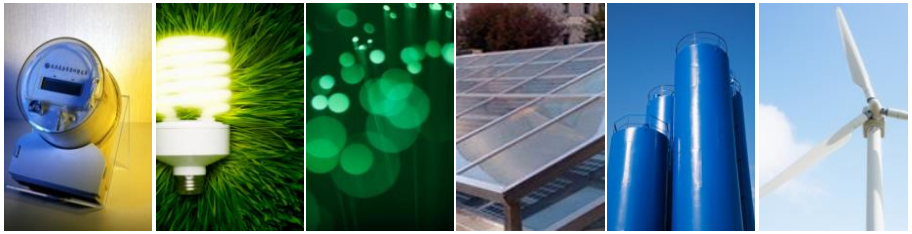
16th APEC Workshop on Energy Statistics 10 – 12 July, 2018

Experience in Filling out the Energy Efficiency Template (Chinese Taipei)



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Date: 7/10/2018

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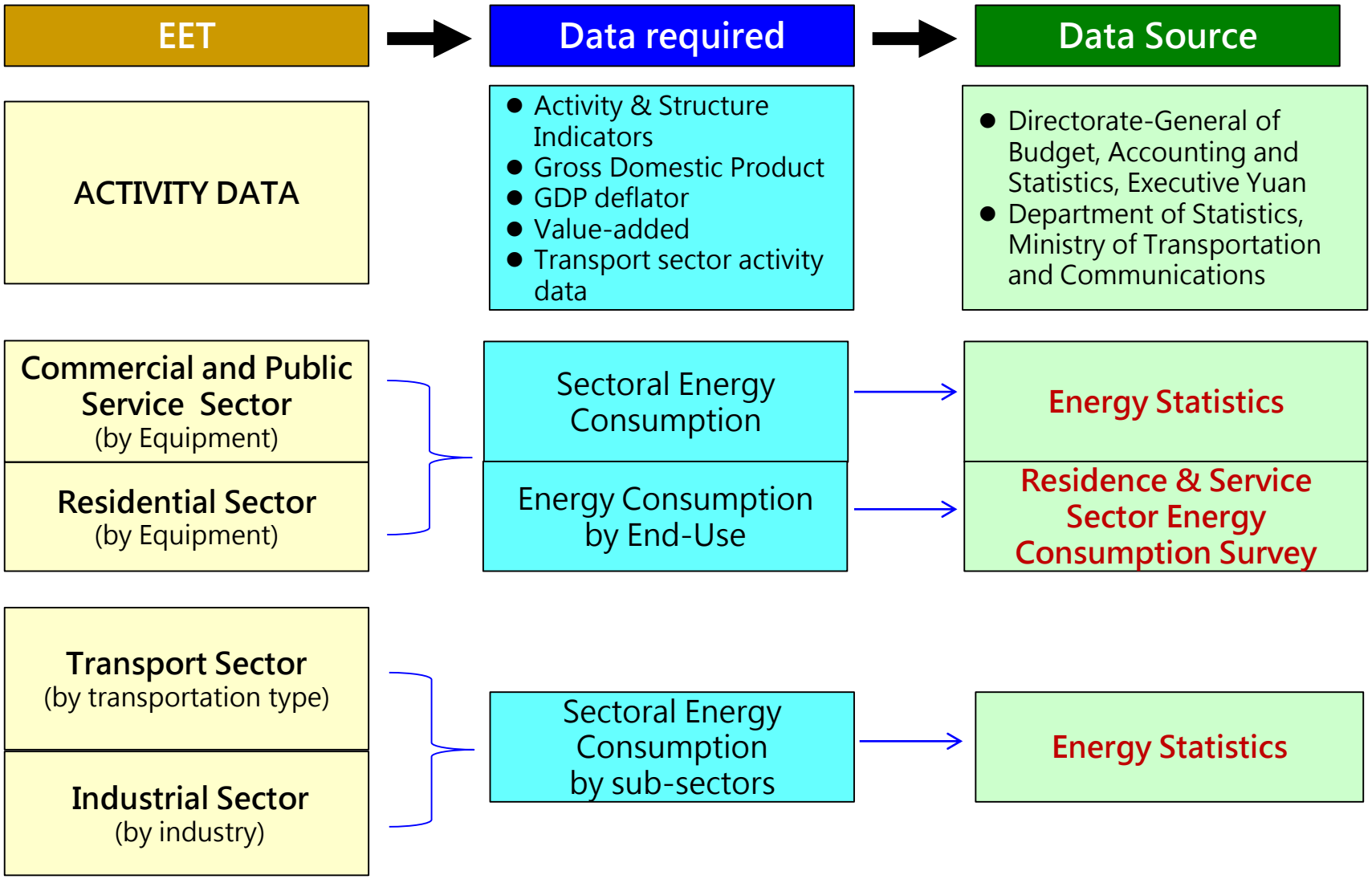
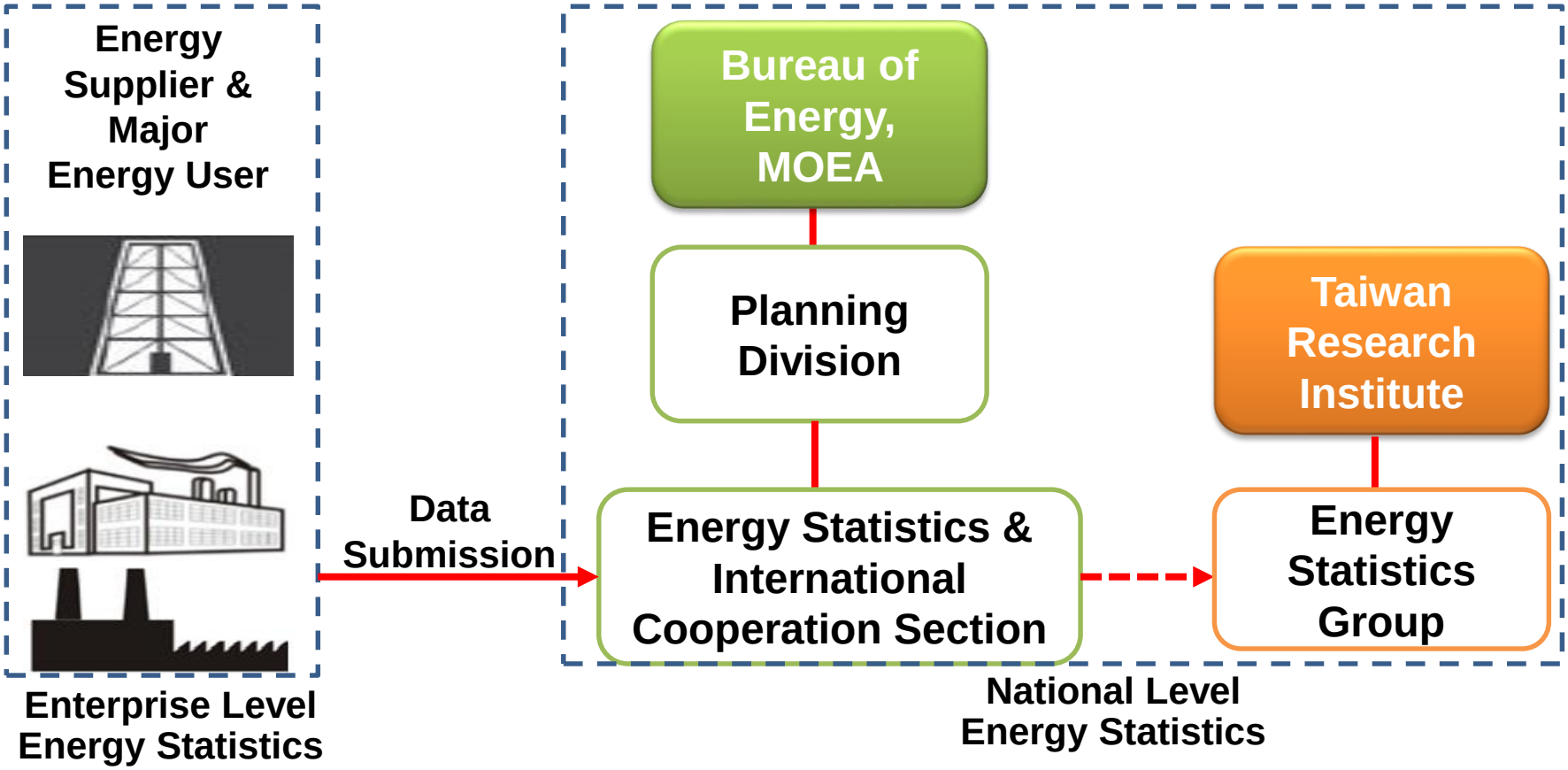
I. Data Coverage of EET



