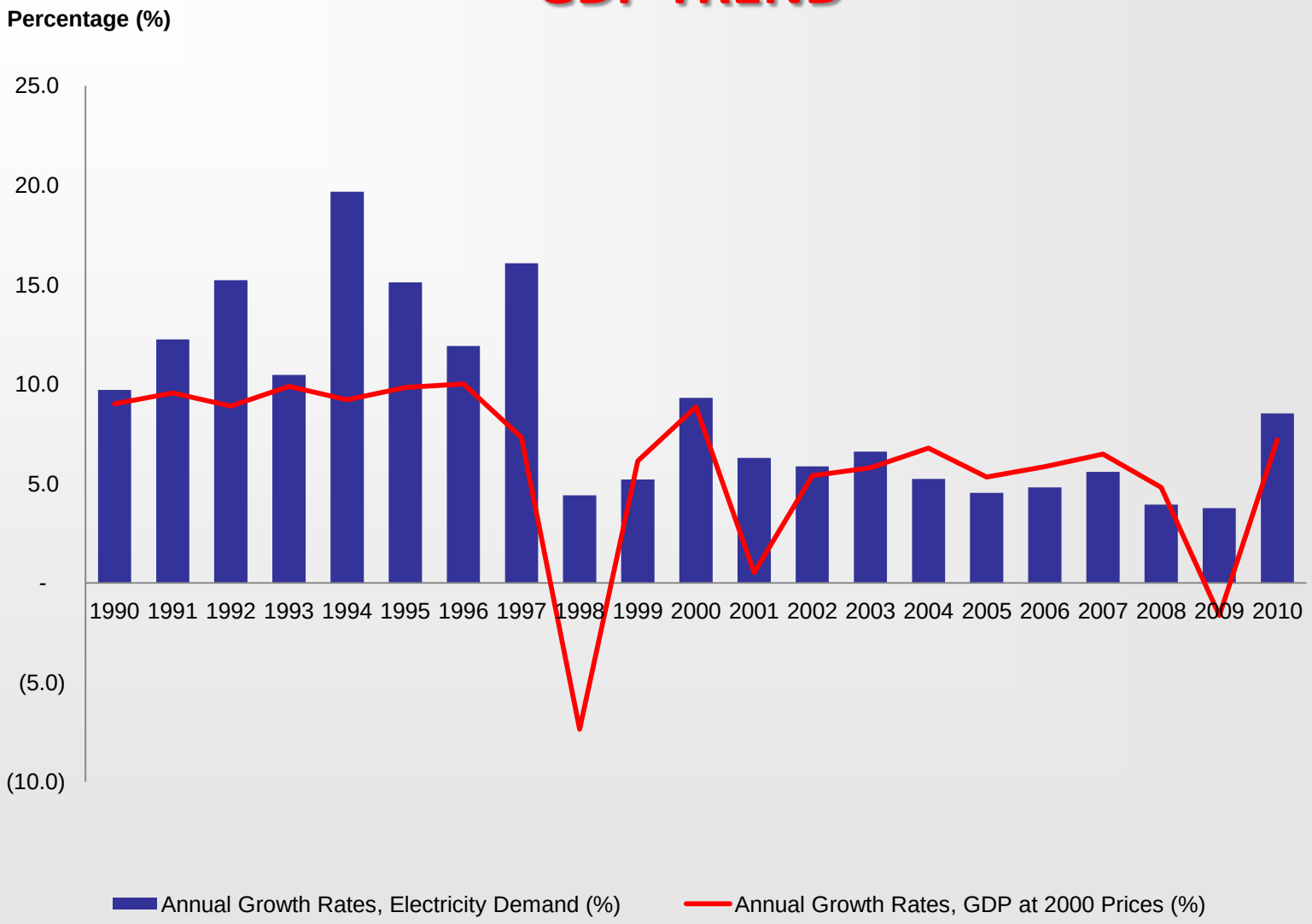
OUTLINE

- **MALAYSIA ELECTRICITY SUPPLY AND DEMAND SITUATION**
- **CLIMATE CHANGE INITIATIVES**
- **CCS – A MALAYSIA PERSPECTIVE**

