AÑO BASE 2013

*BASE YEAR 2013*

Ministerio Coordinador de **Sectores Estratégicos**

# Balance Energético Nacional

## *National Energy Balance*

# 2014

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# Presentación

La planificación energética es la línea de partida ineludible para contar con un sistema energético soberano. Las inversiones en obras de infraestructura eléctrica e hidrocarburífera, así como las medidas de eficiencia energética que implementa el Gobierno Nacional, son diseñadas para el desarrollo adecuado del sector y del país.

Desde los sectores estratégicos, formulamos políticas públicas energéticas para el Buen Vivir dentro de un marco de responsabilidad con las futuras generaciones y que permita aumentar de manera óptima y sustentable las fuentes primarias de energía, desplegar tecnologías modernas para el aprovechamiento y transformación de estos recursos y, al mismo tiempo, modificar las estructuras de consumo de los sectores socio-económicos para que sean eficientes.

Para el análisis continuo de la situación actual y de escenarios energéticos que aseguren una mayor participación de energía limpia y acceso universal, presentamos el Balance Energético Nacional 2014, un documento imprescindible para un sistema integral de planificación energética.

Gracias a este esfuerzo y responsabilidad del Gobierno Nacional, podemos asegurar una política pública energética con información veraz, que provee una visión detallada de la dinámica de los distintos flujos energéticos desde la oferta hasta la demanda final, y que a corto plazo se traduce en una acertada toma de decisiones.

Este documento es el resultado del trabajo conjunto que se desarrolla gracias al valioso aporte de las instituciones rectoras de la electricidad y los hidrocarburos: el Ministerio de Electricidad y Energía Renovable y el Ministerio de Recursos Naturales No Renovables respectivamente. Además de sus instituciones adscritas: Agencia de Regulación y Control Hidrocarburífero, Consejo Nacional de Electricidad, Instituto Nacional de Eficiencia Energética y Energías Renovables, Empresa Pública Petroecuador y Secretaría de Hidrocarburos, quienes creen que una nueva realidad energética es posible en el Ecuador.

**Dr. Rafael Poveda Bonilla**
Ministro Coordinador de Sectores Estratégicos

# *Presentation*

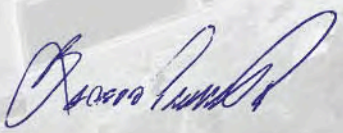
*Energy planning is the essential starting point in order to have a sovereign power system. Government investments made in the power and hydrocarbon infrastructure as well as energy efficiency measures, are designed for the proper development of the sector and the country.*

*From the strategic sectors, we have created public policies in energy for "Good Living" within a framework of responsibility to future generations, ensuring sustainable and wider primary energy sources as well as deploying modern technologies for the exploitation and processing of these resources. At the same time we will modify consumption patterns in the socio-economic sectors so that in turn they can be more efficient.*

*For a continuous analysis of the current situation in all the energy scenarios, and to ensure greater participation of clean energy and universal access, we present the 2014 National Energy Balance, an essential document for a comprehensive energy planning system.*

*Thanks to this joint effort and under the responsibility of the National Government, we can ensure an energy public policy that is truthful and above all provides a detailed picture of the dynamics on the various energy flows from the supply to the demand, and in the short-term the results obtained can be translated into correct and proper decision making.*

*This document is the result of a joint effort that was developed thanks to the valuable contributions of several governing institutions all of whom believe that a new Ecuadorian energy system is indeed a reality, they are: the Ministry of Electricity and Renewable Energy, the Ministry of Non-Renewable Natural Resources, as well as its affiliated institutions, the: Hydrocarbon Agency for Regulation and Control, the National Electricity Council, the National Institute for Energy Efficiency and Renewable Energy, Petroecuador and the Secretary of Hydrocarbons.*



**Dr. Rafael Poveda Bonilla**
*Coodinating Minister for Strategic Sectors*

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**AÑO BASE 2013**

*BASE YEAR 2013*

# Balance Energético Nacional

*National Energy Balance*

# 2014

# Resumen Ejecutivo

## *Executive Summary*

En el Balance Energético Nacional 2014 se evalúa la oferta y demanda de energía en el Ecuador. Se presentan datos históricos a partir del año 2003 hasta el año 2013 para realizar un análisis comparativo de la evolución de las variables que componen el sector energético ecuatoriano. Esta información permite analizar las tendencias de consumo y así poder planificar la implementación de políticas destinadas a la optimización de recursos y proyectos, para satisfacer la demanda actual y de planes futuros.

En el 2013, la producción de energía primaria sumó 218.599 kBEP[1], 3,5 % mayor a la registrada en el 2012, justificado principalmente por el aumento en la extracción de petróleo, la cual pasó de 189.926 kBEP a 197.962 kBEP (equivalentes a 505 y 526 mil barriles diarios en promedio respectivamente). En la actualidad el petróleo constituye el 90,5% de la producción total de energía primaria. Mientras que en la producción de gas natural existió un incremento del 5,6% respecto al 2012, otras energías como la hidroenergía, leña y productos de caña sufrieron un descenso, el cual fue del 9,3%. Además de esto, las energías renovables no convencionales (fotovoltaica y eólica) significaron el 0,02% de la producción de energía primaria.

Las exportaciones de energía realizadas por el Ecuador en el 2013 fueron 151.736 kBEP, mismas que significaron un incremento de 5,7% comparadas al 2012. El crecimiento en las exportaciones se ve justificado nuevamente por la participación del 95,2% que representa el petróleo (en promedio 384 mil barriles por día) del total de las exportaciones. En el caso de la nafta de bajo octanaje, su exportación decreció en 6,1%. La exportación de electricidad incrementó de 12 GWh/año en 2012 a 29 GWh/año en 2013, mientras que el fuel oil experimentó una baja en su exportación del 32,3%.

Las importaciones energéticas secundarias[2] sumaron 44.258 kBEP al 2013, 14,1% más respecto al 2012.

*The National Energy Balance 2014 evaluates supply and demand of energy in Ecuador. Historical data is presented from 2003 until 2013 to allow a comparative analysis of the evolution of the variables that comprise the Ecuadorian energy sector. This information enables the ability to analyse consumption tendencies and therefor, plan the enforcement of policies destined to the optimisation of resources and projects for the future.*

*In 2013, energy production summed up 218.599 kBOE[1], which is 3,5% greater that the value registered in 2012; this mainly due to the increase in petroleum production, which passed from 189.926 kBOE in 2012 to 197.962 kBOE in 2013 (equivalent to 505 and 526 thousand barrels per day respectively). In the present day, petroleum constitutes the 90,5% of primary energy production. Natural gas production increased in 5,6% in comparison to 2012. Other primary sources such as hydro energy, firewood and sugarcane products decreased production in 9,3%. Non-conventional renewable energy (solar and wind) represented 0,02% of primary energy production.*

*Energy exports in 2013 were 151.736 kBOE, which meant a 5,7% increase compared to 2012. Increase in exports is once again justified by the large participation that petroleum has in total energy exports (in average 384 thousand barrels per day). For low octane naphtha, its exports declined in 6,1%. Electricity export increased from 12 GWh/year in 2012 to 29 GWh/year in 2013. Fuel Oil experimented a 32,3% decrease from 2012 to 2013.*

*Secondary energy[2] imports ascended to 44.258 kBOE in 2013, which is 14,1% greater that the value of 2012. This fact is understood by the increase in Gasoline and Diesel which represent 32,3% and 47,2% of total imports respectively. Other secondary energy imports such as electricity, LPG and jet fuel also had an increase.*

1. El barril equivalente de petróleo (BEP) es una unidad de energía equivalente, aproximadamente, a la energía liberada durante la quema de un barril (42 galones estadounidenses) de petróleo crudo.
   *The barrel of oil equivalent (BOE) is a unit of energy based on the approximate energy released by burning one barrel (42 U.S. gallons or 158.9873 litres) of crude oil.*
2. Se denomina Energía Secundaria a los productos resultantes de las transformaciones o elaboración de recursos energéticos naturales (primarios) o en determinados casos a partir de otra fuente energética ya elaborada, como por ejemplo: gasolinas, diésel, gas licuado de petróleo, electricidad, entre otras.
   *Secondary energy refers to the result of transforming of natural energy resources (primary energy), or in some cases from other energy sources previously elaborated.*

Este hecho se ve justificado por el incremento en las importaciones de gasolinas y diésel, los cuales representan el 32,3% y 47,2% del total importado respectivamente. En los restantes energéticos secundarios como la electricidad, GLP, jet fuel la importación tuvo un crecimiento, mientras que para el fuel oil se redujo. En el caso del GLP, las importaciones representaron el 77% de la oferta bruta[3] al 2013. Para las gasolinas y el diesel, las importaciones significaron el 59,4% y 64% de su oferta bruta respectivamente. El saldo o balanza comercial energética total, exportaciones menos importaciones, contabilizó un superávit de 107.478 kBEP al 2013.

Al 2013, la oferta total interna[4] de energía incrementó en 4,4%, lo que significa un valor de 117.838 kBEP, debido al aumento de las importaciones de energía. Las importaciones totales de energía (electricidad y combustibles) cubrieron 38% de la oferta en 2013.

La producción de energía secundaria obtenida de los centros de transformación[5] totalizó 70.179 kBEP, misma que sufrió una reducción del 5% respecto al 2012. Los combustibles derivados de petróleo suman el 79,2% de la energía secundaria obtenida de los centros de transformación y el remanente 20,8% corresponde a la energía eléctrica.

El total de petróleo que ingresó a refinerías durante el 2013 fue de 55,8 millones de barriles (en promedio 153 mil barriles por día), que corresponde a una baja porcentual del 7,5% respecto al 2012.

A nivel de centros de transformación, las refinerías[6] procesan el 66% de la energía, las centrales eléctricas el 24%, los autogeneradores[7] el 8%, un centro de gas[8] el 2% y la destilería el 0,04%.

*LPG imports represented 77% of the gross supply[3] (1.091 million kg) in 2013. For Gasoline and Diesel, imports signified 59,4% (1.133 million gallon) and 64% (1.371 million gallon) of their total gross supply respectively. The energy trade balance, exports minus imports, accounted a surplus of 107.478 kBOE in 2013.*

*In 2013, total local supply[4] of energy increased in 4,4% which means a value of 117.838 kBOE, due to increases in energy imports. Secondary energy imports (electricity and fossil fuels) accounted for 38% of the local energy supply.*

*Secondary energy produced in transformation centres[5] totalised 70.179 kBOE, which suffered a decrease of 5% compared to 2012. Petroleum products (fossil fuels) corresponds to 79,2% of what is produced in transformation centres. The remaining 20,8% corresponds to electricity.*

*The total of petroleum that entered refineries in 2013 was 55,8 million barrels (an average 153 thousand barrels per day). This shows a 7,5% decrease in comparison to 2012. Regarding transformation centres, refineries[6] process 66% of energy, power stations 24%, autogenerators[7] 8%, one gas centre[8] 2% and distilleries 0,04%.*

*Electricity generation[9] grew in 1,8%, which means a production of 14.411kBOE (23.258,6 GWh) in 2013. Generation structure was 47,5% hydro, 51% thermoelectric and 1,5% non-conventional renewable energy (wind, solar and biomass). Total installed capacity was 5103MW, of which 2.237MW was hydropower and 2.843MW was thermoelectric. Wind parks grew from 2,4MW in 2012 to 19,6MW in 2013. Likewise, solar photovoltaic increased from 78kW to 3,9MW between 2012 and 2013.*

3. Considera producción interna más importaciones.
*Considers local production plus imports.*
4. Considera Producción + importación – exportaciones ± variación de inventario – no aprovechado.
*Considers production + imports – exports ± stock variations – nos used.*
5. Los centros de transformación son plantas donde la energía que entra se modifica en procesos especiales de industrialización o conversión energética mediante procesos físicos y/o químicos, entregando una o más fuentes de energía diferentes a la o las de entrada, como por ejemplo: refinerías, centrales eléctricas, centros de gas, entre otras.
*Transformation centres are facilities where energy is modified in special industrial processes o physical/chemical processes. For example: refineries, power stations, gas centres.*
6. Considera las refinerías de Esmeraldas, La Libertad, Shushufindi y plantas topping.
*Considers the refineries of Esmeraldas, La Libertad, Shushufindi and topping plants.*
7. Los autogeneradores corresponden a empresas públicas o privada que tienen instalaciones para producir su propia electricidad y cubrir su demanda.
*Autogenerators are public or private companies that have installed capacity to generate their own electricity ans supply their demand.*
8. Los centros de gas son plantas de tratamiento de gas natural, libre o asociado, con el fin de recuperar hidrocarburos como gasolinas, naftas, butano, propano, entre otros. En el país, el centro de gas se encuentra en la ciudad de Shushufindi.
*Gas centres are facilities for processing natural gas (free or associated) with the purpose of recovering hydrocarbons such as gasoline, naphtha, butane, propane, etc. In Ecuador, the only gas centre is located in the city of Shushufindi.*

La generación eléctrica incrementó en 1,8%, lo que significa una producción de 14.411 kBEP (23.258,6 GWh) al 2013[9]. Para el 2013, esta estructura era 47,5% hidráulica, 51% térmica y 1,5% de otras fuentes renovables (eólica, solar y biomasa). La capacidad instalada total de generación fue de 5.103MW, de los cuales hidráulica fue 2.237 MW y térmica 2.843MW. Por otro lado la potencia efectiva instalada de centrales eólicas fue de 2,4 MW al 2012 incrementándose a 19,6 MW en el 2013. De igual forma la capacidad instalada de generación fotovoltaica incrementó de 78 KW a 3,9 MW entre los años 2012 y 2013.

El consumo final[10] de energía sumó el valor correspondiente a 87.451 kBEP. Su incremento fue de 4,9% respecto al 2012. El consumo energético fue de 84.670 kBEP y los 2.782 kBEP remanentes corresponden al consumo no energético[11]. Al 2013, el consumo energético total de diesel[12] fue de 29.425 kBEP (1.233 millones de galones). Su consumo tuvo un incremento de 7,9% en relación al 2012. En el caso de las gasolinas y GLP, el consumo fue de 23.005 kBEP (1.081 millones galones) y de 8.033 kBEP (1.053 millones de kg), respectivamente.

En 2013, el consumo del sector transporte corresponde al 49% del total del consumo energético nacional, participación que se mantuvo igual a la del 2012. En el caso del sector industrial, su participación en el consumo fue de 18% con un incremento del 7,3% respecto al 2012. Para el sector residencial, el cual representa el 12% del consumo energético, se tuvo un decrecimiento respecto al 2012 del 1,3%. El consumo propio del sector energético corresponde al 12% en 2013. Los demás sectores, comercial, agrícola, construcción y otros representan el 10% del consumo energético, valor similar al año 2012.

Las emisiones de gases de efecto invernadero (GEI)[13] (dióxido de carbono - CO2, metano - CH4 y óxido nitroso - N2O) incrementaron un 5,4% en el 2013.

*Final energy consumption[10] summed up a value of 87.451 kBOE. It increased in 4,9% compared to 2012. Energy use was 84.670kBOE while the remaining 2.782 kBOE correspond to non-energy uses[11]. In 2013, total diesel[12] consumption was 29.425kBOE (1.233 million gallon) and presented a 7,9% increase compared to 2012. Gasoline and GLP consumption was 23.005kBOE (1.081 million gallon) and 8.033 kBOE (1.053 million kg), respectively.*

*Energy consumption in the transport sector corresponds to 49% of the total energy consumption matrix. Industry consumes 18% and had a considerable 7,3% increase compared to 2012. The residential sector, which represents a 12% of participation, decreased in 1,3%. Energy sector (own) consumption was also 12%. Other sectors such as commercial, agricultural, construction and other together consume 10% and did not suffer much change.*

*Green House Gas emissions (GHG)[13] (carbon dioxide CO2, methane CH4, nitrous oxide N20) increased in 5,4%. This represents 46,3 million tons of CO2 equivalent[14], of which the transport sector in the greatest emitter with 44% of total emissions. Power stations and industry are the following emitters with a participation of 13% and 12,6% respectively.*

*Energy use per capita experimented a 3,4% increase in 2013, which is equivalent to 5,4 BOE per capita. Electricity consumption reached and average value of 1.320 kWh per capita.*

*Due to a greater growth rate of the GDP (5,04% in 2013) in comparison to energy consumption growth (4,5%), energy intensity decreased in 0,5%. The energy that was consumed to produce one unit of GDP was 1,44 BOE per thousand dollars. Energy intensities for the sectors of transport, industry and residential were 10,8, 2,3 and 0,3 BOE/thousand dollars, respectively.*

9. No incluye interconexión.
   *Does not include interconnection.*
10. Incluye consumo energético y no energético.
    *Includes energy and non-energy uses.*
11. Incluye asfaltos, solventes, azufre, entre otros.
    *Includes asphalts, solvents, sulphur, tar, etc.*
12. Incluye consumo propio.
    *Includes own (energy sector) consumption.*
13. Para los inventarios de gases de efecto invernadero se utilizaron las directrices del IPCC de 2006.
    *Guidelines of the IPCC 2006 were used. for the estimation of GHG emissions.*

Éstas representaron 46,3 millones de toneladas de CO2 equivalentes[14], de las cuales el transporte es el mayor generador de gases ocupando el 44% del total de emisiones. Los siguientes contribuyentes en emisiones son las centrales eléctricas y la industria con una participación del 13% y el 12,6% respectivamente.

Para el caso del consumo energético per cápita, éste experimentó un incremento del 3,4%, lo cual al 2013 equivale a 5,4 barriles equivalentes de petróleo por habitante en promedio. Por otro lado, el consumo eléctrico per cápita registró en promedio 1.320 kWh por habitante en el 2013.

Debido a una mayor velocidad en la tasa de crecimiento del PIB (5,04%) en relación a la del consumo energético (4,5%), la intensidad energética se redujo en 0,5% al 2013. Debido a esto, la energía consumida necesaria para la generación de una unidad de producto interno bruto fue de 1,44 BEP por cada mil dólares. Por otra parte, las intensidades energéticas del sector transporte, industrial y residencial fueron de 10,8, 2,3 y 0,3 BEP/mil dólares, respectivamente.

Para el caso ecuatoriano, se presenta a continuación y para efectos de comparación una tabla resumen de las principales variables energéticas y sus valores para los años 2003, 2012 y 2013.

*Energy use per capita experimented a 3,4% increase in 2013, which is equivalent to 5,4 BOE per capita. Electricity consumption reached and average value of 1.320 kWh per capita.*

*Due to a greater growth rate of the GDP (5,04% in 2013) in comparison to energy consumption growth (4,5%), energy intensity decreased in 0,5%. The energy that was consumed to produce one unit of GDP was 1,44 BOE per thousand dollars. Energy intensities for the sectors of transport, industry and residential were 10,8, 2,3 and 0,3 BOE/thousand dollars, respectively.*

*Following is a Table that summarizes the main energy variables in Ecuador and its values for 2003, 2012 and 2013.*

14. Para transformar el CH4 y el N2O a CO2 equivalentes se utiliza el índice GWP (potencial de calentamiento global por sus siglas en inglés). Este índice es una medida relativa de cuánto calor puede ser atrapado por un determinado gas de efecto invernadero, en comparación con un gas de referencia, por lo general CO2. El índice GWP utilizado para el CH4 es de 21 y para el N2O de 310.
*To transform CH4 and N2O to CO2 the Global Warming Potential was used. GWP used for CH4 is 21 and N2O is 310.*

# Tabla Resumen

## *Summary Table*

| **Energía Primaria** / *Primary Energy* | **Unidades** | *Units* | **2003** | **2012** | **2013** |
|---|---|---|---|---|---|
| **Producción Total de Energía**<br>*Total Energy Production* | **kBEP** | *kBOE* | **175.101** | **211.126** | **218.599** |
| Producción Total de Petróleo<br>*Total Oil Production* | kBEP | | 158.208 | 189.926 | 197.962 |
| | kBBL/año */year* | | 153.539 | 184.321 | 192.120 |
| | kBBL/día */day* | | 421 | 505 | 526 |
| Exportación Total de Petróleo<br>*Total Oil Exports* | kBEP | | 95.286 | 133.454 | 144.510 |
| | *kBBL/año*/year* | | 92.474 | 129.516 | 140.245 |
| | *kBBL/día */day* | | 253 | 355 | 384 |
| Producción Total de Gas Natural (1)<br>*Total Natural Gas Production (1)* | kBEP | | 7.703 | 9.214 | 9.732 |
| | **MM pies cúbicos | ***MM cubic feet* | 45.485 | 54.408 | 57.469 |
| Producción de Hidroenergía<br>*Hydro energy Production* | kBEP | *kBOE* | 4.449<br>7.180 | 7.582<br>12.238 | 6.840<br>11.039 |
| Producción de Leña<br>*Firewood Production* | kBEP | *kBOE* | 2.765<br>1.066 | 1.909<br>736 | 1.486<br>573 |
| Producción de productos de caña<br>*Cane products Production* | kBEP | *kBOE* | 1.976<br>1.976 | 2.493<br>2.473 | 2.543<br>2.518 |
| Carga total a centros de Transformación<br>*Total load to transformation centers* | kBEP | *kBOE* | 70.968 | 89.885 | 87.169 |
| Carga a Refinería<br>*Refinery Load* | kBEP | *kBOE* | 57.572 | 62.249 | 57.586 |
| | *kBBL | | 55.874 | 60.412 | 55.886 |
| **Energía Secundaria** / *Secondary Energy* | | | | | |
| **Producción Total de Energía**<br>*Total Energy Production* | **kBEP** | *kBOE* | **62.233** | **73.896** | **70.179** |
| Producción de Electricidad<br>*Electricity Production* | kBEP | *kBOE* | 7.154 | 14.156 | 14.411 |
| | GWh | | 11.546 | 22.848 | 23.259 |
| Potencia efectica nacional<br>*National efective power* | MW | | 3.828 | 5.063 | 5.103 |
| Producción de Diésel<br>*Diesel Production* | kBEP | *kBOE* | 12.374 | 13.212 | 11.831 |
| | miles galones | *thousand gallons* | 518.938 | 554.079 | 496.164 |
| Importación de Diésel<br>*Diesel Imports* | kBEP | *kBOE* | 6.051 | 17.048 | 20.872 |
| | miles galones | *thousand gallons* | 253.761 | 714.961 | 875.323 |
| Producción de Gasolinas y Naftas<br>*Gasolines and Naphthas Production* | kBEP | *kBOE* | 10.173 | 10.873 | 9.777 |
| | miles galones | *thousand gallons* | 478.261 | 511.767 | 460.398 |
| Importación de Gasolinas y Naftas<br>*Gasolines and Naphthas imports* | kBEP | *kBOE* | 4.257 | 12.715 | 14.300 |
| | miles galones | *thousand gallons* | 200.108 | 597.734 | 672.255 |
| Producción de GLP<br>*LPG Production* | kBEP | *kBOE* | 1.701 | 2.032 | 1.912 |
| | miles kg. | *thousand kg.* | 222.910 | 266.381 | 250.633 |
| Importación de GLP<br>*LPG Imports* | kBEP | *kBOE* | 4.339 | 6.039 | 6.410 |
| | miles kg. | *thousand kg.* | 568.692 | 791.444 | 840.064 |

** KBBL: miles de barriles*

***MM: Millones*

| Consumo de Energía (2) / *Energy Consumption(2)* | | | | | |
|---|---|---|---|---|---|
| **Consumo Total de Energía**<br>*Total Energy Consumption* | **kBEP** | *kBOE* | **64.171** | **94.868** | **98.970** |
| Consumo energético sector transporte<br>*Energy Consumption in Transportation Sector* | kBEP | *kBOE* | 27.857 | 45.999 | 48.551 |
| Consumo energético sector industrial<br>*Energy Consumption in Industrial Sector* | kBEP | *kBOE* | 11.470 | 16.819 | 18.050 |
| Consumo energético sector residencial<br>*Energy Consumption in residential Sector* | kBEP | *kBOE* | 10.076 | 12.291 | 12.127 |
| Consumo de Electricidad<br>*Electricity Consumption* | kBEP<br>GWh | *kBOE* | 6.106<br>9.855 | 12.241<br>19.756 | 12.909<br>20.843 |
| Consumo de Diésel<br>*Diesel Consumption* | kBEP<br>miles galones | *kBOE*<br>*thousand gallons* | 17.555<br>736.194 | 28.356<br>1.189.180 | 30.576<br>1.282.278 |
| Consumo de Gasolinas y Naftas<br>*Gasolines and Naphthas Consumption* | kBEP<br>miles galones | *kBOE*<br>*thousand gallons* | 11.544<br>542.700 | 21.237<br>998.397 | 23.152<br>1.088.387 |
| Consumo de GLP<br>*LPG Consumption* | kBEP<br>miles kg. | *kBOE*<br>*thousand kg.* | 5.953<br>780.162 | 8.048<br>1.054.753 | 8.209<br>1.075.900 |
| Consumo de Kerosene<br>*Kerosene Consumption* | kBEP<br>miles galones | *kBOE*<br>*thousand gallons* | 1.875<br>82.164 | 2.512<br>110.101 | 2.806<br>122.971 |
| Consumo de Fuel Oil<br>*Fuel Oil Consumption* | kBEP<br>miles galones | *kBOE*<br>*thousand gallons* | 8.359<br>340.725 | 8.124<br>331.152 | 7.106<br>289.652 |

(1) Al 2013, la producción de gas natural asociado representa el 68% de la producción total de gas. / *In 2013, the production of associated natural gas represents 68% of total natural gas production.*

(2) Incluye consumo propio / *Includes own (energy sector) consumption*

## Mejoras al Balance Energético Nacional 2014

*Improvements to the National Energy Balance 2014*

El Balance Energético Nacional requiere de un desarrollo metodológico constante el cual detalle la mayor parte de los flujos energéticos del país. En este contexto, a continuación se detallan las mejoras metodológicas que se han incorporado al Balance Energético Nacional 2014:

**Gas Natural:** Incluye los despachos, desde 2010, a las industrias cerámica y de plásticos.

**Melaza y Jugo de Caña:** A partir del registro de etanol, que es utilizado mediante mezcla para la obtención de gasolina "ecopaís", se logró estimar la producción de melaza y jugo de caña[16]. Asimismo, y con la información detallada anteriormente se incorporó el registro de la destilería dentro de los centros de transformación.

