

# Chapter 3

## Questionnaire and Manual for Oil Data

Ministry of Energy and Mines, Lao PDR

June 2021

**This chapter should be cited as**

Study team (2021), 'Questionnaire and Manual for Oil Data', in Kimura, S. and H. Phoumin (eds.), *Establishment of Energy Statistics Regulation in Lao PDR*. ERIA Research Project Report FY2021 No. 05, Jakarta: ERIA, pp.7-19.

# Chapter 3

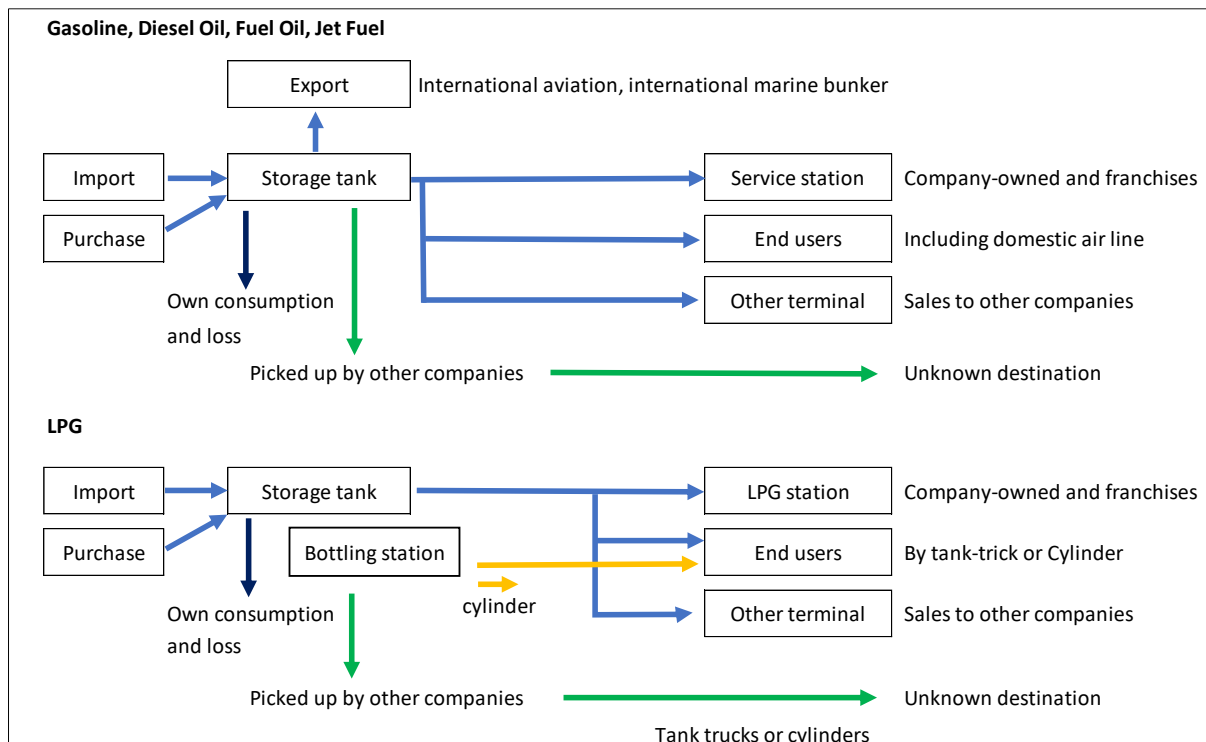
## Questionnaire and Manual for Oil Data

All oil and liquefied petroleum gas (LPG) companies in the Lao PDR are requested to answer the oil questionnaire. The questionnaire is about supply chain and sectoral demand for petroleum products. The successful realisation of data collection will contribute to completing the Lao PDR energy statistics. The questionnaire consists of Tables A, B, and C. Questionnaire A relates to the receiving (import or purchase) and shipping (delivery) of petroleum products. Questionnaire B breaks down the shipments to end users by sector. Questionnaire C relates to the import origin (country) of petroleum products. Also, each company responds to the questionnaires based on its total data.

### 1. Supply flow of petroleum products

Figures 3.1 and 3.2 illustrate the supply flow of petroleum products. LPG and lubricants have slightly different supply flows than gasoline, diesel oil, fuel oils, and jet fuels. Please keep this in mind when answering the questionnaires.

Figure 3.1 Supply Flow of Petroleum Products



Source: Author.