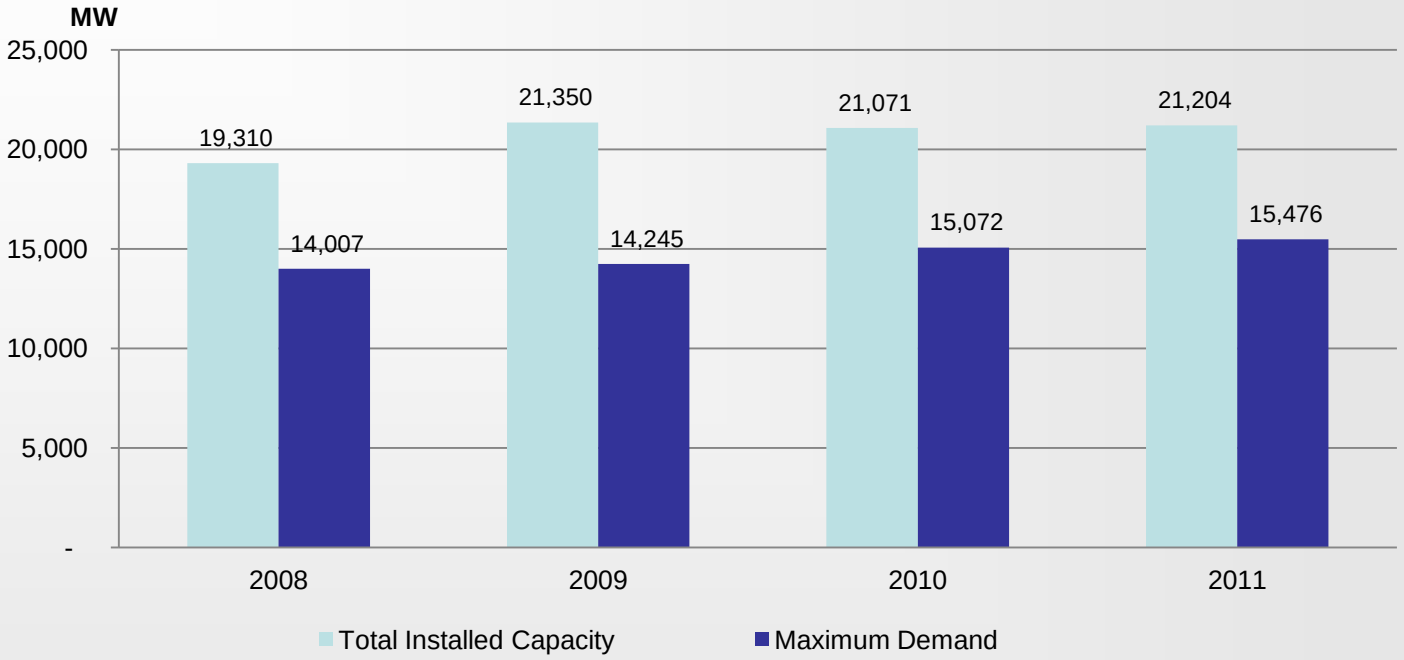
MAP OF MALAYSIA

MALAYSIA ELECTRICITY SUPPLY AND DEMAND SITUATION

ANNUAL GROWTH OF ELECTRICITY DEMAND AND GDP TREND



INSTALLED CAPACITY, MAXIMUM DEMAND AND RESERVE MARGIN FOR PENINSULAR MALAYSIA



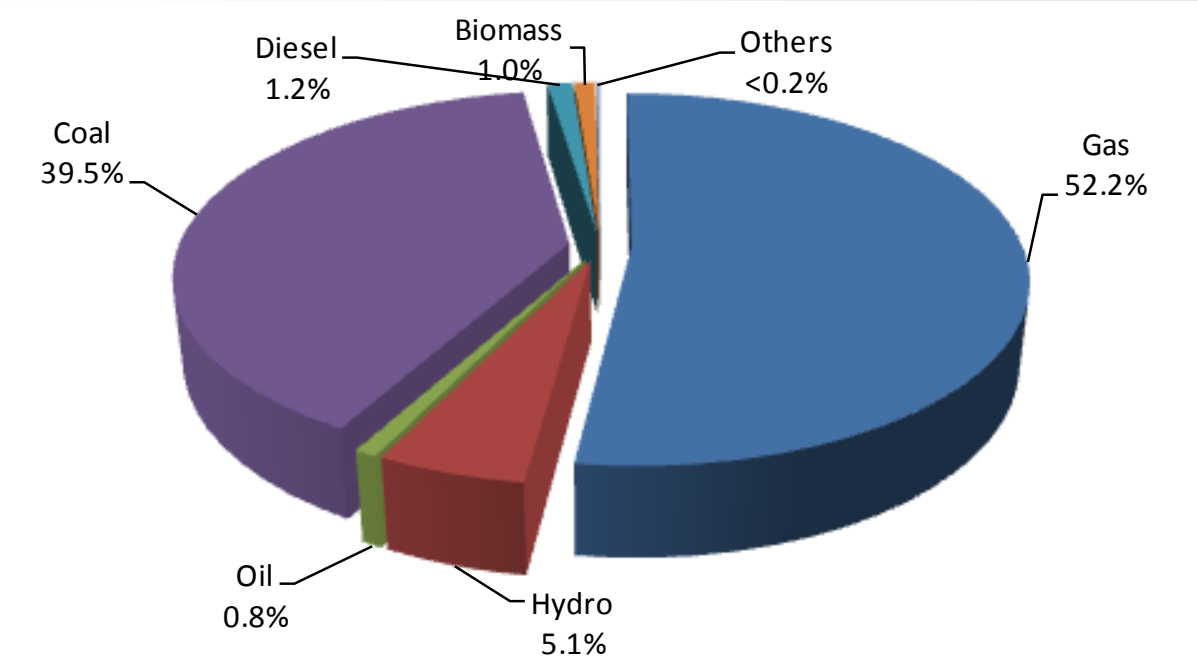
Year	2008	2009	2010	2011
Reserve Margin (%)	37.9	49.9	39.8	37