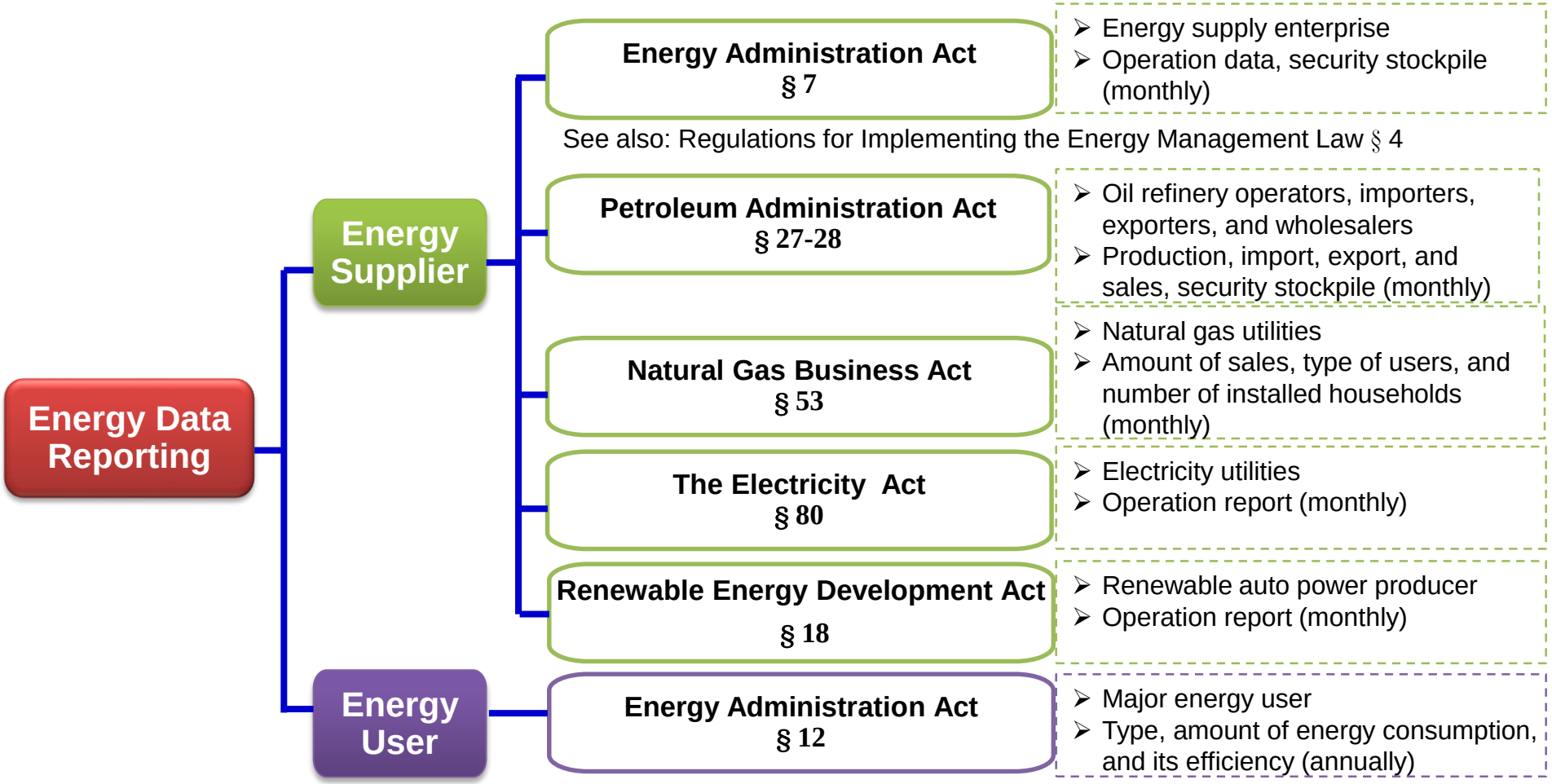
II. Collection of Energy Statistical Data(1/8)