### **2-3 Total received: (1) – (2) total**

#### **(1) Import**

Enter the total yearly import volume of your company per petroleum product. The Lao PDR imports all petroleum products, and the Department of Customs of the Ministry of Industry and Commerce collects import data. The total import volume of all oil and LPG companies meets this quantity. Do not include quantities of petroleum products in transit (that is, en route through the country).

#### **(2) Purchase**

Enter the total yearly purchase volume of your company from other domestic companies per petroleum product. Since this pertains to domestic sales, it should not be counted in the primary energy supply of the energy balance table.

### **2-4 Total shipment: (3) – (5) total**

#### **(3) Export**

Enter the total yearly export volume of your company by petroleum product. The Department of Customs of the Ministry of Industry and Commerce collects export data. The total export volume of all oil and LPG companies meets this quantity. The export volume includes international aviation bunker and international marine bunker. International aviation bunker refers to aviation fuels, such as jet fuel for aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic and international split should be determined based on the departure and landing locations and not by the airline's nationality. International marine bunker refers to fuels delivered to ships of all flags that are engaged in international navigation. International navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Exclude consumption of ships engaged in domestic navigation. Determine the domestic and international split based on the port of departure and port of arrival, not by the ship's flag or nationality. Exclude consumption by fishing vessels and military forces.

#### **(4) Direct delivery by your company: (a) – (c) total**

- a) Total delivery volume to service stations of your company, including franchises
- b) Total delivery volume to end users; please break down in Questionnaire B later
- c) Total delivery volume to other oil company's terminal; this is wholesale

#### **(5) Picked-up volume by other companies**

This is also wholesale, so the final destination is unknown. LPG is picked up in tank trucks or cylinders. Lubricant is picked up in drums or pail cans.

### **2-5 Own consumption and loss**

Enter the total volume of fuel used in-house for automobiles, self-generation, etc.

Loss means inventory loss.

### **2-6 Closing stock**

Closing stock is defined as:

Opening stock + Total received – Total shipment – Own consumption and loss

\*Note: Closing stock is automatically calculated in Questionnaire A.



01 – crop and animal production, hunting and related service activities; 02 – forestry and logging; 03 – fishing and aquaculture. Fishing includes coastal and deep-sea fishing and should cover fuels delivered to ships of all flags that refuelled in the country (includes international fishing). It also includes energy used in the fishing industry. Table A3.1, in the annexes, shows all ISIC divisions. Refer to ISIC Rev. 4 <https://unstats.un.org/unsd/classifications/Econ> for the breakdown of each division. Break down of the division is ‘group’; click division number 01, 02, 03.

### 3-3 Industry

Industry is also classified according to the ISIC divisions. Enter the total quantity that the company has shipped to the industry sector to which the end user's primary activity belongs. Include the amounts of fuels consumed in heat or combined heat and power (CHP) plants to produce used by the plant itself. However, the quantities of fuels consumed to produce heat sold and electricity should be reported under the appropriate transformation sector. Enter the quantity to each industry classification.

- (1) Iron and steel  
ISIC group 241 of Division 24 – Manufacture of basic iron and steel. Enter fuel for open hearth and blast furnace. Report in the transformation sector the fuel used in blast furnaces (coke) to avoid double counting.
- (2) Chemical and petrochemical  
ISIC Divisions 20 and 21 – Manufacture of chemicals and chemical products and manufacture of basic pharmaceutical products and pharmaceutical preparations. These divisions include the transformation of organic and inorganic raw materials by a chemical process and the formation of products. These also include the manufacture of basic pharmaceutical products and pharmaceutical preparations and medicinal chemical and botanical products.
- (3) Non-ferrous metals  
ISIC groups 242 and 243 of Division 24. These groups include the production of basic precious metals; the production and refining of unwrought or wrought precious metals such as gold, silver, and platinum from ore and scrap; and the casting of non-ferrous metals.
- (4) Non-metallic minerals  
ISIC Division 23. This division includes manufacturing activities related to a single substance of mineral origin. This division covers the manufacture of glass and glass products (e.g. flat glass, hollow glass, fibres, technical glassware, etc.); ceramic products; tiles and baked clay products; and cement and plaster from raw materials to finished articles. Also included in this division is the manufacture of shaped and finished stone and other mineral products.
- (5) Transport equipment  
ISIC Divisions 29 and 30 – Manufacture of motor vehicles, trailers, and semi-trailers; parts and accessories; and other transport equipment. This division also includes the manufacture of transport equipment such as shipbuilding and boat making, railroad rolling stock and locomotives; and aircraft, spacecraft, and parts.
- (6) Machinery  
ISIC Divisions 25, 26, 27, and 28 – Manufacture of fabricated metal products; computer, electronic, and optical products; and electrical equipment.
- (7) Mining (excluding energy-producing industries) and quarrying