MAJOR GENERATION STATIONS & GRID IN PENINSULAR MALAYSIA

MAJOR GENERATION STATIONS & GRID IN SABAH

MAJOR GENERATION STATIONS & GRID IN SARAWAK

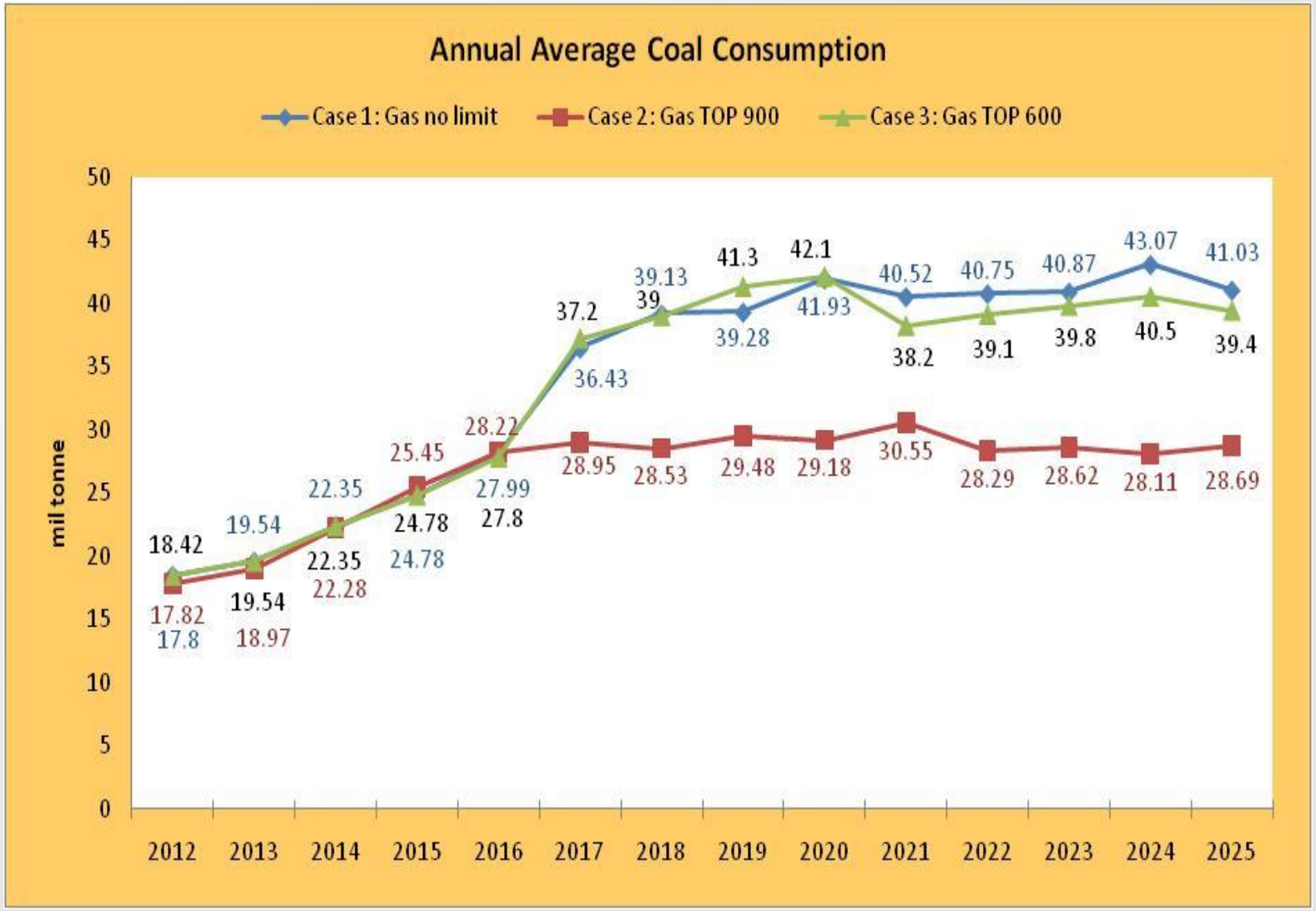
OVERVIEW OF ELECTRICITY GENERATION MIX



Electricity Generation for Malaysia in 2010 = 125,045 GWh

GENERATION MIX BY REGION

MOVING FORWARD - FUTURE ENERGY SUPPLY



*** Coal consumption gradually increase to more than 40 million tonnes per year.**

INITIATIVES TO SECURE FUTURE ENERGY SUPPLY

1. **Diversifying sources of fossil fuel supply**
   - **Seeking a more balanced generation fuel mix**
   - **Intensifying indigenous gas and hydro resources development**
   - **Securing coal and gas from foreign sources**
   - **Strengthening and expanding fuel and electricity supply infrastructures towards regional interconnection**
2. **Exploring and building capacity for the nuclear option**
3. **Promoting renewable energy resources through enhanced fiscal incentives, grants and subsidies**
   - **Biomass, biogas, solar, mini-hydro, wind**
4. **Enhancing Energy Efficiency & Conservation**

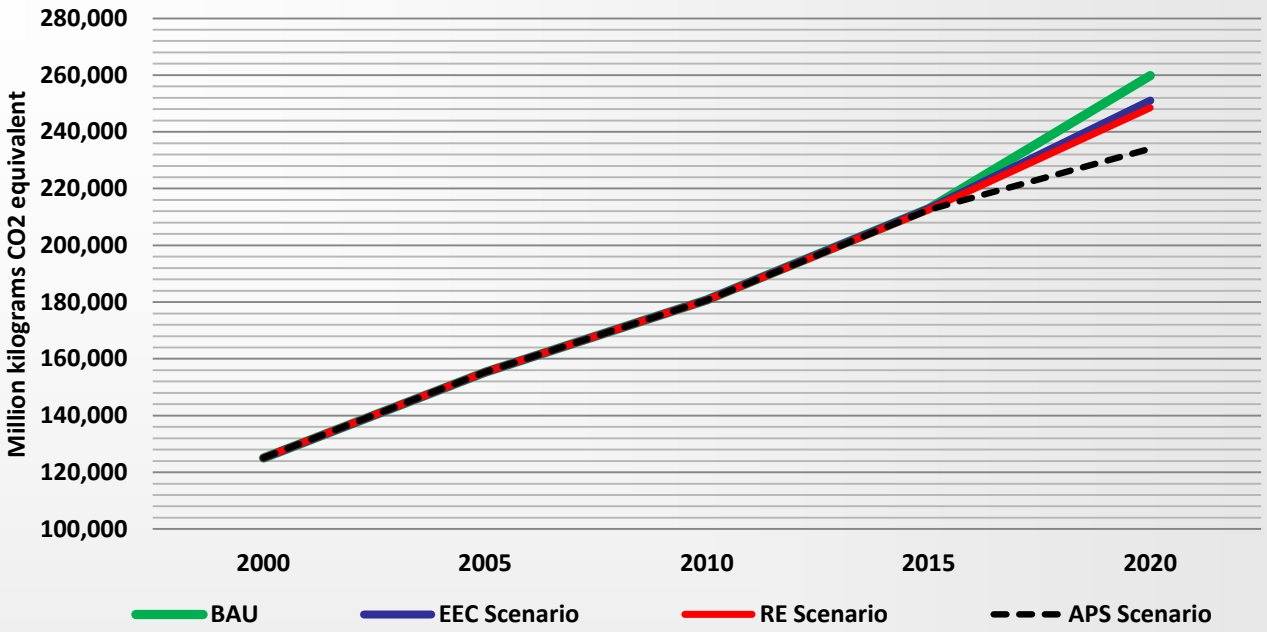
CLIMATE CHANGE INITIATIVES

COMMITMENTS TOWARDS CLIMATE CHANGE

1. Malaysia is committed to ensure 50% of land area remains as forests (at present natural forests and agriculture crop plantations cover 75% of land area)

2. COP15 - Voluntary reduction of up to 40% of carbon intensity by 2020 compared to 2005 levels
   - Conditional on receiving technology transfer and finance from Annex 1 countries

CO2 EMISSION IN THE ENERGY SECTOR



Year	2000	2005	2010	2015	2020
BAU	125,071	155,306	180,716	212,902	259,844
EEC Scenario	125,071	155,306	180,716	212,902	251,058
RE Scenario	125,071	155,306	180,716	212,447	248,433
APS Scenario	125,071	155,306	180,716	212,447	234,065

- As of 2000, electricity and heat generation accounted for about 30 percent of the total CO2 emission in the energy sector.
- Source : Ministry of Natural Resources and Environment (National Communication 2)

RENEWABLE ENERGY POLICY & ACTION PLAN

1. Regulatory framework

- Renewable Energy (RE) Act 2011 (Act 725)
- Sustainable Energy Development Authority Act (SEDA) 2011 (Act 726)
- Feed-in Tariff Mechanism

