ENERGY DATA COMPILATION AND PROCESSING

INTERNATIONAL WORKSHOP ON
ENERGY STATISTICS AND ENERGY BALANCE
23-25 MAY 2016
BEIJING, CHINA

SALMIAH PONGGOT
DEPARTMENT OF STATISTICS MALAYSIA (DOSM)

Key Economic Indicator:

MALAYSIA @ A GLANCE 2015	
Area (km2)	330,323
Population (million)	31.0
GNI Per Capita	RM36,299
GDP Nominal (bil.)	RM1,157.1
GDP Real (bil)	RM1,062.8
Labour Force (million)	14.5
Employment (million)	14.1
Unemployment rate (%)	3.1

Key Economic Indicator:

Annual Growth - 2015

Services 5.1%

Manufacturing 4.9%

Electricity and gas 2.9%

2015 GDP 5.0%

Mining, 4.7%

Agriculture 1.2%

Construction 8.2%
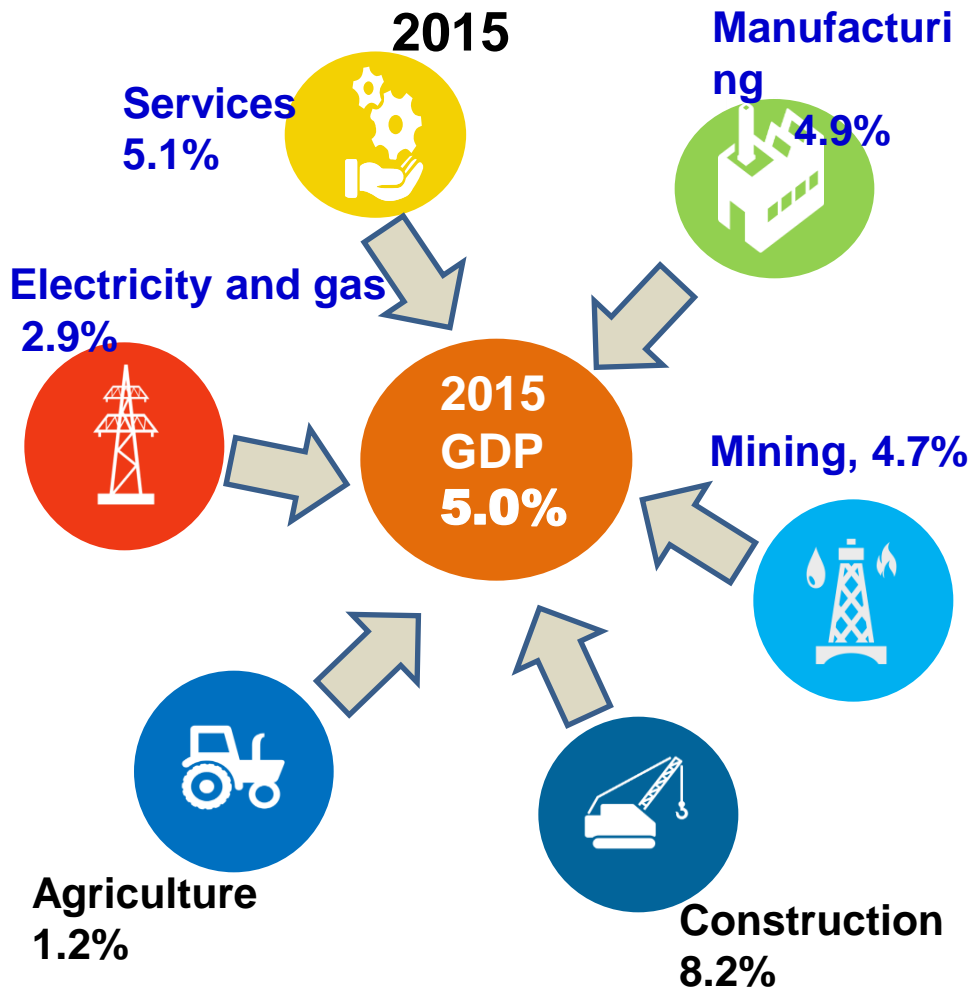
GDP by Kind of Economic Activity at Constant 2010 Prices - Percentage Share to GDP

