GOBIERNO de GUATEMALA | **MINISTERIO DE ENERGÍA Y MINAS**

ENERGY
BALANCE
2022

ENERGY BALANCE

2022

ENERGY BALANCE

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PRESENTATION

The energy balance is a crucial tool for accounting for, understanding, and analyzing the country's energy flow. It allows for the evaluation of the various stages and activities of the energy chain, from production to consumption, and understanding how they interrelate and balance each other. Furthermore, it provides insights into how energy is produced, transformed, and consumed across different economic sectors.

To develop an energy balance, it's essential to standardize the unit of measure for all energy sources. For this document, the barrel of oil equivalent (BOE) is used, enabling a consistent comparison and quantification of each source's contribution to the country's energy flow.

By grasping how energy is distributed and utilized within the country, more informed decisions can be made in the energy sector. This includes promoting more sustainable and renewable energy sources, enhancing energy efficiency across various sectors, and planning policies and projects that drive more equitable and sustainable energy development for the nation.

The information used to compile this document was supplied by both public and private entities. This includes the General Directorate of Hydrocarbons (DGH for its acronym in Spanish) from this Ministry, the National Electric Energy Commission (CNEE for its acronym in Spanish), the Wholesale Market Administrator (AMM for its acronym in Spanish), the National Electrification Institute (INDE), the Bank of Guatemala (BANGUAT for its acronym in Spanish), and electric energy generation and distribution entities. We extend our gratitude for their invaluable support in the creation of the Energy Balance 2022.
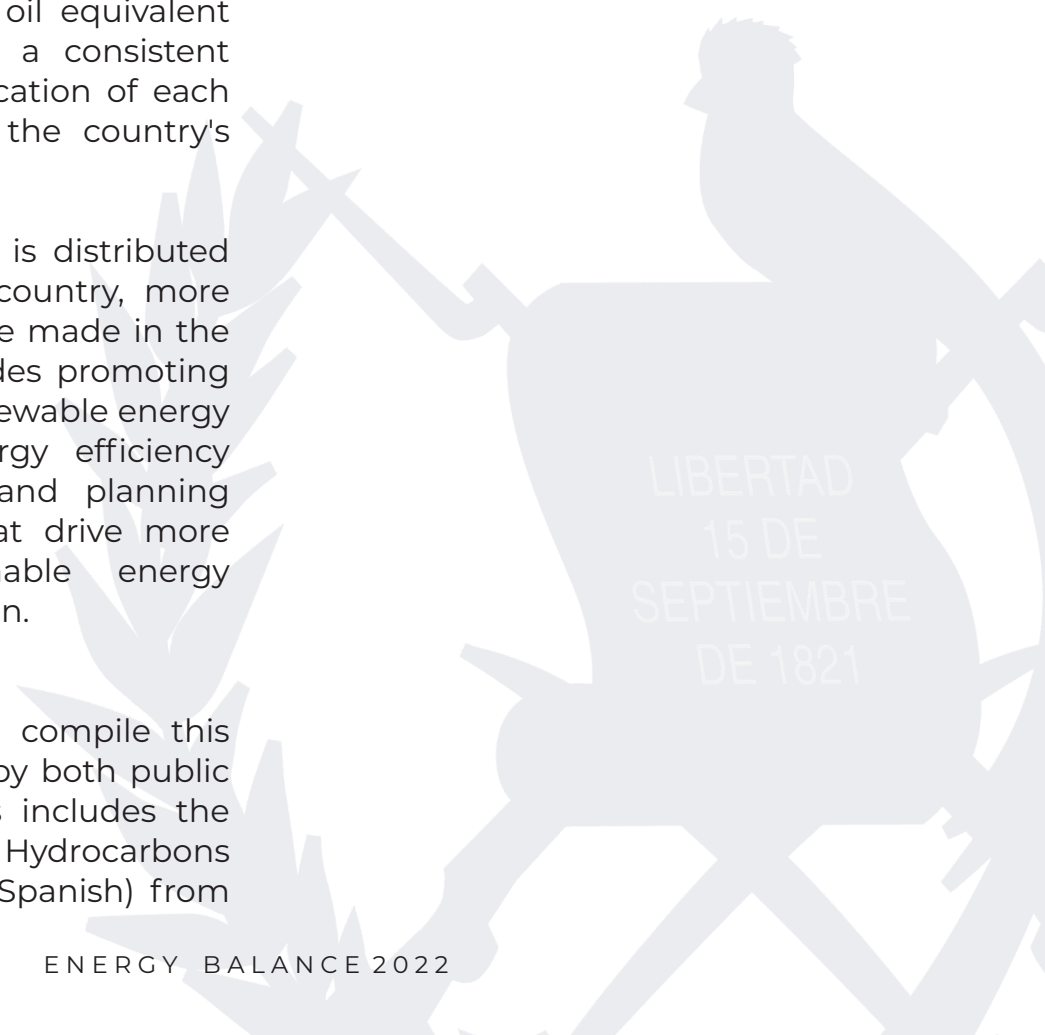
ENERGY AND SOCIETY

1. Energy and Society

The National Energy Balance 2022 serves as a valuable tool for decision-makers and users of the Guatemalan energy system. It provides a quantitative description of the supply, transformation, and demand for energy in the country, as well as the relationship of the energy sector with consumption subsectors. In this regard, a detailed analysis of the evolution of the population, the Gross Domestic Product (GDP), and the energy consumption in Guatemala during 2022 is of paramount importance to understand current dynamics and establish realistic projections for the future.
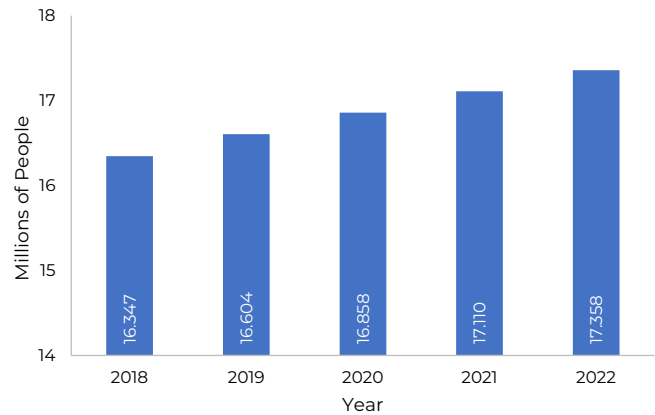
According to projections from the National Institute of Statistics (INE for its acronym in Spanish) for 2022, Guatemala's population has seen a growth of 0.72% compared to 2021, totaling 17.375 million inhabitants. Similarly, according to the Bank of Guatemala (BANGUAT for its acronym in Spanish), the country's GDP has grown by 2.02% compared to 2021, reaching 569,127.1 million Quetzales in real values. These indicators reflect the dynamism and development opportunities Guatemala has experienced in 2022. These projections indicate continuous population and economic growth, making the need for accessible and reliable energy supply even more critical to support sustainable development and benefit the citizens and productive sectors of Guatemala.

It's essential to display and analyze Guatemala's social and energy indicators, to track various actions fulfilling national policies and international commitments acquired as a nation, such as: The Energy Policy 2013-2027, National Development Plan: K'atun Our Guatemala 2032, Nationally Determined Contribution (NDC), and Sustainable Development Goals (SDGs).

1.1 Social and Energy Indicators

Analyzing the last five years, it is known that for 2022, there has been a population growth of 6.18%, which represents an increase of 1,010,936 people. This behavior is depicted in Graph 1, according to estimates made by the National Institute of Statistics (INE, for its acronym in Spanish).

Graph 1. Inhabitants per Year in Guatemala.

Source. Proprietary production with population data from the National Institute of Statistics (INE).

According to projections made by the Bank of Guatemala (BANGUAT), the Gross Domestic Product has grown a total of 25.7% in the last five years, as shown in Graph 2.

