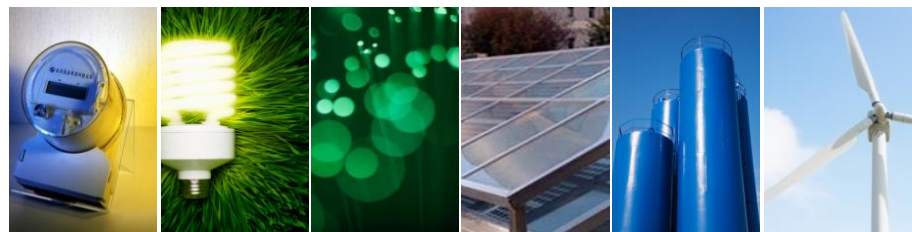




19<sup>th</sup> APEC Workshop on Energy  
Statistics 28 – 30 June, 2021



# Collection of activity indicators and end-use energy consumption data (Chinese Taipei)

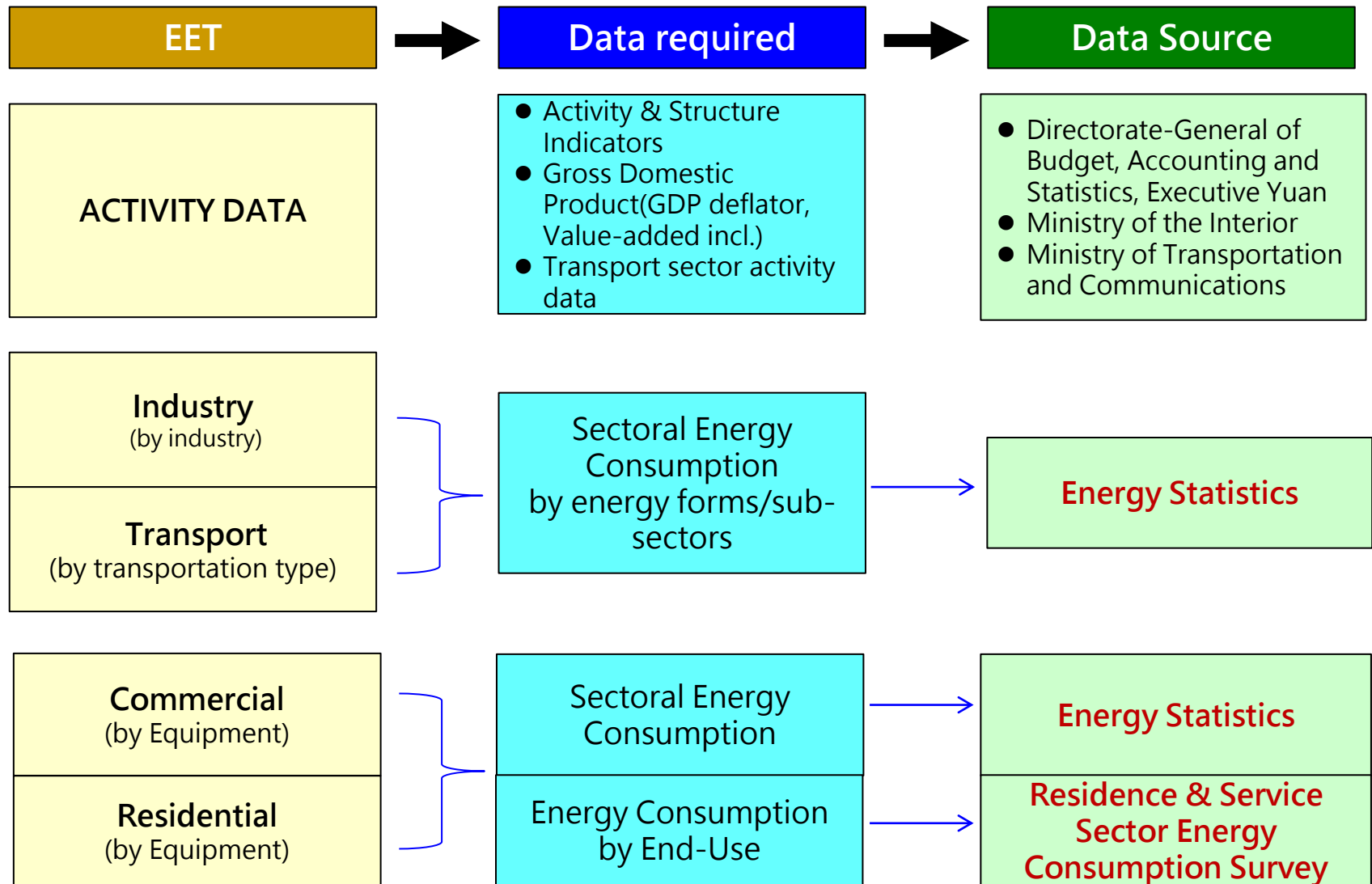


Chih-Ching Yang (Vanessa)  
Taiwan Research Institute  
Date: 2021.6.28

# Content

- I. Data Coverage of Energy Efficiency Template
- II. Collection of Activity Indicators
- III. Collection of End-Use Data
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# I. Data Coverage of Energy Efficiency Template



# II. Collection of Activity Indicators(1/8)

## 1. Activity & Structure Indicators

Reporting Item	Data Source	website
Total Population	Ministry of the Interior	<a href="https://statis.moi.gov.tw/micst/stmain.jsp?sys=100">https://statis.moi.gov.tw/micst/stmain.jsp?sys=100</a>
Urban & Rural	-	-
Total Employment	Directorate-General of Budget, Accounting and Statistics, Executive Yuan	<a href="https://win.dgbas.gov.tw/dgbas04/bc4/manpower/year/year_f.asp?table=56">https://win.dgbas.gov.tw/dgbas04/bc4/manpower/year/year_f.asp?table=56</a>
Services & Industry & Agriculture		
Total Dwellings	Housing Stock	<a href="https://pip.moi.gov.tw/V3/E/SCRE0303.aspx">https://pip.moi.gov.tw/V3/E/SCRE0303.aspx</a>
Occupied Dwellings	Sampling survey report on housing conditions(once per 10 years)	<a href="https://pip.moi.gov.tw/V3/F/SCRFO201.aspx">https://pip.moi.gov.tw/V3/F/SCRFO201.aspx</a>
New Dwellings	under construction + newly constructed	<a href="https://pip.moi.gov.tw/V3/E/SCRE0301.aspx">https://pip.moi.gov.tw/V3/E/SCRE0301.aspx</a>
Household Occupancy	Calculated by "Total Population / Occupied Dwellings"	-