Kind of economic activity	2010	2015[p]
1 Agriculture	10.1	8.9
2 Mining and quarrying	10.9	9.0
2.1 Crude oil and condensate	5.6	4.4
2.2 Natural gas	4.9	3.9
2.3 Other mining & quarrying and supporting services	0.4	0.6
3 Manufacturing	23.4	23.0
2.1 Refined petroleum products	3.4	3.0
2.2 Chemicals & chemical products and pharmaceutical products	2.6	2.4
4 Construction	3.4	4.4
5 Services	51.2	53.5
5.1 Utilities	2.7	2.6
5.1.1 Electricity and gas	2.2	2.0

2010: RM821.4b   2015: RM1,062.8b

Energy data is collected and compiled by :

Energy Commission (EC)

- Custodian and focal point for Malaysia's energy data
- Statutory body under the Ministry of Energy, Green Technology and Water Malaysia
- Regulating the energy sector particularly the electricity supply and piped gas distribution industries
- Data source: from various Ministry/Agency
  via **The Malaysia Energy Information Hub (MEIH)**
    www.meih.st.gov.my
- Energy data compilation:
  - **National Energy Balance**

http://www.st.gov.my/

Department of Statistics Malaysia (DOSM)

- DOSM collect data from primary/ secondary sources relates to energy i.e:
  - ✓coal
  - ✓petroleum & petroleum products
  - ✓natural gas
  - ✓ electricity, chilled water for air conditioning
  - ✓ biomass
  - ✓ imports/exports of energy commodity & products
- Energy data compilation :
  Development of Malaysia SEEA PSUT – Energy Account 2010
  https://www.statistics.gov.my/

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FUNCTION OF DOSM

• Under the **"Statistics Act 1965 (Revised 1989)",** the main functions of the Department are:

i. To collect and interpret statistics for the purpose of formulation or implementation of government policies in whatever fields as needed by the government or for fulfilling the requirements of trade, commerce, industry, agriculture or others;

ii. To disseminate statistics which have been collected or interpretation based on statistics collected, not only to government agencies but also to authorities or persons where the information is useful to them.

Energy Policy Maker

National Key Economic Areas – Oil, Gas & Energy Sectors

http://etp.pemandu.gov.my/annualreport2011/12_National_Key_Economic_Areas-@-Oil,_Gas_-%E2%97%98-_Energy.aspx

National Energy Policy

http://www.epu.gov.my/en/tenaga

National Mineral Policy 2

http://www.nre.gov.my/ms-my/PustakaMedia/Penerbitan/Dasar%20Mineral%20Negara%202.pdf

10th & 11th Malaysia Plans

http://onlineapps.epu.gov.my/rmke10/img/pdf/en/chapt3.pdf
http://rmk11.epu.gov.my/book/eng/Chapter-6/Chapter%206.pdf

PEMANDU
PERFORMANCE MANAGEMENT AND DELIVERY UNIT
JABATAN PERDANA MENTERI

EPU
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT, MALAYSIA

NRE

KeTTHA
KEMENTERIAN TENAGA,
TEKNOLOGI HIJAU DAN AIR

ELEVENTH
MALAYSIA
PLAN
2016-2020
ANCHORING GROWTH ON PEOPLE

3. COMPILATION AND PROCESSING

i.   CLASSIFICATION
ii. DATA SOURCE
iii. STATISTICAL UNIT
iv. PRODUCT & MEASUREMENT UNIT
v.   DATA PROCESSING

i. CLASSIFICATION

SIEC	CPC	ISIC	MSIC 2008 VER 1.0

CORRESPONDENCE BETWEEN SIEC & MSIC 2008 VER 1.0

For energy statistics compilation, the available standard classifications are:

1. Malaysia Standard Industrial Classification (MSIC 2008 Ver.1.0). MSIC is based on International Standard Industrial Classification of All Economic Activities, ISIC UNSD)
2. Malaysia Classification of Products by Activity (MCPA), 2009 (Based on CPC)
3. HS and SITC code – Trade data
4. COICOP (Household consumption for energy)

i. CLASSIFICATION

No.	ISIC	MSIC	Description MSIC 2008
1.	0510	05100	Mining of hard coal
2.	0520	05200	Mining of lignite (brown coal)
3.	1910	19100	Manufacture of coke oven products
4.	1920	19201	Manufacture of refined petroleum products
5.	3520	35201	Manufacture of gaseous fuels with a specified calorific value, by purification, blending and other processes from gases of various types including natural gas
6.	3520	35202	Transportation, distribution and supply of gaseous fuels of all kinds through a system of mains
7.	0892	08921	Peat digging