Graph 2. Gross Domestic Product Real Values in Thousands of Millions of Quetzals.
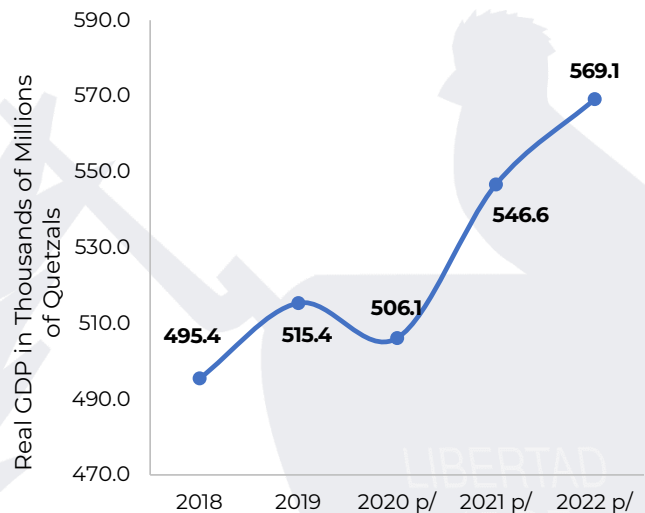
Source. Proprietary production with data from Macroeconomics, Economic Activity, annual gross domestic product from the Bank of Guatemala (BANGUAT).
Note: (p/) are projected values,

The trend of these two variables is clearly on the rise, which makes it necessary to consider these important factors for energy supply.

Based on the above, it is necessary to analyze the relationship between electricity generated and the overall population, considering the gross energy produced in the country for the entire year 2022. The result is a decrease compared to 2021, as can be seen in Graph 3. It is important to mention that the years 2020 and 2021 were atypical due to the economic reactivation following the COVID-19 pandemic.

Graph 3. Electric Energy Consumption per Inhabitant in kWh/inhabitant.
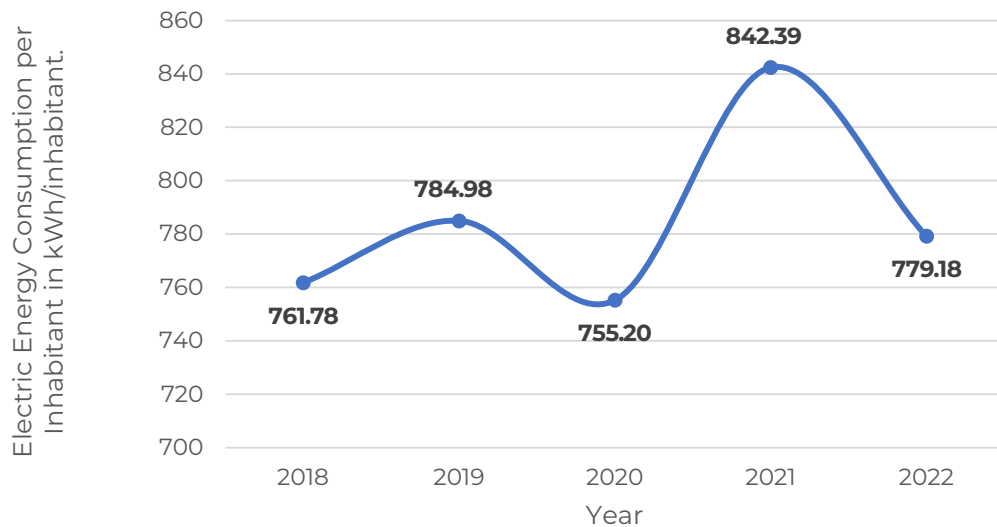
Source: Proprietary Production.

The energy consumption in the national territory has increased by 2.8% compared to 2021, amounting to a total of 103.33 mega barrels of oil equivalent (MBOE). It is important to highlight that over the last 5 years, the total demand for energy has increased by 13.53%, as observed in Graph 4.

Graph 4. Total Energy Consumption in the National Territory in MBEP.
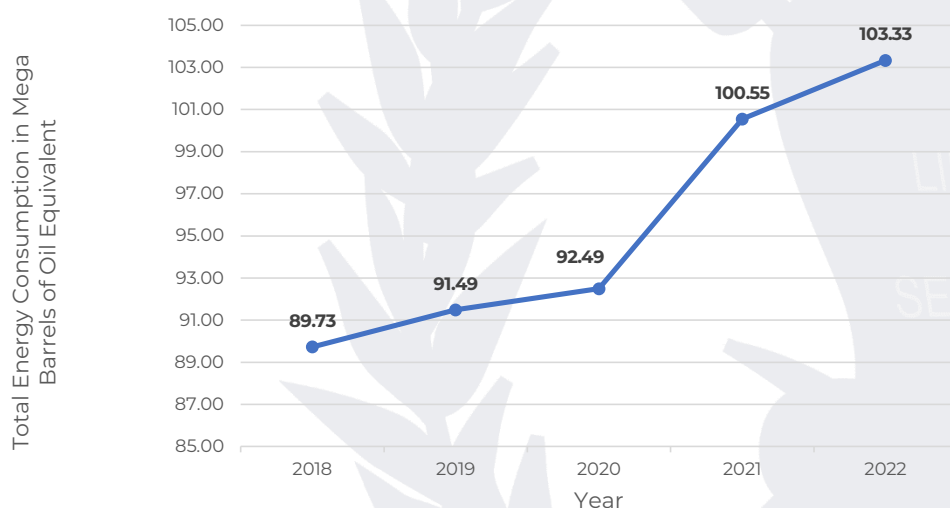
Source: Proprietary Production.

The per capita energy consumption of the country increased from 5.88 to 5.95 barrels of oil equivalent (BOE), reflecting a 1.3% increase compared to 2021, and a growth of 8.45% over the last 5 years as shown in Graph 5. The per capita energy demand is expected to increase according to its historical behavior. However, this behavior must be taken into consideration for future energy efficiency plans.
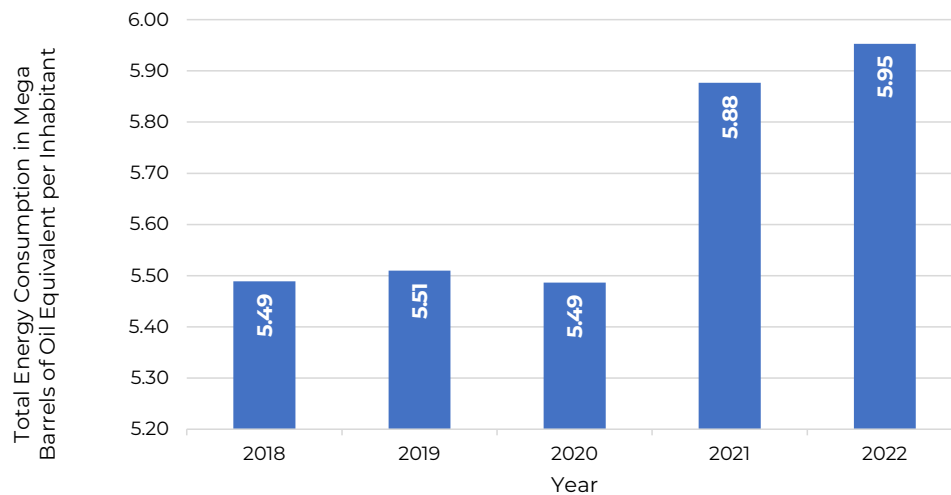
Graph 5. Total Energy Consumption per Inhabitant in BOE/inhabitant.

Source: Proprietary Production.

The generation of electric energy is a center for transforming primary and secondary energy sources. Below, in Graph 6, the energy in kBOE used for electric power plants and self-producers among the total consumed energy is shown. This index displays the participation of gross electric energy production including self-production, the National Interconnected System, and isolated power plants within the total energy consumption matrix.

Graph 6. Index of Energy Source Consumption Used for Electric Generation.
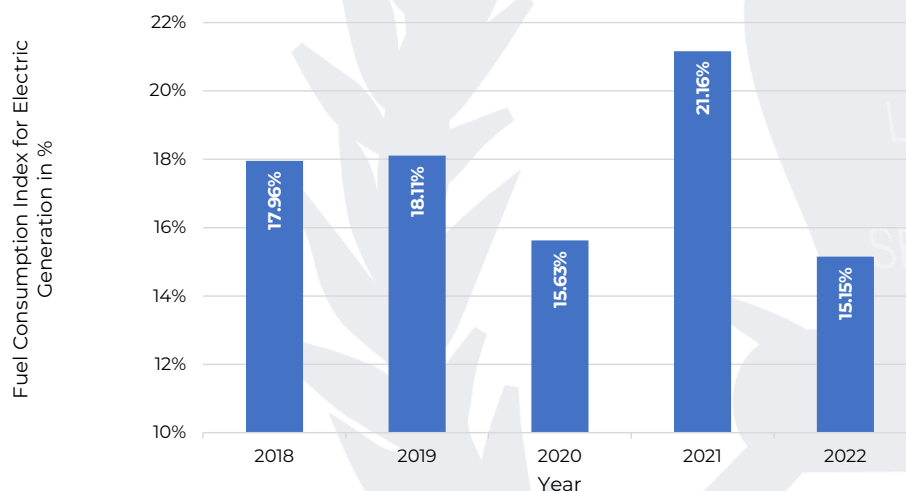
Source: Proprietary Production.