Total Dwelling Area (Residential Floor Area)	Construction and Planning Agency, MOI. (8.1 Construction License by Use)	<a href="https://ws.moi.gov.tw/001/Upload/400/refile/0/4413/27991d24-047e-42d5-b38a-59704823138f/month/month.html">https://ws.moi.gov.tw/001/Upload/400/refile/0/4413/27991d24-047e-42d5-b38a-59704823138f/month/month.html</a>
Annual Heating Degree-Days	-	-
Annual Cooling Degree-Days	Energy statistics handbook p.140(Calculated based on the data from Central Weather Bureau; Ministry of the Interior )	-
U.S. Dollar Exchange Rate (national currency per USD)	Directorate-General of Budget, Accounting and Statistics, Executive Yuan	<a href="http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8101A1A&amp;ti=%B0%EA%A5%C1%A9D2%B1o%B2%CE%ADp%B1%A5%CE%B8%EA%AE%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L">http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8101A1A&amp;ti=%B0%EA%A5%C1%A9D2%B1o%B2%CE%ADp%B1%A5%CE%B8%EA%AE%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L</a>
PPP conversion factor, GDP	-	-
Consumer Prices Index (2016=100)	Directorate-General of Budget, Accounting and Statistics, Executive Yuan	<a href="http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=PR0101A1A&amp;ti=%AE%F8%B6O%AA%CC%AA%AB%BB%F9%B0%F2%A5%BB%A4%C0%C3%FE%AB%FC%BC%C6-%A6~&amp;path=../PXfile/PriceStatistics/&amp;lang=9&amp;strList=L">http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=PR0101A1A&amp;ti=%AE%F8%B6O%AA%CC%AA%AB%BB%F9%B0%F2%A5%BB%A4%C0%C3%FE%AB%FC%BC%C6-%A6~&amp;path=../PXfile/PriceStatistics/&amp;lang=9&amp;strList=L</a>
Household final consumption expenditure, PPP	-	-
Total Services Floor Area	Construction and Planning Agency, MOI. (8.5 Usage License by Use-)	<a href="https://ws.moi.gov.tw/001/Upload/400/refile/0/4413/27991d24-047e-42d5-b38a-59704823138f/month/month.html">https://ws.moi.gov.tw/001/Upload/400/refile/0/4413/27991d24-047e-42d5-b38a-59704823138f/month/month.html</a>
New Services Floor Area	-	-