**Otras Primarias:** Incluye la energía eólica y solar[17] que es utilizada para la generación de electricidad.

**Gasolinas:** Se incluyó la producción de naftas de la planta topping de Repsol[18] la cual se destina esencialmente al consumo interno de planta.

**Gas:** Incluye una actualización de los factores de conversión obtenidos mediante la aplicación de cromatografías realizadas en la Planta de Gas de Shushufindi. Este factor modificó principalmente la producción de Gas Combustible de la planta de gas.

**Transporte terrestre:** Ajuste realizado al recorrido de los automóviles para determinar el consumo de energía por tipo de vehículo. El Instituto Nacional de Eficiencia Energética y Energía Renovable (INER) determinó un recorrido de 20.000 km/año para el vehículo particular promedio.

*The National Energy Balance requires a constant methodological development that it is intended to improve the understanding of energy flows in the country. In this context, the methodological improvements that have been included in the National Energy Blanace 2014 are presented:*

***Natural Gas:*** *gas dispatch to the ceramic and plastic industry were added from 2010 onward.*

***Molasses and Sugar cane juice:*** *as from the ethanol registered that is used for the mixture with gasoline to obtain the E5 blend gasoline named "ecopais"[15], it was possible to estimate the production of molasses and sugar cane juice[16]. The information about distilleries was also included.*

***Other primaries:*** *Inclusion of wind and solar[17] energy that is used for electricity generation.*

***Gassoline:*** *Inclusion of the production of naphthas of the topping plant of Repsol[18], which is mostly destined the own consumption of the plant.*

***Gas:*** *conversion factors for gas production in the Gas Plan of Shushufindi were updated. The new factors were obtained the recent chromatography of the gas.*

***Ground transportation:*** *adjustments to the distance travelled for standard vehicles to estimate its energy consumption. According to the National Institute of Energy Efficiency and Renewable Energy (INER) this value is in average 20.000 km/year.*

15. Considera 5% de etanol y 95% de gasolina. A partir del 2010, el terminal Pascuales prepara premezcla para el despacho de gasolina extra con etanol (ecopaís) a la ciudad de Guayaquil.
*Considers 5% of ethanol and 95% of gasoline. Since 2010, the Pascuales fuel terminal prepares the mixed the E5 gasoline "ecopais" that is distributed in the city of Guayaquil.*
16. Son estimaciones que consideran los procesos de destilación de los ingenios azucareros del país y los procesos de transformación de algunos países de la región. De igual manera, los factores de conversión utilizados se basaron en la experiencia de otros países de la región.
*Estimations for the production of sugar cane ethanol were used from several countries in the region.*
17. La participación de estas energías renovables en el balance energético siguen siendo poco representativas.
*The participation of these sources in the county are still not significant.*
18. Información remitida por la Agencia de Regulación y Control Hidrocarburífero –ARCH- y obtenida de la base de hidrocarburos que es administrada por el Ministerio de Recursos Naturales No Renovables.
*Information from the National Hydrocarbon Agency and the Ministry of Non Renewable Resources.*

**Gases de Efecto Invernadero:** Considera la emisión de gases de efecto invernadero –GEI- (dióxido de carbono -CO2-, metano –CH4- y óxido nitroso –N2O-) del sector energético[19]. Para el cálculo de las emisiones se utilizaron los factores de emisión de las "Directrices del IPCC de 2006" para combustión estacionaria[20], combustión móvil y emisiones fugitivas.

**Despacho de energía por provincia:** Incluye la desagregación geográfica de los despachos de hidrocarburos[21]. Asimismo se ha incorporado la energía eléctrica factura y potencia máxima requerida por cada provincia del país.

**Exportaciones e Importaciones:** Se determinó los países de destino de las exportaciones de energía del país; y los países de orígen de las importaciones de energía.

***Greenhouse Gases:*** *Consider the emission of greenhouse gases -GHG- (-CO2- carbon dioxide, methane –CH4- and nitrous oxide -N2O-) in the energy sector[19]. To calculate emission factors of the "2006 IPCC Guidelines" for stationary[20] combustion, mobile combustion and fugitive emissions were used.*

***Energy dispatch in provinces:*** *Includes geographical breakdown of fuel[21] dispatch. It also includes electricity and maximum power required by each province.*

***Exports and Imports:*** *Countries of energy export destination was determined; countries of origin of energy imports was determined too.*

19. Al momento existe un trabajo conjunto con el Ministerio del Ambiente –MAE- para desarrollar la metodología de contabilización de inventarios de gases de efecto invernadero. En este sentido, las cifras presentadas en el presente documento son consideradas provisionales.
*At the momento there is a joint effort with the Ministry of Environment to develop the methodology of accounting for inventories of greenhouse gases. In this sense, the data presented are considered provisional.*
20. Comprende los factores de emisión por defecto.
*Includes default emission factors*
21. En el caso del Gas Licuado de Petróleo, considera despachos a envasadoras por lo cual no existe contabilización en todas las provincias. En este sentido, se ha incluido información adicional de la desagregación geográfica de las ventas de GLP la cual si se realiza en todas las provincias del país.
*In the case of liquefied petroleum gas, considered dispatch to packaging firms so there is no data in all provinces. In this sense, it has included additional information on the geographical breakdown of sales of LPG, which if done in all provinces.*

# Análisis Agregado de Energía
## *Agregated Analysis of Energy*

Este capítulo detalla la evolución histórica de la energía en el Ecuador a partir de 1970, en términos agregados, de la producción y consumo energético. Así mismo, se destacan los aspectos más importantes y se elabora un diagnóstico de la realidad energética actual del país al 2013, haciendo referencia a diagramas que muestran los resultados de los flujos energéticos.

*This chapter details the historic evolution of the energy sector in an aggregated way for production and consumption since 1970. The main highlights of the sector are presented and a diagnosis of the energy situation of the country in 2013 is elaborated, as well as diagrams that show the results of energy flows.*

Foto: Parque Eólico Villonaco

## 1.1. Evolución histórica de la energía en Ecuador

*Historic evolution of energy in Ecuador*

Ecuador es considerado actualmente como un exportador neto de energía. Desde 1972, en vísperas de iniciar las exportaciones de crudo oriente, el sector petrolero asume importancia inusitada en la estructura económica del país (EP Petroecuador, 2010), donde la matriz de energía primaria ha sido dominada por el petróleo tanto como principal energético interno como para su exportación. Sin embargo, en el mismo lapso, la brecha entre la producción secundaria total y la demanda se ha ampliado, situación que ha sido resuelta mediante importación de derivados. Esas importaciones cubren la demanda sectorial de transporte, industria, residencial y generación de electricidad.

El análisis energético de esta publicación presenta la matriz energética al 2014, que consiste en la información energética validada al año 2013 por las fuentes oficiales de información del sector energético ecuatoriano.

La (figura 1-1) muestra la producción de energía por fuentes primarias durante los últimos 40 años, en donde es claramente visible la importancia que juega el petróleo en la sociedad ecuatoriana, no solo para abastecer la demanda interna, sino también por la renta derivada de las exportaciones que forman parte de los recursos fiscales con los que cuenta el Gobierno. Dentro del análisis histórico hay que mencionar dos acontecimientos que influyeron directamente en la producción de petróleo. Durante 1987, un terremoto de gran magnitud rompió el Oleoducto Transecuatoriano, lo que paralizó las actividades hidrocarburíferas del país (EP Petroecuador, 2010). El otro suceso relevante en la historia petrolera del Ecuador fue el inició de operación del Oleoducto de Crudos Pesados (OCP) en el 2003, que incidió positivamente en el nivel de producción de crudo del país.

Las energías renovables convencionales, como la biomasa (leña y bagazo[22]) y la hidráulica, así como las energías renovables no convencionales (fotovoltaica y eólica), históricamente han tenido una mínima participación en la matriz de energía primaria. La demanda total de energía, representada en la (figura 1-1), ha crecido de forma acelerada los últimos 10 años.

*Ecuador is currently considered as a net energy exporter. Since 1972, when oil reserves were discovered, the oil sector assumed an important role in the economic structure of the country (EP Petroecuador, 2010). The primary energy matrix has been dominated by oil as the main energy source as well as the main export good. However, in this same timeframe, the gap between total secondary energy production and internal demand has increased and the country has needed to import oil products. These imports supply sectorial demand of transportation, industry, residential and electricity generation.*

*This publication presents the energy matrix in at the begging of 2014, which consists in the validated energy information closed by the end of 2013 from official data sources of the Ecuadorian energy sector.*

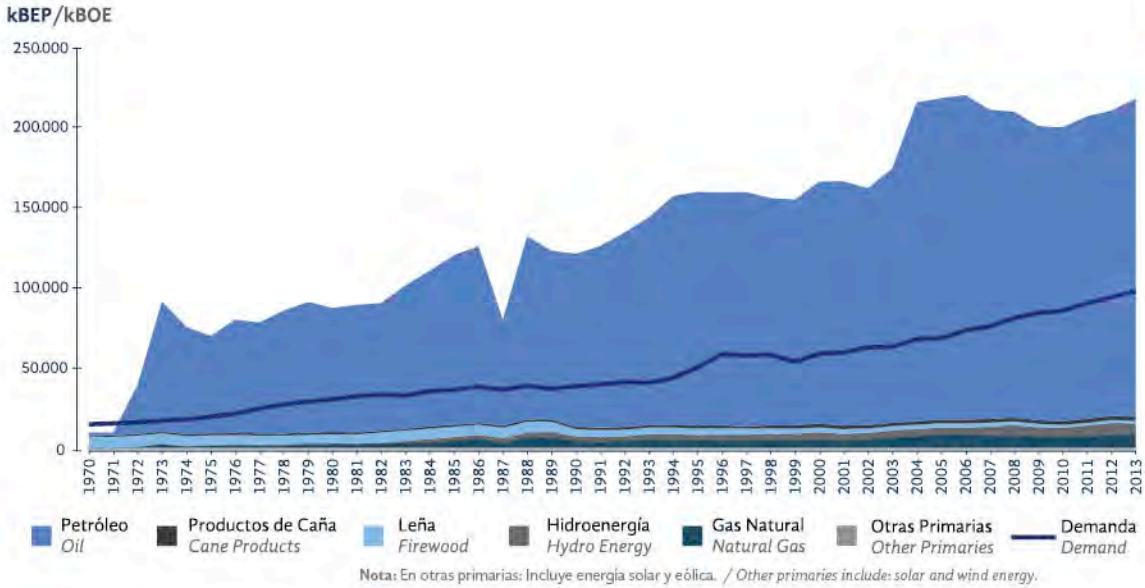
*Figure (1-1) shows primary energy production for the last 40 years, where the importance that oil has in the Ecuadorian society is clearly shown, not only to supply internal demand, but also for the profit that this source contributes to the national budget. Within the historic analysis, two facts must be mentioned that influenced oil production. During 1987, an earthquake broke the oil pipeline which forced to stop oil extraction activities (EP Petroecuador, 2010). And the other fact is the starting of operation of the Heavy Crude Oil Pipeline in 2003, that allowed to increase production levels.*

*Conventional renewable energies, such as biomass (firewood and bagasse[22]) and hydroenergy, as well as non-conventional renewable energy (wind and solar), historically have not had a strong participation in the primary energy matrix. The total energy demand, presented in (Figure 1.1), has rapidly grown during the last 10 years. Everything that is above the demand line (red line) is the energy surplus that Ecuador is free to export. Oil production has declined since 2007, caused mainly by the decrease of production of mature oil fields (Shushufindi-Aguarico y Libertad-Atacapi). The long-term energy planning challenges for Ecuador are to shift from a net crude oil exporting model to a model where oil products are exported that have greater added value.*

22. Al 2013, se ha estimado la producción de caña de los ingenios azucareros con un rendimiento del 33% para la obtención de bagazo.
*For 2013, the efficiency to obtain bagasse from sugar cane plantations has been estimated in 33%*

## Figura 1-1 Evolución de la oferta de energía primaria por fuentes 1970 - 2013

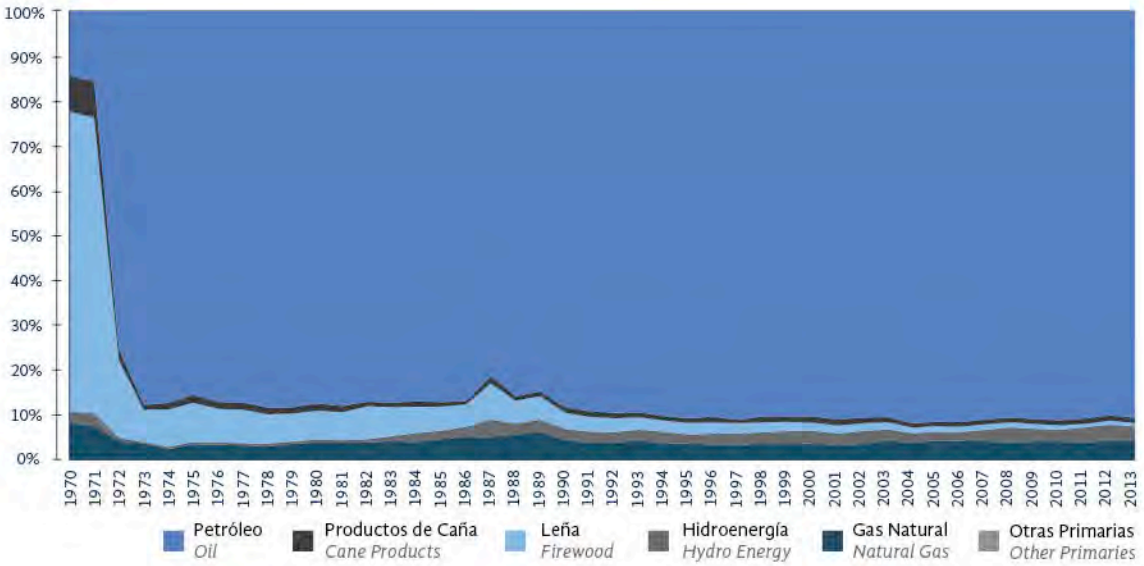
*Figure 1-1 Evolution of primary energy supply by sources 1970 – 2013*




**Nota:** En otras primarias: Incluye energía solar y eólica. / *Other primaries include: solar and wind energy.*

## Figura 1-2 Estructura de la oferta de energía primaria por fuentes 1970 - 2013

*Figure 1-2 Structure of primary energy supply by source 1970 - 2013*



Todo lo que está sobre la línea de demanda es el excedente energético que Ecuador es libre de exportar. La producción de petróleo ha declinado a partir de 2007, causada principalmente por el agotamiento de los campos maduros (Shushufindi-Aguarico y Libertad-Atacapi). Los desafíos de la planificación energética a largo plazo se centran en la posibilidad de que Ecuador pase de un modelo exportador neto de petróleo a uno de exportador de derivados con valor agregado mediante su refinación.

Analizando el histórico de la demanda de energía[23] del país en las últimas tres décadas se observa que el sector transporte gana paulatinamente participación en la matriz de consumo, pasando de un 33% en 1980 a alrededor de un 49% en 2013. El segundo sector de mayor consumo, pero distante del transporte, es el sector industrial (18%) y en tercer término el residencial (12%). En buena medida esta estructura refleja la condición de una economía basada en la producción de recursos primarios y en servicios.

En la matriz de consumo por tipo de fuentes, puede verse el predominio absoluto de los derivados del petróleo (Figura 1-4), que aun cuando la electricidad ha aumentado su participación, el diesel y las gasolinas son las principales fuentes de consumo en especial para el sector transporte.

Es claramente visible como la matriz energética ecuatoriana ha sufrido cambios en los últimos 40 años. Como resumen del análisis histórico se puede concluir sobre el predominio del petróleo en la oferta de energía, pero con una caída en el ritmo de producción en los últimos años, el aumento del consumo del sector transporte debido al crecimiento del parque automotor, y la participación mayoritaria de los combustibles fósiles, gasolina y diesel en la matriz final de consumo por tipo de fuente.

En la (figura 1-6) se puede observar que el petróleo ha sido el principal energético que ha ingresado a los centros de transformación en el Ecuador, sin embargo el gas natural, hidroenergía y los derivados del petróleo (diésel

*Analysing the historic evolution of energy consumption[23] for the last three decades, the transport sector has increased from 33% in 1980 to 49% in 2014. The second consumption group (but still far away from transport) is industry (18%), followed by the residential sector (12%). This structure reflects an economy based on the production of basic primary resources and services.*

*In the energy consumption matrix by source, it is clear that oil products have the greatest participation (Figure 1-4). Diesel and Gasoline are the most consumed, especially in the transport sector. Electricity has also an important participation.*

*The changes that the Ecuadorian energy matrix has experienced during the last 40 year are clearly visible. As a summary of the historic analysis it can be concluded that oil has a total predominance in the primary energy supply but with decaying production in the last few years, transportation is the sector that most energy consumes because of greater numbers of vehicles, and the considerable participation of fossil fuels (diesel and gasoline) in the final energy consumption matrix by source.*

*(Figure 1-6) shows that oil has been the main energy input for transformation centres, however natural gas, hydroenergy and oil products (diesel, fuel oil and gasoline) have maintained their participation through time. On the other hand, liquid petroleum gas (LPG), sugar cane products and other primary energies has only participated during the last decade.*

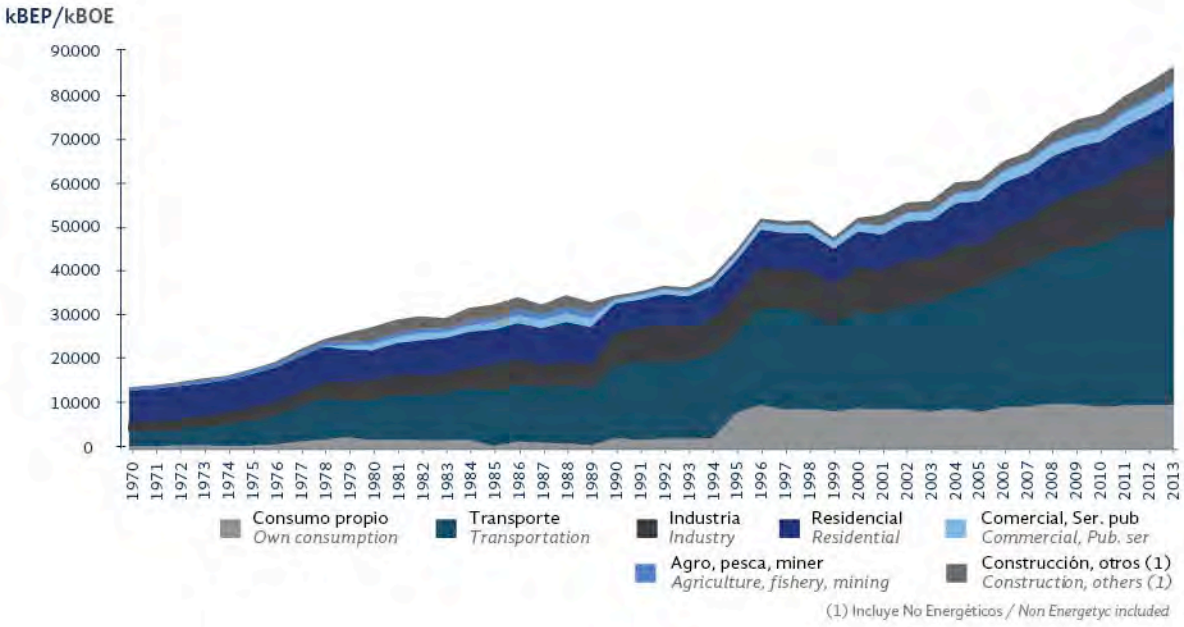
*The secondary energy production matrix shows that refineries are the main transformation centres; however electricity power stations are increasingly raising their participation. Gas centres' participation has remained fairly constant, while autoproducers have been present since 2000 and distilleries sin 2010.*

