SAMOA
BUREAU OF STATISTICS

Environment Statistics

Energy Accounts

Samoa 2022

Foreword

This report presents the information on the physical flow accounts for energy in Samoa's economy for the year 2022. The report is the 3rd version of the Energy Accounts for Samoa. The first two was compiled for the years 2016 (as an experimental energy account) and 2020.

These accounts record energy flows in physical units (i.e. joules) from its extraction (i.e. the capture of energy from natural inputs from the environment) into the economy, the flows within the economy in the form of supply and use of energy products by industries and households, and, finally, the flows of energy back to the environment as energy residuals.

The physical supply and use of energy accounts for Samoa was compiled according to the United Nation System of Environmental-Economic Accounting 2012 (UN-SEEA 2012) Central Framework and SEEA-Energy 2019.

The SEEA central framework is designed to measure the environment and its relationship with the economy and its use to organize different environmental and economic information to produce energy indicators that are relevant to environmental and economic issues.

The report provides useful and basic energy statistics, aggregates and energy-related climate change indicators that can be used for inform energy policies and monitoring progress of national and international goals like the Sustainable Development Goals (SDGs2030).

I am hopeful that this report will provide the necessary statistical information to assist in future energy policy formulation and strategic planning for Samoa.

I would like to acknowledge the usual contributions of our valued energy partners for their ongoing support by providing the data and information for our Energy Account compilation.

Laulu Sialafua Lova
Acting Government Statistician/CEO

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Executive Summary

This publication is the 3rd Energy Accounts for Samoa, and is one of the environmental economic accounts compiled by the bureau, using the United Nation System of Environmental--Economic Accounting (UN SEEA, 2012) and SEEA-Energy 2019.

The Energy Account, Samoa 2022 presents estimates on physical supply and use of energy (in joules[1]) for Samoa. It also presents physical supply and use of energy for a time series of seven consecutive years from 2016 to 2022.

Table 1 highlights the key statistics for the account. The physical supply and use accounts can be used in the derivation of some of the important energy aggregates and indicators such as the following;

- Total Energy Supply
- Net Domestic Energy Use (NDEU)[2]
- Share of Fossil Fuels in Total Energy Use
- Share of Renewable Energy in Total Energy Use (**SDG 7.2.1)**
- Total Energy Intensity of Production Activities of National Economy (**SDG 7.3.1**)
- Energy Use by Households per capita
- Share of Renewable Electricity to Total Electricity Production

One of Samoa's main goals for the energy sector is to achieve **70.0 % renewable energy use by the end of 2031**, as stipulated in the Pathway for the Development of Samoa (PDS 2021/22-2025/26). The Energy Account also provides statistics to assess and monitor the progress of that goal.

[1] **Joules**: a recommended unit of energy in the International System of Units (SI) for the SEEA Energy Accounts. The figures in this report are presented in Terajoules (TJ) which is equivalent to trillion joules.
[2] **Net Domestic Energy Use** is the total end use of energy less re-exports of energy. Refer **Appendix A4**.

Abbreviations and Acronyms

$	Tala
$m	in million Tala
ADO	Automotive Diesel Oil
DPK	Dual Purpose Kerosene
EPC	Electric Power Corporation
GDP	Gross Domestic Product
LPG	Liquefied Petroleum Gas
MCR	Ministry of Customs and Revenue
MOF	Ministry of Finance
NDEU	Net Domestic Energy Use
PPS	Petroleum Products Supply
PSUTS	Physical Supply and Use Tables
SBS	Samoa Bureau of Statistics
SDG	Sustainable Development Goals
SEEA	System of Environmental Economic Accounting
SI	The International System of Unit
SSC	Samoa Shipping Corporation
TJ	Terajoule
ULP	Unleaded Petrol
UN	United Nations
UNESCAP	United Nations Economic and Social Commission for Asia Pacific

Key Energy Statistics

In 2022 compared with 2021,

- Total energy supply decreased by 10.2% to 5,047.4 TJ
- Total Energy from Natural Inputs decreased by 6.3% to 1,304.4 TJ
- Total Imported Energy Products decreased by 11.5% to 3,743.0 TJ
- Net Domestic Energy Use marginally decreased by 0.1% to 4,979.5 TJ
- Household energy end use decreased by 8.7% to 2,776.0 TJ
- Industry energy end use increased by 12.1% to 1,372.4 TJ
- Re-exported energy products increased by 110.4% to 399.2 TJ
- Share of Renewable energy to total energy use decreased from 27.9% in 2021 to 26.2% in 2022

Table 1: Key Energy Statistics, Samoa 2016-2022

Key Energy Statistics	2016	2017	2018	2019	2020	2021	2022
Total Energy Supply (TJ)	6,074.2	5,778.7	5,560.4	6,227.0	5,281.8	5,621.5	5,047.4
Energy from Natural Inputs (TJ)	1,657.1	1,491.4	1,553.6	1,592.2	1,593.0	1,392.1	1,304.4
Imported Energy Products (TJ)	4,417.1	4,287.3	4,006.8	4,634.8	3,688.8	4,229.4	3,743.0
Net Domestic Energy Use (TJ)	5,375.0	5,054.4	4,953.3	5,377.1	4,985.7	4,985.8	4,979.5
Household Energy End Use (TJ)	3,520.2	3,163.8	3,077.2	3,197.8	3,441.7	3,041.3	2,776.0
Industry Energy End Use (TJ)	1,200.2	1,203.0	1,289.7	1,443.1	1,056.3	1,223.8	1,372.4
Re-Exports (TJ)	552.7	590.3	611.3	674.1	348.5	189.7	399.2
Renewable Energy Share (%)	30.8	29.5	31.4	29.6	32.0	27.9	26.2

1. Energy Supply

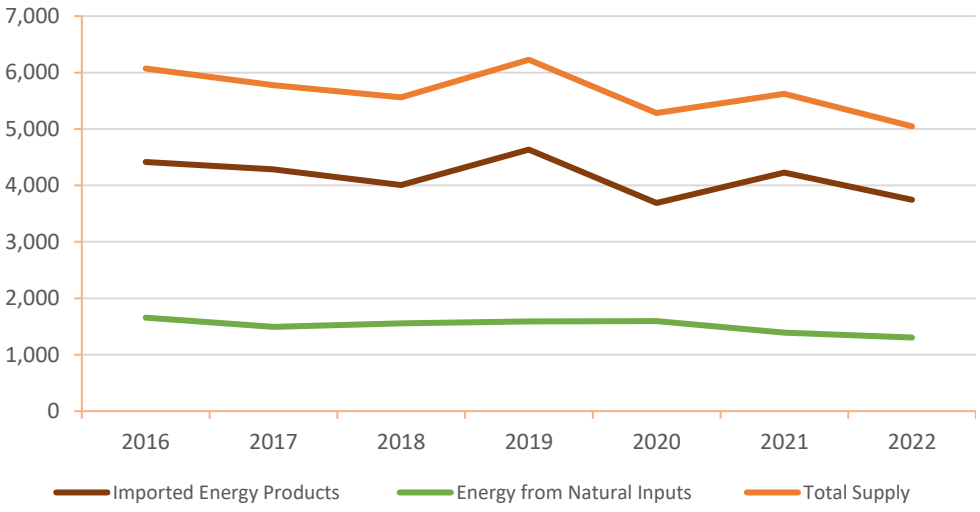
In 2022[3], Samoa's total energy supply of 5,047.4 TJ was supplied from:

- Imported Energy Products, 3,743.0 TJ (74.2%)
- Energy from Natural Inputs (environment), 1,304.4 TJ (25.8%)

As depicted in **Chart 1**, Samoa's total energy supply trend is evidently influenced by the supply of imported energy products. Total energy supply in 2022 was decreased by 10.2% compared to 5,621.5 TJ in 2021. Imported energy products also decreased by 11.5% (Refer **Table 1**).