The energy intensity index is a measure used to assess energy efficiency. It shows the amount of energy used per unit of economic production. A low energy intensity index indicates that less energy is being used to generate the same amount of economic output, which is considered positive as it implies higher energy efficiency and a more rational use of energy resources. Below, in Graph 7, the behavior of this indicator is shown.

Graph 7. Energy Intensity Index in Barrels of Oil Equivalent per Thousand Quetzales.
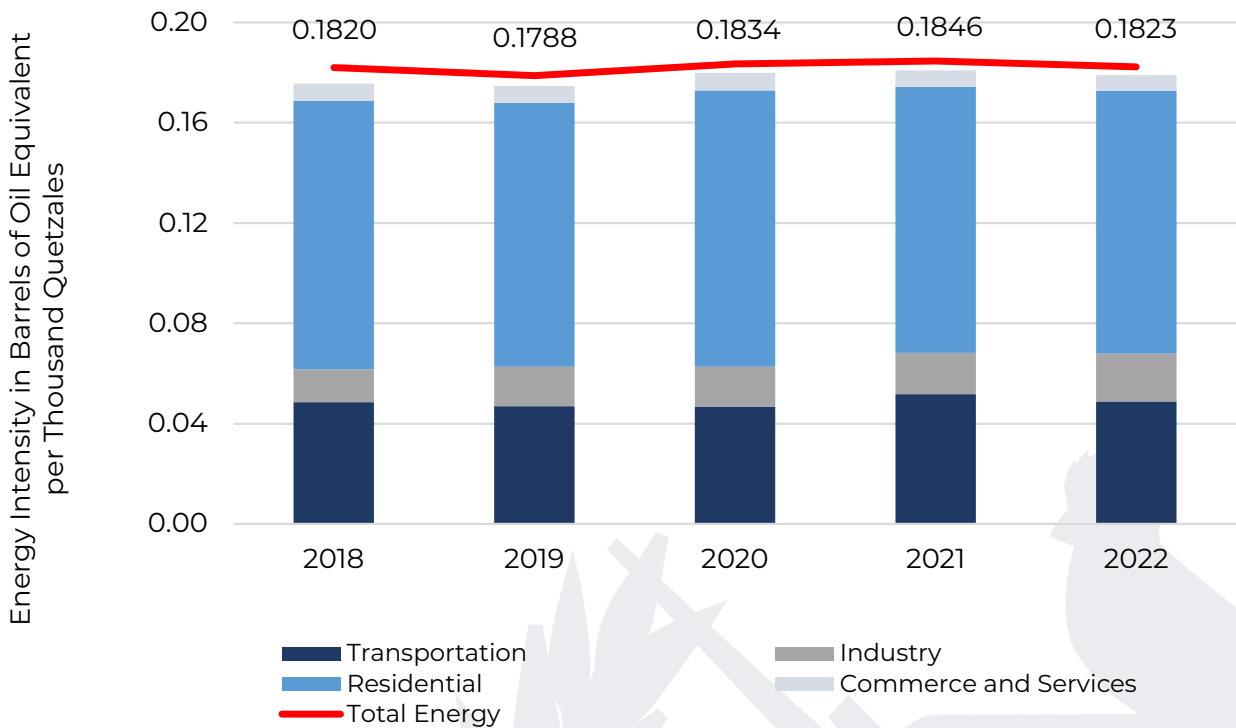
Source: Proprietary Production.

The total energy sufficiency index observed in Graph 8 shows the participation of primary energy supply within the total energy consumption matrix. In the case of Guatemala, the majority of these represent national resources that are part of the production and energy supply chain. For the year 2022, there has been an 8% reduction in the use of primary energy sources compared to 2021, with mineral coal being the energy source with the most significant reduction at 62%.

Graph 8. Total Energy Sufficiency Index.
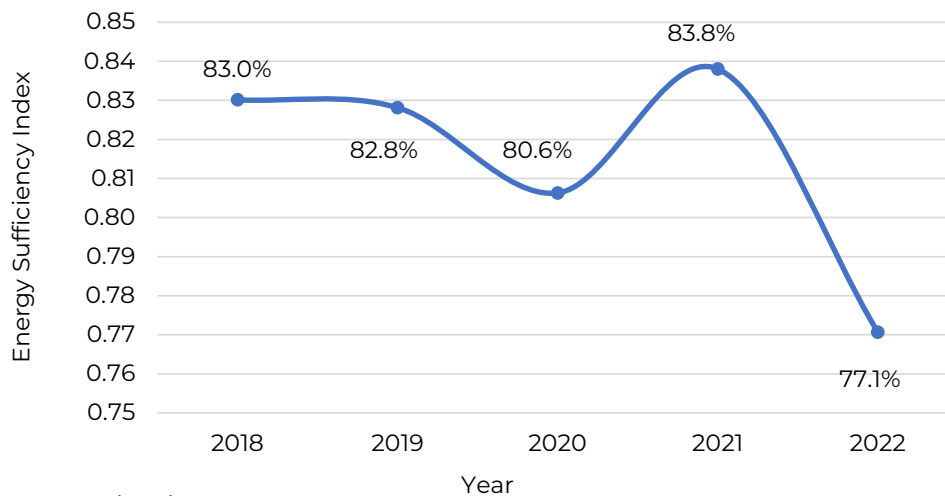
Source: Proprietary Production.

The primary energy sufficiency index shows the ratio of national production of primary energy sources to the total supply of these sources, indicating that for the year 2022, 97.1% of the primary energy supply is produced within the national territory. This marks a 3.9% increase compared to 2021, serving as an indicator of national energy security, as shown in Graph 9.

Graph 9. Sufficiency Index for Primary Energy Sources.

Source: Proprietary Production.
Note: this index only includes primary energy sources.

The renewability index is the ratio between the supply of renewable primary energy sources and the total supply of primary energy sources or the total national energy consumption. Graph 10 displays the two variants of this Index.

Graph 10. Renewability Index.