# II. Collection of Activity Indicators(1/8)

## 2. Gross Domestic Product

Reporting Item	Data Source	website
GDP (constant 2010 US\$)	-	-
GDP (constant 2016 LCU)	Directorate-General of Budget, Accounting and Statistics, Executive Yuan	<a href="http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8102A1A&amp;ti=%B0%EA%A4%BA%A5%CD%B2%A3%A4%F2%C3B%A8%CC%A4%E4%A5%A4%CO-%A6~(1951-1980)&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L">http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8102A1A&amp;ti=%B0%EA%A4%BA%A5%CD%B2%A3%A4%F2%C3B%A8%CC%A4%E4%A5%A4%CO-%A6~(1951-1980)&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L</a>
GDP (current LCU)		
GDP (current US\$)		
GDP, PPP (constant 2011 international \$)		
GDP, PPP (current international \$)	-	-
GDP deflator (base year varies by country)	Directorate-General of Budget, Accounting and Statistics, Executive Yuan (2016=100)	<a href="http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8101A1A&amp;ti=%B0%EA%A5%C1%A9%D2%B1o%B2%CE%ADp%B1`%A5%CE%B8%EA%AE%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L">http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8101A1A&amp;ti=%B0%EA%A5%C1%A9%D2%B1o%B2%CE%ADp%B1`%A5%CE%B8%EA%AE%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L</a>
Value-added(Services & Industry & Agriculture, forestry and fishing)	Directorate-General of Budget, Accounting and Statistics, Executive Yuan	<a href="http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8103A1A&amp;ti=%B0%EA%A4%BA%A6U%B7~%A5%CD%B2%A3%A4%CE%A5%AD%B4%EE%AB%FC%BC%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L">http://statdb.dgbas.gov.tw/pxweb/Dialog/varval.asp?ma=NA8103A1A&amp;ti=%B0%EA%A4%BA%A6U%B7~%A5%CD%B2%A3%A4%CE%A5%AD%B4%EE%AB%FC%BC%C6-%A6~&amp;path=../PXfile/NationalIncome/&amp;lang=9&amp;strList=L</a>