[3] Refer **Appendix A1 & A2** for the 2022 Physical Supply and Use Tables (PSUT)

Chart 1: Total Energy Supply, Samoa 2016-2022 (TJ)



Source: EPC, PPS, MOF & SBS

Table 1: Total Energy Supply, Samoa 2016-2022 (TJ)

Year	Imported Energy Products	Energy from Natural Inputs	**Total Energy Supply**
2016	4,417.1	1,657.1	**6,074.2**
2017	4,287.3	1,491.4	**5,778.7**
2018	4,006.8	1,553.6	**5,560.4**
2019	4,634.8	1,592.2	**6,227.0**
2020	3,688.8	1,593.0	**5,281.8**
2021	4,229.4	1,392.1	**5,621.5**
2022	3,743.0	1,304.4	**5,047.4**

Source: EPC, PPS & MCR

1.1 Imported Energy Products

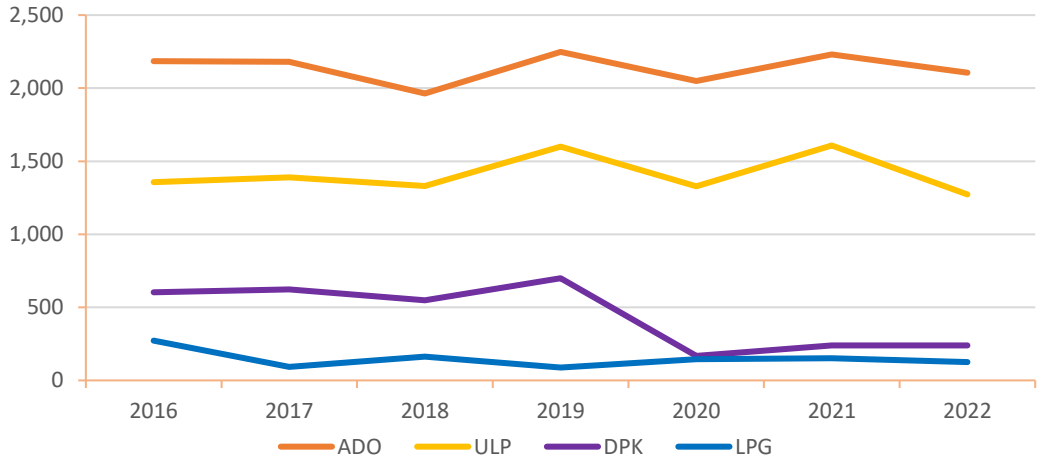
In 2022, the main imported products were;

- ADO 2,106.0 TJ (56.2%)
- ULP 1,272.8 TJ (34.0%)
- DPK 238.6 TJ (6.4%)
- LPG 125.6 TJ (3.4%

Automotive Diesel Oil (ADO) was the main imported product with 56.3% or 2,106.0 TJ with liquified petroleum gas (LPG) the least imported fuel, constituting around 125.6 TJ or 3.4%.

As depicted in Chart 2, DPK significantly declined by 76.0% from 699.2 TJ in 2019 to 167.8 TJ in 2020 and about 65.9% decrease to 238.6 TJ in 2022. The cessation of Samoa Airways Boeing aircraft was the main contributor to this decline (Refer **Chart 2** & **Table 2**).

Chart 2: Imported Energy Products, Samoa 2016-2022 (TJ)



Source: PPS & MCR

Table 2: Imported Energy Products, 2016-2022 (TJ)

Year	ADO	ULP	DPK	LPG	**Total Imports**
2016	2,185.5	1,356.5	602.9	272.1	**4,417.1**
2017	2,181.3	1,390.0	623.8	92.1	**4,287.3**
2018	1,963.6	1,331.4	548.5	163.3	**4,006.8**
2019	2,248.3	1,599.4	699.2	87.9	**4,634.8**
2020	2,048.1	1,327.2	167.8	145.8	**3,688.8**
2021	2,231.6	1,607.7	239.4	150.7	**4,229.4**
2022	2,106.0	1,272.8	238.6	125.6	**3,743.0**

Source: PPS & MCR

1.2 Energy from Natural Inputs

In 2022, the main sources of energy from natural inputs are;

(a) Natural Resource Inputs

- Fuelwood and Wood-waste, 829.0 TJ (63.6%)

(b) Inputs of Energy from Renewable Energy

- Hydro energy, 104.4 TJ (8.0%)
- Solar energy, 79.2 TJ (6.1%)

- Wind energy, 0.7 TJ (0.05%)
- Others, 0.1 TJ (0.01%)

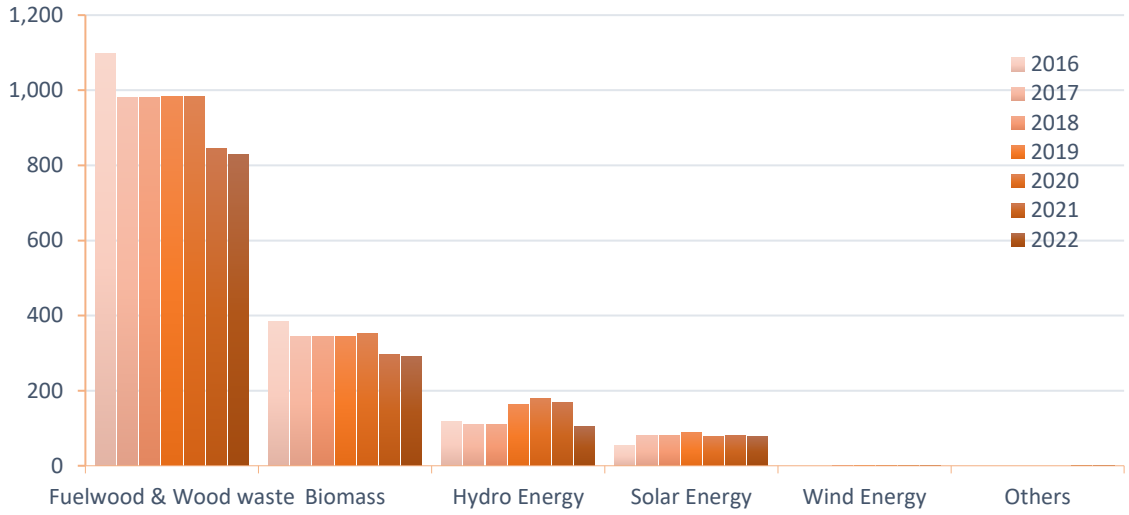
(c) Energy inputs to cultivated biomass

- Biomass, 291.0 TJ (22.3%)

Hydro energy decreased by 38.0% to 104.4 TJ in 2022 when compared to 168.4 TJ reported in 2021. Hydro energy is the main contributor to the total renewable electricity production for Samoa every year, contributing to more than 60.0% of total renewable energy production.