2. RE Targets:

- 2015: 985 MW (6%)
- 2020: 2,080 MW (11%)
- 2030: 4,000 MW (17%)

3. Feed-in Tariff (FiT) Mechanism

- Mechanism that allows electricity that is produced from indigenous RE resources to be sold to power utilities at a fixed premium price and for specific duration
- Enforced under RE Act 2011 from 1st December 2011
- Sources of fund – 1% collection from consumers' electricity bills

RENEWABLE ENERGY (RE) - CURRENT DEVELOPMENTS

- **Number of RE projects approved by SEDA as at 30th April 2012**

Source	No of Application Approved	Installed Capacity (MW)	% of Installed Capacity	CO2 Reduction (tonnes)
Biogas	10	14.48	4.65	60,494
Biomass	8	91.80	29.46	1,209,399
Small Hydro	10	65.25	20.94	568,662
Solar PV	348	140.03	44.95	332,623
Total	377	311.56	100.00	2,171,179

EE INITIATIVES

- **Efficient Management of Electrical Energy Regulations 2008**
- **EE Rating and Labelling of Electrical Appliances and Material**
- **Sustainability Achieved Via Energy Efficiency (SAVE) Programme**
- **National Energy Efficiency Masterplan**
- **Energy Audit Programme for Government Buildings**

CCS – A MALAYSIA PERSPECTIVE

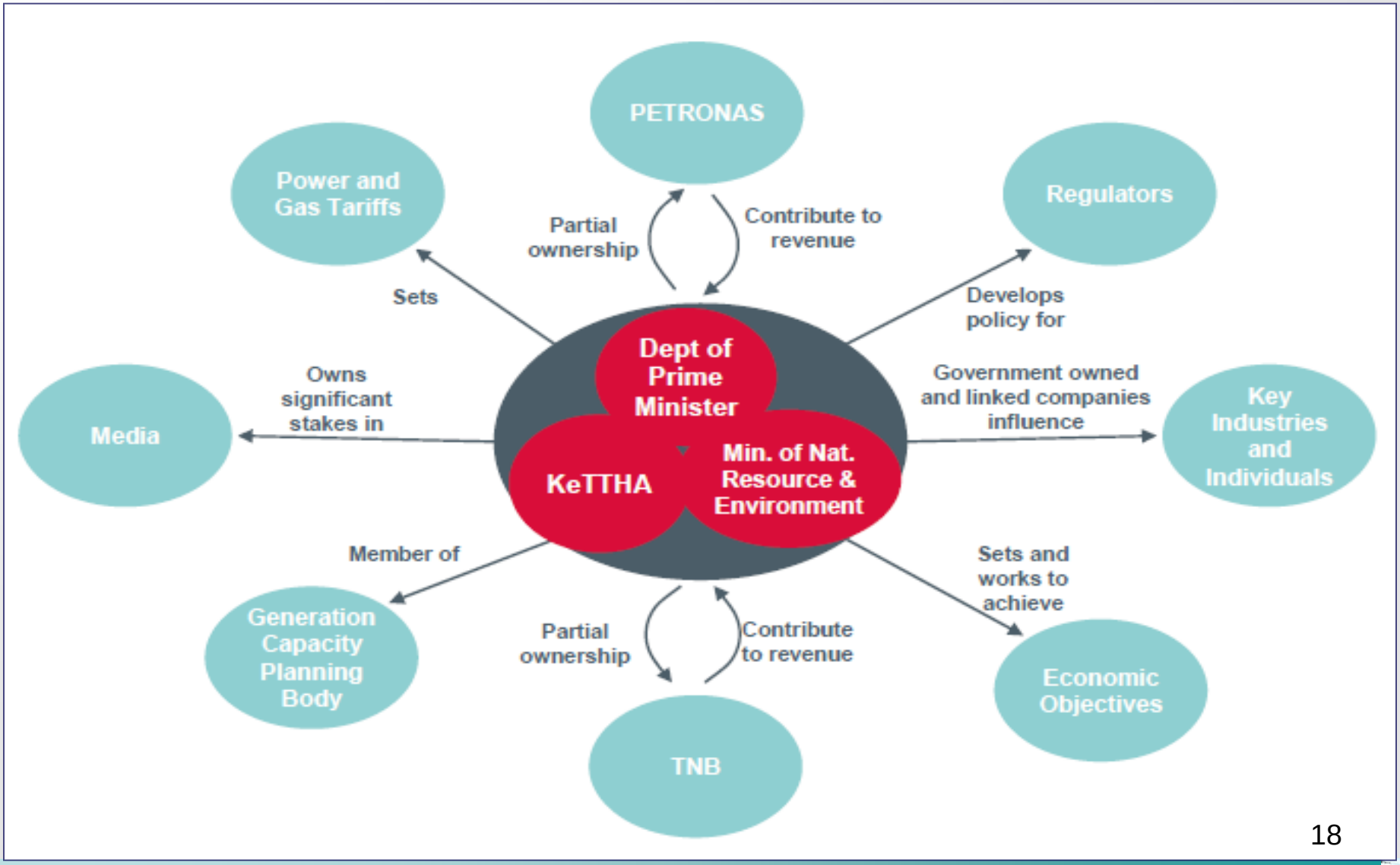
OVERVIEW

Power sector contributes about 30%-40% of CO_2 emission of Malaysia

Malaysia has 7,650 MW capacity of coal generation - the major contributor to the power sector emissions

CCS is one of the options being considered by Malaysia to mitigate Malaysia CO_2 emissions in the longer term