Renewability Index in the Supply of Primary Energy Sources
Renewability Index in Total Energy Consumption
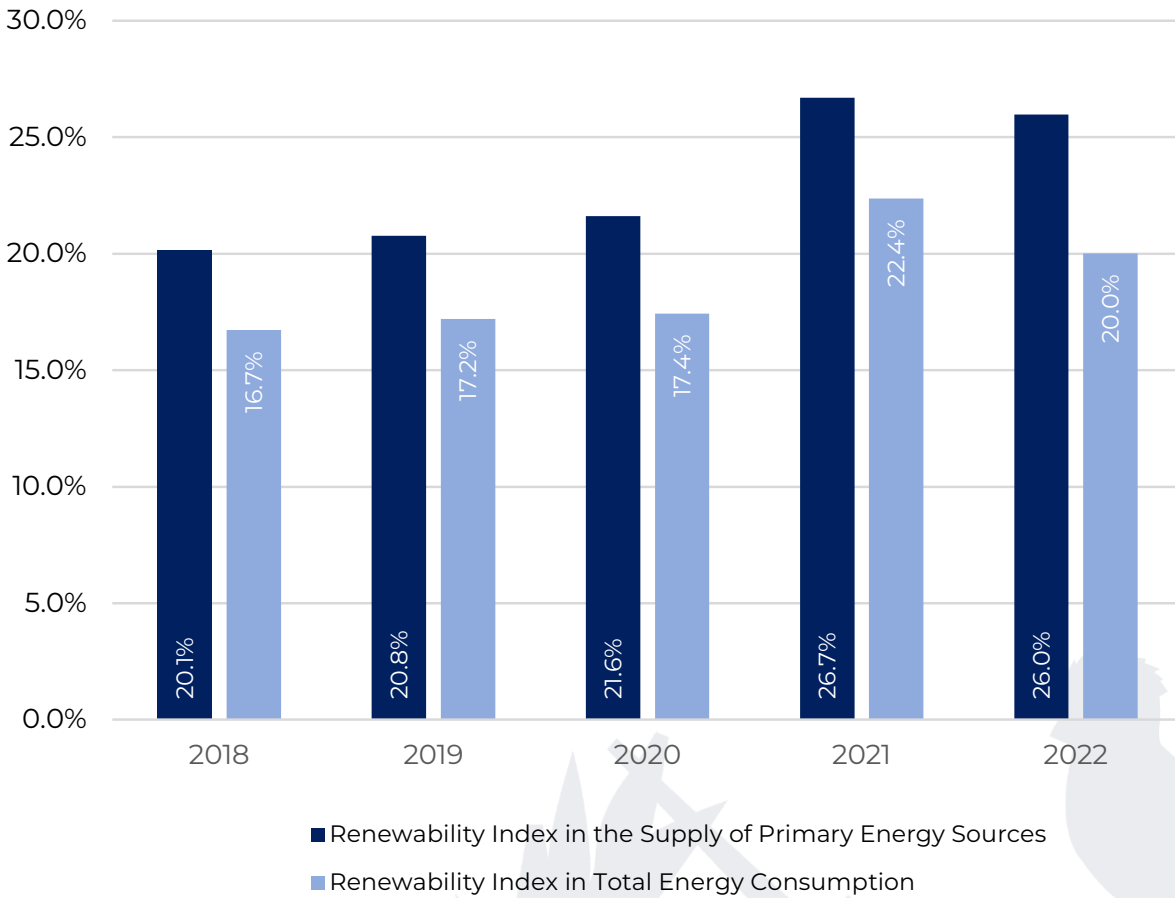
Source: Proprietary Production.

COMPONENTS
OF THE ENERGY BALANCE

2. Components of the Energy Balance

2.1 Primary Energy

The energy balance is presented in its components defined as primary energy and secondary energy; the sum of both components represents the outcome of the total energy balance.

Primary energy is the result of different sources of energy obtained directly from nature.

The energy sources include hydro, solar, wind, and fuels such as firewood, bagasse from sugarcane; furthermore, fuels obtained after a process of extraction like petroleum, coal, natural gas, or geothermal energy are classified as sources of primary energy.

Primary energy sources, except for petroleum and firewood, undergo transformation processes to be converted into electrical energy. Petroleum is transformed into fuel for activities which, in addition to the generation of electrical energy, is also used for transportation, industry, residential purposes, commerce, and services.

Firewood is the only primary fuel that does not require transformation processes for its end use, with the residential subsector being the main consumer of this fuel in the country. In 2022, consumption increased by 16,726.50 kBOE compared to 2021.

Table 1. Energy balance of primary energy sources in kBOE, 2022.

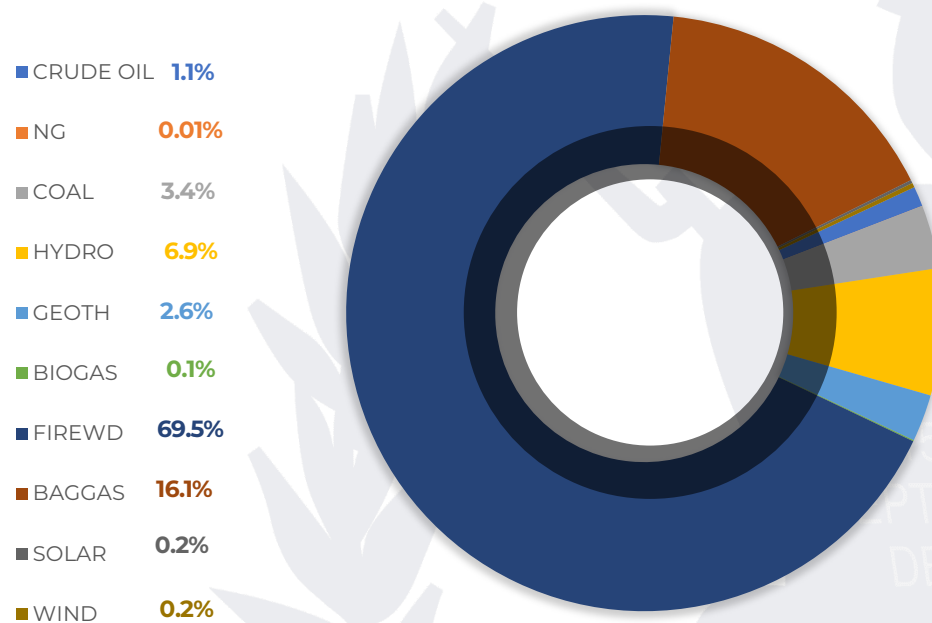| ACTIVITIES	CRUDE OIL	NG	COAL	HYDRO	GEOTH	BIOGAS	FIREWOOD	SGRCNE BAGASSE	SOLAR	WIND	Total Primary
Production	1,310.07	7.44	0.00	5,501.23	2,042.42	50.61	55,567.28	12,846.82	136.60	195.39	77,657.85
Importation	15.50	0.00	4,546.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4,561.84
Extraction	862.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	862.90
Inventory Variation	402.96	0.00	-1,801.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1,398.26
TOTAL OFFER	865.62	7.44	2,745.12	5,501.23	2,042.42	50.61	55,567.28	12,846.82	136.60	195.39	79,958.52
Refineries	-865.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-865.62
Power Plants	0.00	-7.44	-2,640.81	-5,481.24	-2,042.42	-50.61	0.00	-9,078.41	-136.60	-195.39	-19,632.92
Auto-producers	0.00	0.00	-104.30	-19.99	0.00	0.00	0.00	-3,768.40	0.00	0.00	-3,892.70
TOTAL TRANSFORMATION	-865.62	-7.44	-2,745.12	-5,501.23	-2,042.42	-50.61	0.00	-12,846.82	-136.60	-195.39	-24,391.24
Own Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Losses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transportation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Residential	0.00	0.00	0.00	0.00	0.00	0.00	53,900.26	0.00	0.00	0.00	53,900.26
Commerce and Services	0.00	0.00	0.00	0.00	0.00	0.00	1,667.02	0.00	0.00	0.00	1,667.02
ENERGY CONSUMPTION	0.00	0.00	0.00	0.00	0.00	0.00	55,567.28	0.00	0.00	0.00	55,567.28
NON-ENERGETIC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FINAL CONSUMPTION	0.00	0.00	0.00	0.00	0.00	0.00	55,567.28	0.00	0.00	0.00	55,567.28

Source: Proprietary Production

The supply of primary energy sources represents a high diversity of options for electricity generation; Graph 11 shows the participation of each of these sources; additionally, there is firewood as a primary supply, which is consumed directly by the residential sector and commerce and services.

Table 2. Primary Energy Supply 2022 at kBOE.

ACTIVITIES	TOTAL OFFER [kBOE]
CRUDE OIL	865.62
NG	7.44
COAL	2745.12
HYDRO	5501.23
GEOTH	2042.42
BIOGAS	50.61
FIREWOOD	55567.28
SGRCNE BAGASSE	12846.82
SOLAR	136.60
WIND	195.39

Source: Proprietary Production.

Graph 11. Primary energy supply matrix 2022 by share in percentage.

CRUDE OIL	1.1%
NG	0.01%
COAL	3.4%
HYDRO	6.9%
GEOTH	2.6%
BIOGAS	0.1%
FIREWD	69.5%
BAGGAS	16.1%
SOLAR	0.2%
WIND	0.2%

Source: Proprietary Production

2.2 Secondary Energies

Secondary energy refers to the various products that come from transformation centers and are destined for different consumption sectors and/or transformation centers; these include electricity, liquefied petroleum gas (LPG), gasoline, kerosene, diesel oil, fuel oil, petroleum coke, and non-energy products.