Throughout the years, fuelwood and wood waste contributed the most to energy from natural inputs (Refer **Chart 3** & **Table 3**).

Chart 3: Energy Supply from Natural Inputs, Samoa 2016-2022 (TJ)



Source: EPC & MOF
Note: Others refer to biogas.

Table 3: Energy from Natural Inputs, 2016-2022 (TJ)

Year	Fuelwood & Wood Waste	Biomass	Hydro	Solar	Wind	Others[1]	**Total**
2016	1,096.9	385.2	118.2	56.0	0.7	-	**1,657.1**
2017	979.7	343.4	95.1	72.7	0.6	-	**1,491.4**
2018	979.7	343.3	154.1	75.9	0.5	-	**1,553.6**
2019	983.9	343.3	179.3	84.9	0.8	-	**1,592.2**
2020	983.8	351.3	178.2	79.1	0.7	-	**1,593.0**
2021	845.7	296.4	168.4	81.2	0.3	0.1	**1,392.1**
2022	829.0	291.0	104.4	79.2	0.7	0.1	**1,304.4**

Source: EPC & MOF

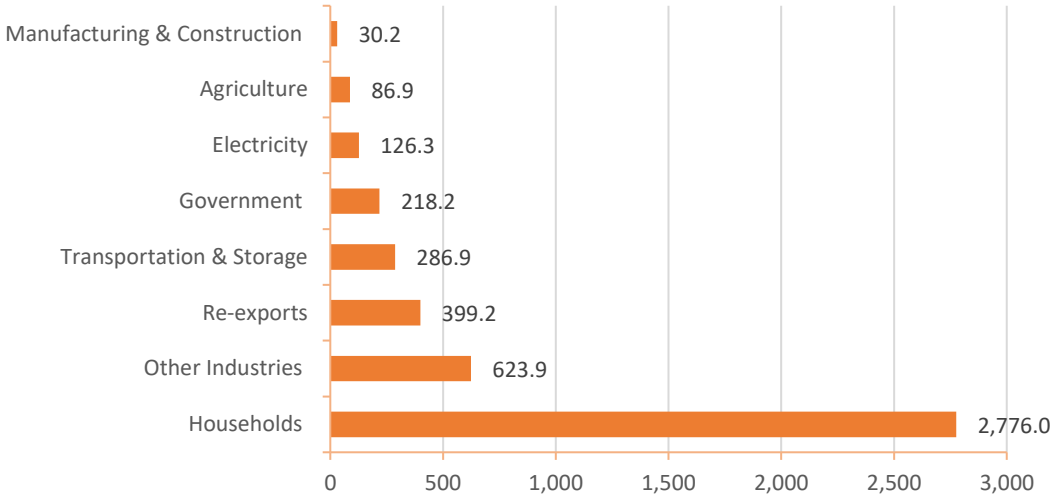
Note **-:** zero or not available at the time
1: Refer to biogas energy from animal waste

2. End Use of Energy

End use[4] of energy refers to the final transformation stage of energy use. i.e. the energy is no longer available for use in the respective accounting period.

In 2022, the total end use of energy was calculated to be 4,547.7 TJ. Households constituted the largest amount of total end use with 2,776.0 TJ or 61.0% while Manufacturing and Construction accounted for the least with about 30.2 TJ or 0.7% of total end use. Re-exported energy products accounted for 399.2 TJ or 8.8 % (Refer **Chart 4 & Table 4**).

Chart 4: Total End Use of Energy, Samoa 2022 (TJ).



Source: EPC, MOF, PPS, SSC & SBS

Table 4: Total End Use of Energy, Samoa 2022.

Industries	TJ	%
Manufacturing & Construction	30.2	0.7
Agriculture	86.9	1.9
Electricity	126.3	2.8
Government	218.2	4.8
Transportation & Storage	286.9	6.3
Other Industries	623.9	13.7
Households	2,776.0	61.0
Re-Exports	399.2	8.8
Total End Use	**4,547.7**	**100.0**

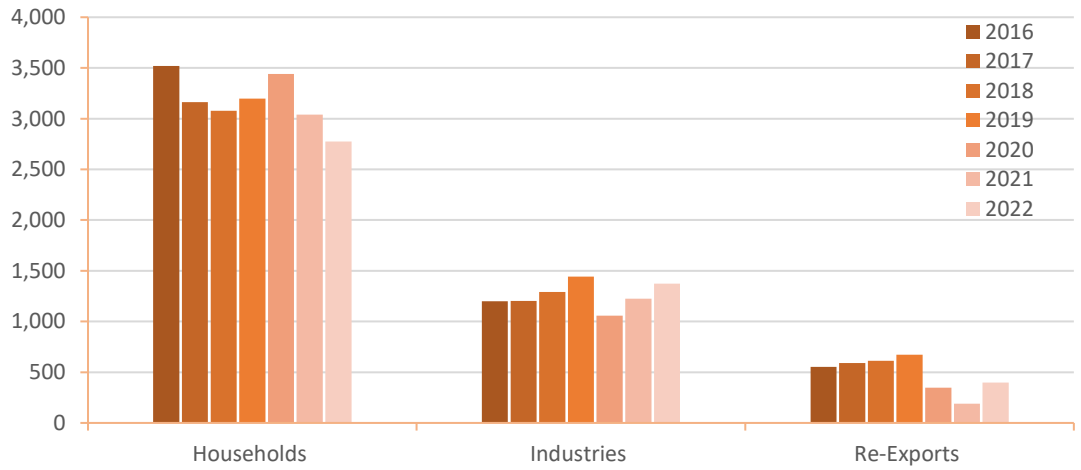
Source: EPC, MOF, PPS, SSC & SBS

[4] **End use** does not include changes in inventories and energy losses. Refer **Appendix A3**

2.1 End Use by Total Industry, Households and Re-exports

As depicted in **Chart 5** and **Tabel 5** below, households are the main user of energy since 2016 despite the decrease in 2021 and 2022. Re-exports of energy products on the other hand increased in 2022 after a declining trend in both 2020 and 2021.

Chart 5: End Use by Total Industry, Households, and Re-exports, Samoa 2016-2022 (TJ)



Source: EPC, MOF, PPS, SSC & SBS

Table 5: End Use by Total Industry, Households and Re-exports, Samoa 2016-2022 (TJ)

Year	Industry	Households	Re-Exports	**Total** [1]
2016	1,200.2	3,520.2	552.7	**5,273.1**
2017	1,203.0	3,163.8	590.3	**4,957.1**
2018	1,289.7	3,077.2	611.3	**4,978.2**
2019	1,443.1	3,197.8	674.1	**5,315.0**
2020	1,056.3	3,441.7	348.5	**4,846.4**
2021	1,223.8	3,041.3	189.7	**4,454.7**
2022	1,372.4	2,776.0	399.2	**4,547.7**