*Secondary energy production (Figure 1-10) has constantly grown and fuel oil is the most produced energy source, followed by electricity, diesel and gasoline.*

23. No incluye carga a centros de transformación.
*Does not include transformation centres.*

## Figura 1-3 Evolución del consumo de energía por sectores 1970 – 2013

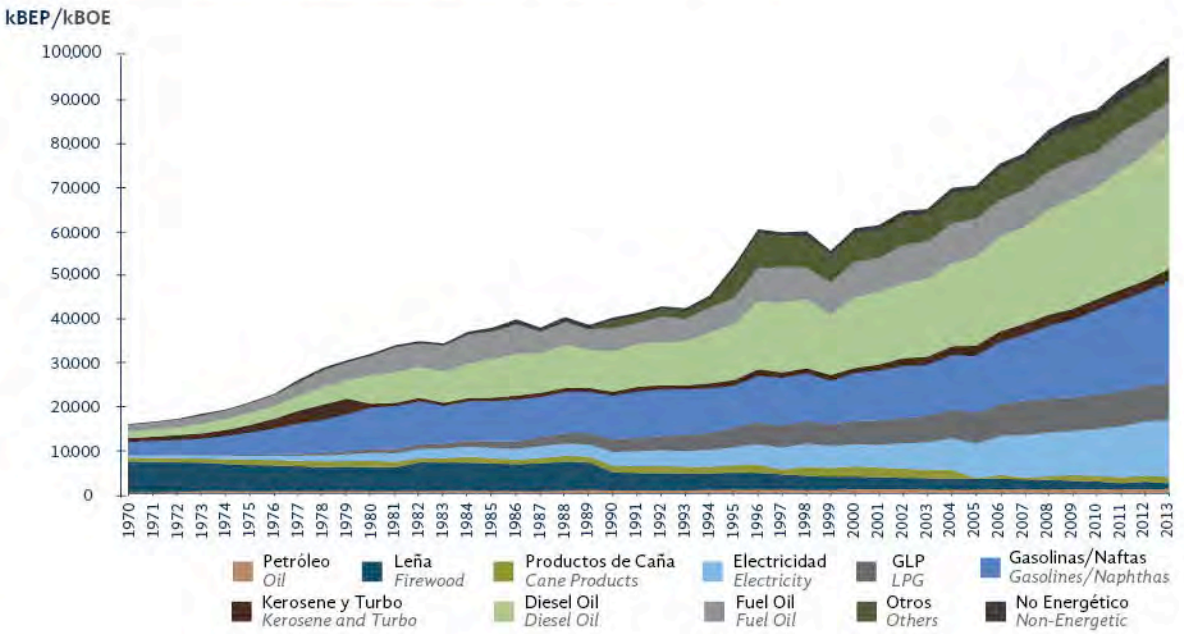
*Figure 1-3 Evolution of energy consumption by sectors 1970 – 2013*




(1) Incluye No Energéticos / *Non Energetyc included*

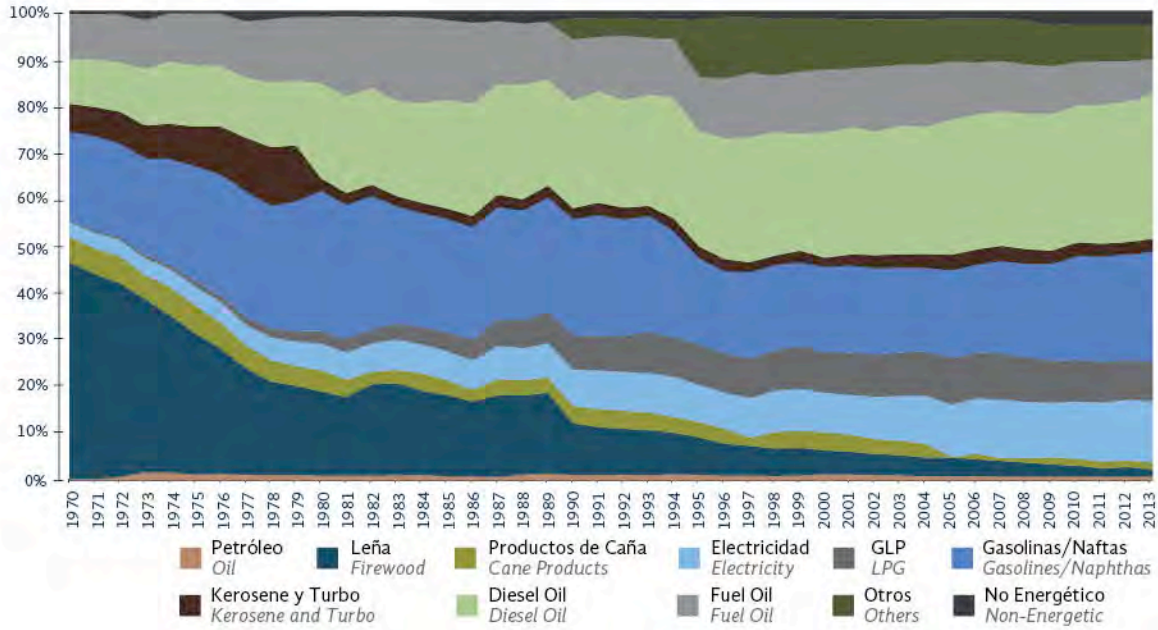
## Figura 1-4 Evolución del consumo de energía por fuentes 1970 - 2013

*Figure 1-4 Evolution of energy consumption by sources 1970 – 2013*



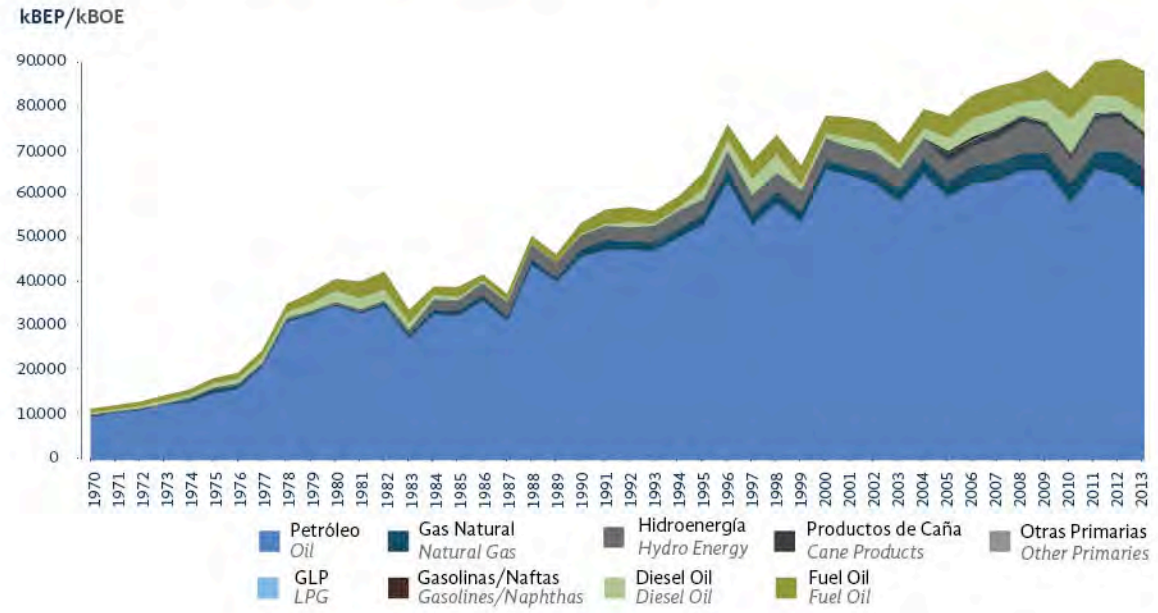
## Figura 1-5 Estructura del consumo de energía por fuente 1970 - 2013

*Figure 1-5 Structure of energy consumption by source 1970 – 2013*




## Figura 1-6 Carga a centros de transformación 1970 - 2013

*Figure 1-6 Energy input in transformation centres 1970 - 2013*



oil, fuel oil y gasolinas) han aumentado su participación constante durante el tiempo. Por otra parte, el gas licuado de petróleo, productos de caña y otras primarias han tenido un aporte únicamente durante la última década.

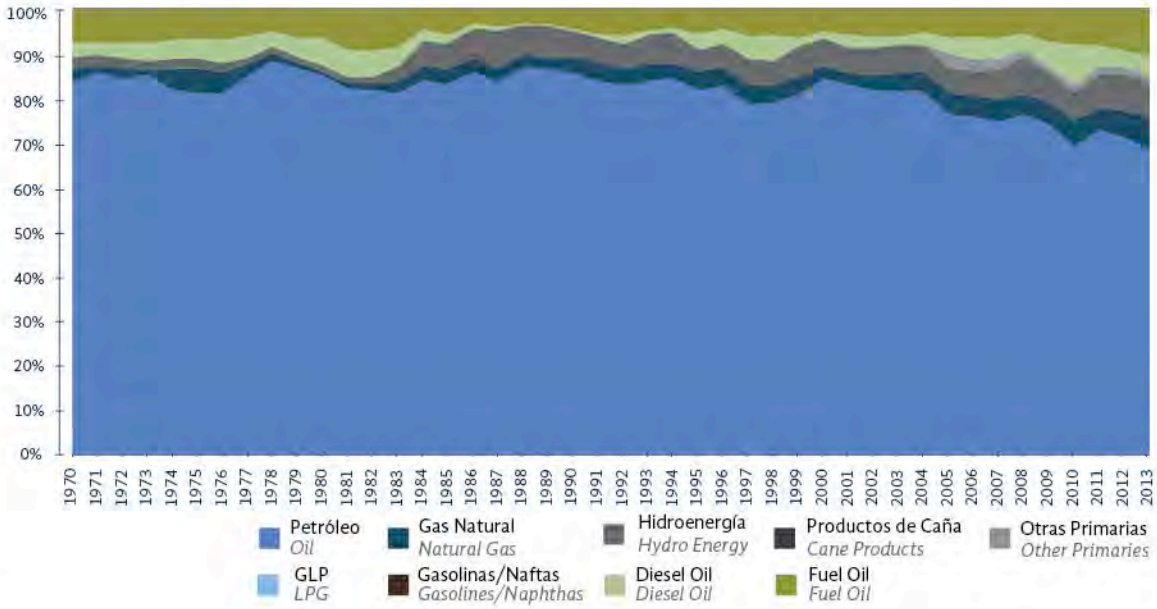
En la matriz de producción de energía secundaria puede observarse la supremacía de las refinerías como principal centro de transformación, sin embargo el aporte constante y creciente de las centrales eléctricas forma parte importante dentro de la producción de energía secundaria. Por otra parte el centro de gas se ha mantenido con una participación constante, mientras que, los autoproductores han aportado desde el año 2000 y las destilerías desde el año 2010.

La producción de energía secundaria (figura 1-10) ha crecido continuamente, de la cual el energético más producido en los centros de transformación en los últimos años ha sido el fuel oil, seguido por la electricidad, el diesel oil y las gasolinas. Sin embargo, la electricidad es la energía secundaria con mayor tendencia al crecimiento. Por otra parte, el gas licuado de petróleo, el Kerosén y Turbo, los gases y las otras energías secundarias, han tenido un aporte menor dentro del balance de producción de energía secundaria por fuente.

*Electricity is the secondary energy source with fastest growth rate. LPG, Kerosene and Turbo, gases and other secondary energy sources have had a minor participation in the secondary energy production balance.*

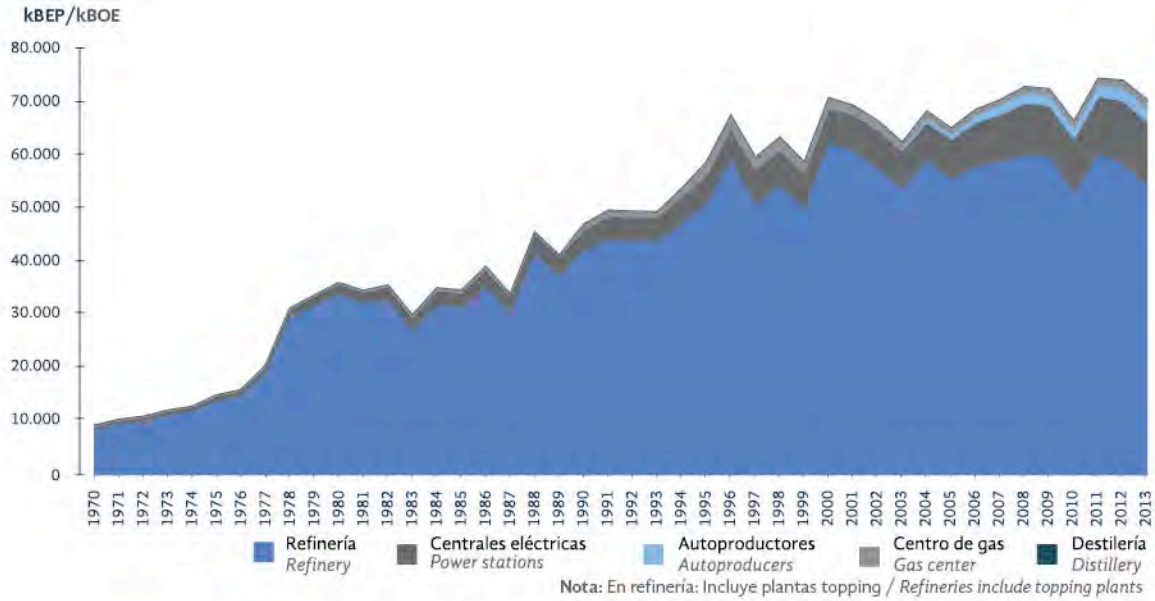
## Figura 1-7 Estructura de carga a centros de transformación 1970 - 2013

*Figure 1-7 Structure of energy input in transformation centres 1970 – 2013*



## Figura 1-8 Producción de energía secundaria por centro de transformación 1970 - 2013

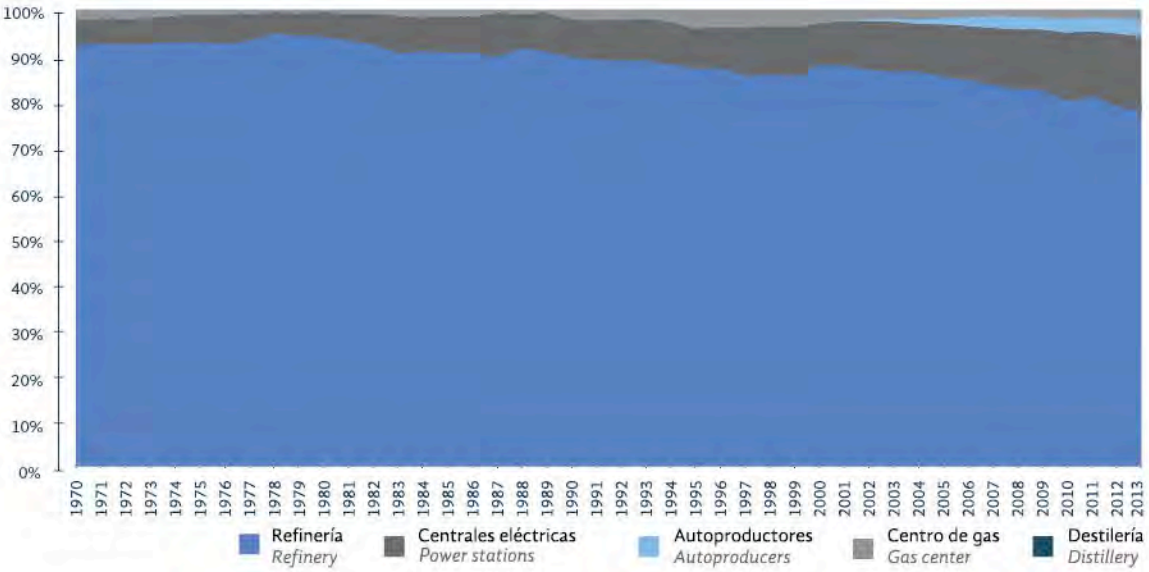
*Figure 1-8 Secondary energy production by transformation centre 1970 – 2013*




**Nota:** En refinería: Incluye plantas topping / *Refineries include topping plants*

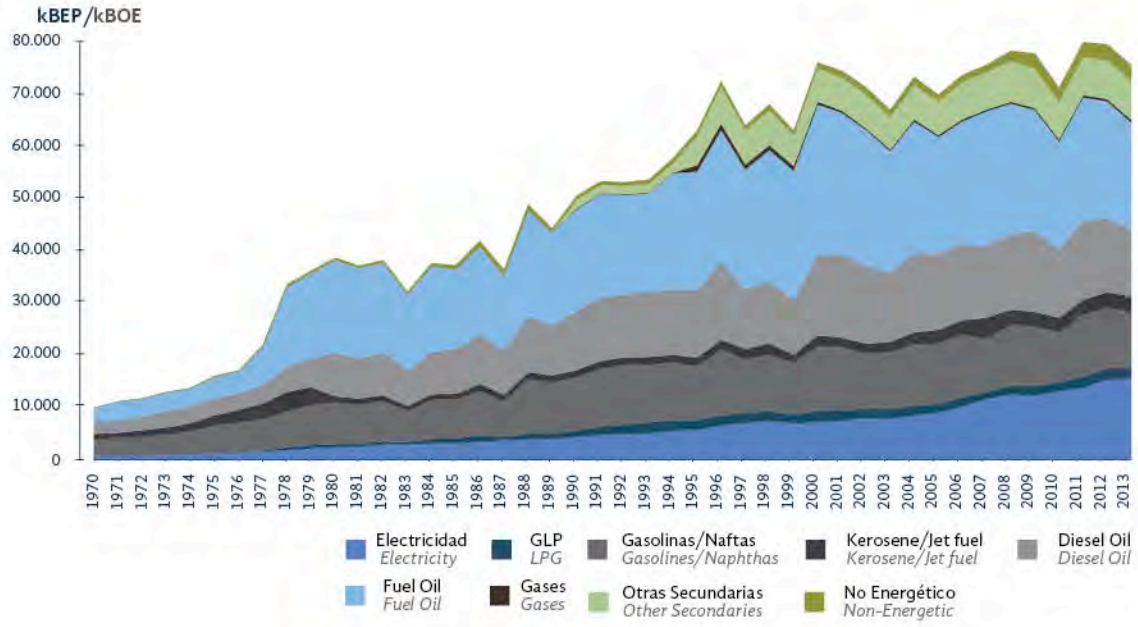
## Figura 1-9 Estructura de producción de energía secundaria por centro de transformación 1970 - 2013

*Figure 1-9 Structure of energy input in transformation centres 1970 – 2013*



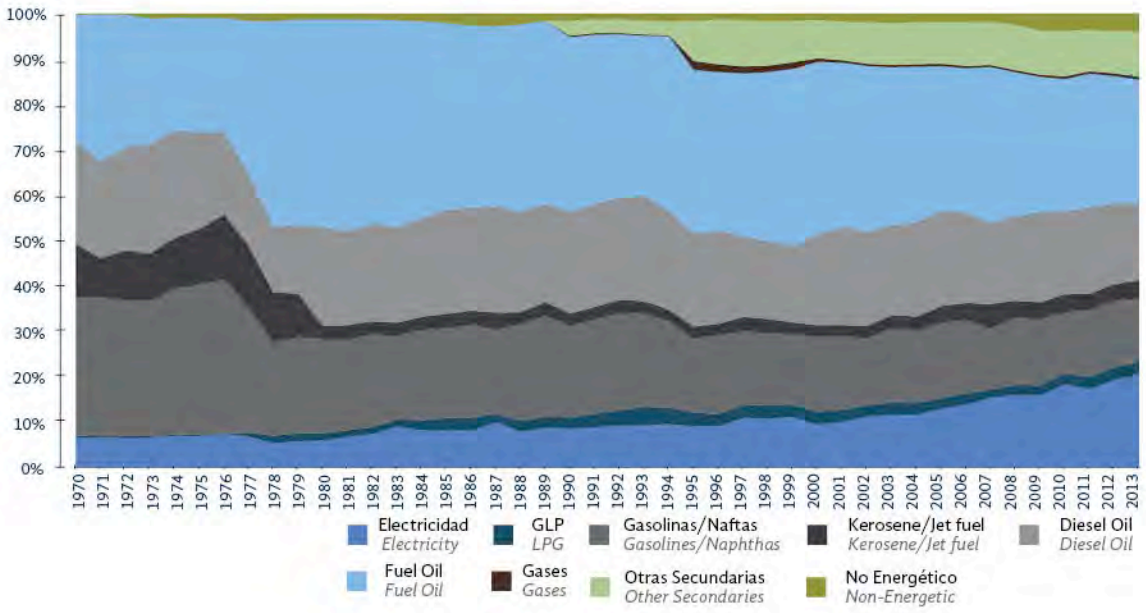
## Figura 1-10 Producción de energía secundaria por fuente 1970 - 2013

*Figure 1-10 Secondary energy production by source 1970 - 2013*




## Figura 1-11 Estructura de producción de energía secundaria por fuente 1970 - 2013

*Figure 1-11 Structure of secondary energy production by source 1970 - 2013*



## 1.2 Diagnóstico de la matriz energética 2013

*Diagnosis of the energy matrix 2013*

A continuación se presenta de manera agregada los resultados más importantes del Balance Energético Nacional al final de 2013, en los cuales se expone la situación actual de la matriz energética ecuatoriana.

### 1.2.1 Oferta y transformación de energía

La producción de energía primaria (figura 1-12) se concentra en la energía de origen fósil: petróleo (91%), que se divide a su vez en una fracción para exportación (66%) y otra para carga a refinerías nacionales (25%), además de contar con algo de gas natural (4%). De esta forma, la energía de origen fósil representa 95% del total de la producción de energía primaria. El resto es producción hidráulica (3%), producción de productos de caña (1%), leña con menos del 1% y otras primarias (solar y eólica) con el 0,02%.

Concerniente a la generación de energía eléctrica y a las plantas que alimentan al Sistema Nacional Interconectado (SNI), la base de la oferta de electricidad es predominantemente generación térmica (49,6%), compuesto por sistemas turbogas (TG), motor de combustión interna (MCI) y turbovapor (TV), seguido por producción hidroeléctrica con un aporte de 46,1% (Figura 1-13). Además, hasta final de 2013 existía la importación de electricidad (2,8%), proveniente de Colombia. La generación con fuentes renovables no convencionales supera el 1% de participación en la matriz eléctrica, debido al aporte de fuentes de biomasa, eólica y solar fotovoltaica. En la figura 1- 14 puede visualizarse la capacidad instalada efectiva (no incluye interconexión) por tipo de central hasta final de 2013.

Respecto a la disponibilidad de derivados de petróleo para el abastecimiento interno, se muestra en la figura 1.15 el contraste de la composición en la oferta interna de derivados (producción local, importación y variación de inventarios) con la demanda necesaria (consumo local y exportación). Además en la figura 1.16 se detalla la composición de la oferta de combustible (únicamente producción e importación).