i. CLASSIFICATION

| No.	ISIC	MSIC	Description MSIC 2008
8.	0610	06101	Extraction of crude petroleum oils
9.	0610	06102	Extraction of bituminous or oil shale and tar sand
10.	0620	06201	Production of crude gaseous hydrocarbon (natural gas)
11.	2011	20111	Manufacture of liquefied or compressed inorganic industrial or medical gases
12.	2011	20112	Manufacture of basic organic chemicals
13.	2011	20113	Manufacture of inorganic compounds

i. CLASSIFICATION

No.	ISIC	MSIC	Description MSIC 2008
14.	2029	20299	Manufacture of other chemical products n.e.c
15.	3510	35101	Operation of generation facilities that produce electric energy
16.	3530	35301	Production, collection and distribution of steam and hot water for heating, power and other purposes
17.	0721	07210	Mining of uranium and thorium ores
18.	2011	20119	Manufacture of other basic chemicals n.e.c.

Economic data:

1. **Petroleum and Natural Gas Statistics (Annual Census)**

2. **Report on Survey of Electricity, Gas, Steam and Air Conditioning Supply - (Biennial Census)**

3. **Report on Survey of Manufacturing Industries (includes manufacture of refined products and biodiesel products) - (Biennial Suvey)**

4. **Economic Census – Mining & Quarrying – (every 5 years)**

5. **Prices (CPI and PPI)**

6. **Trade data (import & export)**

7. **Administrative data from energy regulators & related agencies**

- **Primary data from censuses/surveys are to compile the principal statistics such as:**

1. **Value of output**
2. **Value of input**
3. **Value added**
4. **Employment & qualification**
5. **Salaries & wages**
6. **Value of asset**
7. **Production (value & quantity)**
8. **Stocks**
9. **Electricity consumed (quantity and value)**
   - **Electricity purchased (kilowatt -hour)**
   - **Electricity generated (kilowatt- hour)**
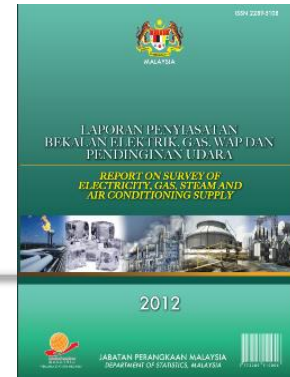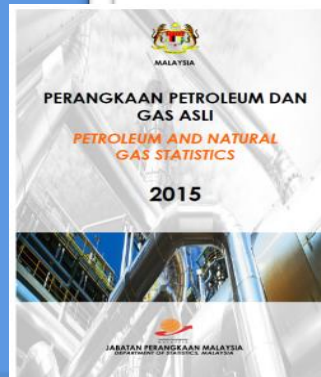
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a) **Mining** (Extraction of Crude Petroleum & Natural Gas)
   - Extraction of Crude Petroleum Oil & Condensates
   - Production of Crude Gaseous Hydrocarbon

b) **Electricity**
- Production (value & volume)
- Consumption data is categorised by industries, businesses, residential and domestic lighting

b) **Manufacturing**
   - Manufacture of refined petroleum products
     - Production data for LPG, fuel oil, diesel/gas oil and gasoline (unit: tonne)

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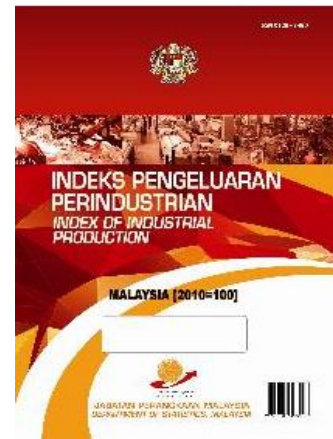
Household Income and Consumption Survey (HIES)

Statistical Unit : Household (Sample)
Frequency: Twice every 5 years

DOSM also compile energy data for household consumption as follows:

Energy Consumption (COICOP)

0451 ELECTRICITY
0452 GAS
0453 LIQUID FUELS
0454 OTHER FUELS
0722 FUELS & LUBRICANTS FOR PERSONALTRANSPORT
EQUIPMENT

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SECONDARY DATA (MONTHLY & ANNUALLY)

- **Electricity** : National, Regional Power Producer and Independent Power Producers