Source: EPC, MOF, PPS, SSC & SBS

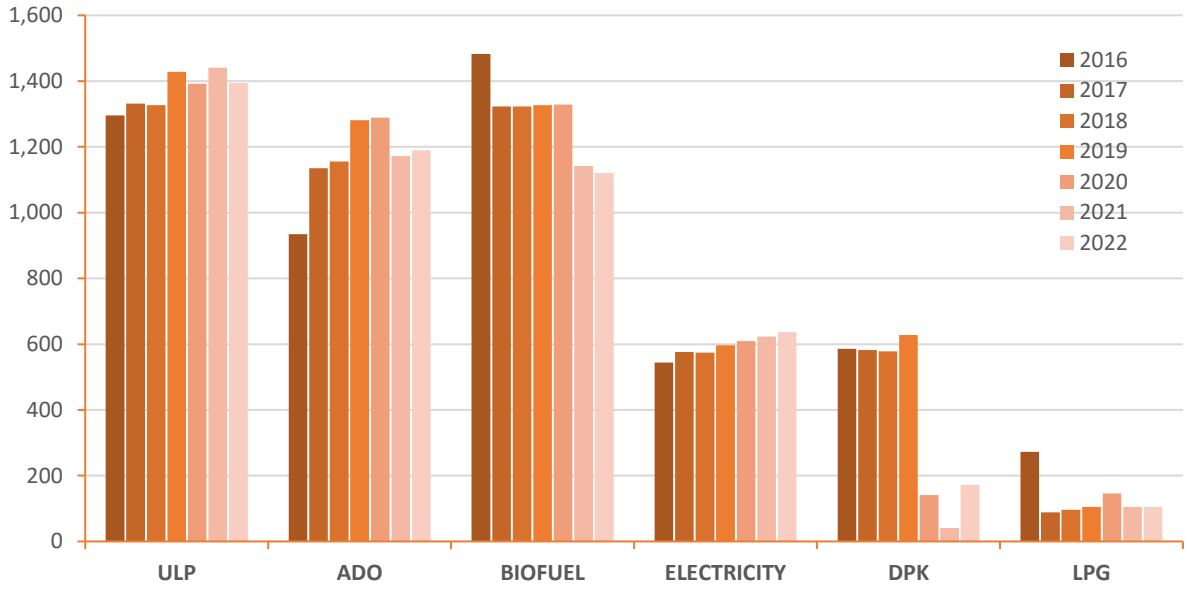
Note: 1- Not including changes in inventories and losses. Totals rounded to one decimal place.

2.2 End Use by Energy Products

Energy use by product was dominated by unleaded petrol (ULP) followed by diesel fuel (ADO) and biofuel. **Chart 6** and **Table 6** portrays Energy Use by product between 2016 and 2022. The

most notable trend shown in both Chart 6 and Table 6 is the significant decrease in DPK use in both 2020 and 2021 due to international travel restrictions as a result of Covid-19.

Chart 6: End Use by Energy Products, Samoa 2016-2022 (TJ)



Source: EPC, PPS, MOF, SSC, MCR & SBS

Table 6: End Use by Energy Products, Samoa 2016-2022 (TJ)

Year	ULP	Biofuel	ADO	Electricity	DPK	LPG	**Total** [1]
2016	1,302.1	1,482.1	1,147.2	483.4	586.2	272.1	**5,273.1**
2017	1,331.4	1,323.0	1,134.6	498.2	582.0	87.9	**4,957.1**
2018	1,327.2	1,323.0	1,155.6	498.3	577.8	96.3	**4,978.2**
2019	1,427.7	1,327.2	1,281.2	546.3	628.0	104.7	**5,315.0**
2020	1,392.4	1,328.6	1,289.1	549.4	141.1	145.8	**4,846.4**
2021	1,440.3	1,141.8	1,172.3	555.4	40.3	104.7	**4,454.7**
2022	1,394.2	1,120.1	1,189.1	567.3	172.2	104.7	**4,547.7**

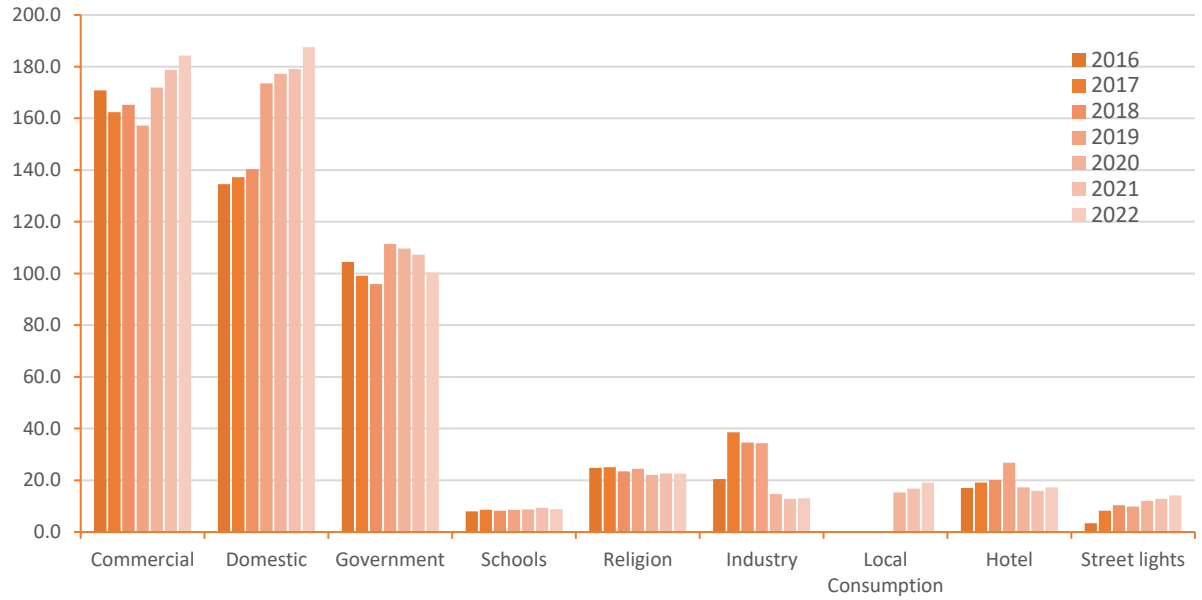
Source: EPC, PPS, MOF, SSC, MCR & SBS

Note: - 1: not including changes in inventories and energy losses

3. Electricity Use

Electricity use was classified according to EPC end-use sectors. Both Commercial and Domestic (households) electricity use has gradually increased since 2019, as shown in **Chart 7** and **Table 7**.