The most significant consumption of secondary energy sources comes from petroleum derivatives, of which 39,385.62 kBOE were consumed during the year 2022. This value represents an increase of 4.53 percentage points compared to the consumption accounted for in 2021.
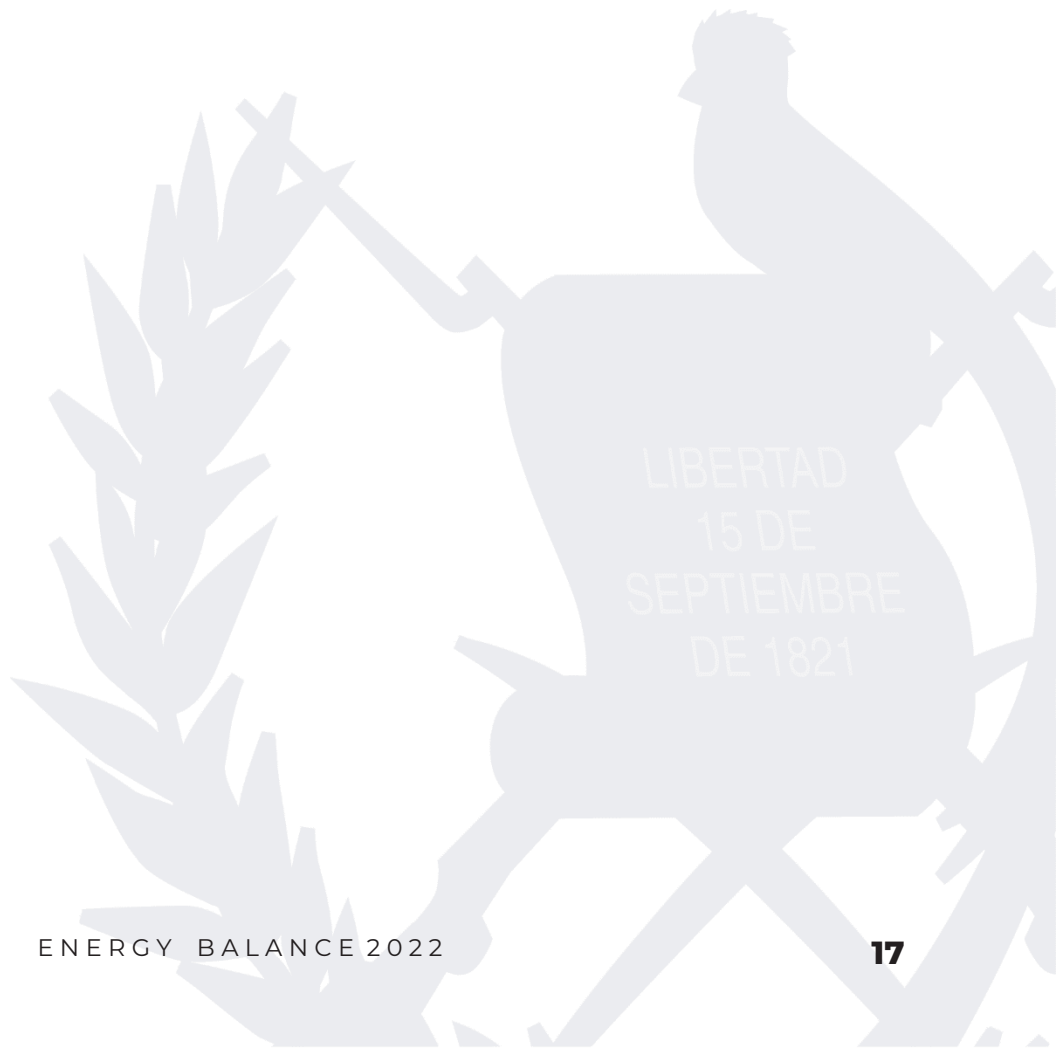
Table 3. Energy Balance of Secondary Energy Sources in kBOE, 2022.

ACTIVITIES	ELEC	LPG	GAS	KER	DOIL	FOIL	ORIM	COQE	NOEN	Total Petroleum Derivatives	Total Secondary
Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Importation	917.50	5,109.99	14,907.38	762.96	14,236.55	1,785.46	0.00	5,248.32	69.63	42,120.29	43,037.79
Exportation	684.01	959.06	442.78	20.22	81.94	0.00	0.00	0.00	496.52	2,000.52	2,684.53
Inventory Variation	0.00	-1.25	-161.81	29.39	68.61	-122.55	0.00	-699.49	24.68	-862.43	-862.43
TOTAL OFFER	233.49	4,149.67	14,302.79	772.14	14,223.21	1,662.91	0.00	4,548.83	-402.21	39,257.34	39,490.84
Refineries	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	822.34	822.34	822.34
Power Plants	7,654.11	0.00	0.00	0.00	-17.50	-245.86	0.00	0.00	0.00	-263.36	7,390.75
Auto-producers	492.41	0.00	0.00	0.00	0.00	-10.57	0.00	0.00	0.00	-10.57	481.84
TOTAL	8,146.52	0.00	0.00	0.00	-17.50	-256.43	0.00	0.00	822.34	548.41	8,694.93
Own Consumption	344.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	344.26
Losses	1,064.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,064.21
Adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transportation	0.00	41.50	13,945.56	772.14	13,069.26	0.00	0.00	0.00	0.00	27,828.46	27,828.46
Industry	2,639.50	829.93	285.79	0.00	1,136.46	1,406.47	0.00	4,548.83	0.00	8,207.48	10,846.98
Residential	2,533.08	3,195.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,195.25	5,728.32
Commerce and Services	1,798.97	82.99	71.45	0.00	0.00	0.00	0.00	0.00	0.00	154.44	1,953.41
ENERGY CONSUMPTION	8,380.02	4,149.67	14,302.79	772.14	14,205.72	1,406.47	0.00	4,548.83	0.00	39,385.62	47,765.64
NON-ENERGETIC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	420.13	420.13	420.13
FINAL CONSUMPTION	8,380.02	4,149.67	14,302.79	772.14	14,205.72	1,406.47	0.00	4,548.83	420.13	39,805.75	48,185.77

Source: Proprietary Production.

The supply of primary energy sources represents a high diversity of options for the generation of electric energy. Graph 12 shows the participation of each of these; additionally, firewood is presented as a primary supply, which is directly consumed by the residential subsector and commerce and services.

Table 4: Supply of Secondary Energy Sources 2022.

ACTIVITY	TOTAL
ELEC	233.49
LPG	4,149.67
GAS	14,302.79
KER	772.14
DOIL	14,223.21
FOIL	1,662.91
ORIM	0.00
COQE	4,548.83
NOEN	402.21

Source: Proprietary Production.

From the energy balance results of the year 2022, it is noted that the transformation of energy sources increased by 6.8 percentage points compared to the total transformation accounted for in 2021; while the total demand for energy sources increased by 2.8 percentage points.

Graph 12. Supply Matrix of Secondary Energy Sources 2022.

- ELEC 1%
- LPG 10%
- GAS 36%
- KER 2%
- DOIL 36%
- FOIL 4%
- COQE 11%
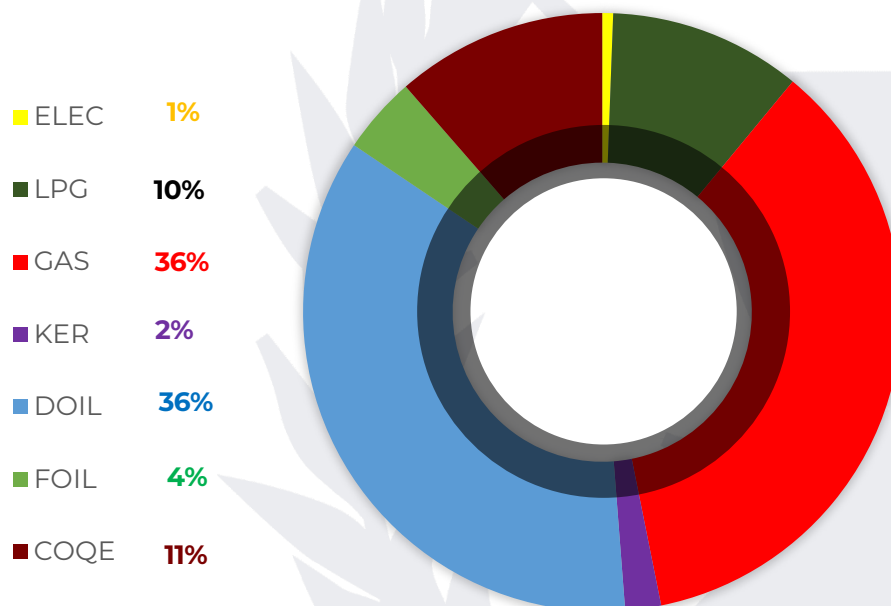
Source: Proprietary Production.