- **Mining**: Oil & gas companies and Department of Mineral and Geosciences

- **Trade Data** (Value and volume of Import & Export) from Royal Malaysian Customs Department (RMCD)
  - via online system

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iii. STATISTICAL UNIT

- **Establishment, and Enterprise (Energy Industries & Energy Consumers)**
- **Household (Energy consumers)**

No.	Statistics	Statistical Unit	Frequency	Coverage
1.	Petroleum and Natural Gas Statistics	Establishment	Annual	Population
2.	Survey/Census of Electricity, Gas, Steam, Air Conditioning Supply	Establishment	Bienniel / Every 5 years	Population
3.	Survey/Census of Manufacturing Industries	Establishment	Bienniel/ Every 5 years	Sample/ Population
4.	Census of Mining & Quarrying	Establishment	Every 5 years	Population
5.	Household Income and Consumption Survey (HIES)	Household	Twice in 5 years	Sample

No.	Products	Unit	Production
1.	Coal	tonne	Value and quantity
2.	Petroleum	tonne	Value and quantity
3.	Natural gas	mscf	Value and quantity
4.	Electricity	kWh	Value and quantity
5.	Refined petroleum products	tonne	Value and quantity
6.	Trade data Eg. Crude Oil, LNG & Petroleum Products	tonne	Value and volume
7.	**Type of fuels :** • Diesel (litre) • Petrol (litre) • Furnace oil/ Fuel oil (litre) • Liquified petroleum gas (tonne) • Natural gas/ Natural gas for vehicle • Other fuels (e.g bio-mass, solar, • battery hybrid etc.)	Litre Litre Litre Tonne Tonne tonne	Establishment's consumption by quantity and value

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Completed questionaire from respondent will be processed and validated by using Intelligent Recognition Character (ICR) machine:

Stages in data processing :

1. Integrate data
2. Codes & Classifications
3. Data review & validatation
4. Editing & imputation of missing data
5. Estimation of population characteristics
6. Derive variables & unit
7. Weights calculation
8. Calculate aggregates data
9. Finalise data files

Reference: GSBPM and NQAF
http://unstats.un.org/unsd/dnss/qualityNQAF/nqaf.aspx

CURRENT DEVELOPMENT OF ENERGY STATISTICS

MALAYSIA EXPERIENCE : SEEA PSUT – ENERGY ACCOUNT

Physical & account

1. Supply & Use Table (SUT)

i. Energy

ii. Water

iii. Emission (Gas, waste, water)

2. Asset Account

i. Mineral & energy resources

ii. Land

iii. Soil resources

iv. Timber resources

v. Aquatic resources

vi. Water

3. Functional account

i. Environmental Protection Expenditure Account (EPEA)

ii. Environmental Goods & Services Sector (EGSS)

4. Sequence of economic account

Production Account (elaborated in SUT)

Distribution and Use of Income Accounts

Capital Account

Financial Account

Less depletion of natural resources

Add back depletion of natural resources

Account

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A. References

1

System of Environmental-Economic Accounting 2012
Central Framework

SEEA – Central Framework 2012

2

System of Environmental-Economic Accounting for Energy

SEEA-Energy

Draft Version for Global Consultation

SEEA – Energy

3

System of Environmental-Economic Accounting 2012
Applications and Extensions

SEEA – Applications & Extensions

4

eurostat

Physical Energy Flow Accounts (PEFA)

Manual 2014

PEFA manual 2014, Eurostats

5

NATIONAL ENERGY BALANCE 2010

National Energy Balance, Malaysia 2010

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Australian Environmental-Economic Accounts 2014