Chart 7: Electricity Use by End Use Sectors, Samoa 2016-2022 (TJ)



Source: EPC
Note: Industries based on EPC customer end use sectors

Table 7: Electricity Use by End Use Sectors, Samoa 2016-2022 (TJ)

Year	Com.	Dom.	Gov.	Sch.	Rel.	Ind.	Hot	S/lights	EPC	**TOTAL**
2016	170.8	134.5	104.4	8.0	24.8	20.5	17.1	3.4	-	**483.4**
2017	162.4	137.2	99.1	8.6	25.0	38.5	19.1	8.2	-	**498.2**
2018	165.3	140.3	95.9	8.2	23.5	34.7	20.1	10.3	-	**498.3**
2019	157.2	173.5	111.3	8.6	24.5	34.4	26.9	9.9	-	**546.3**
2020	172.0	177.3	109.7	8.7	22.1	14.7	17.3	12.1	15.3	**549.4**
2021	178.7	179.2	107.3	9.3	22.6	12.8	15.9	12.8	16.7	**555.4**
2022	184.3	187.6	100.3	8.9	22.6	13.1	17.2	14.2	19.1	**567.3**

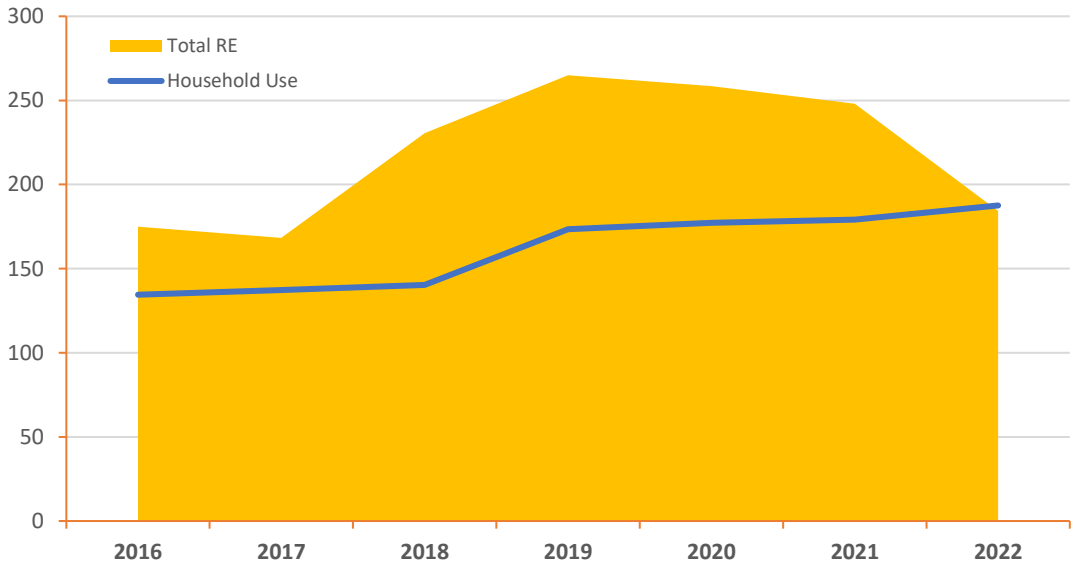
Source: EPC

Note: Industries here refer to EPC's own classification of End User Sectors. Domestic refers to Households.

3.1 Renewable Electricity Production and Household Use

Total renewable electricity in 2022 was calculated to be 184.2 TJ, a decline of about 25.7% from 248.1 TJ in 2021. 2022 was the only year where household electricity demand of 187.6 TJ was higher than total renewable electricity production of 184.2 TJ (Refer **Chart 8** & **Table 8**).

Chart 8: Total Renewable Electricity versus Total Household Electricity Use, Samoa 2016-2022 (TJ)



Source: EPC

Table 8: Total Renewable Electricity versus Household Electricity Use, 2012-2022 (TJ)

Year	Hydro Electricity	Solar Electricity	Wind Electricity	Biomass Electricity	**Total Renewable Electricity Production**	**Total Household Electricity use [1]**
2016	118.3	56.0	0.7	-	**175.0**	**134.5**
2017	95.1	72.7	0.6	-	**168.4**	**137.2**
2018	154.1	76.0	0.5	-	**230.6**	**140.3**
2019	179.3	84.9	0.8	-	**265.0**	**173.5**
2020	178.3	79.1	0.7	0.5	**258.5**	**177.3**
2021	168.4	79.1	0.3	0.3	**248.1**	**179.2**
2022	104.4	79.2	0.7	0.04	**184.2**	**187.6**

Source: EPC

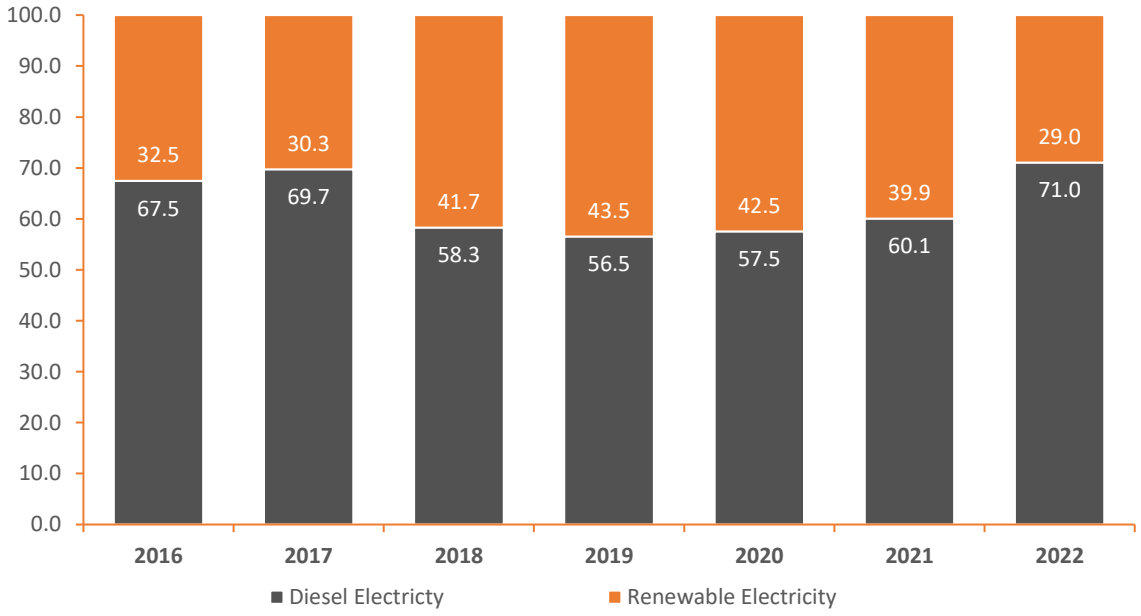
Note: 1: Total household electricity use included both electricity from renewable and diesel production

-: nil or not available

3.2 Renewable Electricity Share in Total Electricity Production

The share of renewable electricity in total electricity production gradually decreased from its highest share of 43.5% in 2019 to the least recorded in 2022 with 29.0%. The significant decrease of about 42.0% in hydropower from 179.3 TJ in 2019 to 104.4 TJ in 2022 was the main contributing factor to the overall decline in renewable electricity share in total electricity production (Refer **Chart 9** & **Table 8 & 9**).