Table 5. Energy Balance Results for the Year 2022, in kBOE.

ACTIVITIES	Total Primary	Total Secondary	TOTAL
Production	Secondary	TOTAL	77,657.85
Importation	4,561.84	43,037.79	47,599.63
Exportation	862.90	2,684.53	3,547.43
Inventory Variation	-1,398.26	-862.43	-2,260.69
TOTAL OFFER	79,958.52	39,490.84	119,449.36
Refineries	-865.62	822.34	-43.28
Power Plants	-19,632.92	7,390.75	-12,242.17
Auto-producers	-3,892.70	481.84	-3,410.86
TOTAL TRANSFORMATION	-24,391.24	8,694.93	-15,696.31
Own Consumption	0.00	344.26	344.26
Losses	0.00	1,064.21	1,064.21
Adjustment	0.00	0.00	0.00
Transportation	0.00	27,828.46	27,828.46
Industry	0.00	10,846.98	10,846.98
Residential	53,900.26	5,728.32	59,628.59
Commerce and Services	1,667.02	1,953.41	3,620.43
ENERGY CONSUMPTION	55,567.28	47,765.64	103,332.92
NON-ENERGETIC	0.00	420.13	420.13
FINAL CONSUMPTION	55,567.28	48,185.77	103,753.05

Source: Proprietary Production.

2.3 Transformation Center

The quantity of primary energy utilized in refineries, power plants, and by auto-producers was 24,391.24 kBOE (Table No. 1). This consumption experienced a reduction of 20.3 percentage points compared to the year 2021.

2.4 Energy Consumption

For the year 2022, the energy usage by consumption subsector was 103,332.92 kBOE, representing growth of 2.8 percentage points relative to the year 2021.

**Energy Consumption by Subsector, in kBOE**

The energy consumption by subsectors is described as follows: for residential it was 59,628.59 kBOE, representing 57.7%, followed by transportation with 27,828.46 kBOE, which accounts for 26.93% of the national energy consumption; this information is seen in table No. 4 and in graph No. 13.

Table 6. Sectorized Energy Consumption in the Year 2022, in kBOE.

ACTIVITY	TOTAL
Own Consumption	344.26
Losses	1,064.21
Transportation	27,828.46
Industry	10,846.98
Residential	59,628.59
Commerce and Services	3,620.43

Source: Proprietary Production.

Graph 13. Participation Matrix of Consumer Sectors of Energy in the Year 2022..

Industry 10.50%

Other 61.21%

Transportation 26.93%

Residential 57.71%

Losses 1.03%

Own Consumption 0.33%

Commerce and Services 3.50%
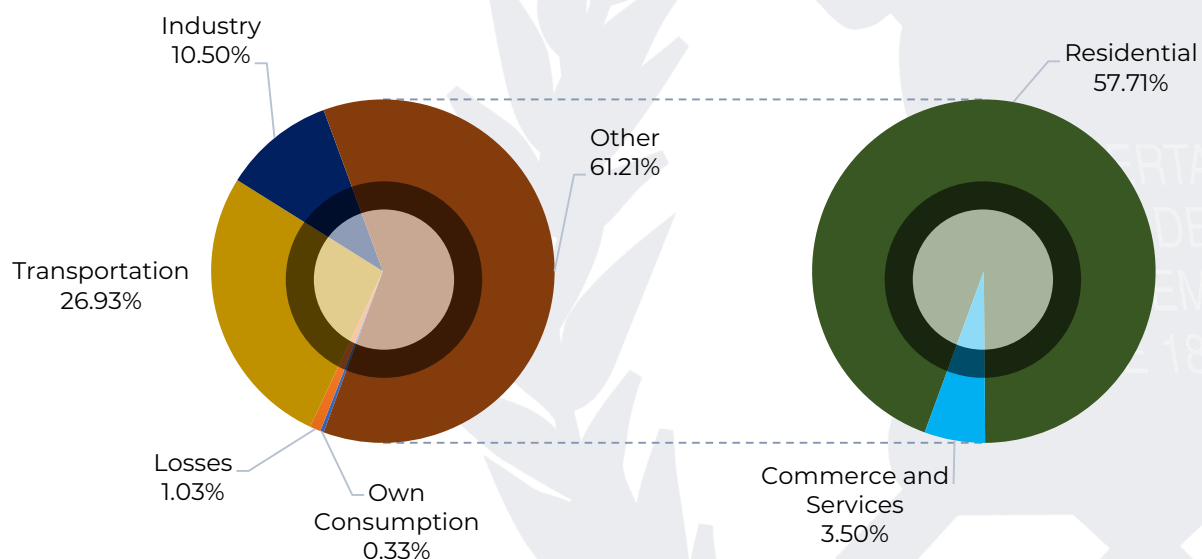
Source: Proprietary Production.

2.5 Final Consumption

The breakdown presented in Table 7 represents the final energy consumption in Guatemala for the year 2021, with firewood and electricity being the only final energy consumables not counted as petroleum derivatives.

Table 7. Final consumption by energy in the year 2022, in kBOE.

ENERGY	FINAL CONSUMPTION
Firewood	55,567.28
Electricity	8,380.02
Total firewood and electricity	63,947.30
LPG	4,149.67
GAS	14,302.79
KER	772.14
DOIL	14,205.72
FOIL	1,406.47
COQE	4,548.83
NOEN	420.13
Total petroleum derivatives	39,805.75
TOTAL	103,753.05

Fuente: Elaboración propia.

The consumption of firewood is a predominant factor in the national energy balance, as previously indicated, it represents more than 50% of the total energy consumption, and in graph 4 the difference in kBOE of firewood compared to the rest of the fuels is observed.
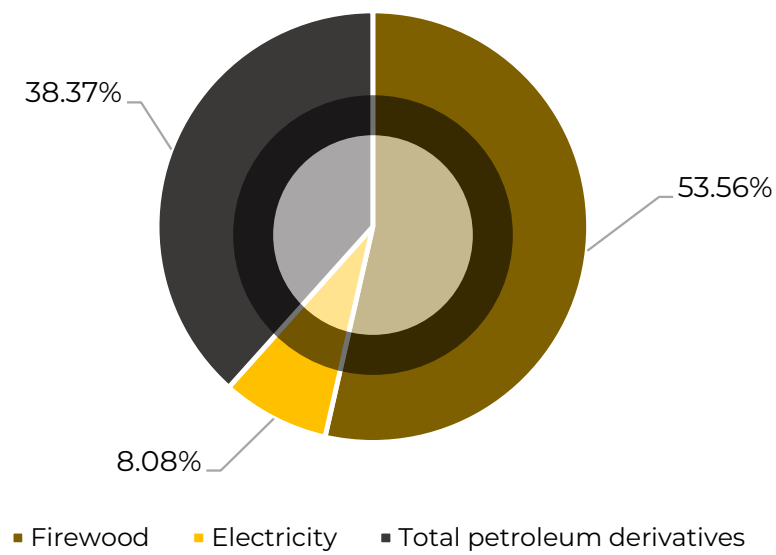
Graph 14. Final consumption by energy in 2022, in kBOE.
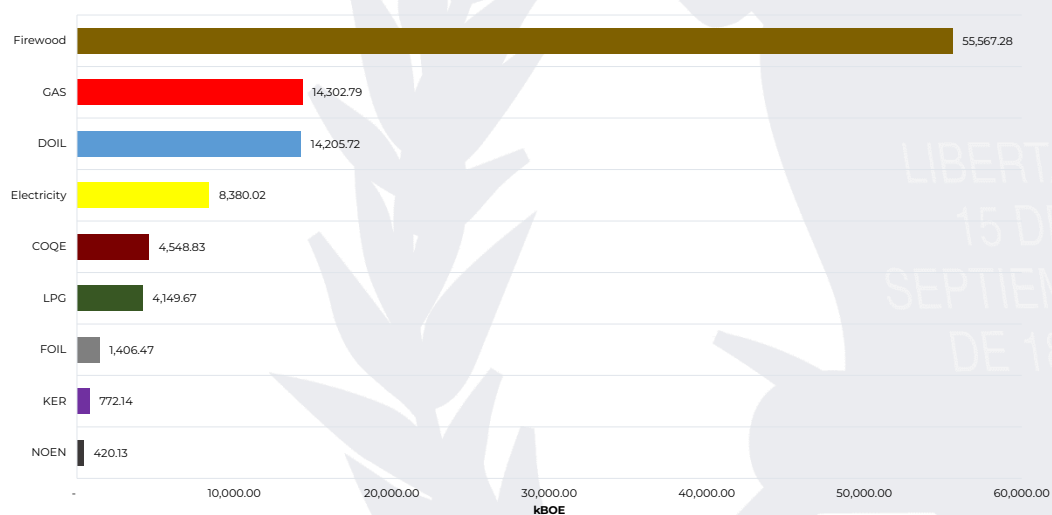
Source: Proprietary Production.