Australians Environmental-Economic Accounts 2014

B. Methodology

Top-down approach

National Energy Balance (NEB)- Aggregate Data

Structure:
- Economic Census
- I-O Table
- Household Expenditure Survey

| Agriculture | Mining | Manufacturing | Construction | Services | Household |
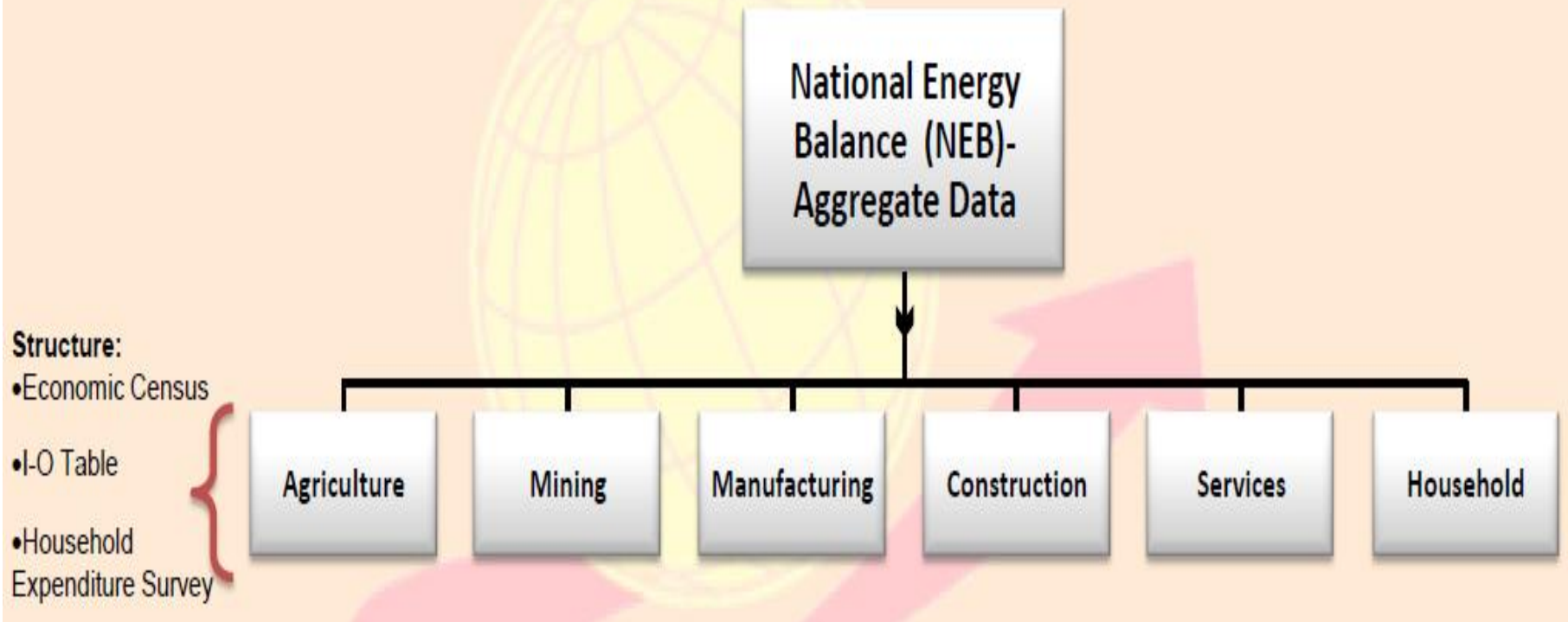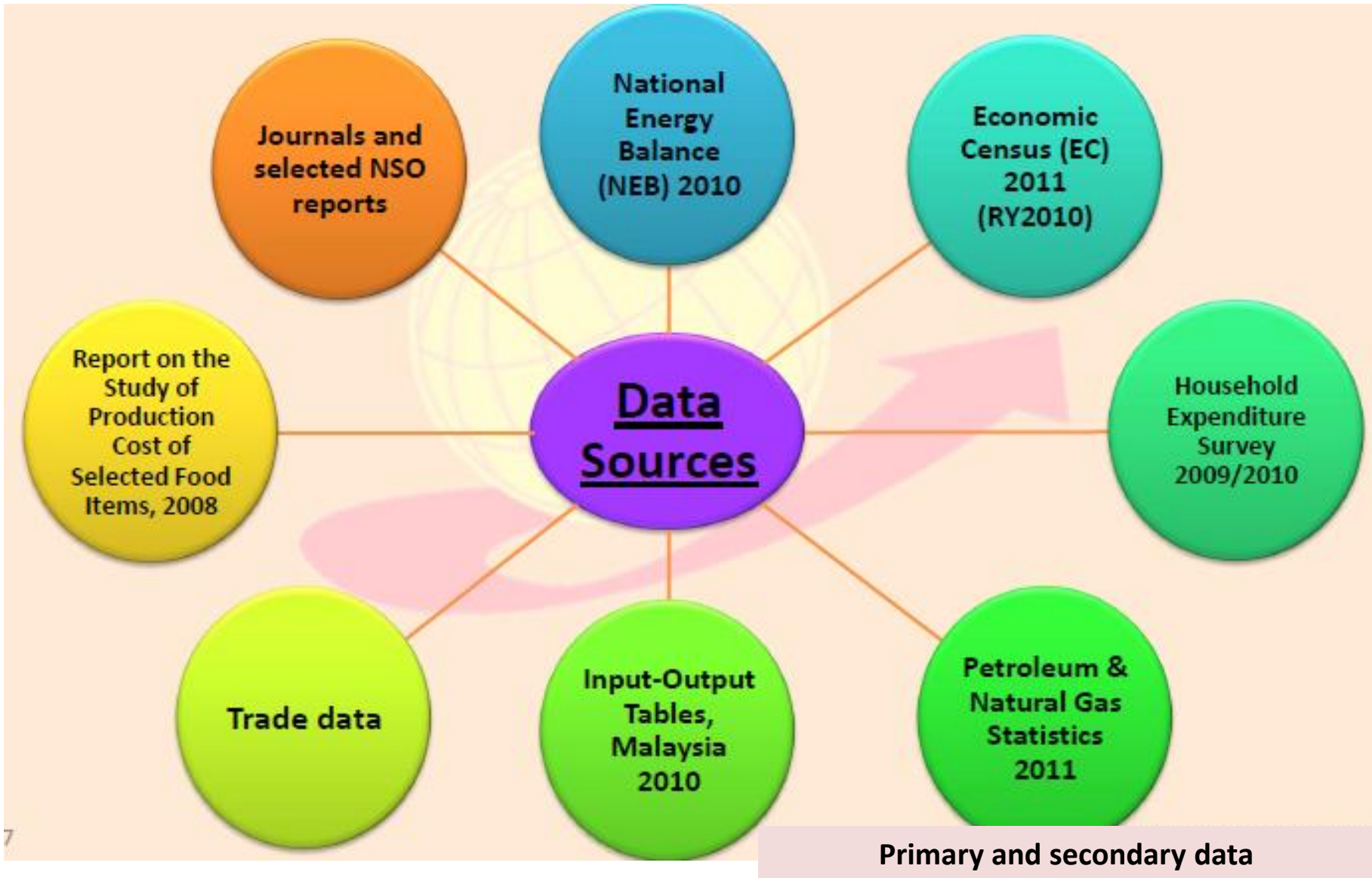
NATURAL INPUT