## 3. Transport sector activity data

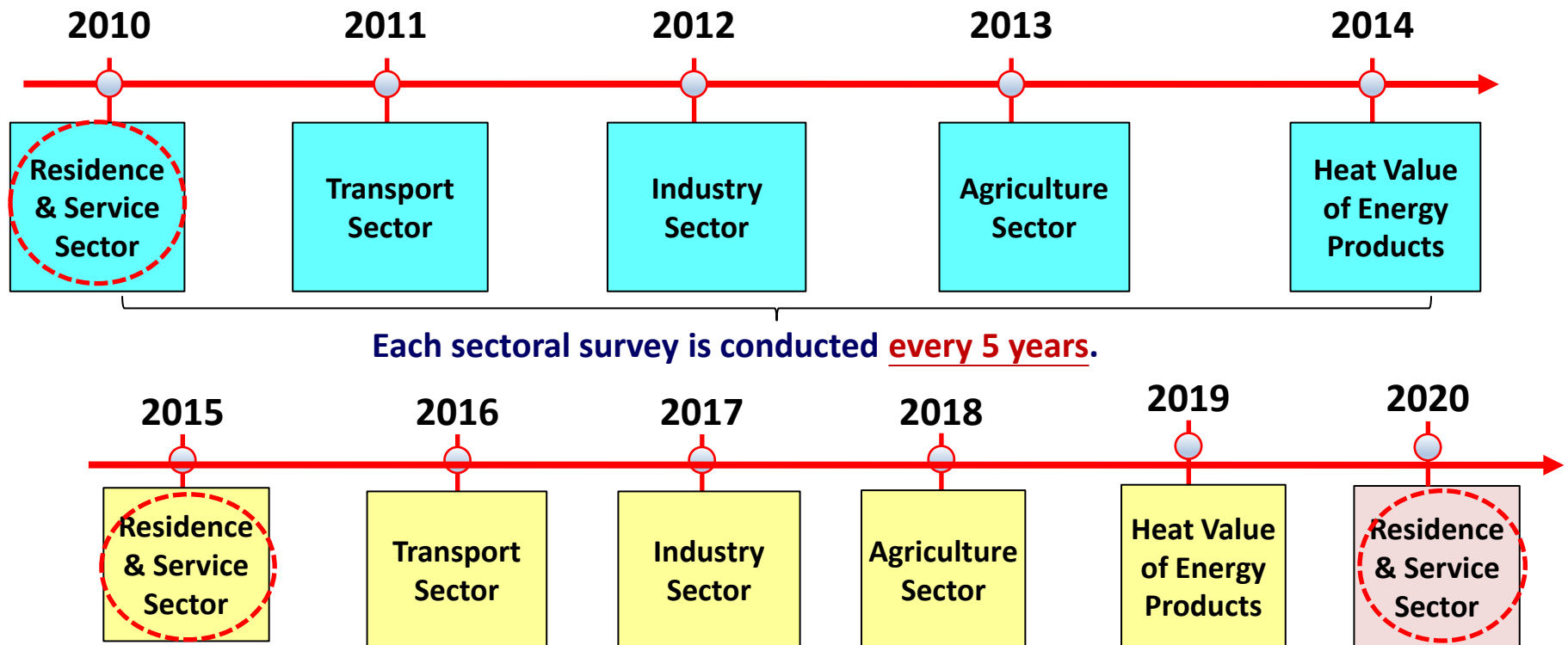
Reporting Item	Data Source	website
Vehicle stocks	Department of Statistics, Ministry of Transportation and Communications	<a href="https://stat.motc.gov.tw/mocdb/stmain.jsp?sys=100">https://stat.motc.gov.tw/mocdb/stmain.jsp?sys=100</a>
Passenger transport		
Vehicle kilometres		
Freight transport		