*The main results of the National Energy Balance by the end of 2013 are presented, in which the current situation of the Ecuadorian energy matrix is exposed.*

### *1.2.1 Supply and transformation of energy*

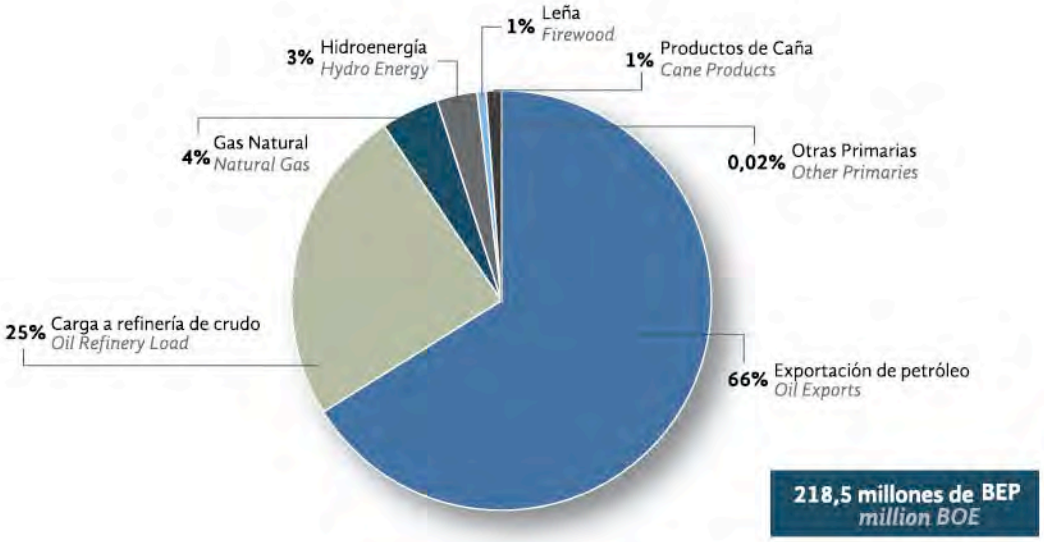
*Primary energy production (Figure 1.12) concentrates in fossil sources: oil (91%), which is partly produced for exports (66%) and for refining (25%). Natural gas participation is (4%). Fossil sources sum up 95% and the remaining is hydroenergy (3%), sugar cane products (1%), firewood (less than 1%) and other primaries (solar and wind) with 0,0002%.*

*Regarding electricity generation and the power stations that feed the National Interconnected System (SNI), thermoelectric generation has the highest participation (49,6%) and is comprised by several generation technologies such as gas turbines (TG), steam turbines (TV) and internal combustion engines (ICE). Following is hydropower with a participation of 46,1% (Figure 1-13). By the end of 2013, there was also a small fraction of electricity that was imported from Colombia (2,8%). Generation with non-conventional renewable energy exceeds 1% and considers biomass, solar photovoltaic and wind energy. In Figure 1-14 the effective installed capacity by technology type is shown (with out interconnection).*

*Regarding the availability of oil products for local supply, Figure 1-15 presents the contrast between internal supply (local production, imports and stock variations) in comparison to the demand (local supply and exports). Figure 1-16 details the composition of fuel supply (only production and imports).*

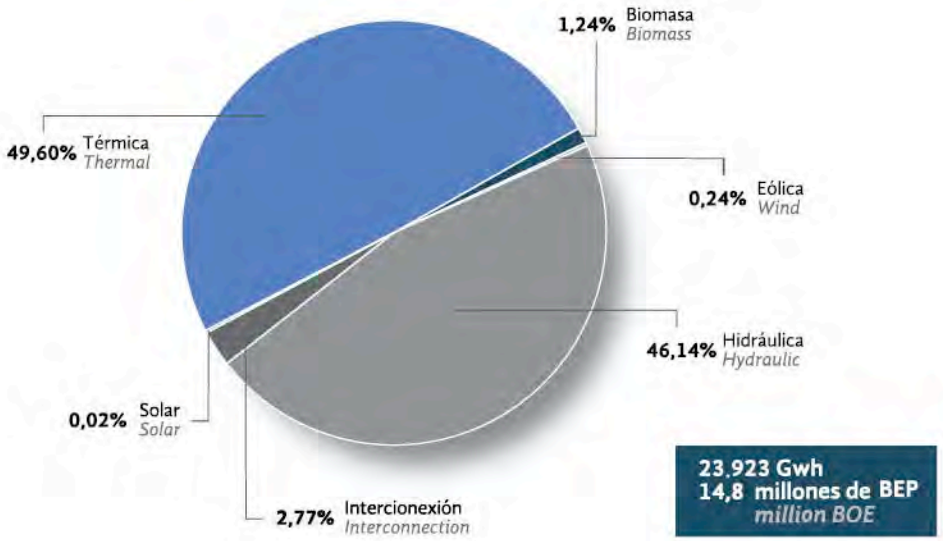
## Figura 1-12 Estructura de la oferta de energía primaria

*Figure 1-12 Structure of primary energy production*



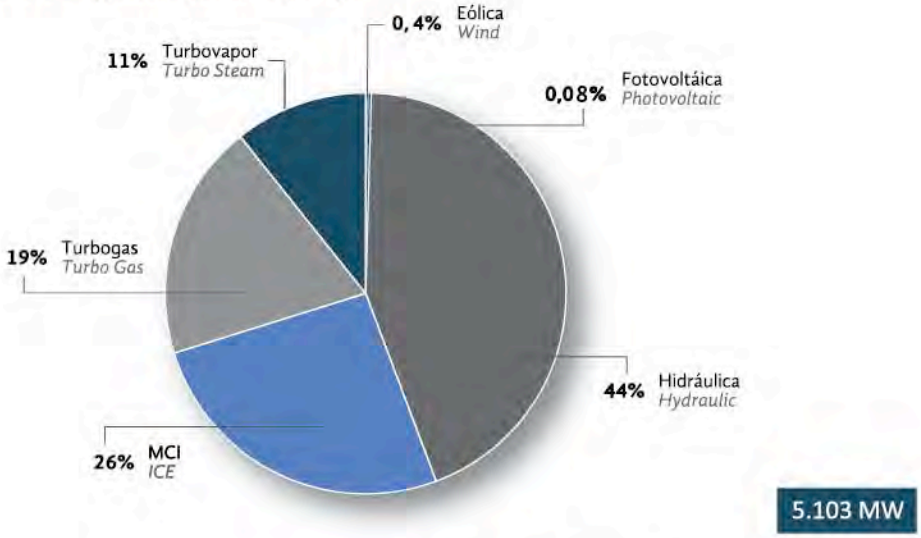

## Figura 1-13 Estructura de generación eléctrica

*Figure 1-13 Electricity generation structure*



## Figura 1-14 Potencia efectiva nacional

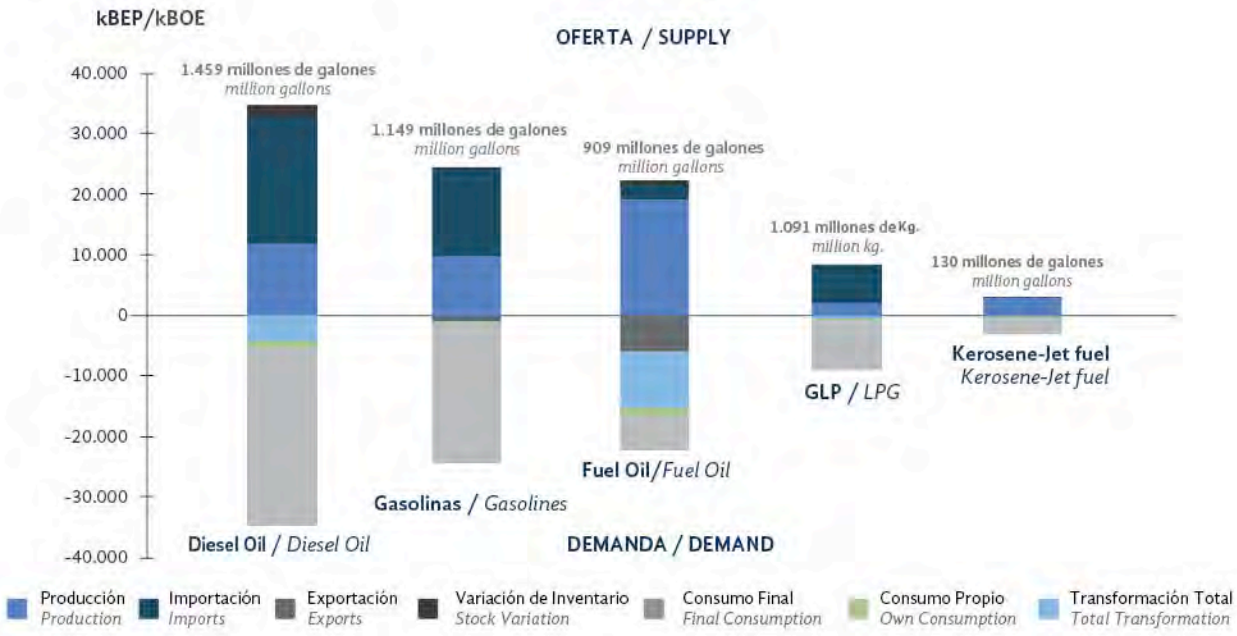
*Figure 1-14 Effective power capacity*




**NOTA:** No incluye interconexión / *Does not include interconnection*

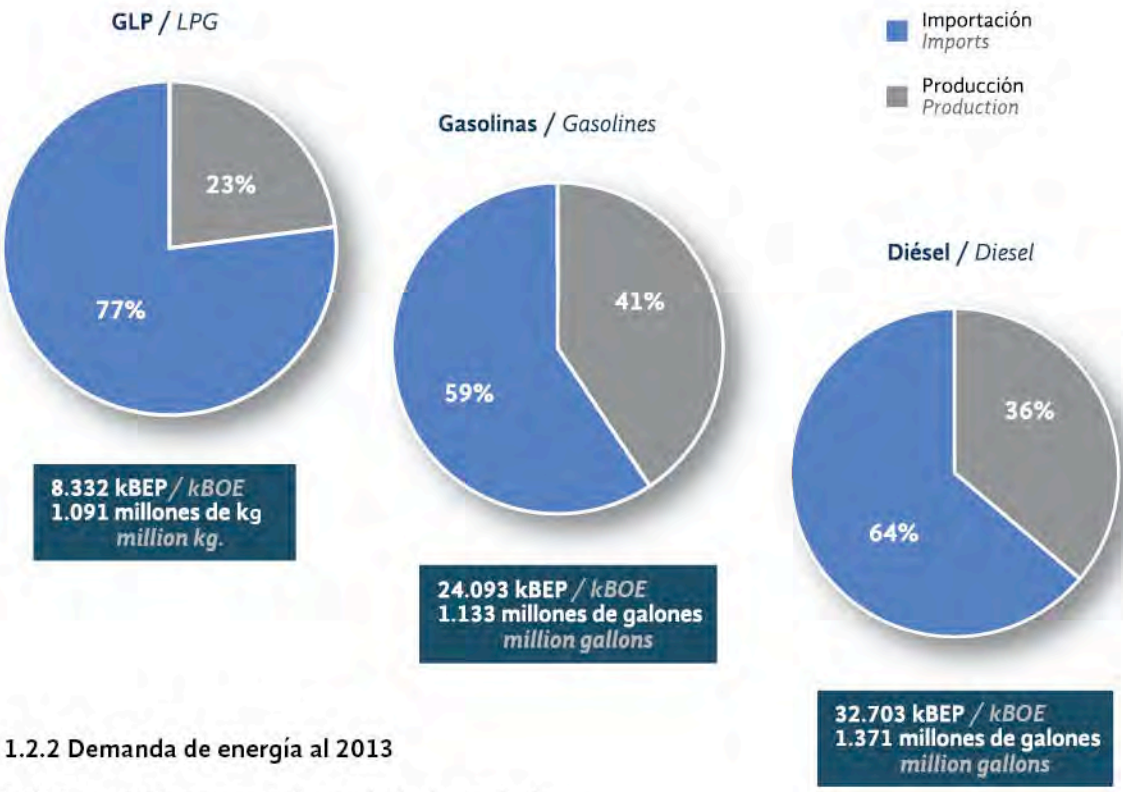
## Figura 1-15 Comparación entre oferta y demanda de derivados

*Figure 1-15 Comparison of supply and demand of oil products*



## Figura 1-16 Composición de la oferta de derivados

*Figure 1-16 Composition of oil products supply*




### 1.2.2 Demanda de energía al 2013

En la figura 1-17 se muestra la matriz de demanda de energía (incluido el consumo de no energéticos y consumo propio[24]), en la cual se visualiza el consumo de energía final o neta por sector. El sector que más consume energía es el transporte (49%), seguido por la industria (18%), el consumo residencial (12%), consumo propio (12%), comercial y servicios públicos (4%) y uso No energético[25] (3%). El consumo por tipo de fuentes (figura 1.18) se concentra en diesel (31%), gasolinas (23%), electricidad (13%), Gas licuado de petróleo (8%) y fuel oil (7%).

En la figura 1-19 se presentan los energéticos consumidos por los sectores de transporte, industria, residencial y comercial. En el sector transporte el fuel oil

### *1.2.2 Energy demand 2013*

*Figure 1-17 shows the energy demand matrix according to net energy consumption by economic sectors (including non-energy use and own consumption[24]). The sectors that most consumes is transportation (49%) followed by industry (18%), residential (12%), own (energy sector) consumption (12%), commercial and public services (4%) and non-energy use[25] (3%).*

24. Se refiere al consumo propio del sector energético.
*Refers to the consumption of the energy sector.*
25. Corresponde a usos No energéticos de combustibles, por ejemplo: breas, solventes, etc.
*Non-energy uses are comprised of tars, asphalts, solvents, etc.*

también tiene una importante participación (6%) debido al consumo de transporte naviero de gran calado. La electricidad en transporte es casi inexistente y el único caso representativo es el sistema de transporte público trolebús de la ciudad de Quito[26]. En la industria, el consumo predominante sigue siendo de diesel (41%), que es usado para la mayoría de procesos térmicos y también tiene una importante participación la electricidad (29%) como el energético ideal para los procesos de fuerza. El sector residencial es dominado por el uso del Gas licuado de petróleo (60%), destinado especialmente para cocción. En el caso de la leña[27], tiene un rol muy representativo para usos de cocción en zonas rurales.

Cabe mencionar que el consumo residencial representa aproximadamente 12 millones de BEP, equivalente a casi una cuarta parte del consumo del sector transporte (49 millones de BEP). Esto contrasta con lo que sucede en países desarrollados en donde debido a las exigencias del clima y a la cantidad de artefactos en los hogares, el sector residencial equipara o supera al sector transporte. En el sector comercial el energético más consumido es la electricidad (97%) y en su mayoría sirve para iluminación.

El detalle de consumo de los principales energéticos como la gasolina, diesel, GLP y electricidad se presentan en la figura 1.20. El GLP es consumido casi en su totalidad por el sector residencial (91%) para la cocción de alimentos. La gasolina es consumida en su mayor parte (96%) por el sector transporte. El diesel también tiene como mayor consumidor al sector transporte (71%), pero la industria representa igualmente un consumo significativo (25%) en especial para usos térmicos. La mayoría de la electricidad es consumida por la industria (41%) seguido por el sector comercial (30%) y residencial (29%).

*Figure 1-19 presents energy consumption of energy sources according to economic sectors (transport, industry, residential and commercial). The fuels that are most consumed in the transport sector are gasoline (45%), diesel (43%) and fuel oil (6%) (used for sea transportation). Electricity is barely used for transportation and the only representative case is the electric trolleybus in the city of Quito[26].*

*Diesel is still the main energy source used by industry (41%), which is used for most thermal processes. Electricity has a participation of 29% in the industry sector. The residential sector is characterized for intense use of residential sector is characterized for intense use of LPG (60%), used mainly for cooking and water heating. Firewood[27] is present due to cooking in rural areas.*

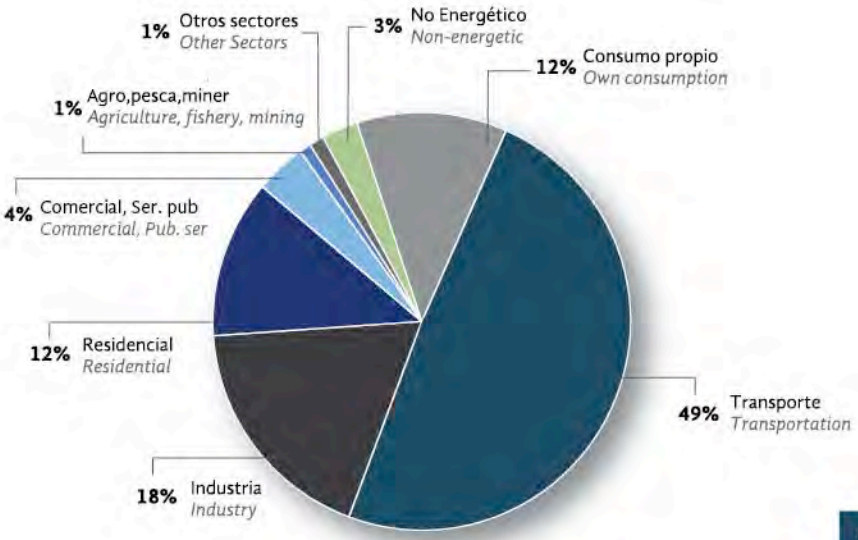
*It is important to mention that the residential sector is approximately 12 million BOE, equivalent to one fourth or the transport sector consumption (49 million BOE). This contrasts with the situation in industrialized countries where due to climate conditions; the residential sector consumption almost equals the transport sector. The commercial sector mostly uses electricity and mostly directed for lighting applications.*

*The consumption of economic sector according to fuel type is presented in Figure 1-20. LPG is mostly used by the residential sector (91%) for cooking. Gasoline is mostly used by the transport sector (96%). Diesel also is mainly consumed by the transport sector (71%), but industry also consumes a representative amount (25%). Electricity is mostly used by the industry (41%), followed by the commercial sector (30%) and residential (29%).*

26. Se ha considerado un consumo constante desde la creación del Sistema Integrado Trolebús.
*A constant consumption since the creation of the trolleybus system in Quito has been considered.*
27. Para estimar el consumo de leña en el sector residencial se realizó el siguiente procedimiento: i) Se calculó el consumo de energía por hogar, multiplicado por un factor de eficiencia de 40%, que utiliza GLP para cocción (kbep por hogar); ii) Se multiplico el factor anterior por el número de hogares que utilizan leña para cocción y se dividió por un factor de eficiencia de 12%; iii) Finalmente se realizó la conversión de unidades energéticas a unidades físicas.
*To estimate firewood consumption the following process was used: i) the energy consumption per household was registered in kg per household was multiplied by an efficiency factor of 40% (LPG cook stove) (kBEP/household), ii) The previous value was multiplied by the number of households that use firewood to cook and later divided by 12% (efficiency of a firewood cook stove); iii) the values were transformed from energy units to physical units.*

## Figura 1-17 Estructura del consumo por sectores

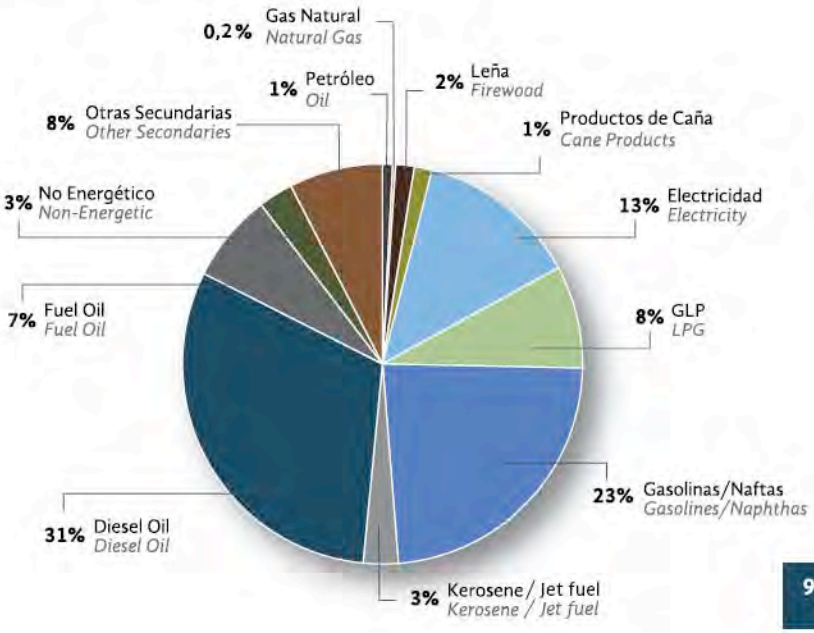
*Figure 1-17 Energy consumption structure by sectors*




**99 millones de BEP**
***million BOE***

## Figura 1-18 Estructura del consumo por fuente

*Figure 1-18 Energy consumption structure by source*

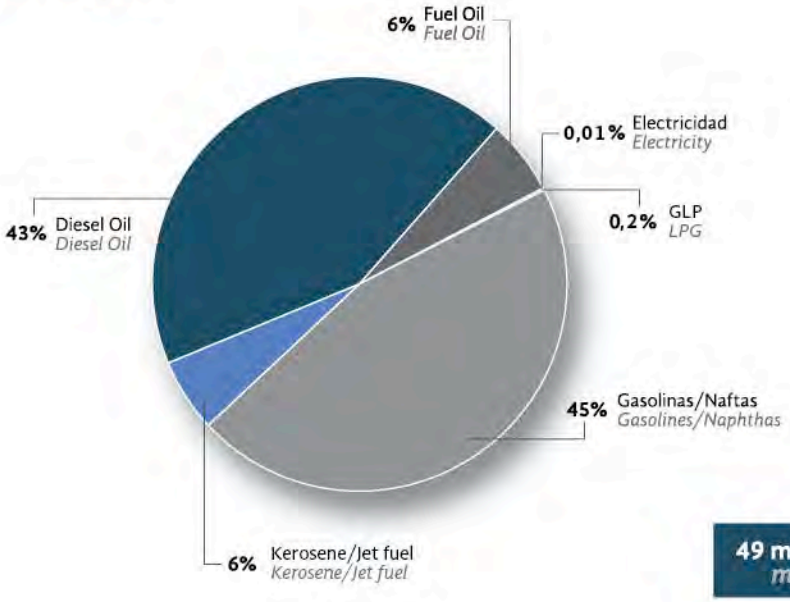



**99 millones de BEP**
***million BOE***

## Figura 1-19 Consumo de los sectores económicos por tipo de fuente

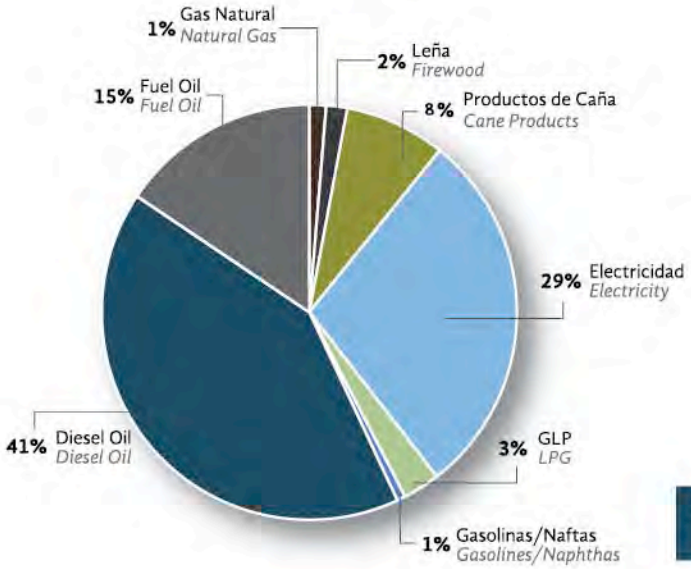
*Figure 1-19 Energy consumption of the economic sectors by energy source.*