ISIC Divisions 07 and 08 and group 099 of Division 09 – Mining of metal ores, other mining and quarrying, support activities for other mining and quarrying

(8) Food, beverages, and tobacco

ISIC Divisions 10, 11, and 12 – Manufacture of food products, beverages, and tobacco products

(9) Paper, pulp, and printing

ISIC Divisions 17 and 18 – Manufacture of paper and paper products, printing and reproduction of recorded media

(10) Wood and wood products (other than pulp and paper)

ISIC Division 16 – Manufacture of wood and products of wood and cork, except furniture; articles of straw and plaiting materials.

(11) Construction

ISIC Divisions 41, 42, and 43 – Construction of buildings, civil engineering, specialised construction activities

(12) Textile and leather

ISIC Divisions 13, 14, and 15 – Manufacture of textiles, wearing apparel, leather, and related products

(13) Not elsewhere specified (Industry)

Please enter quantities not included above.

### **3-4 Commercial and public services**

Business and offices in the public and private sectors. For example, hotel, restaurant, hospital, school, office building, etc. Refer to non-transport activities of ISIC Divisions 49, 50, and 51. Refer also to ISIC Divisions 33 (repair and installation of machinery and equipment); 36–39 (water supply; sewerage, waste management, and remediation activities); 45–47 (wholesale and retail trade; repair of motor vehicles and motorcycles); 52 (warehousing and support activities for transportation); 53 (postal and courier activities); 55–56 (accommodation and food service activities); 58–63 (information and communication); 64–66 (financial and insurance activities); 68 (real estate activities); 69–75 (professional, scientific, and technical activities); 77–82 (administrative and support service activities); 84 (public administration and defence; compulsory social security); 85 (education); 86–88 (human health and social work activities); 90–93 (arts, entertainment, and recreation); 94–96 (other service activities); and 99 (activities of extraterritorial organisations and bodies).

### **3-5 Transport**

All transport activities irrespective of the economic sector in which the activity occurs, except military use. Fuels used for heating and lighting at railways, bus stations, and airports should be reported in commercial and public services.

(1) Railway company

Report fuels delivered to railway companies for use in rail traffic, including industrial railways and transport as part of urban or suburban transport systems (e.g. metro, tram).

(2) Ship company

Report fuels delivered to vessels of all flags not engaged in international navigation. The domestic and international split should be determined based on the port of departure and the port of arrival and not by the ships' flag or nationality.

(3) Land transportation company (taxi, bus, etc.)

Report fuels delivered to the land transportation company (taxi, bus, etc.)

The energy balance table 'transportation' is this quantity plus the quantity shipped to the service stations and LPG stations.

(4) Airlines (domestic aviation)

Report fuels to aircraft for domestic aviation – commercial, private, agricultural, etc. These include use for purposes other than flying, e.g. bench testing of engines. The domestic and international split should be determined based on the departure and landing locations and not by the airline's nationality.

### **3-6 Residential**

Report fuels to all households including 'households with employed persons ISIC Divisions 97 and 98'. Activities of households as employers of domestic personnel, undifferentiated goods- and services-producing activities of private households for own use

### **3-7 Other – Not elsewhere specified**

Report fuels to unclassifiable destination.

### **3-8 Non-energy**

Report fuels consumed as raw materials, solvent, cleaning agent, etc.

### **3-9 Total**

Please confirm that each petroleum product's total matches the quantity of 'total shipment to end users for each petroleum product of Questionnaire A'.

## **4. Questionnaire C**

Enter import origin (country). Confirm that each petroleum product's total matches the quantity of 'Total received: import of each petroleum product of Questionnaire A'.

Although crude oil, NGL (natural gas liquids), and natural gas are reported as coming from the country of origin, petroleum products are reported as coming from the last production country (Definition of Energy Balance Table of IEA). <https://www.iea.org/subscribe-to-data-services/world-energy-balances-and-statistics> (access date 20 July 2020).

Questionnaire C is Table 3.3 below.