MALAYSIAN ENERGY INDUSTRY ISSUES



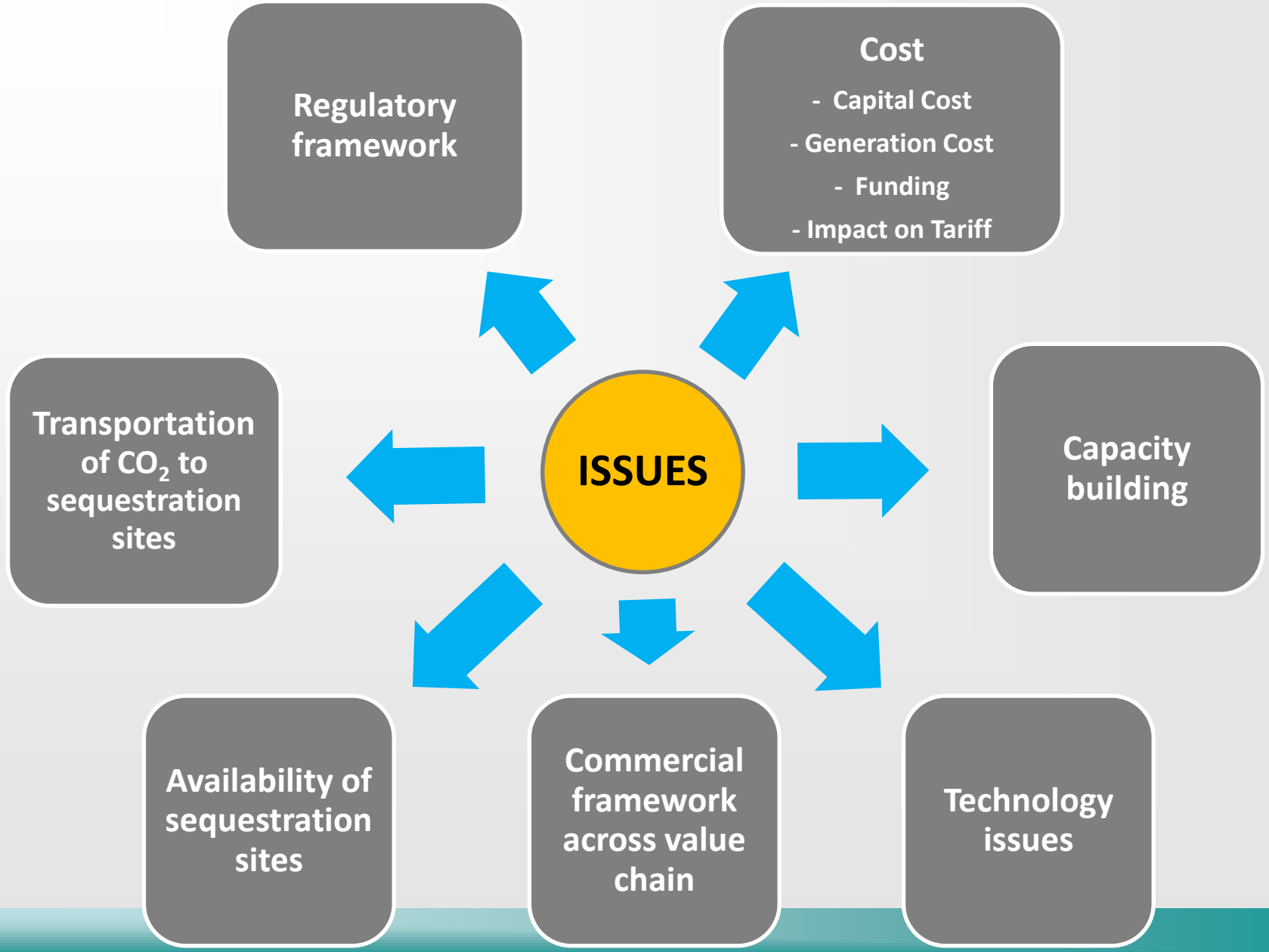
RATIONALE FOR CCS IN MALAYSIA

- Malaysia energy profile includes significant use of fossil fuel.
- Over 90% of electricity generation is through fossil fuels.

- In Copenhagen 2009, Prime Minister of Malaysia made a voluntary commitment to reduce CO2 intensity by 40% by 2020 relative to 2005 levels.

- Malaysia aims to have RE contribution at 11 % of energy mix by 2020. Nevertheless, fossil fuel expected to be prominent in the foreseeable future

ISSUES ON CCS IMPLEMENTATION



CCS STRATEGY

- To expose relevant Malaysian stakeholders and clients to CCS technology in the short term
- Build capacity in CCS technology and operations, including CCS curriculum in education institutions, in the medium term
- Institute appropriate legal and regulatory framework for CCS in the medium term
- Consider possibility of CCS implementation in the longer term

CCS ACTIVITIES

2009 & 2010

- Joined the Global CCS Institute (GCCSI) in 2009
- Implementing Scoping Study for CCS implementation in Malaysia in 2010, with the assistance of GCCSI and Clinton Foundation
- Malaysia has participated in the Global CCS Institute Policy, Legal and Regulatory Study Group (PLR-SG)

2011

- Participated in the APEC CCS Regulatory Assessment Project
- IEA CCS Roundtable in Malaysia
- Organized Panel Discussion on CCS and Low Emission Strategy with GCCSI
- Malaysia in the GCCSI Capacity Building Program

2012

- Planning for CCS curriculum in Malaysian universities
- Training of Trainers Program planned for July 2012 for Academic staff of Malaysian universities to introduce CCS curriculum
- Final report of APEC CCS Regulatory Assessment expected to be released