- **Natural gas**
- **Crude oil**
- **Coal & coke**

RENEWABLE ENERGY

- **Hydro**
- **Bio Mass***
- **Bio Gas***

ENERGY RESULTING FROM TRANSFORMATION PROCESS

- **LNG**
- **Petroleum products**
- **Electricity**
- **Others****

Note: * will be covered in 2015

**Others refers to the energy imported (*additive material)*

i.   Various institution involved. Data collected and produced for specific objectives. Data integration process is needed by using standard codes and classifications as well as measurement unit.

ii.   Engagement and collaborative efforts with related energy agencies/authorities to improve data coordination mechanism.

iii. Needs for capacity building in developing Malaysia SEEA PSUT–Energy

iv.   The availability of the data in compiling SEEA PSUT- Energy:
   • No detailed breakdown for NEB data on petroleum products
   • Decentralised data from various sources -scattered data and needs coordination
   • Quality of administrative data
   • Territory principle
   • Other residuals - excessive amount in other residuals

Official count of all businesses and companies....
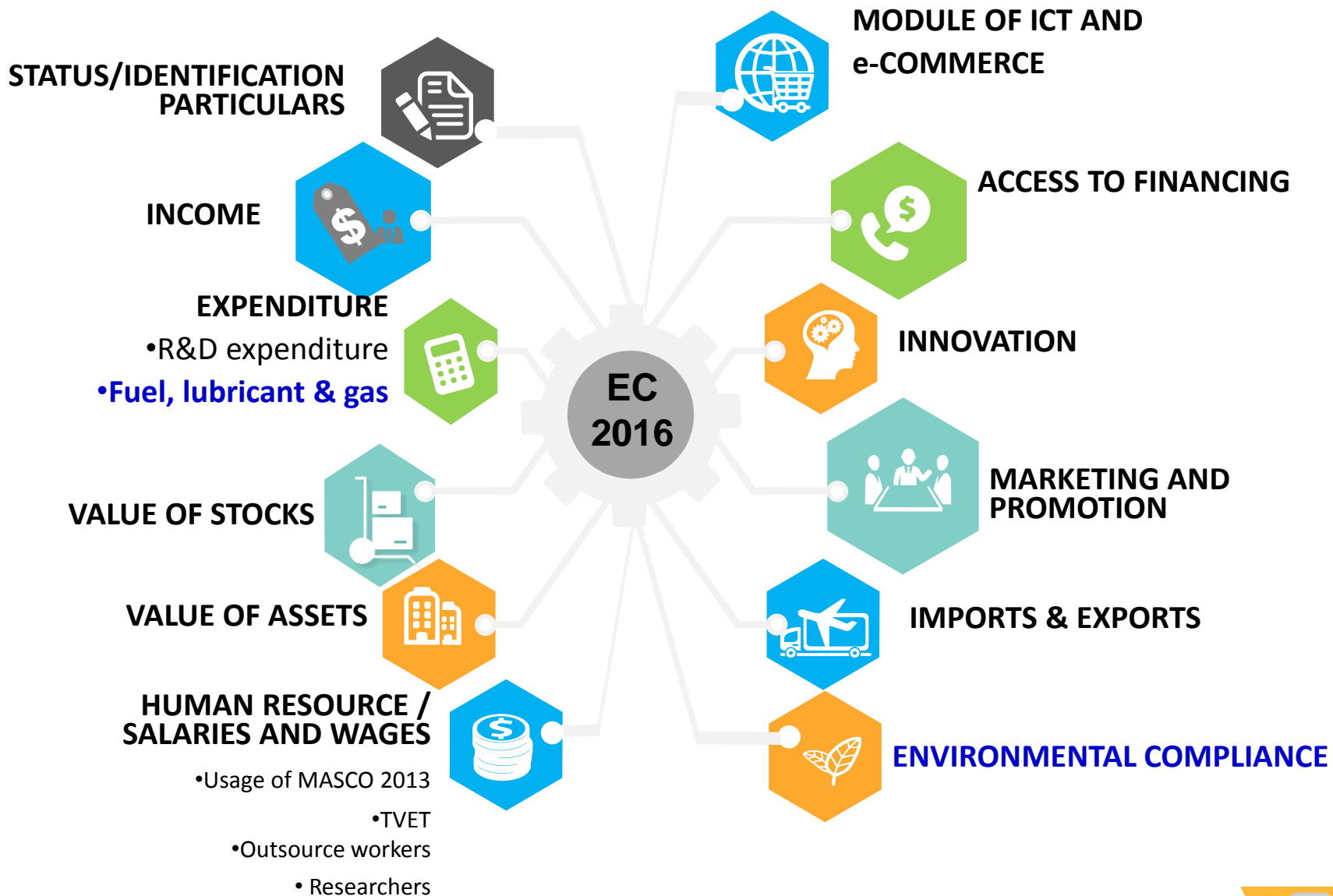
Conducted every 5 years

The last Economic Census was conducted in 2011 for reference year 2010

Covers all companies/businesses registered with Companies Commission of Malaysia, professional bodies, business associations and local authorities.

EC 2016

STATUS/IDENTIFICATION PARTICULARS

INCOME

EXPENDITURE
- R&D expenditure
- **Fuel, lubricant & gas**

VALUE OF STOCKS

VALUE OF ASSETS

HUMAN RESOURCE / SALARIES AND WAGES
- Usage of MASCO 2013
- TVET
- Outsource workers
- Researchers

MODULE OF ICT AND e-COMMERCE

ACCESS TO FINANCING

INNOVATION

MARKETING AND PROMOTION

IMPORTS & EXPORTS

ENVIRONMENTAL COMPLIANCE

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i. Compilation of System of Environment Accounting (SEEA) Physical Supply & Use Table (PSUT) – Energy FY 2010
The development at a final stage : 2014- 2016
(will be published in June 2016 as Preliminary Report)

ii. Department Transformation Plan (2015 – 2020)
- SEEA - PSUT Energy Account – 2016 (RY 2010) & 2018 (RY2015)
- SEEA - PSUT Water Account – 2018 (RY2015)
- Environment Protection Expenditure Accounts (EPEA) – 2020

iii. Compilation of Green Economic Indicator and Green Growth (GEI/GG)

iv. SDGs Indicators

v. Economic Census 2016 (detailed questions for energy & water data as needed to compile SEEA)

vi. Oil & Gas Satellite Account

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