1.Data Collection Scheme



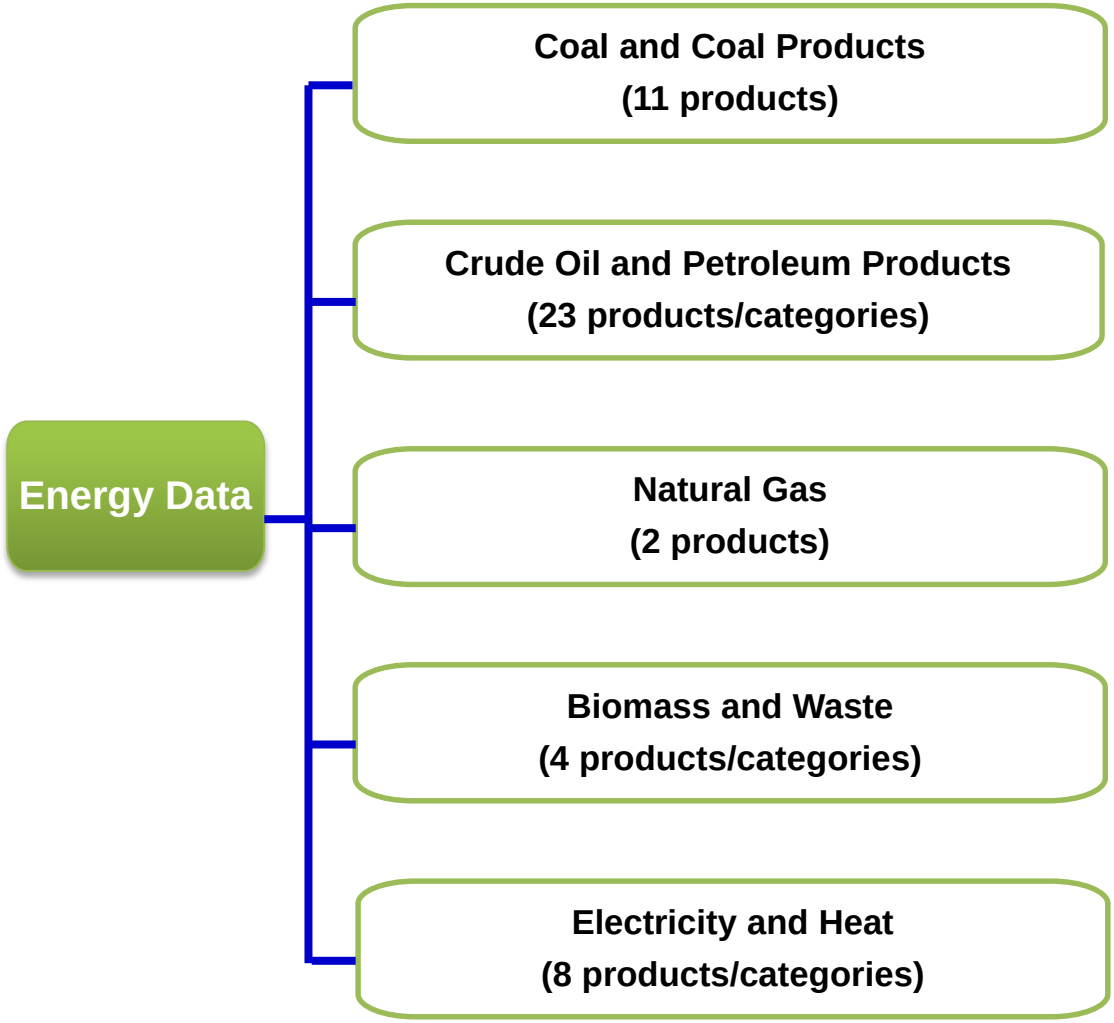
II. Collection of Energy Statistical Data(2/8)