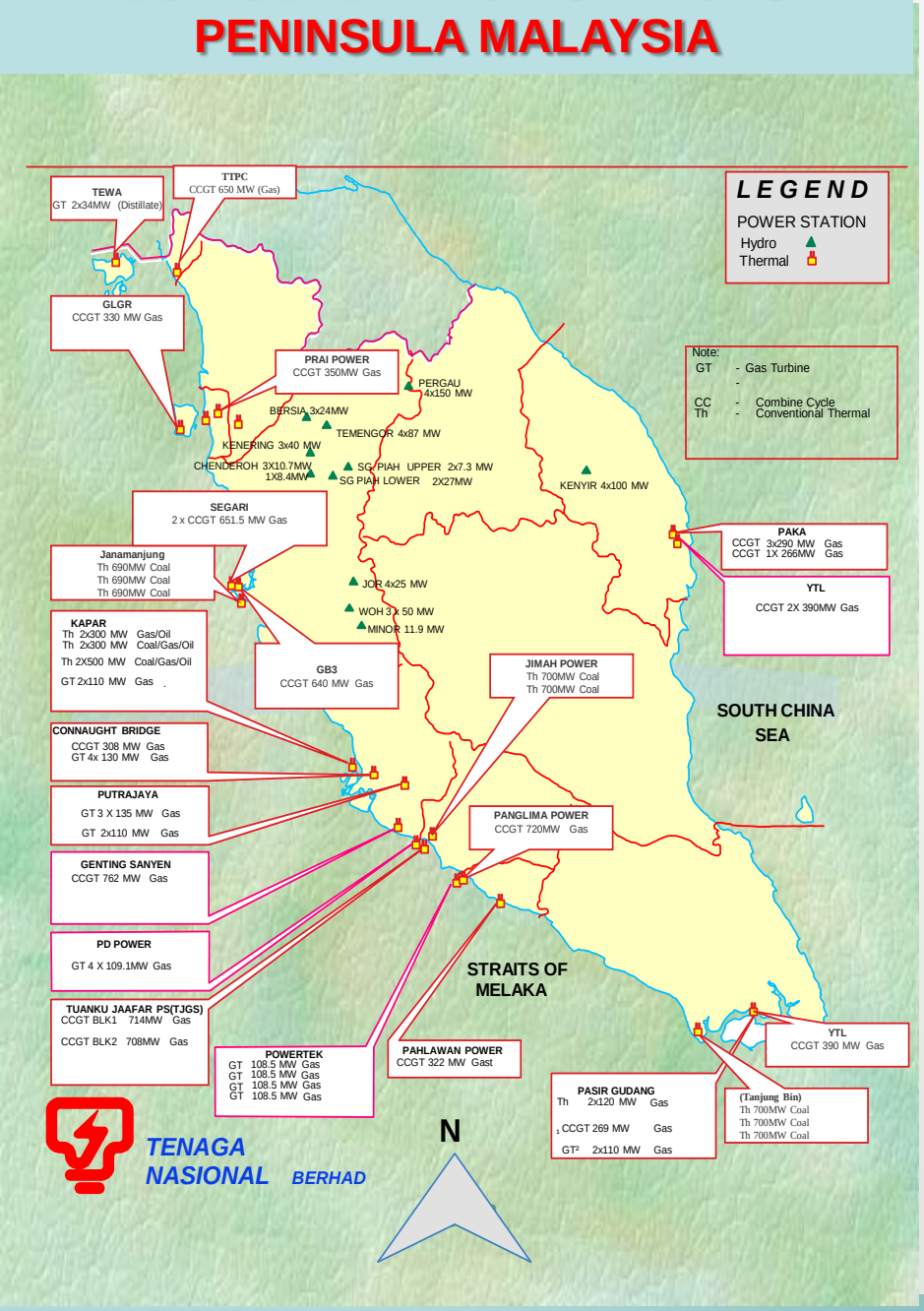
PROPOSED CCS ACTIVITIES

- **Establish inter-agency CCS steering committee to plan for CCS activities**
- **CCS legal and regulatory study and take appropriate follow-up**
- **Undertake Storage Study and plan for storage activities**
- **Implement trainings for CCS professionals – technology, economics/finance, safety, public awareness and etc.**
- **Decide on CCS implementation in the long term**