Chart 9: Renewable Electricity Share in Total Electricity Production, 2016-2022



Source: EPC

Table 9: Renewable Electricity Share in Total Electricity Production, 2016-2022 (TJ)

Year	Diesel electricity (TJ)	%	Renewable electricity (TJ)	%	Total electricity (TJ)	%
2016	363.0	67.5	175.0	32.5	538.0	100
2017	387.4	69.7	168.4	30.3	555.8	100
2018	322.1	58.3	230.6	41.7	552.7	100
2019	344.4	56.5	265.0	43.5	609.4	100
2020	350.4	57.5	258.5	42.5	608.9	100
2021	373.2	60.1	248.1	39.9	621.3	100
2022	452.0	71.0	184.2	29.0	636.2	100

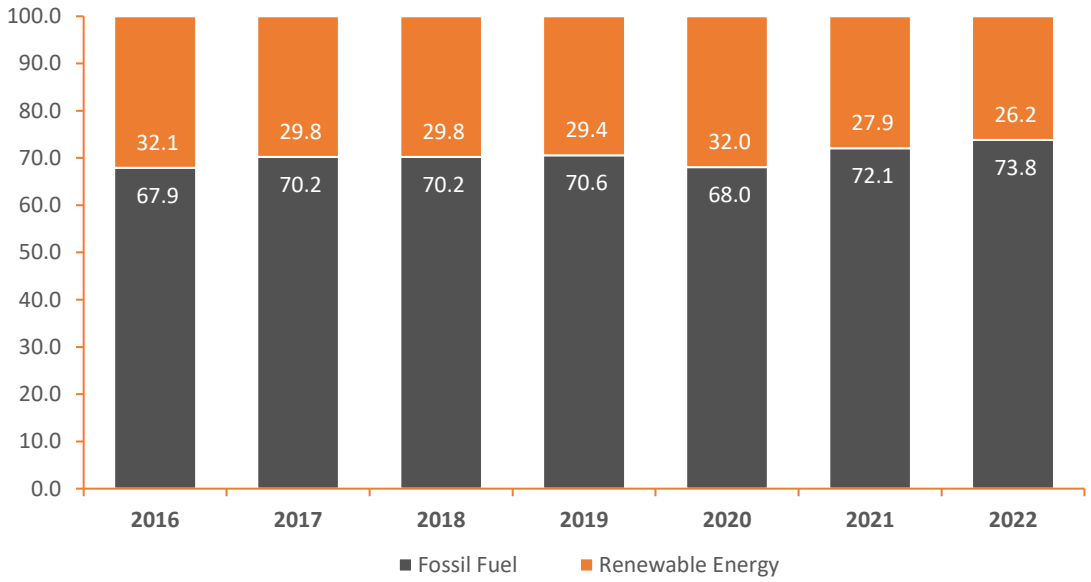
Source: EPC

4. Samoa's Renewable Energy Goal

Samoa through its Pathway for the Development of Samoa strategy (PDS, 2021/22 – 2025/26) is committed to achieving one of its Key Priority Areas; KPA 18 - 'Sustainable Energy Development Enhanced', with the goal of achieving '**70.0% Renewable Energy use by the end of 2031'.**

The share of renewable energy in total energy use in 2022 was calculated to be 26.2% which was the lowest being calculated since 2016. This share has decreased by 1.7% compared to 2021 as a result of the reduction in hydropower from 168.4 TJ in 2021 to 104.2 in 2022 (Refer **Chart 10** & **Table 10**).

Chart 10: Share of Renewable Energy in Total Energy Use, Samoa 2016-2022



Source: Samoa Bureau of Statistics

5. Energy Related Climate Change Indicators and SDGs

Table 10: Energy Related Climate Change Indicators

	Unit	2016	2017	2018	2019	2020	2021	2022
GDP (Nominal GDP)	$m.	2,232.0	2,252.2	2,313.2	2,417.2	2,209.6	2,191.4	2,305.2
Population (a)	No.	195,979	197,611	199,243	200,874	202,506	205,557	207,473
Indicators								
Net Domestic Energy Use (b)	TJ	5,375.0	5,054.4	4,953.3	5,377.1	4,985.7	4,985.8	4,979.5
Total Industries Energy End Use	TJ	1,200.2	1,203.0	1,289.7	1,443.1	1,056.3	1,223.8	1,372.4
Total Households Energy End Use	TJ	3,520.2	3,163.8	3,077.2	3,197.8	3,441.7	3,041.3	2,776.0
Share Of Fossil Fuels in Total Energy Use (c)	%	69.2	70.5	68.6	70.4	68.0	72.1	73.8
Renewable Energy Share in Total Energy Use [SDG 7.2.1]	%	30.8	29.5	31.4	29.6	32.0	27.9	26.2
Total Energy Intensity of Production Activities [SDG 7.3.1] (d)	MJ/$	0.7	0.8	0.8	0.9	0.7	0.9	1.0
Energy Use by Households Per Capita (e)	GJ /Person	18.9	16.0	15.4	15.9	17.0	14.8	14.4

Source: Samoa Bureau of Statistics

Note:

a. Population projection except for Population Census Years 2016 and 2021.
b. Net domestic energy use refers to the amount of energy that is end used minus re-exports. Refer **Appendix A4**
c. Fossil fuel for Energy Account Samoa refers to ADO, ULP, DPK and LPG
d. Expresses the energy used by production activities in terms of GDP. Calculated by total end use of energy by industries divided by total nominal GDP
e. Refers to the total end use of energy by households divided by resident population

6. Definitions

Biofuel refers to any fuel derived directly or indirectly from biomass, i.e., animal waste or plant or algae (IRES, 2018).

Biomass refers to all organic matter that comes from plants and animals; Biomass such as wood and wood waste are burned to generate electricity.

Dual Purpose Kerosene (DPK) is a refined product from crude oil and is used mainly by aircrafts and for lighting and heating.

Energy from Natural Inputs denotes physical flows from the environment to the economy that are derived principally from stocks of timber and mineral and energy resources.

Energy Intensity is ratio measure of how much energy is needed for every unit of value added or GDP

Energy Losses include energy losses during extraction, distribution, storage and transformation.

Energy Residuals are flows of energy from the economy to the environment and comprise energy losses as well as other energy residuals

Energy Supply includes all energy made available for use. Total Energy Supply for Samoa refers to Energy from Natural Inputs plus imported energy products.

Energy Use includes all final use including exports and inventory changes.

Fossil Fuels refers to diesel, motor gasoline or unleaded petrol, dual purpose kerosene and LPG.

Household Consumption of energy entails the consumption by households of energy products purchased or otherwise obtained from energy suppliers. All such consumption reflects the end use of energy. Household consumption also includes the energy products produced by the households themselves for own use, for example, energy produced from fuelwood gathered by households.

Hydropower is a process in which flowing water is used to spin a turbine connected to a generator

Industry consists of a group of establishments engaged in the same, or similar kinds of activity

Natural Inputs Are all physical inputs that are moved from their location in the environment as part of the economic production processes or are directly used in production.

Net Domestic Energy Use (Total Energy Use by National Economy) refers to the end use of energy products less exports of energy products plus all losses of energy.

Physical Flows The movement and use of energy.

Products Are goods and services that result from a process or production.

Renewable Energy refers to energy resources that are naturally replenishing. These include biomass, hydropower, solar and wind.

Residence Principle assigns flows of energy to the country of residence of the producing or consuming unit.

Solar Power Photovoltaic conversion generates electric power directly from sunlight in a photovoltaic cell.

Wind Power refers to the conversion of wind energy into electricity using wind turbines.

Fuelwood and wood waste refers to wood and wood waste used to produce energy, usually through burning.

7. Industries Classification

The bureau classified establishments according to relevant industry based on the International Standard Classification of Industries, Revision 4 (ISIC, Rev.4). However, with different data sources and classification used, this task was not without challenges. Hence, the bureau classified energy users and suppliers according to the following industries and with the exception of Government, the following industries closely followed the SEEA-Energy Account Industries Classification.