## Annexes

**Table A3.1 ISIC Classification**

A - Agriculture, forestry, and fishing
01 - Crop and animal production, hunting, and related service activities
02 - Forestry and logging
03 - Fishing and aquaculture
B - Mining and quarrying
05 - Mining of coal and lignite
06 - Extraction of crude petroleum and natural gas
07 - Mining of metal ores
08 - Other mining and quarrying
09 - Mining support service activities
091 - Support activities for petroleum and natural gas extraction
099 - Support activities for other mining and quarrying
C - Manufacturing
10 - Manufacture of food products
11 - Manufacture of beverages
12 - Manufacture of tobacco products
13 - Manufacture of textiles
14 - Manufacture of wearing apparel
15 - Manufacture of leather and related products
16 - Manufacture of wood and of products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials
17 - Manufacture of paper and paper products
18 - Printing and reproduction of recorded media
19 - Manufacture of coke and refined petroleum products
20 - Manufacture of chemicals and chemical products
21 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
22 - Manufacture of rubber and plastics products
23 - Manufacture of other non-metallic mineral products
24 - Manufacture of basic metals
241 - Manufacture of basic iron and steel
242 - Manufacture of basic precious and other non-ferrous metals

243 - Casting of metals
25 - Manufacture of fabricated metal products, except machinery and equipment
26 - Manufacture of computer, electronic, and optical products
27 - Manufacture of electrical equipment
28 - Manufacture of machinery and equipment
29 - Manufacture of motor vehicles, trailers, and semi-trailers
30 - Manufacture of other transport equipment
31 - Manufacture of furniture
32 - Other manufacturing
33 - Repair and installation of machinery and equipment
D - Electricity, gas, steam, and air-conditioning supply
35 - Electricity, gas, steam, and air-conditioning supply
E - Water supply; sewerage, waste management, and remediation activities
36 - Water collection, treatment, and supply
37 - Sewerage
38 - Waste collection, treatment, and disposal activities; materials recovery
39 - Remediation activities and other waste management services
F - Construction
41 - Construction of buildings
42 - Civil engineering
43 - Specialised construction activities
G - Wholesale and retail trade; repair of motor vehicles and motorcycles
45 - Wholesale and retail trade and repair of motor vehicles and motorcycles
46 - Wholesale trade, except of motor vehicles and motorcycles
47 - Retail trade, except of motor vehicles and motorcycles
H - Transportation and storage
49 - Land transport and transport via pipelines
50 - Water transport
51 - Air transport
52 - Warehousing and support activities for transportation
53 - Postal and courier activities
I - Accommodation and food service activities
55 - Accommodation

56 - Food and beverage service activities
J - Information and communication
58 - Publishing activities
59 - Motion picture, video and television program production, sound recording, and music publishing activities
60 - Programming and broadcasting activities
61 - Telecommunications
62 - Computer programming, consultancy, and related activities
63 - Information service activities
K - Financial and insurance activities
64 - Financial service activities, except insurance and pension funding
65 - Insurance, reinsurance and pension funding, except compulsory social security
66 - Activities auxiliary to financial service and insurance activities
L - Real estate activities
68 - Real estate activities
M - Professional, scientific, and technical activities
69 - Legal and accounting activities
70 - Activities of head offices; management consultancy activities
71 - Architectural and engineering activities; technical testing and analysis
72 - Scientific research and development
73 - Advertising and market research
74 - Other professional, scientific, and technical activities
75 - Veterinary activities
N - Administrative and support service activities
77 - Rental and leasing activities
78 - Employment activities
79 - Travel agency, tour operator, reservation service, and related activities
80 - Security and investigation activities
81 - Services to buildings and landscape activities
82 - Office administrative, office support, and other business support activities
O - Public administration and defence; compulsory social security
84 - Public administration and defence; compulsory social security
P - Education
85 - Education

Q - Human health and social work activities
86 - Human health activities
87 - Residential care activities
88 - Social work activities without accommodation
R - Arts, entertainment, and recreation
90 - Creative, arts, and entertainment activities
91 - Libraries, archives, museums, and other cultural activities
92 - Gambling and betting activities
93 - Sports activities and amusement and recreation activities
S - Other service activities
94 - Activities of membership organisations
95 - Repair of computers and personal and household goods
96 - Other personal service activities
T - Activities of households as employers; undifferentiated goods- and services- producing activities of households for own use
97 - Activities of households as employers of domestic personnel
98 - Undifferentiated goods- and services-producing activities of private households for own use
U - Activities of extraterritorial organisations and bodies
99 - Activities of extraterritorial organisations and bodies

Source: United Nations, Department of Economic and Social Affairs Statistics Division; ISIC (International Standard Industries Classification of all Economic Activities) Revision 4 in 2008. <https://unstats.un.org/unsd/classifications/Econ>.