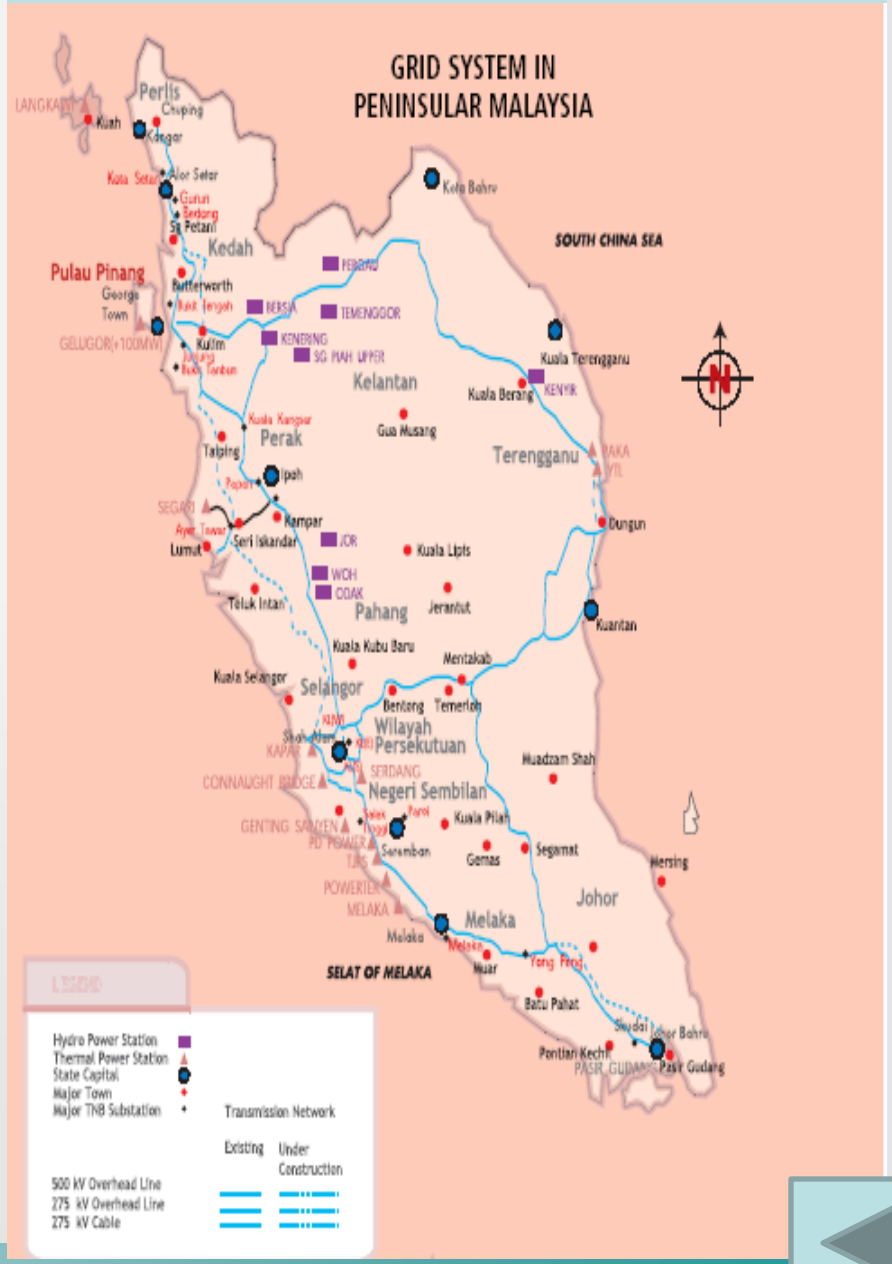
KeTTHA
KEMENTERIAN TENAGA,
TEKNOLOGI HIJAU DAN AIR

THANK YOU

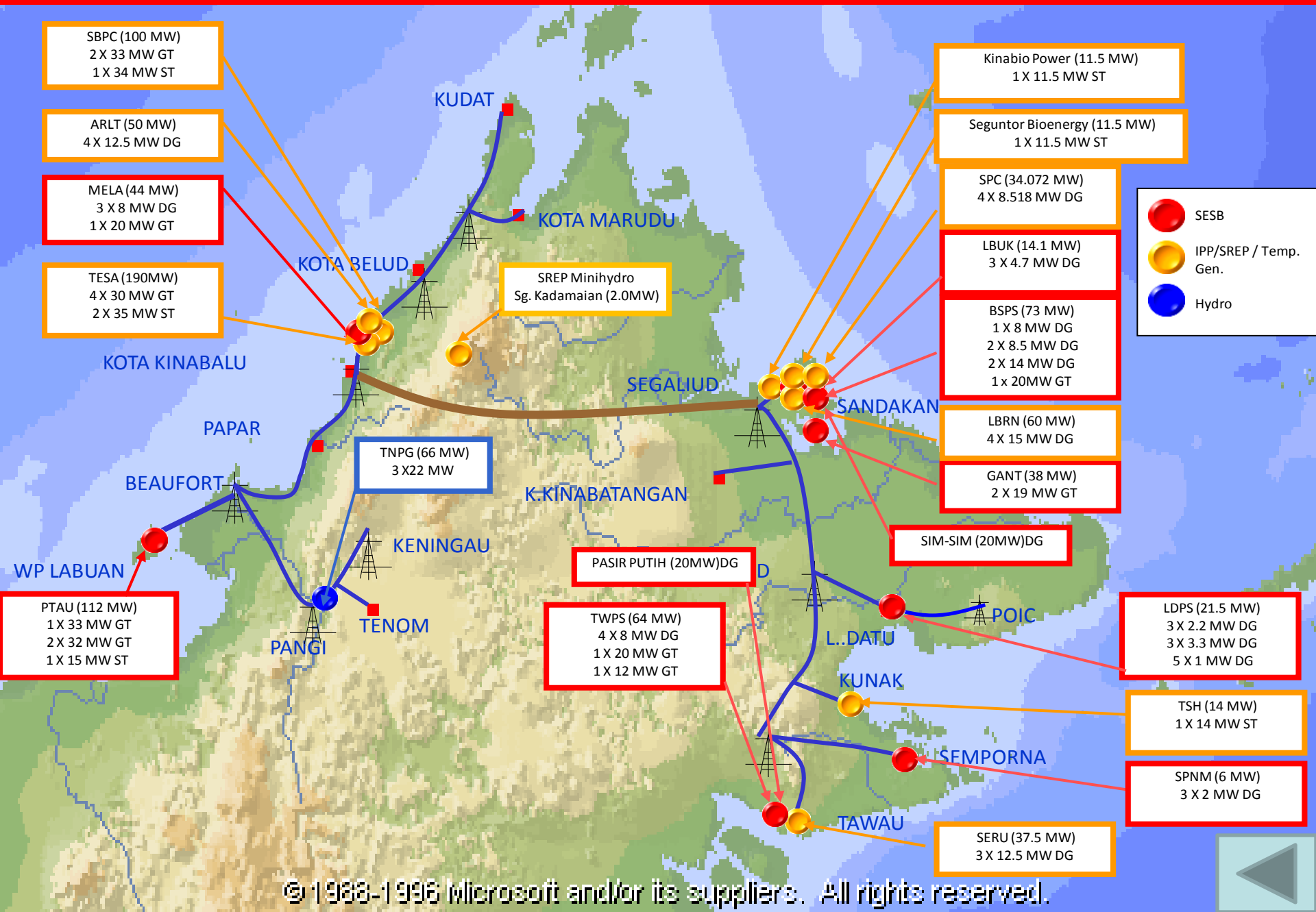
MAJOR GENERATION STATIONS IN PENINSULA MALAYSIA



MAJOR SYSTEM GRID IN PENINSULA MALAYSIA



MAJOR GENERATION STATION AND GRID IN SABAH



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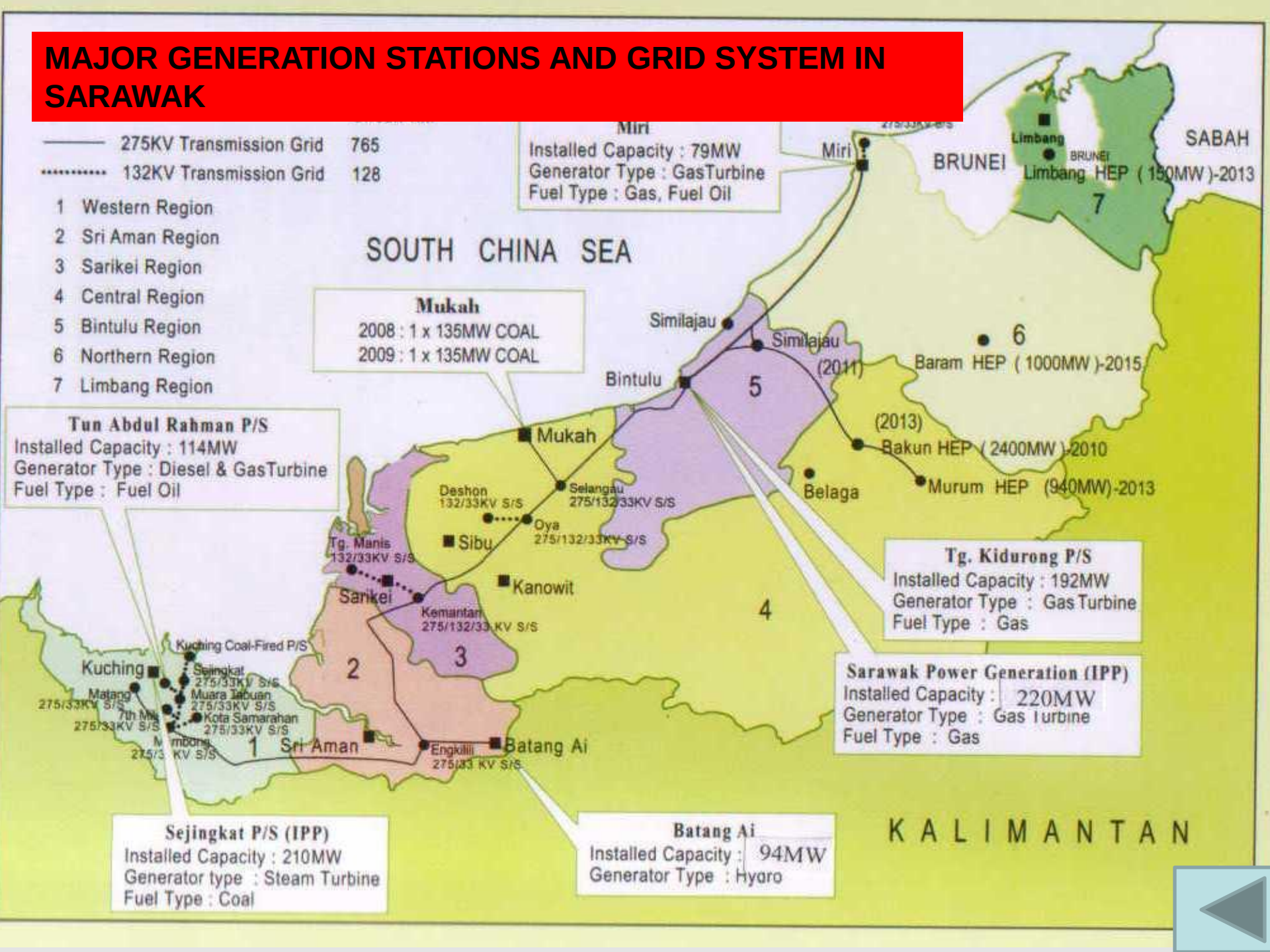