Agriculture Includes Agriculture, Forestry and Fishing

Manufacturing and Construction Includes Manufacturing, Mining and Quarrying and Construction

Electricity: Includes Electricity, Gas and Air Conditioning Supply

Transportation: Includes Transportation and Storage

Government: Includes Government Ministries and Corporations

Other Industries: All Other Industries not classified under any other industries

8. Units of Measurements

J	Joule	
KJ	Kilojoules	(Thousand joules)
MJ	Megajoules	(Million joules)
GJ	Gigajoules	(Billion joules)
TJ	Terajoules	(Trillion joules)

9. Accounts Produced

The report is an annual compilation of physical supply and use of energy for Samoa in the year 2022. However, the report also includes compilation of a time series of seven consecutive years starting from the year 2016 until 2022.

10. Accounts Methodology

The Energy Accounts 2022 compilation relied on the best available energy datasets, information and methodologies to develop the energy estimates presented in this report. Energy data varies for each data source and are converted into the recommended SI units, Terajoules to allow comparisons between different energy products in various forms and measurement units. Conversion factors used for most of the calculations are summarized in **Appendix A5** and it is extracted from Samoa Energy Review 2020-2022.

10.1 Key Standards and Guidelines

- UN System of Environmental Economic Accounting (SEEA) Central Framework 2012
- UN SEEA-Energy 2019
- Energy Statistics Manual 2004
- International Recommendation for Energy Statistics (IRES) 2018
- The Standard International Energy Product Classification (SIEC)
- Physical Energy Flow Accounts (PEFA) Manual 2014
- International Standard Industrial Classification Revision 4 (ISIC Rev.4)

10.2 Key Data Sources and Analysis

- *Electric Power Corporation (EPC)*

  EPC provided the electricity production by source of electricity and electricity sales by month and by end use sectors. All the raw data provided in kilowatt hour (kWh). They were converted into the recommended SI unit, TJ using the conversion factors used by the Ministry of Finance Energy Review Reports 2020-2022 for the energy account's purpose.

- *Petroleum Products Supply (PPS)*

Samoa mainly imports four petroleum products mainly Automotive Diesel Oil (ADO), Unleaded Petrol (ULP), Jet fuel known as Dual Purpose Kerosene (DPK) and Liquified Petroleum Gas (LPG). Three of these are imported into Samoa by Petroleum Products Supplies (PPS). PPS provides the import and re-export data to the bureau.

- *Imports and Exports Data from Ministry of Revenue (ASYCUDA Database)*

  SBS continue to obtain the imports and exports data from the Ministry of Revenue's ASYCUDA database. The information and data are also imported into the bureau's PC Green database for further processing. The data are then extracted and analyzed for energy account purpose using excel.

- *Ministry of Finance (MOF)*

  Ministry of Finance houses a wealth of energy data and information from its energy partners as they have been working closely for years. They also compiled the latest 12th edition of 'Samoa Energy Review Report' for the years 2020-2022. The electricity datasets, PPS and other gas data were shared with the bureau after seeking the approval of the custodians. The ministry also compiled a Fuel Summary Report for the financial years 2017-18 to 2019-20 for all government ministries.

- *Samoa Shipping Corporation (SSC)*

  Fuel used by shipping services for sea transport was provided by the corporation as well as fuel used for their vehicle fleet operation.

- *Ministry of Natural Resources and Environment (MNRE)*.

  The ministry provided the information on the status of the Biogas Systems in Samoa. Five of the systems have a Daily Gas Production capacity of 5 cubic meters and one with 3 cubic meters. The largest one with 300 cubic meters at Piu is reportedly inactive. The number of solar panels with specification detail information were not made available by the time of this compilation.

  The bureau will continue to work collaboratively with the relevant stakeholders on how to account for the other sources of energy not included in this report.

11. Next Steps

Regular and consistent production of energy accounts is the ultimate goal going forward. To achieve this, a collective effort from all relevant partners and stakeholders needs to be strengthen and enhanced to allow the sharing of information and data on a timely manner.

The bureau will also be looking at producing other energy indicators in the next edition of our energy accounts, depending on the availability of relevant data such as;

- Share of household income spent on fuel and electricity
- GHG Emissions from energy production and use
- Degree of Energy self-sufficiency

12. Feedback on the Accounts

The accounts will be improved significantly as we keep publishing series of energy accounts over the years and any feedback provided will further enhance this. The bureau will be very pleased to receive any feedback on any issue or account related matters, for future improvements and should be directed to:

Mr. Papalii Benjamin Sila
benjamin.sila@sbs.gov.ws
ACEO- Social Statistics Division
Samoa Bureau of Statistics
FMFM II Building, PO Box 1151
Apia, Samoa

13. Appendices

A1: Physical Supply Table 2022

PHYSICAL SUPPLY TABLE (unit: TJ)	Production (incl.household own account) & generation of residuals							Households	Inventories	Flows from the Rest of the World (Imports)	Flows from the Environment	TOTAL SUPPLY
	Industries (by ISIC)											
	Agriculture, Forestry & Fishery (ISIC A)	Manufacturing & Construction (ISIC C & F)	Electricity, gas, steam & air conditioning supply (ISIC D)	Transportation & Storage (ISIC H)	Government (ISIC O)	Other Industries	Total Industry					
1. Energy from Natural Inputs:												
Natural Resource inputs											829.0	829.0
Fuelwood & Woodwaste											829.0	829.0
Inputs of energy from renewable sources											184.4	184.4
Hydro											104.4	104.4
Solar											79.2	79.2
Wind											0.7	0.7
Other Electricity and Heat											0.1	0.1
Other Natural Inputs											291.0	291.0
Energy inputs to cultivated biomass											291.0	291.0
Total Energy from Natural Inputs (a+b+c)											**1,304.4**	**1,304.4**
2. Energy Products:												
Production of energy producrts												
ADO	-	-	-	-	-	-	-			2,106.0		2,106.0
ULP	-	-	-	-	-	-	-			1,272.8		1,272.8
DPK	-	-	-	-	-	-	-			238.6		238.6
LPG	-	-	-	-	-	-	-			125.6		125.6
Electricity	-	-	567.4	-	-	-	567.4			-		567.4
Heat	-	-	-	-	-	-	-			-		-
Biofuel	1,120.1	-	-	-	-	-	1,120.1			-		1,120.1
Waste	-	-	-	-	-	-	-			-		-
Total Energy Products	**1,120.1**	**-**	**567.4**	**-**	**-**	**-**	**1,687.5**			**3,743.0**		**5,430.5**
3. Energy Residuals:												
Losses during transforamtion	-	-	762.2	-	-	-	762.2	-				**762.2**
Losses during distribution	-	-	68.9	-	-	-	68.9	-				**68.9**
Losses during transmission	-	-	-	-	-	-	-	-				**-**
Other Residuals	86.9	30.2	126.3	286.9	218.2	623.9	1,372.4	2,776.0				**4,148.4**
Total Energy Residuals	**86.9**	**30.2**	**957.4**	**286.9**	**218.2**	**623.9**	**2,203.5**	**2,776.0**				**4,979.5**
4. Other Residual Flows:												
Residuals from end-use for non-energy purposes												-
Energy From Solid Waste												-
6. TOTAL SUPPLY (Gross)	**1,207.1**	**30.2**	**1,524.8**	**286.9**	**218.2**	**623.9**	**3,891.1**	**2,776.0**	**-**	**3,743.0**	**1,304.4**	**11,714.4**
7. TOTAL SUPPLY (Net)										**3,743.0**	**1,304.4**	**5,047.4**