# 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

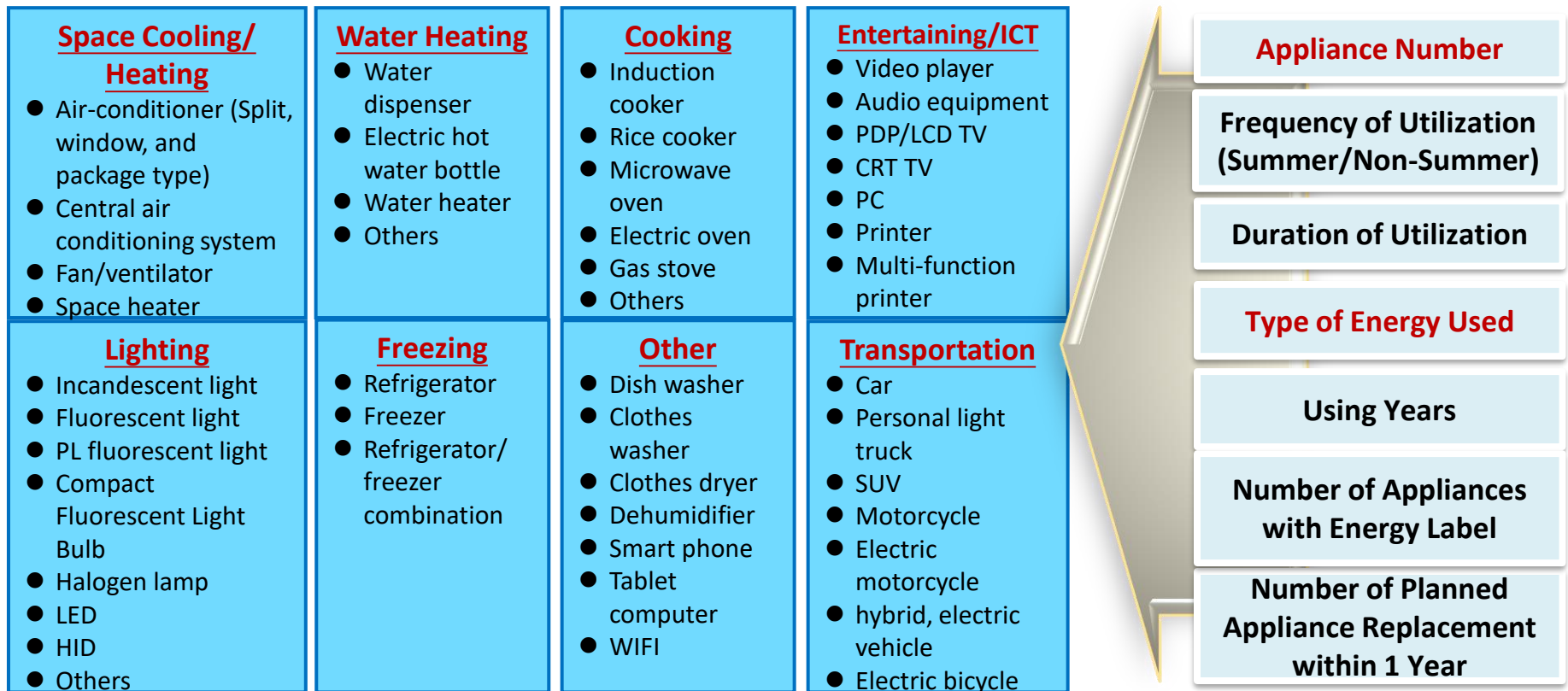


# III. Collection of End-Use Data(2/2)

2. Take Residential 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.



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

## 1. Activity data from non-energy official statistical agencies

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

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

Ministry of the Interior

<https://statis.moi.gov.tw/micst/stmain.jsp?sys=100>

=> 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

Convert Units

	ACTIVITY DATA	units	1990	1991	1992
1					
2	<b>Note: Definitions are found in the last worksheet</b>				
3	<b>I. Activity &amp; Structure Indicators</b>				
22	Consumer Prices Index (2016=100)	index	66.25	68.65	71.72
23	Household final consumption expenditure, PPP (constant 2011 international \$)	US\$ PP	-	-	-
24					
25	Total Services Floor Area	10 <sup>6</sup> m <sup>2</sup>	-	-	-
26	New Services Floor Area	10 <sup>6</sup> m <sup>2</sup>	-	-	-
27					
28	<b>II. Gross Domestic Product (from World Bank World Development Indicators Database)</b>				
29	GDP (constant 2010 US\$)	billions	5,160.86	5,592.92	6,057.70
30	GDP (constant 2016 LCU)		4,474.29	5,018.02	5,609.36
31	GDP (current LCU)		166.39	187.10	222.95
32	GDP (current US\$)		-	-	-
33	GDP, PPP (constant 2011 international \$)		-	-	-
34	GDP, PPP (current international \$)		-	-	-
35	<b>III. GDP deflator 2011=100</b>				
36	GDP deflator (base year varies by country)		86.70	89.72	92.60

Some detailed data is not collected by the authorities => - Data is not available.



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

## 2. Commercial

### (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 × 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

	Unit	2010	2011	2012	2013	2014	2015	2016
	ktoe							
<b>Total</b>		5,413.05	5,290.73	5,194.69	5,272.48	5,368.00	5,433.79	5,435.67
1	Coal & Coal Products	-	-	-	-	-	-	-
2	Oil & Petroleum Products	1,034.45	974.31	925.50	952.21	961.18	962.43	880.64
3	Natural Gas	428.27	376.98	332.55	372.97	407.15	414.09	427.22
4	Renewables	3.09	3.06	3.08	3.05	3.03	3.06	3.03
5	Electricity	3,947.24	3,936.38	3,933.56	3,944.25	3,996.64	4,054.20	4,124.78
6	Heat	-	-	-	-	-	-	-
7	Others	-	-	-	-	-	-	-
<b>Space Heating</b>		10.88	10.85	10.84	10.87	4.99	5.06	5.15
1	Coal & Coal Products							
2	Oil & Petroleum Products							
3	Natural Gas							
4	Renewables							
5	Electricity	10.88	10.85	10.84	10.87	4.99	5.06	5.15

# 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 table is cited.

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

=> reclassify the data of related home appliances according to the required items.