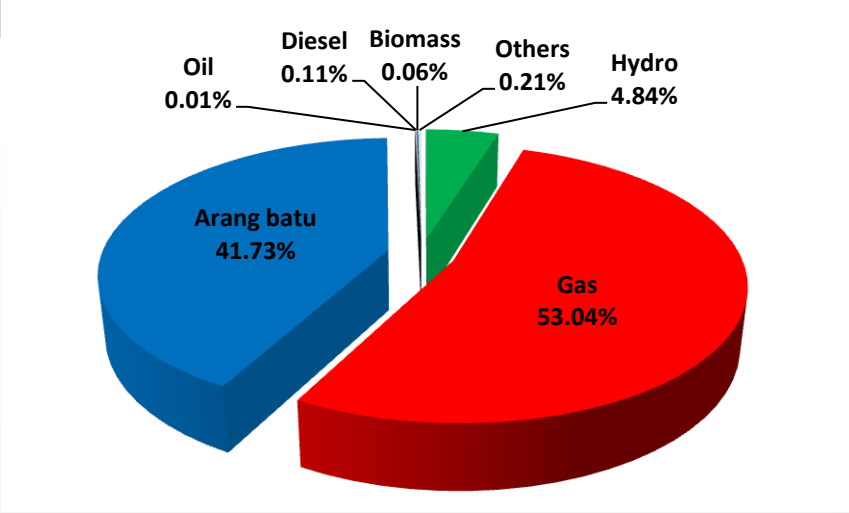
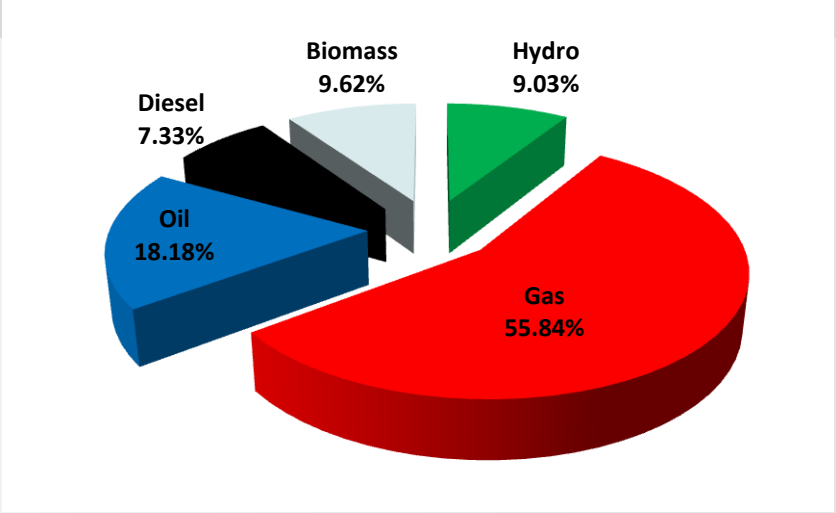
MAJOR GENERATION STATIONS AND GRID SYSTEM IN SARAWAK



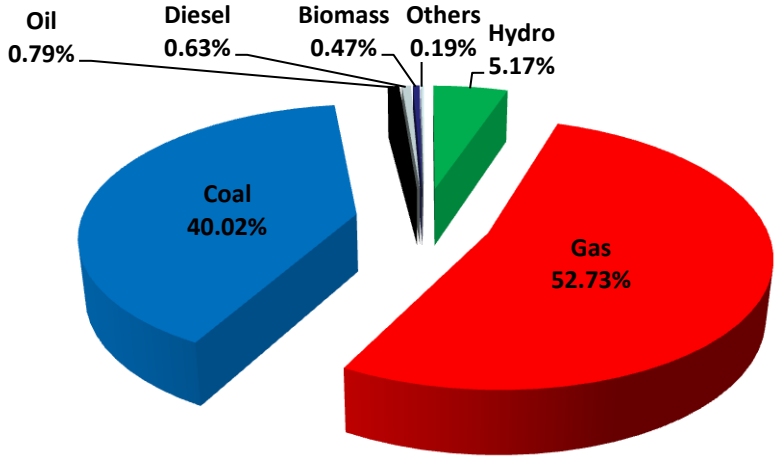
ELECTRICITY GENERATION MIX BY REGION



Electricity Generation for Peninsular Malaysia in 2010 = 110, 750 GWh



Electricity Generation for Sabah in 2010 = 5,359 GWh



Electricity Generation for Sarawak in 2010 = 7, 346 GWh