A2: Physical Use Table 2022

PHYSICAL USE TABLE (unit: TJ)	Immediate Consumption, use of energy resources, receipt of energy							Final Consumption	Accumu-lation	Flows to the Rest of the World (Exports)	Flows to the Environment	TOTAL USE
	Industries (by ISIC)							Households				
	Agriculture, Forestry & Fishery	Manufacturing & Cobstruction	Electricity, gas, steam & air conditioning supply	Transportation & Storage	Government	Other Industries	**Total Industry**					
1. Energy from Natural Inputs:												
Natural Resource inputs	829.0	-	-	-	-	-	**829.0**					829.0
Inputs of energy from renewable sources	0.1	-	184.3	-	-	-	**184.4**					184.4
Hydro	-	-	104.4	-	-	-	**104.4**					104.4
Solar	-	-	79.2	-	-	-	**79.2**					79.2
Wind	-	-	0.7	-	-	-	**0.7**					0.7
Other Electricity and Heat	0.1	-	-	-	-	-	**0.1**					0.1
Other Natural Inputs	291.0	-	-	-	-	-	**291.0**					291.0
Energy inputs to cultivated biomass	291.0	-	-	-	-	-	**291.0**					291.0
Total Natural Inputs	**1,120.1**	**-**	**184.3**	**-**	**-**	**-**	1,304.4					**1,304.4**
2. Energy Products:												
Transformaton of energy products												
ADO	-	-	1,214.17	-	-	-	**1,214.17**					**1,214.17**
ULP	-	-	-	-	-	-	**-**					**-**
DPK	-	-	-	-	-	-	**-**					**-**
LPG	-	-	-	-	-	-	**-**					**-**
Electricity	-	-	-	-	-	-	**-**					**-**
Heat	-	-	-	-	-	-	**-**					**-**
Biofuel	-	-	0.04	-	-	-	**0.04**					**0.04**
Waste	-	-	-	-	-	-	**-**					**-**
End-use of energy products							**-**					
ADO	52.2	16.3	103.0	175.8	96.9	269.4	**713.64**	249.3	- 297.3	226.1		**891.8**
ULP	34.8	0.3	4.2	96.9	20.9	23.4	**180.44**	1,191.3	- 121.4	22.4		**1,272.8**
DPK	-	0.1	0.0	14.2	-	2.5	**16.89**	8.8	66.4	146.5		**238.6**
LPG	-	-	-	-	-	77.5	**77.46**	23.0	20.9	4.2		**125.6**
Electricity	-	14.7	21.4	-	112.5	277.4	**425.95**	210.3	-	-		**636.3**
Heat	-	-	-	-	-	-	**-**	-	-	-		**-**
Biofuel	-	0.4	-	-	-	3.8	**4.19**	1,115.9	-	-		**1,120.1**
End-use of energy products for non-energy purposes	-	-	-	-	-	-	**-**	-				**-**
3. Energy Residuals:												
Losses during transforamtion											693.3	**693.3**
Losses during distribution											68.9	**68.9**
Losses during transmission											-	**-**
Other Residuals											4,217.3	**4,217.3**
Total Energy Residuals											4,979.5	**4,979.5**
4. Other Residual flows:												
Residuals from end-use for non-energy purposes												-
Energy From Solid Waste												-
6. TOTAL USE (Gross)	**1,207.1**	**31.8**	**1,527.1**	**286.9**	**230.4**	**653.9**	**3,937.2**	**2,798.8**	**- 331.3**	**399.2**	**4,979.5**	**11,783.3**
7. TOTAL USE (Net)	**86.9**	**31.8**	**128.6**	**286.9**	**230.4**	**653.9**	**1,418.6**	**2,798.8**	**- 331.3**	**399.2**	**762.2**	**5,047.4**

A3: Total End Use of Energy, Samoa 2022 (TJ)

Energy Products	Agriculture	Manufacturing & Construction	Electricity	Transportation & Storage	Government	Other Industries	**Total Industry**	**Households**	**Re-Exports**	**Sum Of Row**
ADO	52.2	16.3	103.0	175.8	96.9	269.4	713.6	249.3	226.1	1,189.1
ULP	34.8	0.3	4.2	96.9	20.9	23.4	180.4	1,191.3	22.4	1,394.2
DPK	-	0.1	0.0	14.2	-	2.5	16.9	8.8	146.5	172.2
LPG	-	-	-	-	-	77.5	77.5	23.0	4.2	104.7
Electricity	-	13.1	19.1	-	100.3	247.3	379.8	187.6	-	567.4
Biofuels	-	0.4	-	-	-	3.8	4.2	1,115.9	-	1,120.1
Total	**86.9**	**30.2**	**126.3**	**286.9**	**218.2**	**623.9**	**1,372.4**	**2,776.0**	**399.2**	**4,547.7**

Source: EPC, MOF, PPS, MCR, SSC & SBS

A4: Net Domestic Energy Use, Samoa 2022 (TJ)

Energy Products	Agriculture	Manufacturing & Construction	Electricity	Transportation & Storage	Government	Other Industries	**Total Industry**	**Households**	**Flows To Environment**	**Sum Of Row**
ADO	52.2	16.3	103.0	175.8	96.9	269.4	713.6	249.3		963.0
ULP	34.8	0.3	4.2	96.9	20.9	23.4	180.4	1,191.3		1,371.8
DPK	-	0.1	0.0	14.2	-	2.5	16.9	8.8		25.7
LPG	-	-	-	-	-	77.5	77.5	23.0		100.5
Electricity	-	13.1	19.1	-	100.3	247.3	379.8	187.6		567.4
Biofuels	-	0.4	-	-	-	3.8	4.2	1,115.9		1,120.1
Losses	-	-	-	-	-	-	-	-	831.1	831.1
NDEU	**86.9**	**30.2**	**126.3**	**286.9**	**218.2**	**623.9**	**1,372.4**	**2,776.0**	**831.1**	**4,979.5**

Source: EPC, MOF, PPS, SSC, MCR & SBS

A5: Energy Conversion Factors

Liquid Fuels	Megajoules Per Litre	Megajoules Per Kg	Litres Per Tonne
Unleaded Petrol (ULP)	34.20	46.40	1,340.00
Dual-Purpose Kerosene (DPK)	36.80	46.40	1,260.00
Automotive Diesel Oil (ADO)	38.60	45.60	1,182.00
Electricity	**Megajoules per kWh**		
Electricity	3.60		

Source: Ministry of Finance

14. References

Electric Power Corporation. EPC Electricity Production and Sales, *2022*.

Ministry of Finance, Samoa Energy Review, 2020-2022.

OECD / IEA, *Energy Statistics Manual, 2004.*

United Nations, International Standard Industrial Classification of All Economic Activities (ISIC, Rev.4), United Nations New York, 2008.

United Nations, International Recommendations for Energy Statistics (IRES), United Nations New York, 2016.

United Nations, The Standard International Energy Product Classification (SIEC), United Nations New York, 2009.

United Nations et al, 2019; *System of Environmental-Economic Accounting for Energy*, United Nations New York.

United Nations et al. 2012; *System of Environmental-Economic Accounting Central Framework,* United Nations New York.