2.legal Basis



II. Collection of Energy Statistical Data(3/8)

3.Data Coverage



- Production
- Import
- Export
- Stock
- Transformation input and Output
- Energy sector own use
- Total final Consumption: 5 sectors (by industries) and non-energy use

Energy Balance Sheet

- Energy transformation equipment (capacity)
- Energy prices (import, wholesale, and retail)

II. Collection of Energy Statistical Data(4/8)

(1) Coal and Coal Products Data Collection

Supply

- **Indigenous Coal**: reported by the coal mine to the Bureau of Mine, but was not produced after 2000.
- **Imported Coal**:
  - Customs Administration: anthracite.
  - Coal Importers: provided by power companies, public CHP, and energy intensive industries.
- **Imported coke oven coke**: Customs Administration.

Transformation

- **Transformation Input**
  - Coal input:
    - ✓ Coke oven coke and coke oven gas: CSC, DSC.
    - ✓ Electricity: power plants, CHP plants.
  - Coke input to blast furnace gas: CSC, DSC.
  - Coke oven gas, blast furnace gas, and oxygen steel furnace gas input to produce electricity: CSC, DSC.
- **Transformation Output**: CSC, DSC

Consumption

- **End Use Data**: reported by energy Intensive Industries.
  - Textile, Wearing Apparel and Accessories
  - Pulp, Paper and Paper Products
  - Chemical Materials
  - Artificial Fibers
  - Resin, Plastics and Rubber
  - Cement and Cement Products
  - Iron and Steel

II. Collection of Energy Statistical Data(5/8)

(2) Crude Oil and Petroleum Products Data Collection

Supply

- **Indigenous crude oil**: CPC.
- **Imported crude oil and oil products**:
  - Customs Administration: lubricants, solvents, petroleum coke.
  - Refineries. (CPC, Formosa, etc.): crude oil and all petroleum products.
  - LPG importers (2): before 2010.

Transformation

- **Transformation Input**
  - Crude input to produce petroleum products: CPC, Formosa.
  - **Petroleum product input** to produce electricity and heat: power generation plants, CHP plants.
- **Transformation Output** of Petroleum products: CPC, Formosa.
- **Inter-product Transfer**: CPC, CPC-Shell Lubricants (before 2014).

Consumption

- **Sales Data:** CPC, Formosa, LPG importers.
- **End Use Data** reported by:
  - cement and cement product industry (8)
  - Iron and steel industry (2)

II. Collection of Energy Statistical Data(6/8)

(3) Natural Gas Data Collection

Supply

- **Indigenous Natural Gas**: CPC.
- **Imported LNG**: CPC.