**Table A3.2 Conversion Table of Petroleum Products**

	Density		Heating Value		Ton of oil equivalent	
	Unit	Value	Unit	Value	Unit	Value
Gasoline	kg / l	0.737	kcal / kg	10,450	Metric Tonne	10,450
Jet Fuel	kg / l	0.800	kcal / kg	11,675	Metric Tonne	11,675
Diesel Oil	kg / l	0.839	kcal / kg	10,236	Metric Tonne	10,236
Fuel Oil	kg / l	0.890	kcal / kg	10,105	Metric Tonne	10,105
LPG	kg / l	0.510	kcal / kg	11,778	Metric Tonne	11,778
Lubricants	kg / l	0.858	kcal / kg	9,929	Metric Tonne	9,929

Source: ERIA (2018), *Lao PDR Energy Statistics*. Jakarta: ERIA.

**Table A3.3 Definitions of Petroleum Products**

<b>1. Jet fuel:</b> Kerosene-type jet fuel for aviation
Kerosene-type jet fuel is a medium distillate used for aviation turbine power units. It has the same distillation characteristics and flashpoint as kerosene (between 150°C and 300°C but not generally above 250°C). It has particular specifications (such as freezing point) established by the International Air Transport Association. It includes kerosene-blending components. Kerosene-type jet fuel excluding bio does not include the liquid biofuels blended with jet kerosene.
<b>2. Jet fuel:</b> Gasoline-type jet fuel for aviation
Gasoline-type jet fuel includes all light hydrocarbon oils for use in aviation turbine power units, which distil between 100°C and 250°C. This fuel is obtained by blending kerosene and gasoline or naphtha so that the aromatic content does not exceed 25% in volume, and the vapour pressure is between 13.7 kPa and 20.6 kPa. Additives can be included to improve fuel stability and combustibility.
<b>3. Gasoline:</b> Motor gasoline for automobiles
Motor gasoline is light hydrocarbon oil used in internal combustion engines such as motor vehicles, excluding aircraft. Motor gasoline is distilled between 35°C and 215°C and is used as a fuel for land-based spark ignition engines. Motor gasoline may include additives, oxygenates, and octane enhancers, including lead compounds such as TEL (tetraethyl lead) and TML (tetramethyl lead). Motor gasoline, excluding biofuels, does not include liquid biofuel or ethanol blended with gasoline.
<b>4. Diesel oil:</b> Gas oil or diesel oil for boilers, heavy equipment, trucks, ships
Gas oil or diesel oil includes heavy gas oils. Gas oils are obtained from the lowest fraction from atmospheric distillation of crude oil, while heavy gas oils are obtained by vacuum redistillation of the residual from atmospheric distillation. Gas oil or diesel oil distils between 180°C and 380°C. Several grades are available depending on uses: diesel oil for diesel compression ignition (cars, trucks, marine, etc.); light heating oil for industrial and commercial uses; and other gas oils including heavy gas oils that distil between 380°C and 540°C and are used as petrochemical feedstocks. Gas oil or diesel oil excluding biofuels does not include the liquid biofuels blended with gas oil or diesel oil.
<b>5. Fuel oil:</b> Fuel oil (residual oil) for boilers, ships
Fuel oil refers to oils that make up the distillation residue. It comprises all residual fuel oils, including those obtained by blending. Its kinematic viscosity is above 10 centi stokes or cSt at 80°C. The flashpoint is always above 50°C and the density is always higher than 0.90 kg/l.
<b>6. LPG:</b> Liquefied petroleum gas for household, restaurant, factories
Liquefied petroleum gases (LPGs) are the light hydrocarbon fraction of the paraffin series, derived from refinery processes, crude oil stabilisation plants, and natural gas-processing plants, comprising propane (C <sub>3</sub> H <sub>8</sub> ) and butane (C <sub>4</sub> H <sub>10</sub> ) or a combination of the two. They could also include propylene, butylene, isobutene, and isobutylene. LPGs are usually liquefied under pressure for transportation and storage.
<b>7. Lubricant:</b> Lubricant for automobiles, trucks, ships, factories
Lubricants are hydrocarbons produced from distillate or residue; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil – from spindle oil to cylinder oil – and those used in greases, including motor oils and all grades of lubricating oil base stocks.

Source: International Energy Agency (IEA) (2019), World Energy Balances: Database Documentation 2019 Edition. Paris: IEA.