**Transporte** / *Transportation*



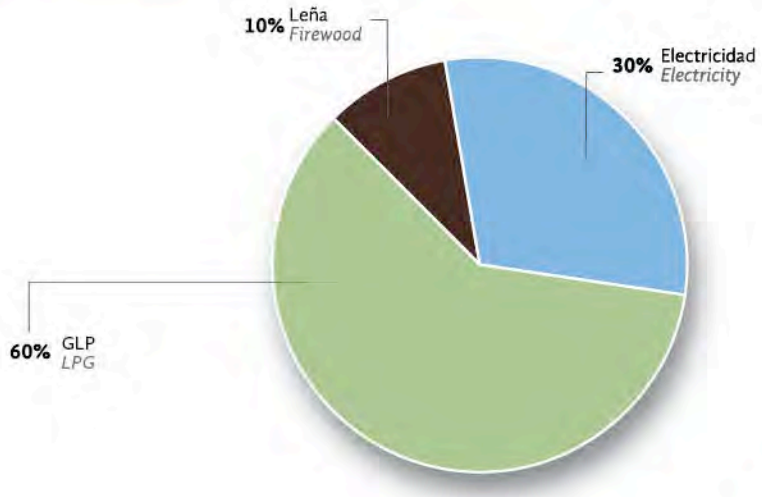

**49 millones de BEP**
***million BOE***

**Industria** / *Industry*



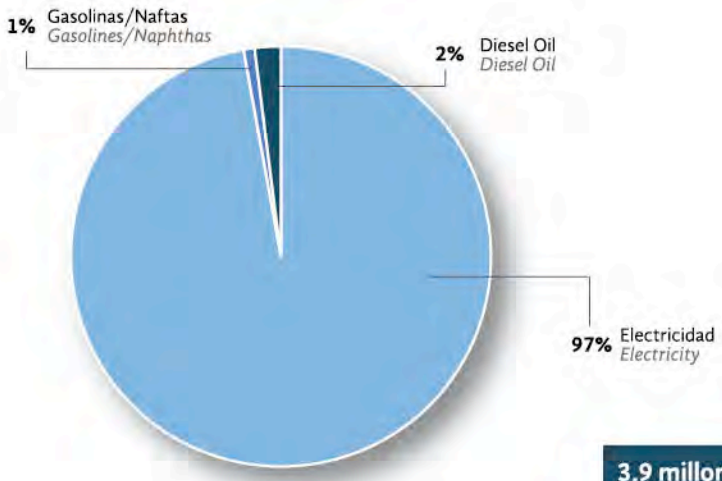

**18 millones de BEP**
***million BOE***

**Residencial** / *Residential*




**12 millones de BEP**
***million BOE***

**Comercial** / *Commercial*

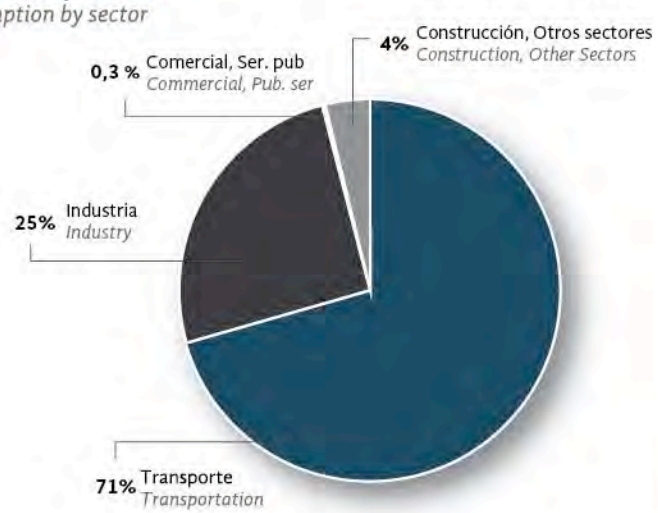



**3,9 millones de BEP**
***million BOE***

## Figura 1-20 Consumo por fuente de los sectores económicos

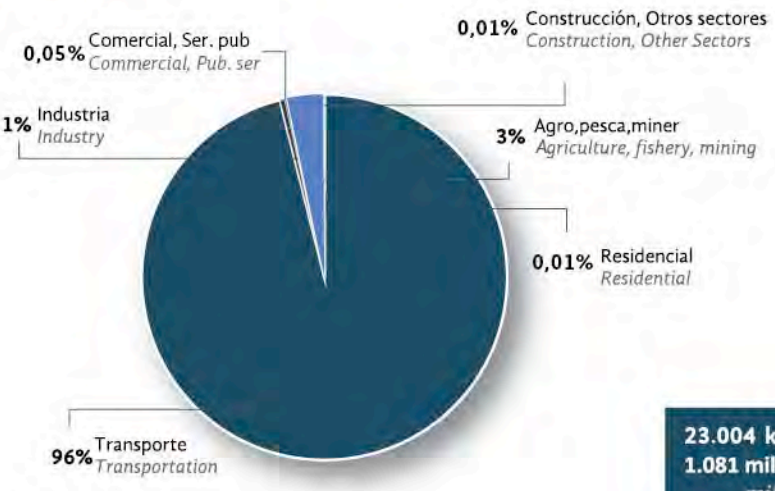
*Figure 1-20 Energy consumption of energy sources by economic sector*

**Consumo de Diésel por sector**
*Diesel consumption by sector*



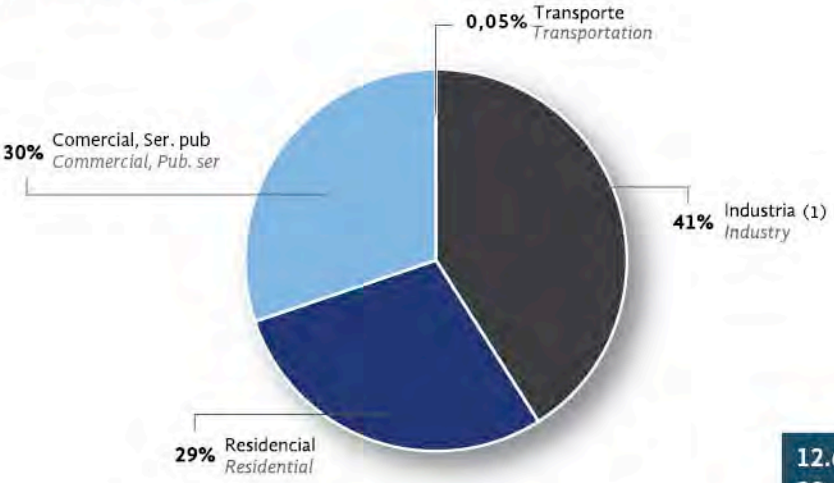

**29.425 kBEP/kBOE**
**1.234 millones galones**
*million gallons*

**Consumo de Gasolinas por sector**
*Gasolines consumption by sector*




**23.004 kBEP/kBOE**
**1.081 millones galones**
*million gallons*

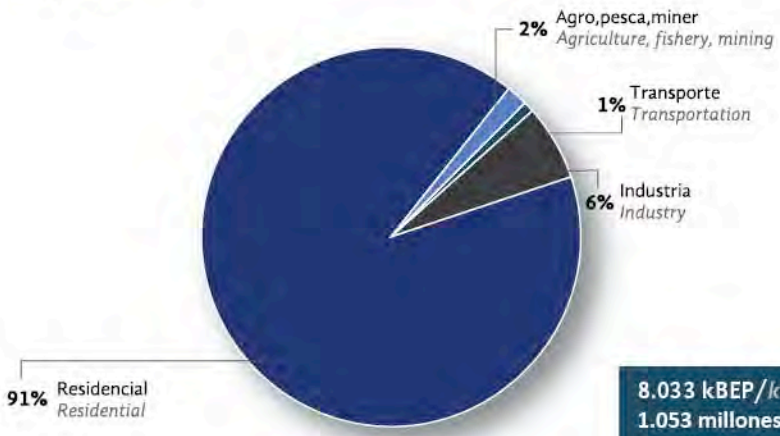
**Consumo de electricidad por sector**
*Electricity consumption by sector*




**12.650 kBEP/kBOE**
**20.417 GWh**

(1) Incluye energía generada no disponible para servicio público y energía entregada a grandes consumidores en subtransmisión[28]
*Includes energy generated that is not available for public use adn enegy delivered to great consumers.*[28]

**Consumo de GLP por sectores**
*LPG Consumption by sector*




**8.033 kBEP/*kBOE***
**1.053 millones kg / *million kg***
**70 millones de cilindros de 15 kg**
***70 million LPG cylinders of 15 kg***

28. CONELEC establece que la energía generada no disponible para servicio público corresponde a la energía utilizada internamente para procesos productivos y de explotación por lo que se ha catalogado a esta variable dentro del segmento industrial. Asimismo, la energía entregada a grandes consumidores en subtransmisión se la cataloga dentro del segmento industrial.
*CONELEC establishes that generated electricity not available for public use corresponds to energy used for productive processes of energy production and has been included in the industrial sector. Electricity delivered to great consumers is also allocated in the industrial sector.*

A nivel geográfico, Guayas es la principal provincia a la cual se abastece de hidrocarburos. En el 2013, el 31% de los despachos de hidrocarburos fueron realizados a esta provincia. Pichincha es la segunda provincia con mayor cantidad de despachos de hidrocarburos (16,5%) seguido por Manabí (8,9%).

*Geographically, Guayas is the main province with more fuel dispatch. In 2013, 31% of fuel dispatch were made to this province. Pichincha province is the second with more fuel dispatch (16.5%) followed by Manabí (8.9%).*

**Figura 1- 21 Despacho de hidrocarburos por provincia 2013**

*Figure 1-21 Fuel dispatch in provinces 2013*

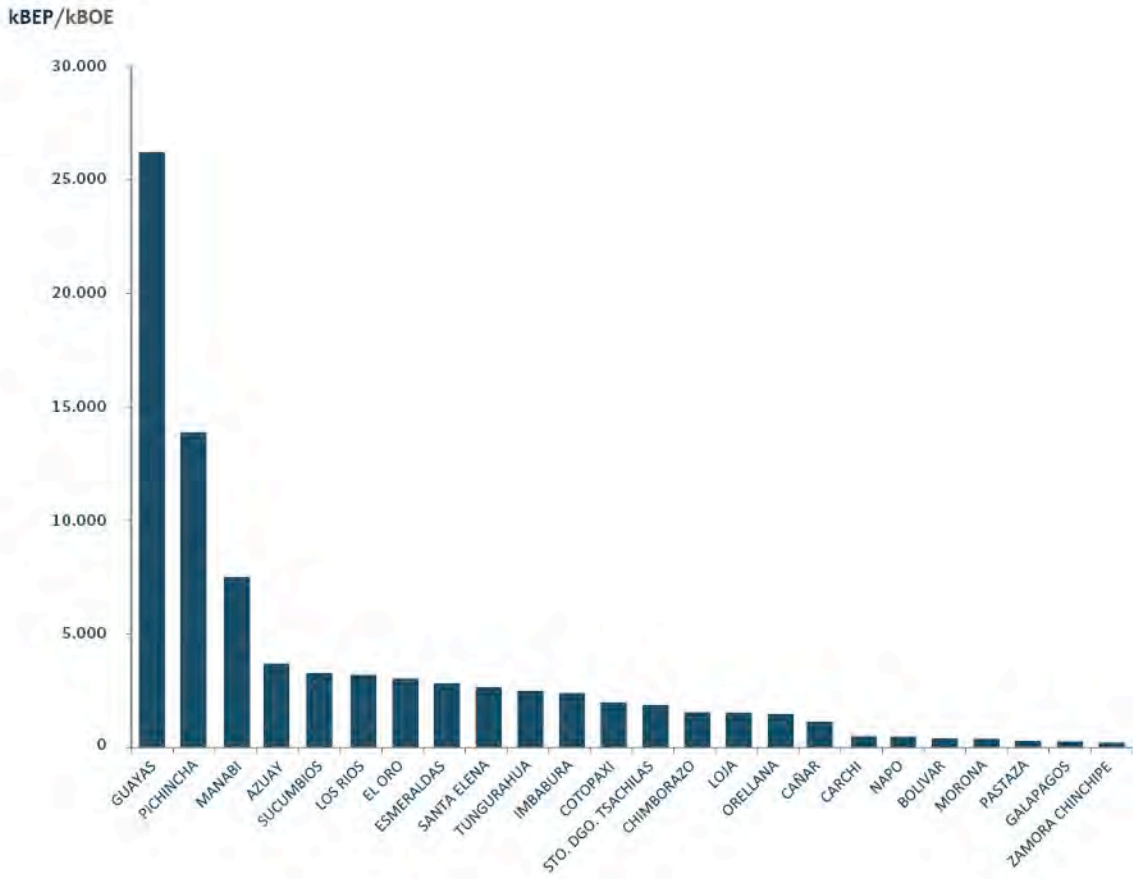
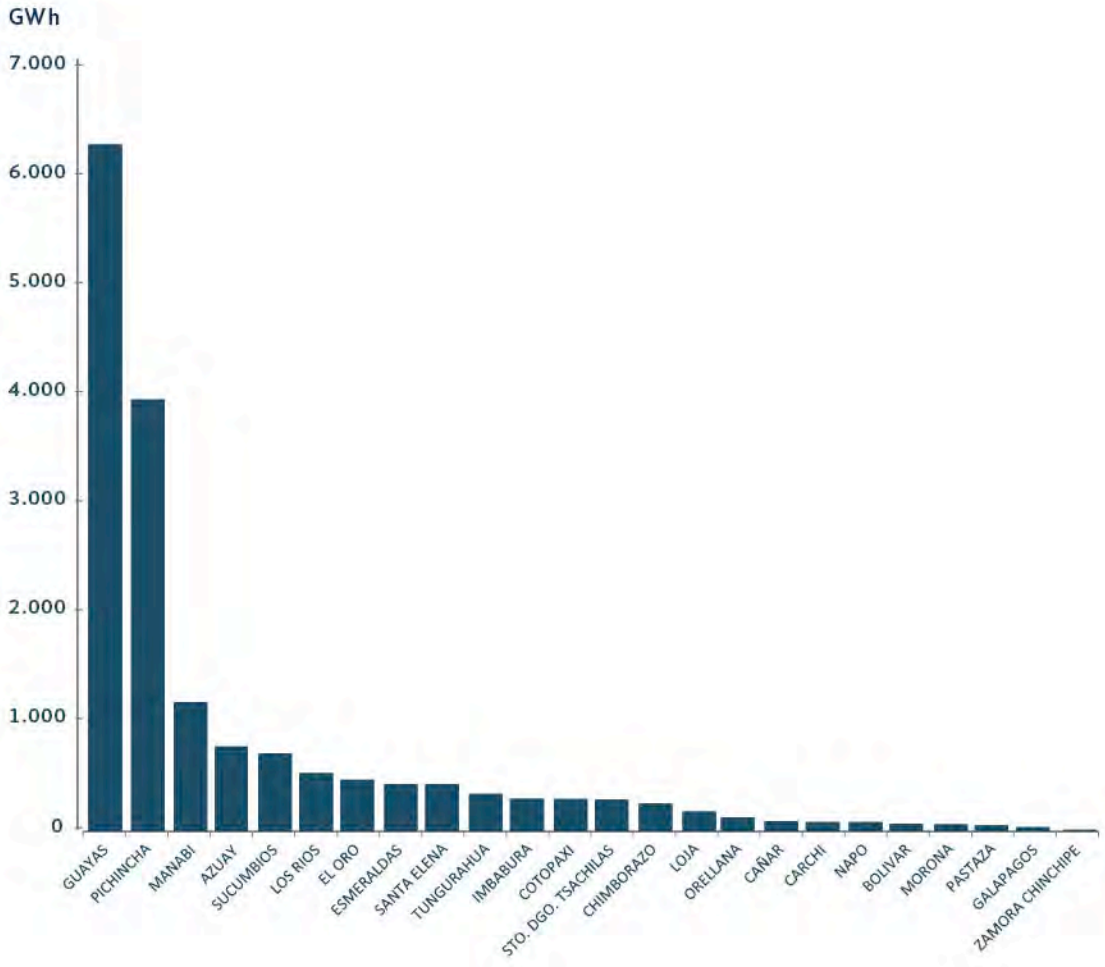


**Figura 1-22 Demanda de electricidad por provincia 2013**

*Figure 1-22 Electricity demand in provinces 2013*



### 1.2.3 Economía, energía y ambiente

El sector energético tiene valiosa importancia en el aspecto económico de un país. De esta manera, al 2013, el Producto Interno Bruto (PIB) petrolero[29] del Ecuador representó el 10% (USD 7 mil millones) en relación al PIB total. Ésta es la segunda participación más alta luego del sector manufacturero (12%).

En el ámbito fiscal, los ingresos provenientes de las exportaciones de petróleo, dentro del Presupuesto General del Estado[30] -PGE-, representaron el 23% (USD 4,7 mil millones).

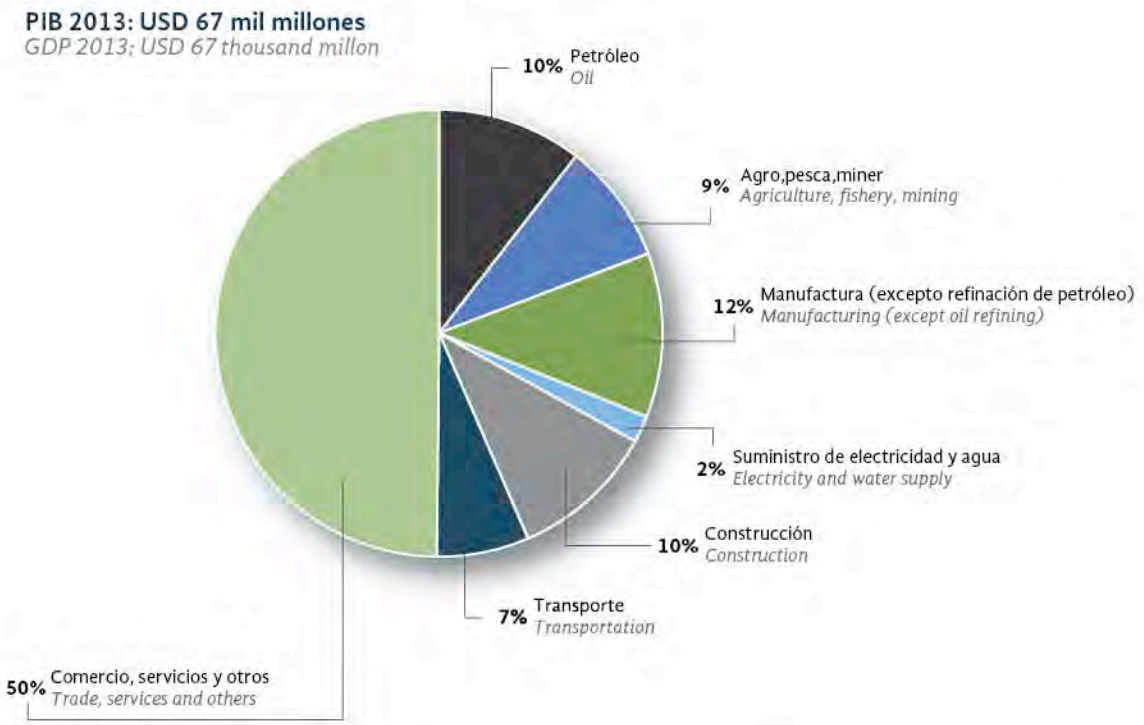
### *1.2.3 Economy, energy and environment*

*The energy sector has a valuable importance in the economy of the country. In 2013, the Oil Industry Gross Domestic Product (GDP[29] of Ecuador represented the 10% (USD 7 thousand million) compared to total GDP. This participation is only surpassed by the manufacturing sector (11,9%).*

*For the central government, income generated by oil exports correspond to 23% of the national budget[30] (USD 4,7 million).*

**Figura 1-23 Estructura porcentual del PIB por industria[31]**

*Figure 1-23 GDP structure by industry[31]*

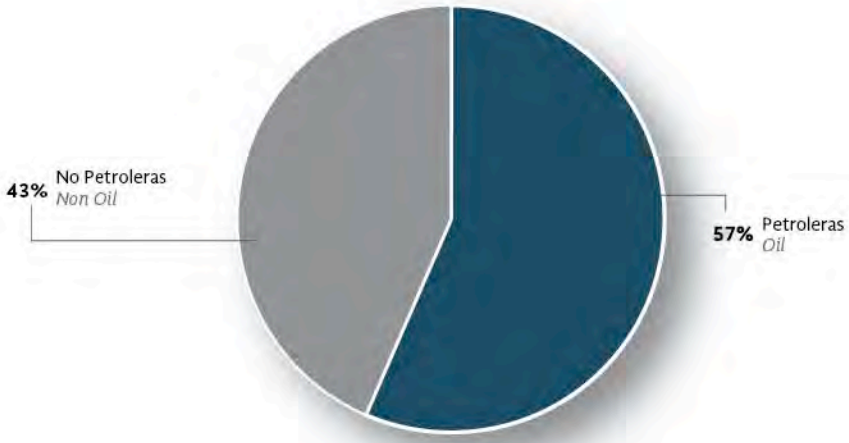



29. Incluye extracción de petróleo, gas natural y actividades relacionadas, además de la Refinación de Petróleo.
*Includes extraction of oil, natural gas and related activities, in addition to the oil refining.*
30. Corresponde a los ingresos del Gobierno Central.
*Central Government income.*
31. A precios del 2007.
*Prices of 2007.*

## Figura 1-24 Exportaciones petroleras y no petroleras

*Figure 1-24 Oil and non-oil exports*

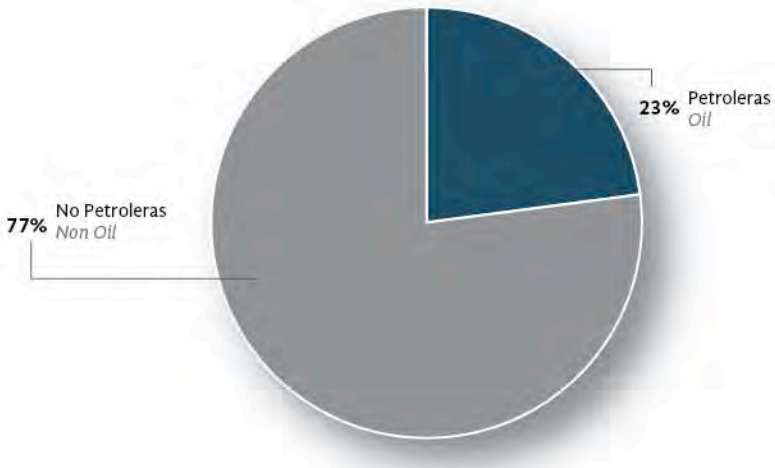
**Exportaciones 2013:USD 24,9 millones**
*Exports 2013:USD 24,9 million*




## Figura 1-25 Ingresos del Gobierno Central

*Figure 1-25 Income of the State*

**Ingresos 2013: USD 20,4 mil millones**
*Income 2013: USD 20,4 thousand million*



El considerable rubro que representan los ingresos obtenidos de las exportaciones petroleras[32] refleja los USD 8 mil millones de superávit de balanza comercial petrolera que Ecuador registró al 2013. Al analizar la balanza comercial de derivados de petróleo muestra un déficit de USD 5,5 mil millones.