Transformation

- **Transformation Input**
  - ➢LNG Gasification input : CPC.
  - ➢Natural Gas input for electricity and heat generation: power generation plants, CHP plants.
- **Transformation Output**:
  - ➢gasified LNG output: CPC.

Consumption

- **Sales Data:** CPC, natural gas utilities (27).
- **End Use Data** reported by:
  - ➢Iron and steel industry (2)

II. Collection of Energy Statistical Data(7/8)

(4) Biomass and Waste Data Collection

Supply

- **Solid Biomass**: CHP plants.
- **Liquid Biomass**: bio-ethanol, bio-diesel, bio-fuel oil producers**.**
- **Biogas**: CHP plants.
- **Waste**: Refuse Resource Recovery Plant, CHP plants.

Transformation

- **Transformation Input**
  - ➢electricity and heat generation: CHP plants.
- **Inter-product Transfer**: bio-ethanol, bio-diesel, bio-fuel oil producers.

Consumption

- **End Use Data:** estimated according to power generation and heat consumption.

II. Collection of Energy Statistical Data(8/8)

(5) Electricity and Heat Data Collection

Supply

- **Electricity:**
  - Indigenous power Production of hydro, wind, solar and geothermal power: Taipower and IPPs.
  - Nuclear power: Taipower.
- **Solar Thermal**: ITRI

Transformation

- **Transformation output of thermal power plants and pump storage hydro power**: Taipower, IPPs, CHP plants.
- **Transformation output of heat**: Public CHP plants.

Consumption

- **Electricity**
  - Own Use: Taipower, IPPs, CHP plants
  - Sales Data: Taipower.
  - End Use Data reported by: CHP power plants.
- **Solar Thermal**: estimated by ITRI
- **Heat**: sales data of public CHP plants

III. Collection of End-Use Data(1/2)

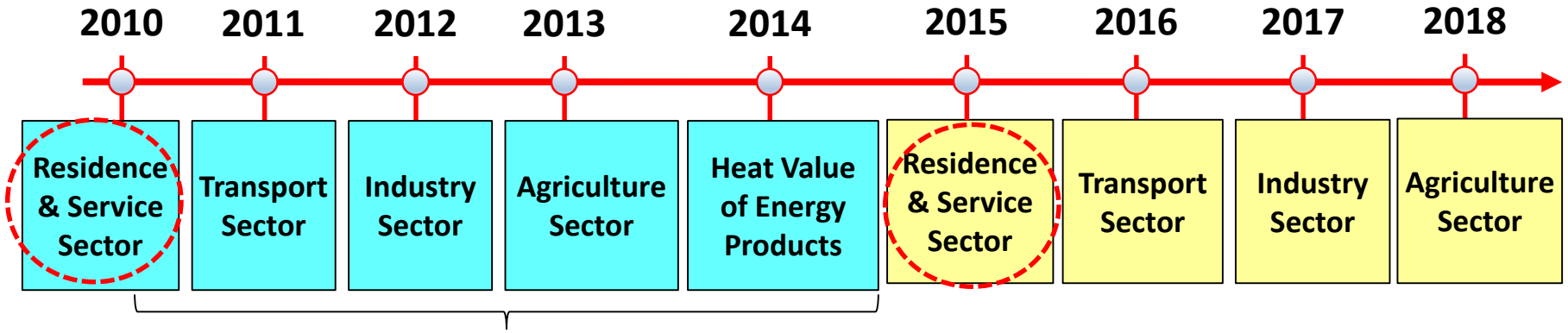
1.Purpose for Detailed Energy Consumption Data Collection

(1)Collect end-use energy consumption data for policy analysis;

(2)Build up energy efficiency indicator database;

(3)Establish energy efficiency indicator statistics for domestic & international reporting.

Recent Energy Surveys in Chinese Taipei



Each sectoral survey is conducted every 5 years.