<u>Reporting items</u>		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
Refrigerators & Freezers	Refrigerator	0.00	0.00	0.00	0.00	0.11	0.11
	Freezer	0.00	0.00	0.00	0.00	0.01	0.01
Other Kitchen Facilities	dishwasher	0.00	0.00	0.00	0.00	0.00	0.00
	washing machine	0.00	0.00	0.00	0.00	0.02	0.02
Laundry Facilities	Clothes dryer	0.00	0.00	0.00	0.00	0.00	0.00
	TV/home entertainment	0.00	0.00	0.00	0.00	0.05	0.05
TV / PC / Entertainment	Computer/communication equipment	0.00	0.00	0.00	0.00	0.05	0.05
	Other electrical appliances	0.00	0.00	0.00	0.00	0.11	0.11
Other Energy Use in Residential Sector	Other energy use	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

The Complete data for energy consumption by transportation usage in EBT

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

民國106年(西元2017年)		(單位：公噸油當量;10 <sup>7</sup> 千卡)(Unit:tonne of oil equivalent;10 <sup>7</sup> kilocalorie)								
項	目	22	28	18	29	37	51	1	54	Item
		車用汽油	柴油	液化石油氣	燃料油	天然氣合計	電力	煤及煤產品	總計	
		Motor Gasoline	Diesel Oil	LPG	Fuel Oil	Natural Gas	Electricity	Coal and Coal	Grand Total	
						Total		Products Total		
					C38-C39		C2-C12			
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  
Pipeline passport  
Inland waterways

	Unit	2001	2002	2003	2004	2005	2006	2007
	ktoe							
<b>Total Energy Use in Transport Sector</b>		<b>11,236.6</b>	<b>11,664.7</b>	<b>11,669.2</b>	<b>12,122.6</b>	<b>12,457.4</b>	<b>12,425.4</b>	<b>12,000.0</b>
1 Coal & Coal Products		0	0	0	0	0	0	0
2 Motor Gasoline	ktoe	7,388.9	7,528.7	7,803.8	8,002.2	8,191.4	7,987.3	7,765.5
3 Gas/ Diesel Oil		3,307.06	3,624.19	3,383.77	3,599.49	3,738.05	3,925.58	3,773.3
4 LPG (Liquefied Petroleum Gas)		17.22	16.20	17.73	26.44	38.55	55.98	61.1
5 Fuel Oil		208.31	202.42	213.24	234.21	242.99	232.99	194.1
6 Jet Fuel & Aviation Gasoline		276.53	252.38	210.65	215.72	197.93	172.53	130.1
7 Natural Gas		0	0	0	0	0	0	0
8 Renewables (Biofuels)		0	0	0	0	0	0	0
9 Electricity		38.53	40.81	39.96	44.59	44.96	47.43	71.1
10 Other		0	0	0	0	3.53	3.58	3.1
<b>Road transport (SUVs, cars, personal light trucks, motorbikes)</b>		<b>10,454.58</b>	<b>10,952.47</b>	<b>11,077.24</b>	<b>11,492.85</b>	<b>11,825.08</b>	<b>11,837.29</b>	<b>11,464.4</b>
12 Motor Gasoline		7,388.9	7,528.7	7,803.8	8,002.2	8,191.4	7,987.3	7,765.5
13 Gas/ Diesel Oil		3,048.5	3,407.6	3,255.7	3,464.2	3,595.1	3,794.0	3,637.1
14 LPG (Liquefied Petroleum Gas)		17.2	16.2	17.7	26.4	38.5	56.0	61.1
15 Fuel oil		0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

## 5.Industry

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

=>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	

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**Thank you**