Así como la economía forma parte de un eje fundamental en la energía, existen algunos indicadores que permiten medir aspectos relevantes. Uno de los principales indicadores es la intensidad energética total[33] que al 2013 fue de 1,44 BEP/miles de dólares. De igual manera, se puede obtener la intensidad energética de algunos sectores económicos como el industrial (2,27 BEP/miles de dólares), el transporte (10,88 BEP/miles de dólares) y residencial (0,28 BEP/miles de dólares) entre los principales.

Otro indicador importante es el consumo final de energía per-cápita que en el Ecuador fue, al 2013, de 5,4 BEP por habitante. Además, el consumo de energía eléctrica per-cápita se ubicó en 1.321 kWh por habitante.

Finalmente, es necesario vincular al sector energético con el ambiental con el objetivo de diseñar políticas energéticas que promuevan un desarrollo sostenible de los dos sectores. Al 2013, las emisiones de gases de efecto invernadero ascendieron a 46,3 millones de toneladas de $CO_2$[34] equivalentes (45,9 millones del $CO_2$, 0,16 de $N_2O$ y 0,2 de $CH_4$)

Por fuente de energía, el diesel es el principal energético contaminante (32%), seguido por las gasolinas (20%) y el fuel oil (16%). Por actividad, el transporte es el principal sector contaminante (45%), lo cual se relaciona directamente con su nivel de consumo de energía. El sector eléctrico (centrales eléctricas y autoproductores) es el segundo mayor emisor de contaminantes (19%) seguido por el sector industrial (13%), el consumo propio del sector energético (10%) y el sector residencial (8%).

*The considerable inflow of economic resources that oil exports[32] produce reflects the USD 8 thousand millions of trade balance surplus that Ecuador registered in 2013. However, when analysing the oil products trade balance, a deficit of USD 5,5 thousand millions is shown.*

*Such as economy is a fundamental aspect of energy, there are several indicators that help to measure relevant aspects. One of them is the total energy intensity indicator[33] that in 2013 has a value of 1,44 BOE / thousand US dollars. Likewise, the energy intensity of several sectors can be estimated: industry (2,27 BOE / thousand US dollars), transport (10,88 BOE / thousand US dollars) and residential (0,28 BOE / thousand US dollars).*

*Other important indicator is the final energy consumption per capita, which in Ecuador was 5,54 BOE per capita in 2013. Also, the electricity consumption per capita was 1.321kWh per capita.*

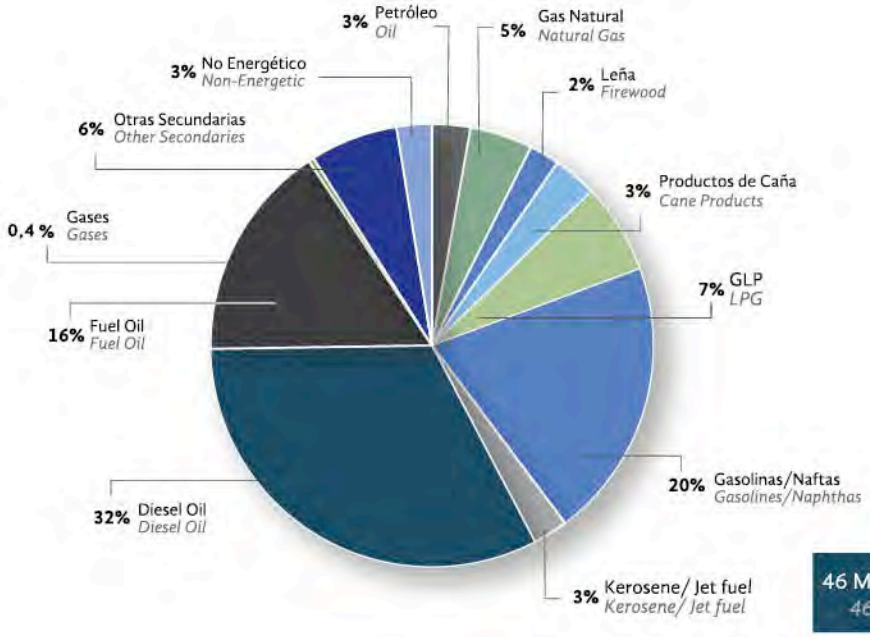
*Finally, it is necessary to link the energy sector and the environmental sector to design energy policies that promote sustainable development of the two sectors. By 2013, emissions of greenhouse gases amounted to 46.3 million tonnes of $CO_2$[34] equivalent (45.9 million of $CO_2$, 0,16 of $N_2O$ and 0,16 of $CH_4$)*

*By energy source, Diesel is the main pollutant fuel (32%), followed by gasoline (20%) and fuel oil (16%). By activity, transport is the main polluting sector (45%), which is directly related to their level of energy consumption. The power sector (power station and electricity autoproducers) is the second polluting (19%) followed by the industrial sector (13%), own consumption of the energy sector (10%) and the residential sector (8%).*

32. Petróleo, crudo y derivados de petróleo
*Oil, crude oil and oil products.*
33. La intensidad energética mide la relación entre el consumo energético y el PIB total de un país en un año determinado.
*Energy intensity measures the relation between energy consumption and the total GDP of a country in a determined year.*
34. Incluye $CO_2$, $CH_4$ y $N_2O$
*Includes $CO_2$, $CH_4$ and $N_2O$*

## Figura 1-26 Emisiones de GEI por fuente

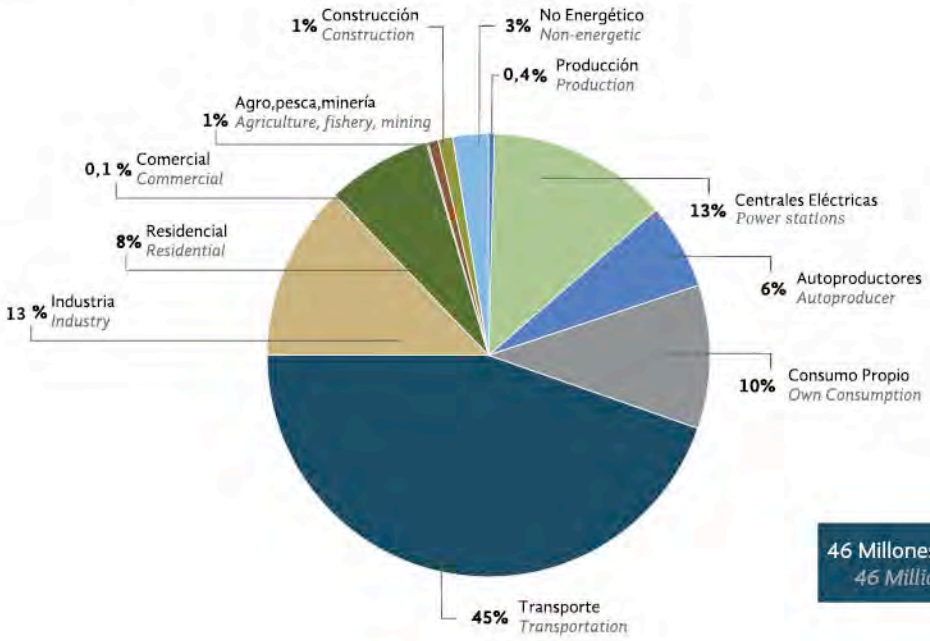
*Figure 1-26 GHG emissions by source*




46 Millones toneladas CO2 eq.
*46 Million tonnes CO2 eq.*

## Figura 1-27 Emisiones de GEI por actividad

*Figure 1-27 GHG emissions by activity*




46 Millones toneladas CO2 eq.
*46 Million tonnes CO2 eq.*

# 2

# Balance de energía primaria y secundaria

## *Primary and secondary energy balance*

En el actual capítulo se estudia la oferta y demanda de las fuentes energéticas. Es decir, se muestra cuantitativamente la cadena de flujos energéticos de fuentes primarias y secundarias. Respecto a la oferta se registra la producción, importación, exportación y variación de existencias de energía. La demanda se desagrega en centros de transformación, pérdidas, ajuste, consumo sectorial energético y consumo no energético. Varios de los resultados se los presenta tanto en unidades físicas como energéticas.

*This chapter studies supply and demand of energy sources. Namely the energy flows of primary and secondary energy sources. Regarding energy supply, the production, import, export and stock variations are presented. Demand is disaggregated in transformation centres, losses, adjustments, sectorial consumption and non-energetic consumption. The results are presented both in energy and physical units.*

Foto: Central Hidroeléctrica Agoyán

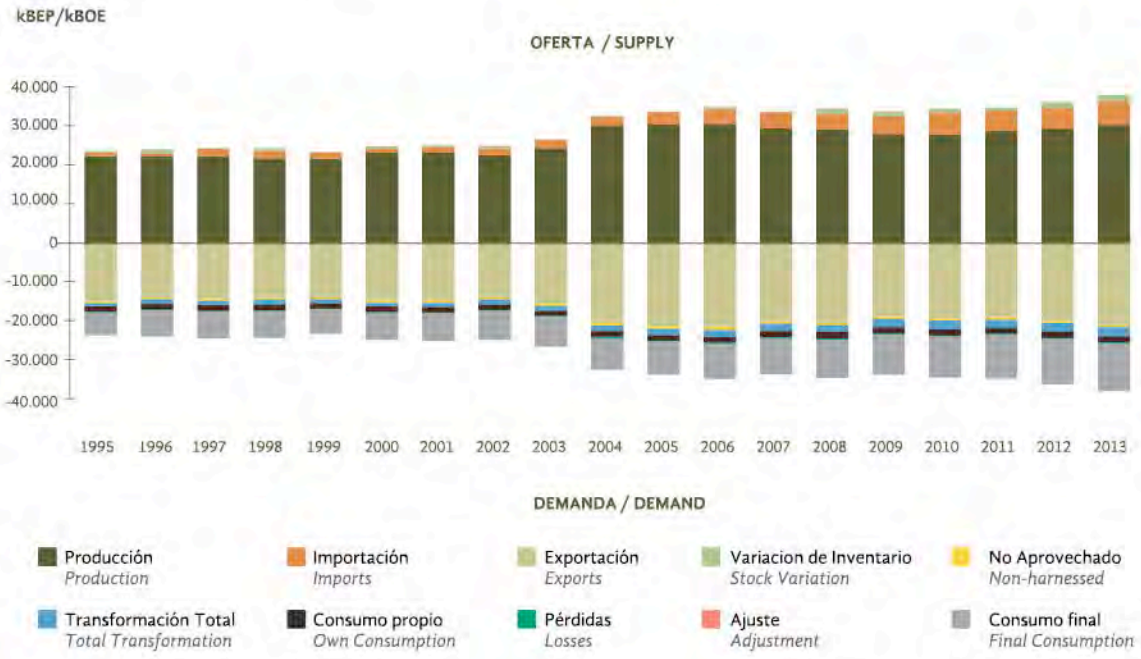
## Tabla 2-1 Balance total de energía (kBEP)

*Table 2-1 National Energy Balance (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción *Production* | 175.101 | 216.184 | 218.876 | 220.712 | 211.708 | 210.390 | 201.468 | 200.732 | 207.521 | 211.126 | 218.599 | 3,5 |
| Importacion *Imports* | 15.368 | 16.431 | 22.518 | 26.342 | 29.058 | 28.053 | 32.037 | 40.961 | 37.397 | 38.780 | 44.258 | 14,1 |
| Exportación *Exports* | 107.275 | 146.873 | 148.696 | 154.586 | 143.323 | 147.144 | 135.791 | 138.941 | 137.221 | 143.603 | 151.736 | 5,7 |
| Variacion de inventario *Stock variation* | -3.886 | 429 | -3.362 | 2.537 | -753 | 9.628 | 8.677 | 6.573 | 4.782 | 10.302 | 10.072 | -2,2 |
| No aprovechado *Non-utilized* | 4.702 | 5.003 | 6.032 | 5.609 | 4.740 | 4.613 | 4.072 | 3.679 | 4.072 | 3.705 | 3.355 | -9,5 |
| Oferta total *Total supply* | 74.606 | 81.167 | 83.305 | 89.395 | 91.951 | 96.313 | 102.319 | 105.646 | 108.407 | 112.900 | 117.838 | 4,4 |
| Refineria *Refinery* | -3.810 | -4.821 | -3.071 | -3.463 | -2.636 | -3.365 | -3.567 | -3.267 | -3.254 | -3.924 | -3.586 | -8,6 |
| Centrales eléctricas *Power stations* | -4.443 | -4.431 | -5.785 | -6.746 | -5.980 | -4.599 | -7.181 | -9.310 | -7.180 | -7.696 | -8.807 | 14,4 |
| Autoproductores *Autoproducers* | -308 | -1.067 | -3.190 | -2.958 | -4.801 | -4.234 | -4.227 | -4.355 | -4.489 | -4.333 | -4.571 | 5,5 |
| Centro de gas *Gas center* | -175 | -182 | -127 | -164 | -110 | -98 | -79 | -41 | -36 | -35 | -26 | -25,4 |
| Destilería *Distillery* | - | - | - | - | - | - | - | - | - | - | - | 27,7 |
| Transformación total *Total transformation* | -8.735 | -10.502 | -12.174 | -13.330 | -13.527 | -12.296 | -15.053 | -16.973 | -14.960 | -15.989 | -16.989 | 6,3 |
| Consumo propio *Own consumption* | 9.728 | 10.597 | 9.676 | 10.891 | 10.966 | 11.852 | 11.616 | 10.985 | 11.287 | 11.499 | 11.519 | 0,2 |
| Pérdidas *Losses* | 1.873 | 2.038 | 2.108 | 2.166 | 2.215 | 2.235 | 2.113 | 2.038 | 2.075 | 2.056 | 1.895 | -7,8 |
| Ajuste *Adjustment* | -173 | -322 | -449 | -567 | -527 | -240 | -5 | - | - | - | - | -107,3 |
| Transporte *Transportation* | 27.857 | 30.385 | 32.374 | 34.497 | 36.804 | 39.294 | 40.797 | 42.114 | 45.121 | 45.999 | 48.551 | 5,5 |
| Industria *Industry* | 11.470 | 12.017 | 10.895 | 12.025 | 11.607 | 12.609 | 14.216 | 14.756 | 15.577 | 16.819 | 18.050 | 7,3 |
| Residencial *Residential* | 10.076 | 10.590 | 11.291 | 11.635 | 11.909 | 11.976 | 11.659 | 11.760 | 11.661 | 12.291 | 12.127 | -1,3 |
| Comercial, Ser. pub *Commercial, Pub. ser* | 2.197 | 2.424 | 2.654 | 2.881 | 3.007 | 3.134 | 2.867 | 2.961 | 3.354 | 3.539 | 3.933 | 11,1 |
| Agro, pesca, miner. *Agriculture,fishing,mining* | 266 | 288 | 348 | 414 | 454 | 547 | 625 | 691 | 731 | 796 | 878 | 10,3 |
| Construcción,otros *Contruction, Others* | 1.300 | 1.356 | 1.079 | 860 | 699 | 839 | 674 | 874 | 1.023 | 1.101 | 1.132 | 2,8 |
| Consumo Energético *Energy Consumption* | 53.166 | 57.059 | 58.640 | 62.313 | 64.481 | 68.400 | 70.838 | 73.157 | 77.467 | 80.545 | 84.670 | 5,1 |
| No Energético *Non-energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |
| **Consumo Final** *Final Consumption* | **54.442** | **58.352** | **59.796** | **63.574** | **65.770** | **70.170** | **73.541** | **75.649** | **80.098** | **83.370** | **87.451** | **4,9** |

## Figura 2-1 Balance total de energía

*Figure 2-1 Total energy balance*



## Tabla 2-2 Oferta interna bruta (kBEP)[35]

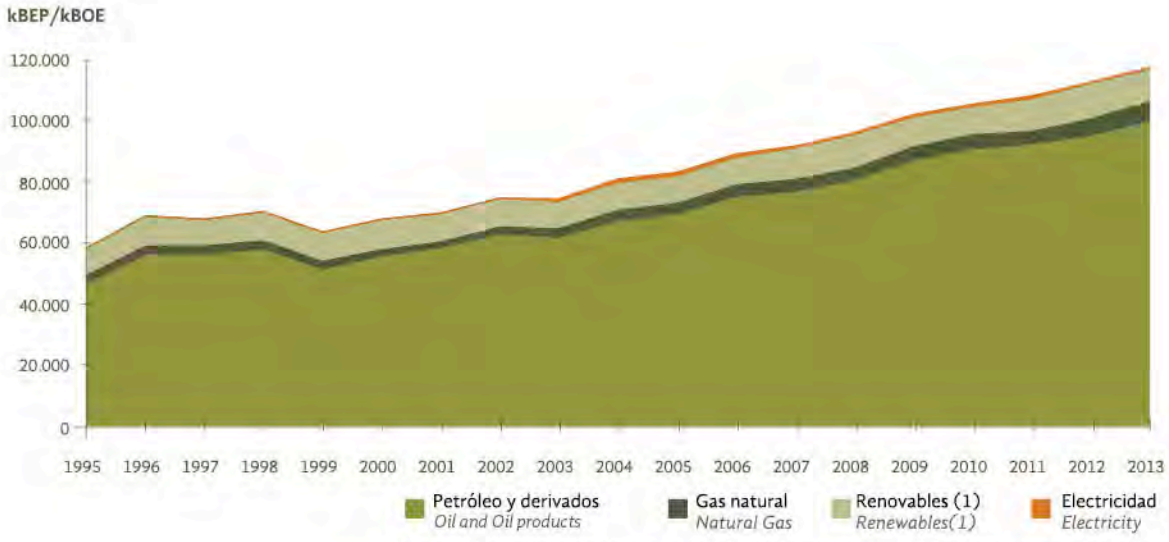
*Table 2-2 Gross internal supply (kBOE)[35]*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo y derivados *Oil and Oil products* | 61.763 | 67.312 | 69.469 | 75.229 | 76.807 | 80.618 | 87.263 | 90.901 | 92.338 | 95.265 | 100.163 | 5,1 |
| Gas natural *Natural Gas* | 3.001 | 3.505 | 3.600 | 3.930 | 4.135 | 3.906 | 4.362 | 4.715 | 4.331 | 5.509 | 6.377 | 15,8 |
| Renovables (1) *Renewables(1)* | 9.190 | 9.354 | 9.178 | 9.264 | 10.498 | 11.503 | 10.012 | 9.496 | 10.944 | 11.986 | 10.905 | (9,0) |
| Electricidad *Electricity* | 652 | 995 | 1.058 | 972 | 510 | 287 | 682 | 535 | 793 | 140 | 392 | 179,8 |
| **OFERTA TOTAL** *TOTAL SUPPLY* | 74.606 | 81.167 | 83.305 | 89.395 | 91.951 | 96.313 | 102.319 | 105.646 | 108.407 | 112.900 | 117.838 | 4,4 |

(1) Incluye hidroenergía, leña y productos de caña / *Includes hydroenergy, firewood and sugar cane products.*

## Figura 2-2 Oferta interna bruta (kBEP)

*Figure 2-2 Gross internal supply (kBOE)*




(1) Incluye hidroenergía, leña y productos de caña / *Includes hydroenergy, firewood and sugar cane products.*

35. En el caso de la oferta interna bruta de energías secundarias (derivados de hidrocarburos y electricidad), no se incluye la producción, en virtud que, de acuerdo a la metodología, la oferta interna bruta nacional solo incluye fuentes primarias. La producción de fuentes secundarias es registrada dentro de los centros de transformación.
*For the case of gross internal secondary energy supply (oil products and electricity), production is not included because according to the methodology, gross internal energy supply only includes primary sources. The production of secondary energy sources is registered in transformation centres.*

## Tabla 2-3 Estructura porcentual de la oferta interna bruta (%)

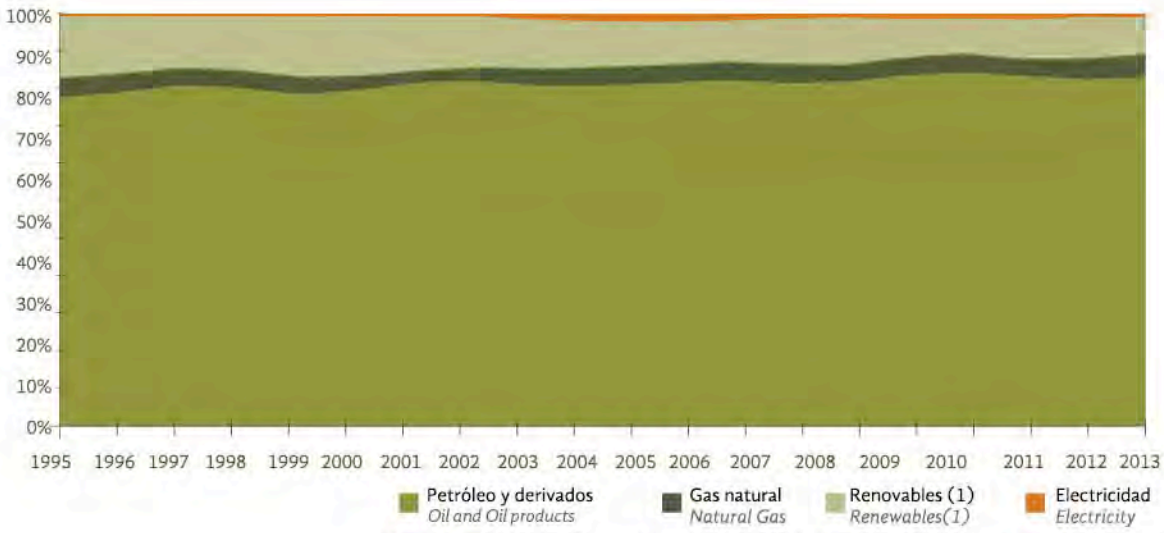
*Table 2-3 Gross internal supply structure (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo y derivados<br>*Oil and Oil products* | 82,8 | 82,9 | 83,4 | 84,2 | 83,5 | 83,7 | 85,3 | 86,0 | 85,2 | 84,4 | 85,0 |
| Gas natural<br>*Natural Gas* | 4,0 | 4,3 | 4,3 | 4,4 | 4,5 | 4,1 | 4,3 | 4,5 | 4,0 | 4,9 | 5,4 |
| Renovables (1)<br>*Renewables(1)* | 12,3 | 11,5 | 11,0 | 10,4 | 11,4 | 11,9 | 9,8 | 9,0 | 10,1 | 10,6 | 9,3 |
| Electricidad<br>*Electricity* | 0,9 | 1,2 | 1,3 | 1,1 | 0,6 | 0,3 | 0,7 | 0,5 | 0,7 | 0,1 | 0,3 |
| **OFERTA TOTAL**<br>*TOTAL SUPPLY* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