III. Collection of End-Use Data(2/2)

2.Take Residence Sector Energy Consumption Survey for example：the questionnaire includes

(1) types and numbers of Energy Consuming Appliance

(2) energy consumption (by energy type) of each appliance

=> As a basis for the allocation of energy consumption by equipment.

Space Cooling/ Heating
- Air-conditioner (Split, window, and package type)
- Central air conditioning system
- Fan/ventilator
- Space heater

Water Heating
- Water dispenser
- Electric hot water bottle
- Water heater
- Others

Cooking
- Induction cooker
- Rice cooker
- Microwave oven
- Electric oven
- Gas stove
- Others

Entertaining/ICT
- Video player
- Audio equipment
- PDP/LCD TV
- CRT TV
- PC
- Printer
- Multi-function printer

Lighting
- Incandescent light
- Fluorescent light
- PL fluorescent light
- Compact Fluorescent Light Bulb
- Halogen lamp
- LED
- HID
- Others

Freezing
- Refrigerator
- Freezer
- Refrigerator/ freezer combination

Other
- Dish washer
- Clothes washer
- Clothes dryer
- Dehumidifier
- Smart phone
- Tablet computer
- WIFI

Transportation
- Car
- Personal light truck
- SUV
- Motorcycle
- Electric motorcycle
- hybrid, electric vehicle
- Electric bicycle

Appliance Number

Frequency of Utilization (Summer/Non-Summer)

Duration of Utilization

Type of Energy Used

Using Years

Number of Appliances with Energy Label

Number of Planned Appliance Replacement within 1 Year

IV. Filling-out the Template(1/5)

1.Activity data form non-energy statistical official publications

Directorate-General of Budget, Accounting and Statistics, Executive Yuan.

https://eng.stat.gov.tw/mp.asp?mp=5

=> Activity & Structure Indicators、Gross Domestic Product 、GDP deflator、Value-added

Department of Statistics, Ministry of Transportation and Communications.

https://stat.motc.gov.tw/mocdb/stmain.jsp?sys=100&funid=emenu

=> Transport sector activity data

Note：Some detailed data is not collected by the authorities

=> Data is not available.

IV. Filling-out the Template(2/5)

2.Commercial and Public Services

(1) Total energy consumption of Service Sector from energy balance sheet

Grand Total	Unit	Item
5,493,757	toe	Service Sector
444,397	toe	Wholesale and Retail
1,063,358	toe	Hotels and Restaurants
136,149	toe	Transport Services
85,139	toe	Storage and Warehousing
126,049	toe	Communication
87,982	toe	Finance, Insurance and Real Estate
145,199	toe	Business Services
764,190	toe	Social and Personal Services
801,249	toe	Public Administration
1,840,044	toe	Activities Not Adequately Defined

(2)Energy consumption by equipment is estimated based on Residence & Service Sector survey

=> Calculate energy consumption ratio of each equipment by energy type .

=>Reported data is equal to total energy consumption ⅹ energy consumption ratio

Energy Consumption Ratio	Oil	LPG	NG	Electricity	Total
Heating	0.00	0.00	0.00	0.00	0.00
Cooling	0.00	0.00	0.00	0.36	0.36
Lighting	0.00	0.00	0.00	0.11	0.11
Other energy use	0.03	0.01	0.06	0.43	0.53
Total	0.03	0.01	0.06	0.90	**1.00**

IV. Filling-out the Template(3/5)

3.Residential

(1) The same logic of data processing with “Commercial and Public Services”

=> Total energy consumption of Residential Sector in energy balance sheet is cited.

(2) Classification of end-use energy consumption (by energy type) data is more detailed

=> Combined related equipment in reporting data.