Of the total final energy consumed in 2022, the most consumed energy sources were firewood at 53.56%, followed by petroleum derivatives, as shown in Graph No. 15.

Graph 15. Matrix of Energy Participation by Final Consumption.

- Firewood - Electricity - Total petroleum derivatives

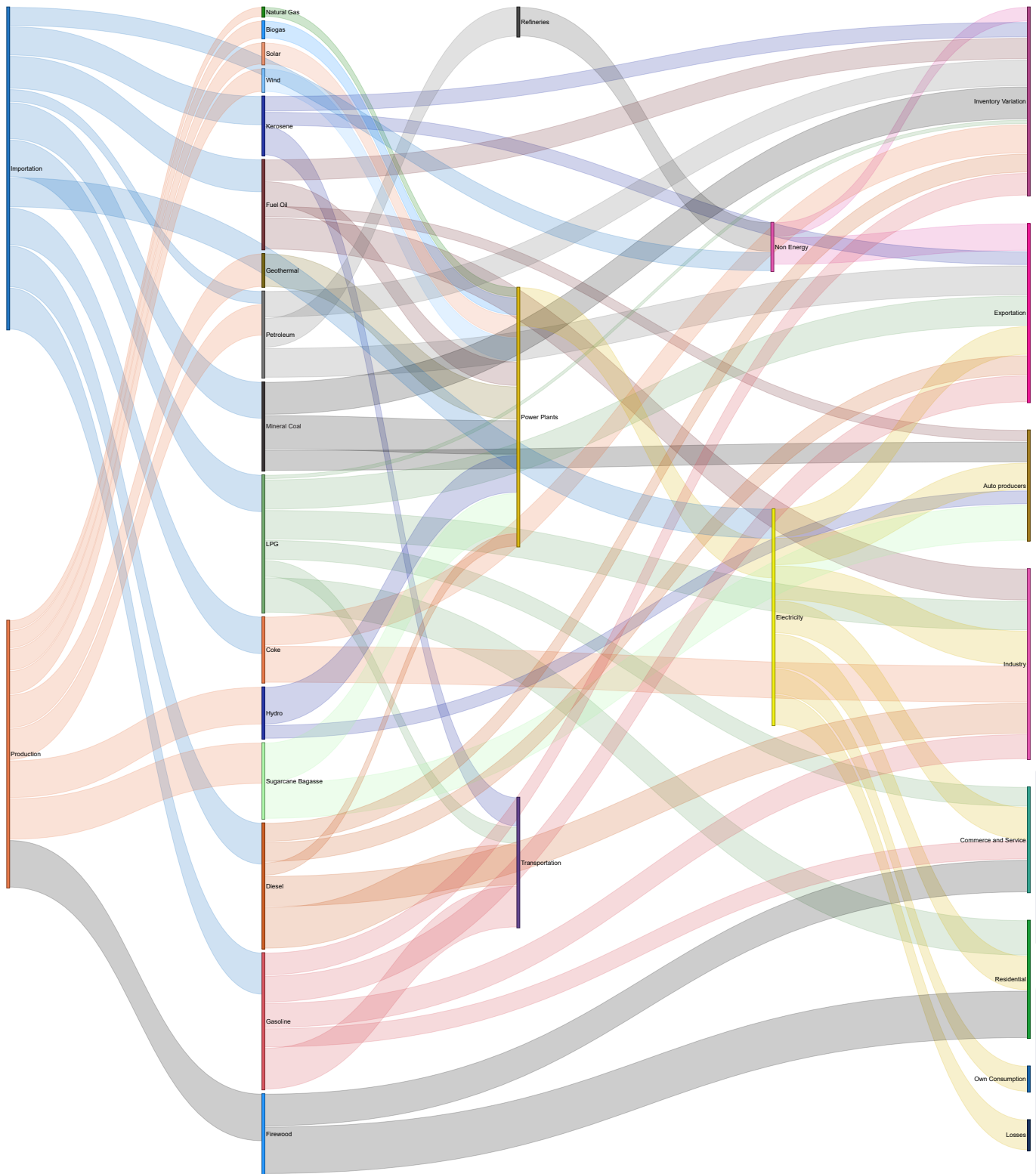Source: Proprietary Production.

Guatemala's energy balance is composed of offers coming from production and importation, there are transformation chain processes, and a diverse range of final consumers, as has been observed previously.

2.6 SANKEY Diagram

A Sankey diagram is presented, which is a tool that allows the visualization and representation of energy flows and their proportions among the various categories of national supply and demand. In this diagram, through flow lines of different thicknesses, it clearly and concisely displays the energy inputs and outputs of the national system, reflecting the amount of energy flowing to the next category.

Graph 16. Sankey Diagram of the Energy Balance 2022.

Source: Proprietary Production.

GREENHOUSE GAS
EMISSIONS

3. Greenhouse Gas Emissions from the Energy Sector

This sector encompasses all activities necessary to generate energy in the form of heat, through the combustion of fossil fuels and for the refining of petroleum products. Additionally, it includes the burning of other energy sources to generate electricity and heat for own use.

The combustion of these fuels produces a certain amount of Greenhouse Gas (GHG) emissions for each unit of energy produced.

3.1 Sectoral Inventory of Greenhouse Gas Emissions

For informative purposes, the greenhouse gas (GHG) inventory of the energy sector is incorporated into the energy balance. With the goal of monitoring the emissions generated by the different activities of the subsectors of the energy sector due to the use of various energy sources, emissions have been accounted for based on the methodology of the Intergovernmental Panel on Climate Change (IPCC), which relates the intensity of the activity conducted and an emission factor for each gas as defined by its guidelines..

In the energy sector, three types of Greenhouse Gases are accounted for: carbon dioxide (CO2), nitrous oxide (N2O), and methane (CH4). However, for uniformity in the information on the quantity of GHGs emitted by the sector, these are converted to a common dimensional unit, which is carbon dioxide equivalent (CO2e).

To calculate GHG emissions in the energy sector, the consumption of fuels is used as Activity Data (AD) and the carbon content per unit of fuel consumed as an Emission Factor (EF).

$$\text{Emissions} = AD \times EF$$

The Activity Data is the quantity and type of fuel burned, referring to its volume in American barrels obtained from the Oil Balance (Net Energy). In some cases, in the generation of electric energy, energy in GWh (Net Energy) may be used when the technology efficiency exceeds 98%.

Emission Factors for each type of fuel used in the calculation were defined according to the IPCC methodological guidelines.

Emission factors for carbon dioxide (CO_2) in the case of biomass (sugarcane bagasse, biogas, and firewood) are estimated, but only reported as informative elements since their emissions are considered biogenic, and thus emissions from these energy sources are not accounted for in the energy sector. However, their emissions of N_2O and CH_4 are included in the sectorial inventory.

3.2 Emission Coefficients

The emission coefficients of the electricity sector in Guatemala are efficiency indicators that determine the amount of GHG emissions released by the generation or consumption of electric energy. Their dimensions are:

Emission coefficients = [Kg CO$_2$ e/KWh]

The emission coefficients are calculated based on the total GHG emissions for each type of fuel, expressed in CO_2e, and their relation to the total electrical generation produced by each of these.