(1) Incluye hidroenergía, leña y productos de caña / *Includes hydroenergy, firewood and sugar cane products.*

## Figura 2-3 Estructura porcentual de la oferta interna bruta (%)

*Figure 2-3 Gross internal supply structure (%)*




(1) Incluye hidroenergía, leña y productos de caña / *Includes hydroenergy, firewood and sugar cane products.*

## 2.1 Energía Primaria / *Primary Energy*

### Tabla 2-4 Producción de energía primaria (kBEP)

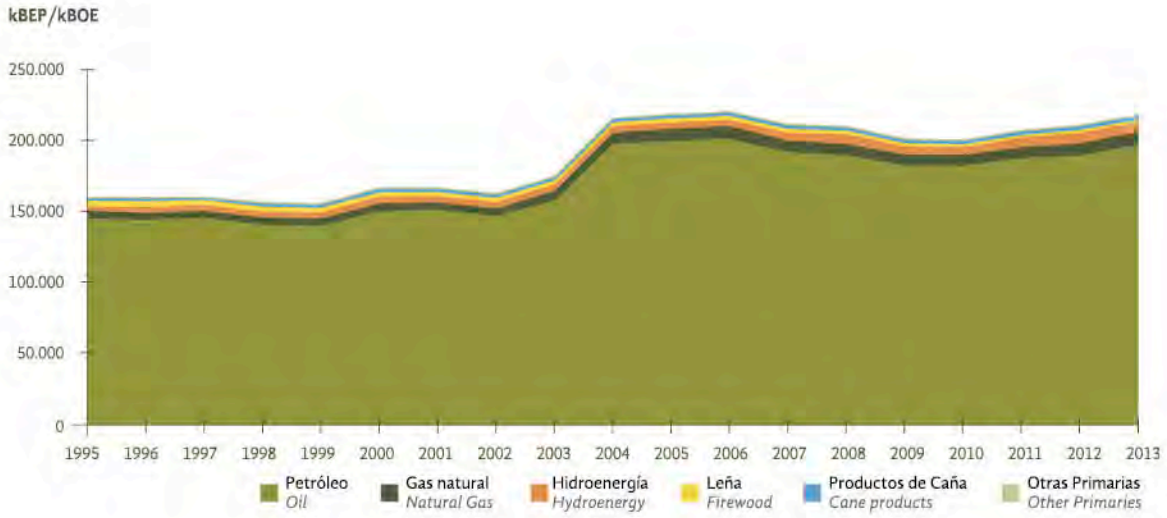
*Table 2-4 Primary energy production (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | 158.208 | 198.321 | 200.066 | 201.909 | 192.334 | 190.368 | 183.021 | 182.842 | 188.174 | 189.926 | 197.962 | 4,2 |
| Gas Natural *Natural Gas* | 7.703 | 8.508 | 9.632 | 9.539 | 8.875 | 8.519 | 8.434 | 8.394 | 8.403 | 9.214 | 9.732 | 5,6 |
| Hidroenergía *Hydro Energy* | 4.449 | 4.592 | 4.264 | 4.417 | 5.600 | 6.999 | 5.716 | 5.351 | 6.898 | 7.582 | 6.840 | -9,8 |
| Leña *Firewood* | 2.765 | 2.730 | 2.745 | 2.650 | 2.540 | 2.374 | 2.136 | 1.992 | 1.618 | 1.909 | 1.486 | -22,2 |
| Productos de Caña *Cane products* | 1.976 | 2.032 | 2.168 | 2.197 | 2.358 | 2.128 | 2.158 | 2.151 | 2.426 | 2.493 | 2.543 | 2,0 |
| Otras Primarias (1) *Other Primaries* | - | - | - | - | 1 | 2 | 2 | 2 | 2 | 2 | 36 | 2058,1 |
| **Total Primarias** *Total primaries* | 175.101 | 216.184 | 218.876 | 220.712 | 211.708 | 210.390 | 201.468 | 200.732 | 207.521 | 211.126 | 218.599 | 3,5 |

(1) Incluye eólica y solar / *Includes eolic and solar*

### Figura 2-4 Producción de energía primaria

*Figure 2-4 Primary energy production*



## Tabla 2-5 Estructura porcentual de la producción energía primaria (%)

*Table 2-5 Primary energy structure (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo<br>*Oil* | 90,4 | 91,7 | 91,4 | 91,5 | 90,8 | 90,5 | 90,8 | 91,1 | 90,7 | 90,0 | 90,6 |
| Gas Natural<br>*Natural Gas* | 4,4 | 3,9 | 4,4 | 4,3 | 4,2 | 4,0 | 4,2 | 4,2 | 4,0 | 4,4 | 4,5 |
| Hidroenergía<br>*Hydro Energy* | 2,5 | 2,1 | 1,9 | 2,0 | 2,6 | 3,3 | 2,8 | 2,7 | 3,3 | 3,6 | 3,1 |
| Leña<br>*Firewood* | 1,6 | 1,3 | 1,3 | 1,2 | 1,2 | 1,1 | 1,1 | 1,0 | 0,8 | 0,9 | 0,7 |
| Productos de Caña<br>*Cane products* | 1,1 | 0,9 | 1,0 | 1,0 | 1,1 | 1,0 | 1,1 | 1,1 | 1,2 | 1,2 | 1,2 |
| Otras Primarias<br>*Other Primaries* | - | - | - | - | - | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 | 0,017 |
| **Total Primarias**<br>*Total primaries* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

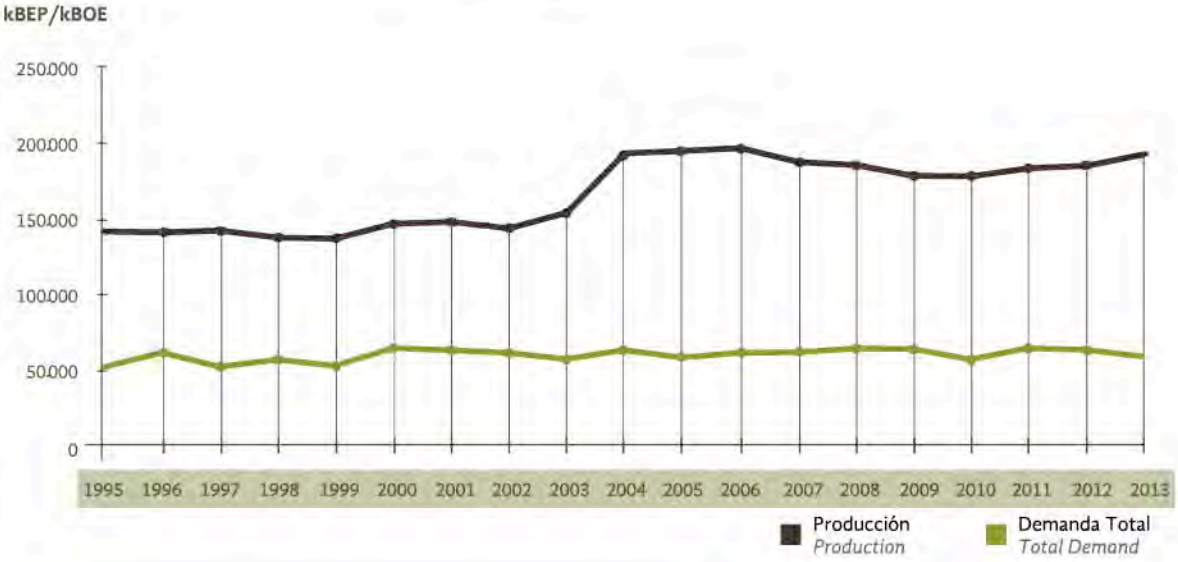
## Tabla 2-6 Oferta y Demanda de energía primaria (kBEP)

*Table 2-6 Supply and demand of primary energy (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción<br>*Production* | 175.101 | 216.184 | 218.876 | 220.712 | 211.708 | 210.390 | 201.468 | 200.732 | 207.521 | 211.126 | 218.599 | 3,5 |
| Exportación<br>*Exports* | 95.286 | 133.345 | 135.596 | 140.789 | 127.872 | 131.420 | 123.193 | 128.249 | 125.433 | 133.454 | 144.510 | 8,3 |
| Variación de Inventario<br>*Stock Variation* | -4.519 | -329 | -5.034 | 1.558 | -1.338 | 6.588 | 5.552 | 3.645 | 2.991 | 8.185 | 6.798 | -16,9 |
| No aprovechado<br>*Non-utilized* | 4.702 | 5.003 | 6.032 | 5.609 | 4.740 | 4.613 | 4.072 | 3.679 | 4.072 | 3.705 | 3.355 | -9,5 |
| Oferta total<br>*Total supply* | 70.594 | 77.507 | 72.214 | 75.872 | 77.758 | 80.945 | 79.754 | 72.448 | 81.006 | 82.152 | 77.533 | -5,6 |
| Refinería<br>*Refinery* | 57.572 | 63.713 | 58.429 | 61.431 | 61.221 | 63.472 | 63.305 | 56.077 | 63.470 | 62.249 | 57.586 | -7,5 |
| Centrales eléctricas<br>*Power plants* | 5.851 | 5.937 | 5.733 | 5.912 | 7.054 | 8.098 | 7.185 | 7.049 | 8.022 | 9.638 | 9.302 | -3,5 |
| Autoproductores<br>*Autoproducers* | 273 | 892 | 3.181 | 3.048 | 4.847 | 4.288 | 3.777 | 4.034 | 4.482 | 4.651 | 4.903 | 5,4 |
| Centro de gas<br>*Gas center* | 1.491 | 1.588 | 1.373 | 1.268 | 1.024 | 1.182 | 1.297 | 1.321 | 1.328 | 1.424 | 1.761 | 23,7 |
| Transformación total<br>*Total transformation* | 65.187 | 72.129 | 68.716 | 71.658 | 74.145 | 77.040 | 75.563 | 68.482 | 77.329 | 77.988 | 73.585 | -5,6 |
| Consumo propio<br>*Own consumption* | 666 | 616 | 637 | 695 | 655 | 715 | 733 | 736 | 719 | 761 | 810 | 6,5 |
| Industria<br>*industry* | 2.291 | 2.343 | 418 | 1.160 | 701 | 1.093 | 1.594 | 1.516 | 1.624 | 1.785 | 1.949 | 9,2 |
| Residencial<br>*Residential* | 2.450 | 2.419 | 2.442 | 2.359 | 2.257 | 2.097 | 1.864 | 1.714 | 1.334 | 1.619 | 1.189 | -26,5 |
| Consumo Energético<br>*Energy consumption* | 4.741 | 4.762 | 2.860 | 3.519 | 2.958 | 3.190 | 3.458 | 3.230 | 2.958 | 3.404 | 3.138 | -7,8 |
| **Demanda total**<br>*Total demand* | 70.594 | 77.507 | 72.214 | 75.872 | 77.758 | 80.945 | 79.754 | 72.448 | 81.006 | 82.152 | 77.533 | -5,6 |

## Figura 2-5 Oferta y demanda de energía primaria

*Figure 2-5 Supply and demand of primary energy*




## 2.1.1 Petróleo
*2.1.1 Oil*

## Tabla 2-7 Oferta y demanda de petróleo (kbbl)

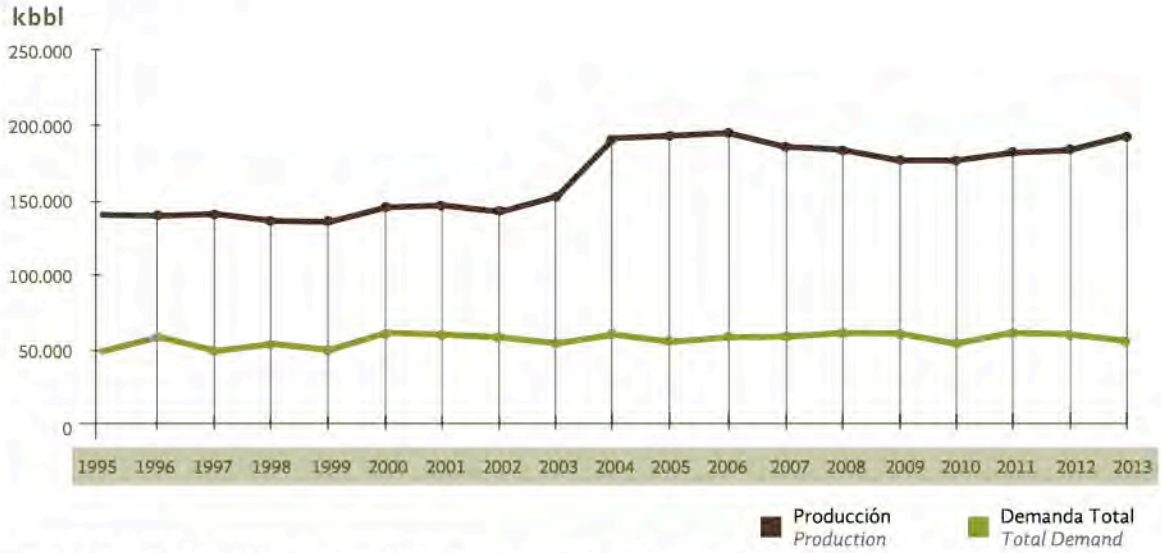
*Table 2-7 Supply and demand of oil*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 153.539 | 192.469 | 194.162 | 195.950 | 186.658 | 184.750 | 177.620 | 177.447 | 182.621 | 184.321 | 192.120 | 4,2 |
| Exportación (2) *Exports (2)* | 92.474 | 129.410 | 131.595 | 136.634 | 124.098 | 127.542 | 119.558 | 124.464 | 121.732 | 129.516 | 140.245 | 8,3 |
| Variación de Inventario *Stock Variation* | -4.385 | -319 | -4.885 | 1.512 | -1.298 | 6.394 | 5.388 | 3.537 | 2.902 | 7.944 | 6.598 | -16,9 |
| Oferta total *Total supply* | 56.680 | 62.740 | 57.682 | 60.828 | 61.262 | 63.602 | 63.450 | 56.519 | 63.791 | 62.749 | 58.473 | -6,8 |
| Refinería (3) *Refinery (3)* | 55.874 | 61.833 | 56.705 | 59.618 | 59.414 | 61.599 | 61.437 | 54.422 | 61.597 | 60.412 | 55.886 | -7,5 |
| Autoproductores *Autoproducers* | 160 | 309 | 359 | 537 | 1.212 | 1.309 | 1.302 | 1.382 | 1.495 | 1.599 | 1.800 | 12,6 |
| Transformación total *Total transformation* | 56.033 | 62.142 | 57.064 | 60.154 | 60.626 | 62.908 | 62.739 | 55.805 | 63.093 | 62.011 | 57.687 | -7,0 |
| Consumo propio (4) *Own consumption* | 646 | 598 | 618 | 674 | 636 | 694 | 711 | 715 | 698 | 738 | 786 | 6,5 |
| **Demanda total** *Total demand* | 56.680 | 62.740 | 57.682 | 60.828 | 61.262 | 63.602 | 63.450 | 56.519 | 63.791 | 62.749 | 58.473 | -6,8 |

(1) Corresponde la producción de campo de compañías públicas y privadas / *Comprises production of public and private oil fields.*
(2) *Incluye crudo reducido / Includes oil residue*
(3) *Incluye plantas topping / Includes topping plants*
(4) *Consumo en SOTE / Consumption of the Oil Pipeline "SOTE"*

## Figura 2-6 Petróleo

*Figure 2-6 Oil*



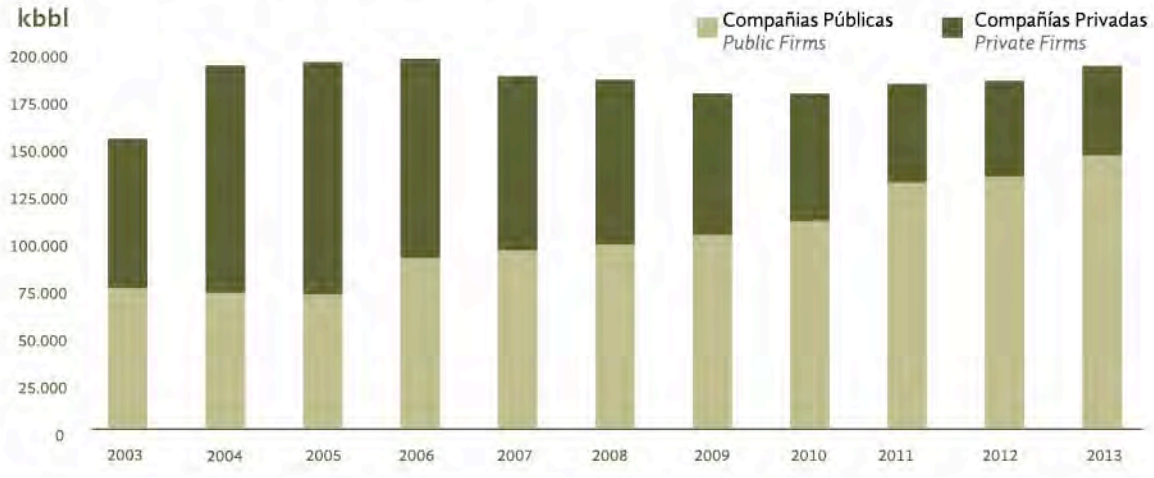

## Tabla 2-8 Producción de petróleo de compañías públicas y privadas (kbbl)

*Table 2-8 Public and private oil production*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción *Production* | 153.539 | 192.469 | 194.162 | 195.950 | 186.658 | 184.750 | 177.620 | 177.447 | 182.621 | 184.321 | 192.120 | 4,2 |
| Compañías Públicas *Public firms* | 74.514 | 71.948 | 70.972 | 90.438 | 94.334 | 97.571 | 102.768 | 109.944 | 130.528 | 133.656 | 144.921 | 8,4 |
| Compañías Privadas *Private firms* | 79.025 | 120.521 | 123.190 | 105.512 | 92.324 | 87.180 | 74.853 | 67.502 | 52.093 | 50.665 | 47.199 | -6,8 |

## Figura 2-7 Producción de Petróleo

*Figure 2-7 Public and private oil production*



## 2.1.2 Gas Natural
*2.1.2 Natural Gas*

### Tabla 2-9 Oferta y demanda de gas natural (MMcf)
*Table 2-9 Supply and demand of natural gas (MMcf)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 45.485 | 50.241 | 56.878 | 56.328 | 52.405 | 50.301 | 49.804 | 49.563 | 49.621 | 54.408 | 57.469 | 5,6 |
| Libre *Free* | 8.810 | 8.523 | 9.301 | 10.005 | 10.513 | 8.872 | 10.550 | 11.776 | 8.630 | 15.375 | 18.219 | 18,5 |
| Asociado *Associated* | 36.675 | 41.717 | 47.577 | 46.323 | 41.891 | 41.429 | 39.254 | 37.787 | 40.991 | 39.033 | 39.250 | 0,6 |
| No aprovechado(2)=(1)-(3) *Non-utilized (2)=(1)-(3)* | 27.763 | 29.544 | 35.621 | 33.123 | 27.987 | 27.239 | 24.044 | 21.724 | 24.044 | 21.878 | 19.811 | -9,5 |
| Oferta Total *Total supply* | 17.722 | 20.697 | 21.257 | 23.204 | 24.418 | 23.062 | 25.760 | 27.840 | 25.577 | 32.530 | 37.658 | 15,8 |
| Centrales Eléctricas *Power Stations* | 8.782 | 8.489 | 9.245 | 9.892 | 10.427 | 8.794 | 10.449 | 11.688 | 8.474 | 13.997 | 16.206 | 15,8 |
| Autoproductores *Autoproducers* | 137 | 2.832 | 3.904 | 5.828 | 7.947 | 7.286 | 7.652 | 8.352 | 9.234 | 9.237 | 9.660 | 4,6 |
| Centro de gas *Gas Center* | 8.803 | 9.375 | 8.108 | 7.485 | 6.044 | 6.982 | 7.659 | 7.800 | 7.842 | 8.408 | 10.400 | 23,7 |
| Transformacion total (3) *Total Transformation* | 17.722 | 20.697 | 21.257 | 23.204 | 24.418 | 23.062 | 25.760 | 27.840 | 25.550 | 31.643 | 36.266 | 14,6 |
| Industria *Industry* | - | - | - | - | - | - | - | - | 27 | 887 | 1.393 | 57,0 |
| Consumo final *Final consumption* | - | - | - | - | - | - | - | - | 27 | 887 | 1.393 | 57,0 |

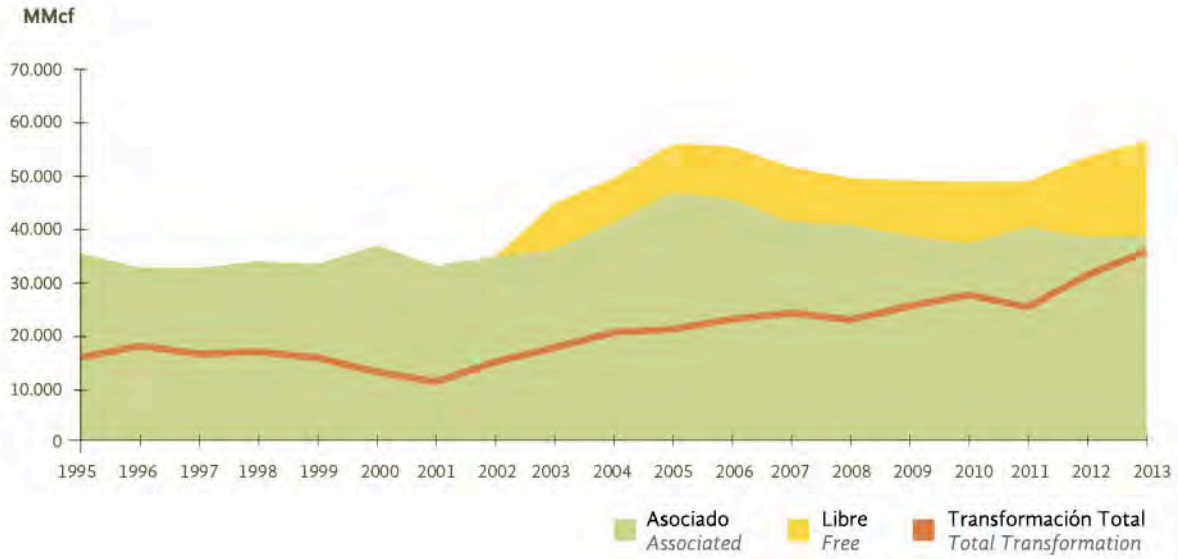
(1) Gas natural libre y asociado / *Free (non-associated) and associated natural gas.*
(2) Diferencia entre la producción de gas natural (libre y asociado), la cantidad de gas natural que ingresó a centros de transformación (generación eléctrica, autogeneración y centro de gas) y lo utilizado por la industria. / *Difference between natural gas (free and associated) and the quantity of natural gas that entered transformation centres (electricity generation, auto-generation and gas centres).*