Reporting items

Energy Consumption Ratio	Oil	LPG	NG	Solar Thermal	Electricity	Total
Heating	0.00	0.00	0.00	0.00	0.01	0.01
Cooling	0.00	0.00	0.00	0.00	0.18	0.18
Water Heating	0.00	0.04	0.03	0.00	0.11	0.18
Cooking	0.00	0.05	0.03	0.00	0.08	0.16
Lighting	0.00	0.00	0.00	0.00	0.12	0.12
Refrigerator (Refrigerators & Freezers)	0.00	0.00	0.00	0.00	0.11	0.11
Freezer (Refrigerators & Freezers)	0.00	0.00	0.00	0.00	0.01	0.01
dishwasher (Other Kitchen Facilities)	0.00	0.00	0.00	0.00	0.00	0.00
washing machine (Laundry Facilities)	0.00	0.00	0.00	0.00	0.02	0.02
Clothes dryer (Laundry Facilities)	0.00	0.00	0.00	0.00	0.00	0.00
TV/home entertainment (TV / PC / Entertainment)	0.00	0.00	0.00	0.00	0.05	0.05
Computer/communication equipment (TV / PC / Entertainment)	0.00	0.00	0.00	0.00	0.05	0.05
Other electrical appliances (Other Energy Use in Residential Sector)	0.00	0.00	0.00	0.00	0.11	0.11
Other energy use (Other Energy Use in Residential Sector)	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.08	0.06	0.00	0.85	**1.00**

IV. Filling-out the Template(4/5)

4.Transport

There is complete data for energy consumption by transportation usage in our balance sheet

=> Simply fill in the corresponding number to the questionnaire.

能源平衡表－OECD能源統計格式（公噸油當量單位）

民國106年(西元2017年)		(單位：公噸油當量;10^7千卡)(Unit:tonne of oil equivalent;10^7kilocalorie)								
項	目	22 車用汽油 Motor Gasoline	28 柴油 Diesel Oil	18 液化石油氣 LPG	29 燃料油 Fuel Oil	37 天然氣合計 Natural Gas Total C38-C39	51 電力 Electricity	1 煤及煤產品 Coal and Coal Products Total C2-C12	54 總計 Grand Total	Item
73	運輸部門	7,986,164	4,048,944	35,715	89,367		122,377		12,380,286	Transport Sector
74	國內航空								97,719	Domestic Air
75	公路	7,986,164	3,948,081	35,715					11,969,960	Road
76	鐵路		16,953				122,377		139,330	Rail
77	管線運輸									Pipeline Transport
78	國內水運		83,910		89,367				173,277	Internal Navigation
79	其他									Non-Specified

Reporting items

Domestic aviation

Road transport

Railways

Inland waterways

IV. Filling-out the Template(5/5)

5.Industry

There is also complete data for industrial energy consumption in our balance sheet

=>Report the data according to the industry reference table below.

Balance sheet	Reporting items
Industrial Sector	Total Industry Use
Mining and Quarrying(excluding coal, oil and gas)	Mining and quarrying
Food, Beverage and Tobacco	Manufacture of food products, beverages, tobacco products
Textile, Wearing Apparel and Accessories	Manufacture of textiles, wearing apparel, leather and related products
Leather and Fur	
Wood, Bamboo and Furniture	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Pulp, Paper and Paper Products	Manufacture of paper and paper products
Printing	
Chemical Materials	Manufacture of chemicals and chemical products & basic pharmaceutical products and pharmaceutical preparations including petro-chemicals
Chemical Products	
Rubber Products	
Plastic Products	
Non-metallic Mineral Products	Manufacture of non- metallic mineral products (including rubber and plastics products)
Basic Metal Industries	Manufacture of basic metals (Iron and steel)
Fabricated Metal Products	Manufacture of fabricated metal products, machinery and equipment
Machinery and Equipments	
Electrical and Electronic Machinery	
Precision Instruments	
Transport Equipments	Manufacture of motor vehicles, trailers, other transport equipment
Construction	Construction
Miscellaneous Industries	Other Manufacturing and Industries Not Elsewhere Specified
Water Supply and Remediation Activities	
Non-Specified	

Thank you