Table 8. CO_2e Emission Coefficients for Electrical Generation by Fuel Type.

Generation by Fuel Type 2022	Emission Factor [Kg CO$_2$e / KWh]
Mineral Coal	0.6351
Fuel Oil	0.6368
Sugarcane Bagasse	0.0576
Biogas	0.0011
Diesel Oil	0.6636
Firewood	0.2285
Hydropower	0.0000
Geothermal Energy	0.0000
Solar Photovoltaic	0.0000
Wind	0.0000

Source: Proprietary Production.

3.3   Greenhouse Gas Emissions -GHG-

During the year 2022, 19.40 million tons of CO_2e were emitted, of which 59.25% correspond to land transportation and 21.29% to industrial activities.

Table 9. GHG Emissions by Subsector in Million Tons CO_2e, Year 2022.

| Energy Sector GHG Emissions	Year 2022
Electric Generation	1.84
Oil Refining	0.37
Industry	4.13
Aviation	0.33
Land Transportation	11.49
Commerce and Services	0.06
Residential	1.17
TOTAL	19.40

Source: Proprietary Production.

Graph 17. Greenhouse Gas Emissions from the Energy Sector (M Ton CO_2e), year 2022.
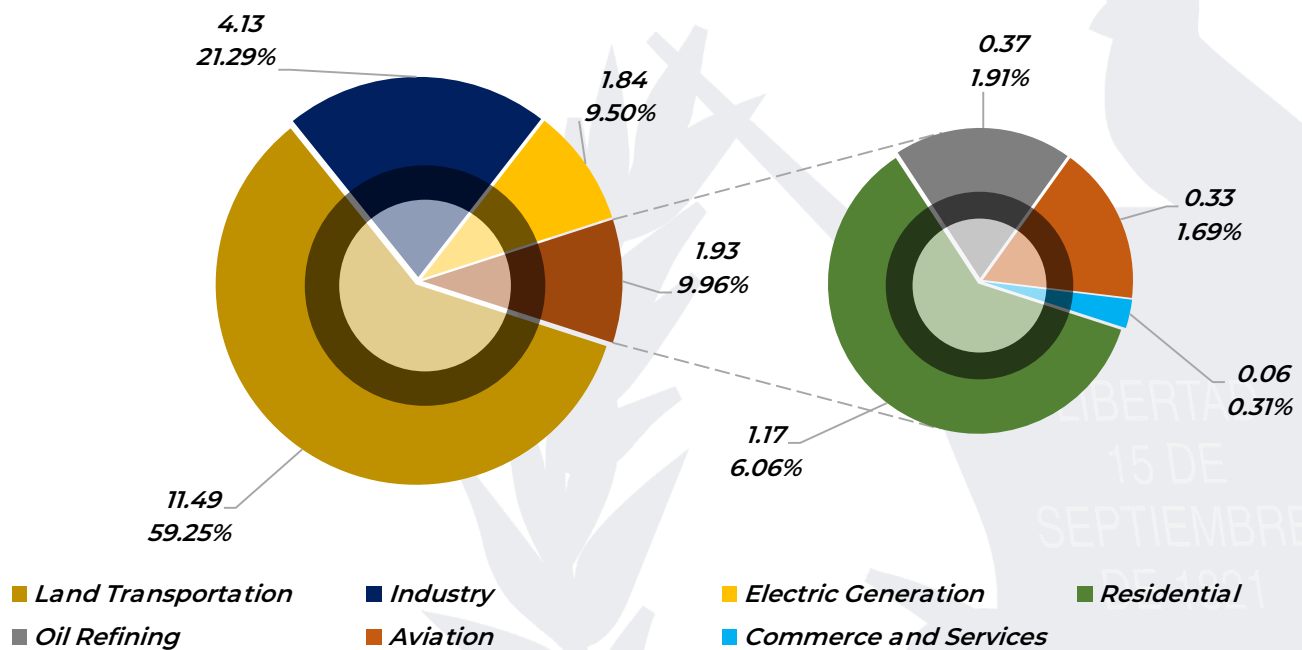
Source: Proprietary Production.

Graph 18. GHG Emissions in Electric Generation (Ton CO_2e), year 2022.
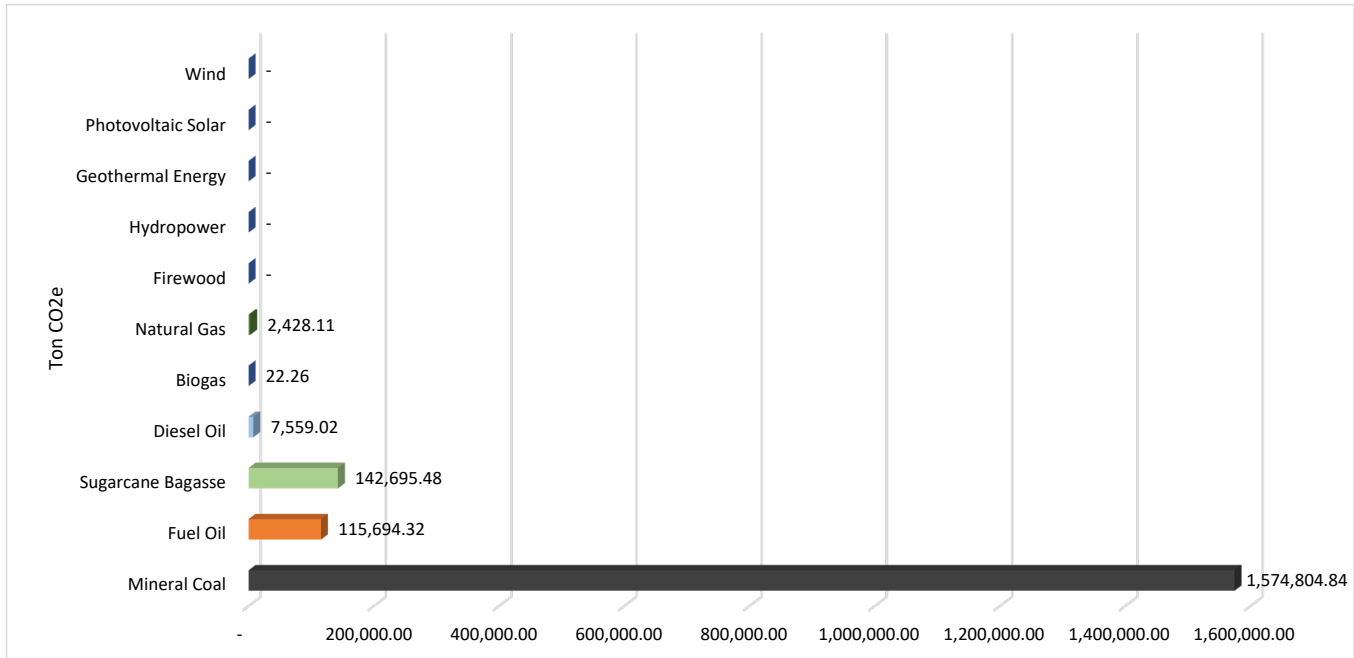
Source: Proprietary Production.

3.4   Grid Emission Factor

The grid emission factor is the quantitative proportion that determines the amount of GHG emissions emitted per unit of electric energy consumed from the national electric grid. For the year 2022, this factor is presented in Table 10.

Table 10. GHG Emission Factor, in the National Electric Grid.

Per Energy Consumed	Kg CO2e / KWh
Emission Factor (Grid)	0.1402

Source: Proprietary Production.

Table 11. Abbreviations Used in the Energy Balance.

Description	Abbreviation
Sugarcane Bagasse	SGRCNE BAGASSE
Mineral Coal	COAL
Diesel Oil	DOIL
Electricity	ELEC
Fuel Oil	FOIL
Liquefied Petroleum Gas	LPG
Natural Gas	NG
Gasoline	GAS
Geothermal Energy	GEOTH
Hydropower	HYDRO
Kerosene and turbodiesel	KER
Firewood	FIREWOOD
Non-Energetic	NOEN
Petroleum Coke	COQE
Petroleum	CRUDE OIL

Source: Proprietary Production.