### Tabla 2-10 Demanda de gas natural del sector industrial (MMcf)
*Table 2-10 Natural gas demand in the industrial sector (MMcf)*

| Industria / *Industry* | Provincia / *Province* | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|
| Cerámica *Ceramic* | Azuay | 26,6 | 654,8 | 944,8 | 44,3 |
| | Pichincha | - | 232,5 | 346,5 | 49,0 |
| | Chimborazo | - | - | 89,6 | |
| Subtotal *Subtotal* | | 26,6 | 887,3 | 1.381,0 | - |
| Plásticos *Plastics* | Guayas | - | - | 11,6 | - |
| **Total** *Total* | | **26,6** | **887,3** | **1.392,6** | **57,0** |

## Figura 2-8 Gas natural

*Figure 2-8 Natural Gas*




## 2.1.3 Hidroenergía

*2.1.3 Hidro Energy*

## Tabla 2-11 Oferta y demanda de hidroenergia (GWh)

*Table 2-11 Supply and demand of hydroenergy*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Centrales Eléctricas *Power Stations* | 7.042 | 7.261 | 6.727 | 6.838 | 8.534 | 10.663 | 8.737 | 8.179 | 10.628 | 11.727 | 10.525 | -10,2 |
| Autoproductores *Autoproducers* | 138 | 151 | 156 | 291 | 505 | 633 | 488 | 457 | 505 | 511 | 514 | 0,6 |
| **Transformación total** *Total transformation* | 7.180 | 7.412 | 6.883 | 7.130 | 9.039 | 11.296 | 9.225 | 8.636 | 11.133 | 12.238 | 11.039 | -9,8 |

## 2.1.4 Leña
*2.1.4 Firewood*

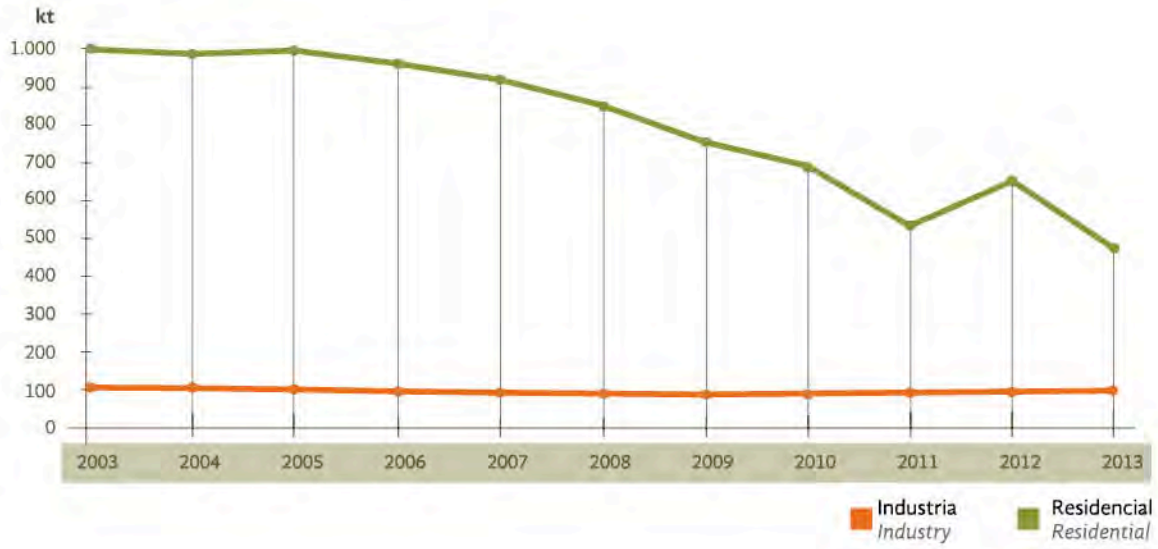
### Tabla 2-12 Oferta y demanda de leña (kt)

*Table 2-12 Supply and demand of firewood*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción *Production* | 1.065 | 1.052 | 1.058 | 1.021 | 979 | 915 | 823 | 767 | 623 | 735 | 572 | -22,2 |
| Industria *Industry* | 121 | 119 | 116 | 112 | 109 | 106 | 104 | 107 | 109 | 111 | 114 | 2,2 |
| Residencial *Residential* | 945 | 933 | 941 | 909 | 870 | 808 | 719 | 661 | 514 | 624 | 459 | -26,5 |

### Figura 2-9 Leña

*Figure 2-9 Firewood*



## 2.1.5 Bagazo de Caña
*2.1.5 Sugar cane bagasse*

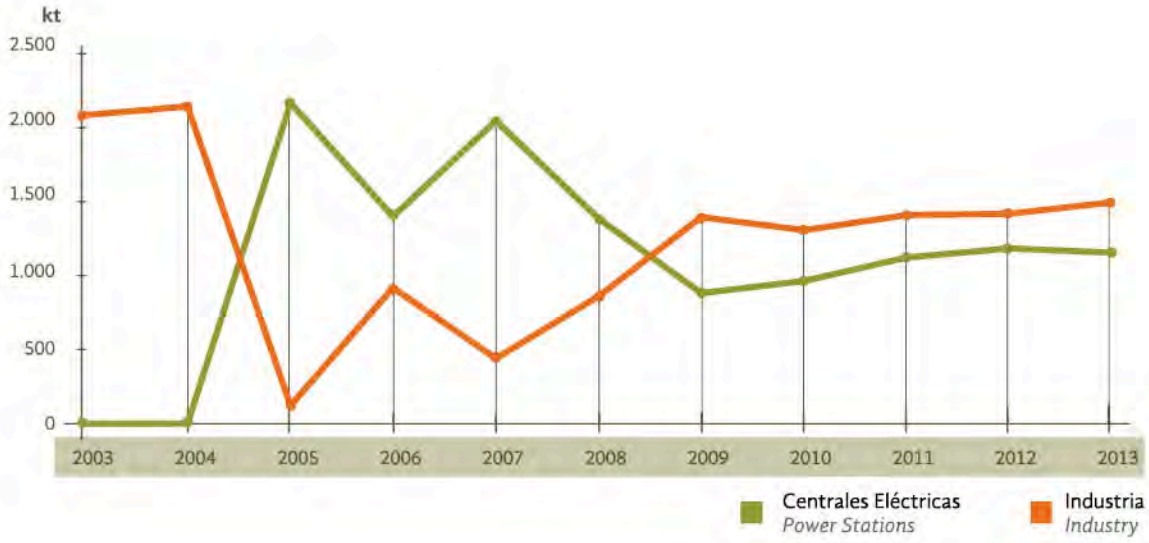
### Tabla 2-13 Oferta y demanda de bagazo de caña (kt)

*Table 2-13 Supply and demand of sugar cane bagasse*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción *Production* | 1.976 | 2.032 | 2.168 | 2.196 | 2.357 | 2.128 | 2.158 | 2.150 | 2.400 | 2.466 | 2.510 | 1,8 |
| Centrales eléctricas *Power stations* | - | - | 2.053 | 1.327 | 1.939 | 1.312 | 836 | 912 | 1.064 | 1.122 | 1.093 | -2,6 |
| Industria *Industry* | 1.976 | 2.032 | 115 | 869 | 417 | 815 | 1.321 | 1.238 | 1.335 | 1.344 | 1.416 | 5,4 |

### Figura 2-10 Bagazo de Caña

*Figure 2-10 Sugar cane bagasse*



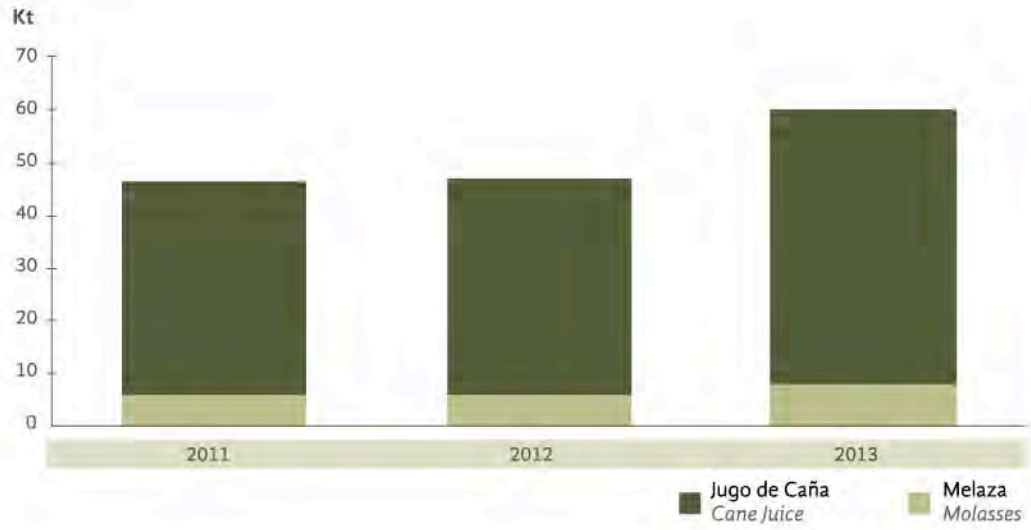
## 2.1.6 Melaza y jugo de caña
*2.1.6 Molasses and cane juice*

### Tabla 2-14 Oferta y demanda de melaza y jugo de caña (kt)
*Table 2-14 Supply and demand of Molasses and cane juice*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Melaza *Molasses* | - | - | - | - | - | - | - | - | 5,98 | 6,04 | 7,72 |
| Jugo de Caña *Cane juice* | - | - | - | - | - | - | - | - | 40,67 | 41,06 | 52,45 |
| Destilería *Destillery* | - | - | - | - | - | - | - | - | 46,66 | 47,10 | 60,17 |

*Estimación realizada a partir del registro de etanol utilizado en la producción de gasolina ecopaís.

### Figura 2-11 Melaza y jugo de caña
*Figure 2-11 Molasses and cane juice*

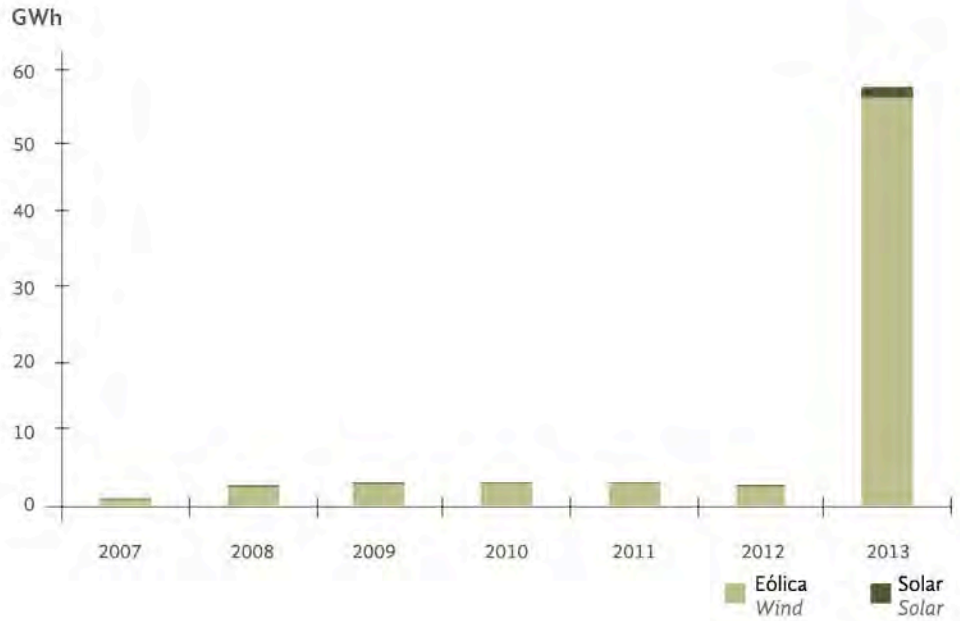


## 2.1.7 Otras Primarias
## *2.1.7 Other Primaries*

### Tabla 2-15 Otras primarias (GWh)
*Table 2-15 Other primaries*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eólica *Wind* | - | - | - | - | 0,962 | 2,682 | 3,204 | 3,435 | 3,34 | 2,40 | 56,70 | 2.264 |
| Solar *Solar* | - | - | 0,012 | 0,015 | 0,018 | 0,027 | 0,008 | - | 0,06 | 0,32 | 2,02 | 526 |
| Total *Total* | - | - | 0,012 | 0,015 | 0,980 | 2,709 | 3,212 | 3,435 | 3,40 | 2,72 | 58,72 | 2.058 |

### Figura 2-12 Otras primarias
*Figure 2-12 Other primaries*



## 2.2 Energía Secundaria / *Secondary Energy*

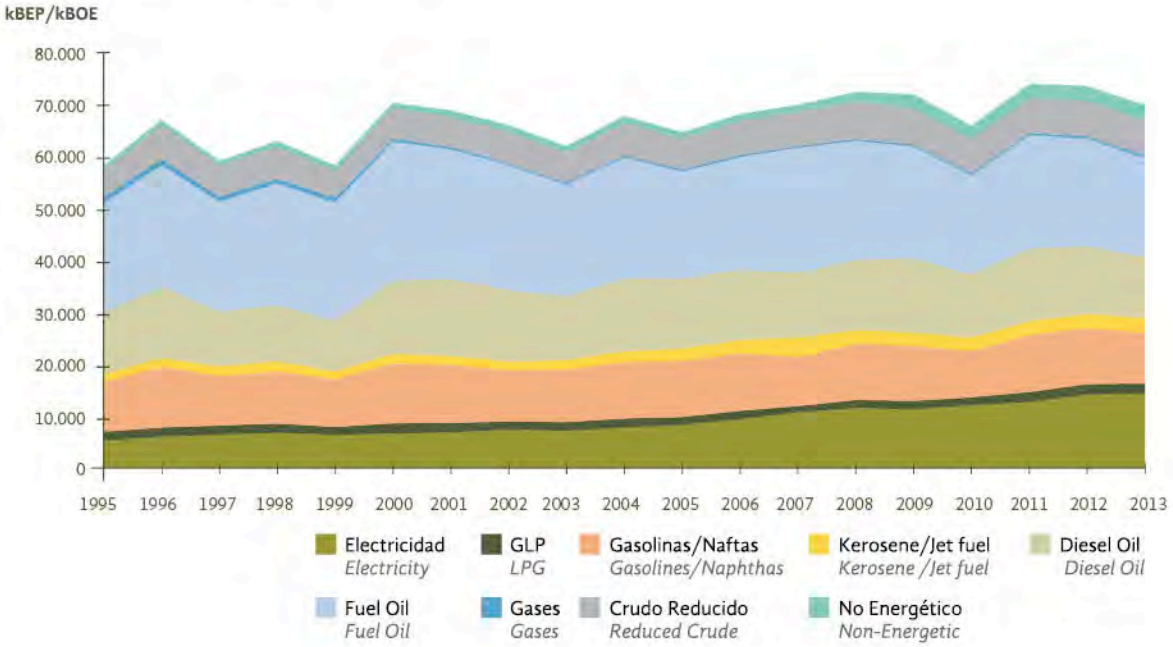
### Tabla 2-16 Producción de energía secundaria (kBEP)

*Table 2-16 Production of secondary energy (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | 7.154 | 7.798 | 8.305 | 9.366 | 10.742 | 11.530 | 11.317 | 12.088 | 12.729 | 14.156 | 14.411 | 1,8 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 1.701 | 1.749 | 1.526 | 1.677 | 1.214 | 1.603 | 1.644 | 1.566 | 1.947 | 2.032 | 1.912 | -5,9 |
| Gasolinas/Naftas *Gasolines/Naphthas* | 10.173 | 10.885 | 10.810 | 11.110 | 9.486 | 10.806 | 10.633 | 8.916 | 11.018 | 10.873 | 9.777 | -10,1 |
| Kerosene/Jet fuel *Kerosene/Jet fuel* | 1.818 | 2.142 | 2.390 | 2.587 | 3.777 | 2.726 | 2.627 | 2.611 | 2.684 | 2.686 | 2.856 | 6,3 |
| Diesel Oil *Diesel Oil* | 12.374 | 14.108 | 13.622 | 13.610 | 12.594 | 13.547 | 14.355 | 12.226 | 14.087 | 13.212 | 11.831 | -10,5 |
| Fuel Oil *Fuel Oil* | 21.640 | 23.437 | 20.732 | 21.830 | 24.154 | 23.099 | 21.610 | 19.202 | 21.949 | 20.750 | 19.127 | -7,8 |
| Gases *Gases* | 325 | 387 | 354 | 368 | 318 | 355 | 365 | 413 | 408 | 451 | 512 | 13,5 |
| Crudo Reducido *Reduced Crude* | 5.771 | 6.294 | 6.014 | 6.628 | 6.667 | 7.286 | 7.019 | 6.663 | 6.811 | 6.910 | 6.971 | 0,9 |
| No Energético *Non-Energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |
| **Total Secundarias** *Total Secondary* | 62.233 | 68.095 | 64.909 | 68.437 | 70.240 | 72.722 | 72.273 | 66.178 | 74.263 | 73.896 | 70.179 | -5,0 |

## Figura 2-13 Producción de energía secundaria

*Figure 2-13 Production of secondary energy*



## Tabla 2-17 Estructura porcentual de la producción de energía secundaria

*Table 2-17 Structure of production of secondary energy*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad<br>*Electricity* | 11 | 11 | 13 | 14 | 15 | 16 | 16 | 18 | 17 | 19 | 21 |
| Gas Licuado de Petróleo<br>*Liquefied Petroleum Gas* | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| Gasolinas/Naftas<br>*Gasolines/Naphthas* | 16 | 16 | 17 | 16 | 14 | 15 | 15 | 13 | 15 | 15 | 14 |
| Kerosene/Jet fuel<br>*Kerosene/Jet fuel* | 3 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| Diesel Oil<br>*Diesel Oil* | 20 | 21 | 21 | 20 | 18 | 19 | 20 | 18 | 19 | 18 | 17 |
| Fuel Oil<br>*Fuel Oil* | 35 | 34 | 32 | 32 | 34 | 32 | 30 | 29 | 30 | 28 | 27 |
| Gases<br>*Gases* | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Crudo Reducido<br>*Reduced Crude* | 9 | 9 | 9 | 10 | 9 | 10 | 10 | 10 | 9 | 9 | 10 |
| No Energético<br>*Non-Energetic* | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 |
| **Total Secundarias**<br>*Total Secondary* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 2-14 Oferta y demanda de energía secundaria

*Figure 2-14 Supply and demand of secondary energy*

## Tabla 2-18 Oferta y demanda de fuentes secundaria (kBEP)

*Table 2-18 Supply and demand of secondary energy (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Produccion *Production* | 62.233 | 68.095 | 64.909 | 68.437 | 70.240 | 72.722 | 72.273 | 66.178 | 74.263 | 73.896 | 70.179 | -5,0 |
| Importación *Imports* | 15.368 | 16.431 | 22.518 | 26.342 | 29.058 | 28.053 | 32.037 | 40.961 | 37.397 | 38.780 | 44.258 | 14,1 |
| Exportación *Exports* | 11.989 | 13.529 | 13.099 | 13.798 | 15.451 | 15.723 | 12.598 | 10.691 | 11.787 | 10.149 | 7.227 | -28,8 |
| Variación de inventario *Stock variation* | 633 | 757 | 1.672 | 979 | 585 | 3.039 | 3.125 | 2.928 | 1.791 | 2.117 | 3.273 | 54,6 |
| Oferta total *Total supply* | 66.245 | 71.754 | 76.000 | 81.961 | 84.432 | 88.090 | 94.838 | 99.376 | 101.663 | 104.644 | 110.484 | 5,6 |
| Transformación total *Total transformation* | 5.781 | 6.468 | 8.367 | 10.110 | 9.622 | 7.978 | 11.763 | 14.669 | 11.894 | 11.897 | 13.584 | 14,2 |
| Consumo propio *Own consumption* | 9.062 | 9.981 | 9.039 | 10.197 | 10.311 | 11.136 | 10.882 | 10.249 | 10.567 | 10.738 | 10.709 | -0,3 |
| Ajuste *Adjustment* | -173 | -322 | -449 | -567 | -527 | -240 | -5 | - | - | - | - | - |
| Pérdidas *Losses* | 1.873 | 2.038 | 2.108 | 2.166 | 2.215 | 2.235 | 2.113 | 2.038 | 2.075 | 2.056 | 1.895 | -7,8 |
| Transporte *Transportation* | 27.857 | 30.385 | 32.374 | 34.497 | 36.804 | 39.294 | 40.797 | 42.114 | 45.121 | 45.999 | 48.551 | 5,5 |
| Industria *Industry* | 9.179 | 9.674 | 10.476 | 10.865 | 10.906 | 11.516 | 12.622 | 13.240 | 13.953 | 15.034 | 16.101 | 7,1 |
| Residencial *Residential* | 7.626 | 8.171 | 8.849 | 9.276 | 9.652 | 9.880 | 9.795 | 10.046 | 10.327 | 10.672 | 10.938 | 2,5 |
| Comercial, Ser. pub *Commercial, Pub. ser* | 2.197 | 2.424 | 2.654 | 2.881 | 3.007 | 3.134 | 2.867 | 2.961 | 3.354 | 3.539 | 3.933 | 11,1 |
| Agro,pesca,miner. *Agriculture, fishing, mining* | 266 | 288 | 348 | 414 | 454 | 547 | 625 | 691 | 731 | 796 | 878 | 10,3 |
| Construcción, otros *Construction, Others* | 1.300 | 1.356 | 1.079 | 860 | 699 | 839 | 674 | 874 | 1.023 | 1.101 | 1.132 | 2,8 |
| Consumo Energético *Energy Consumption* | 48.425 | 52.296 | 55.780 | 58.793 | 61.523 | 65.210 | 67.381 | 69.926 | 74.509 | 77.142 | 81.532 | 5,7 |
| No Energético *Non-energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |
| Consumo Final *Final Consumption* | 49.702 | 53.590 | 56.936 | 60.055 | 62.812 | 66.980 | 70.084 | 72.419 | 77.140 | 79.966 | 84.313 | 5,4 |
| **Demanda Total** *Total Demand* | 66.245 | 71.754 | 76.000 | 81.961 | 84.432 | 88.090 | 94.838 | 99.376 | 101.676 | 104.657 | 110.500 | 5,6 |

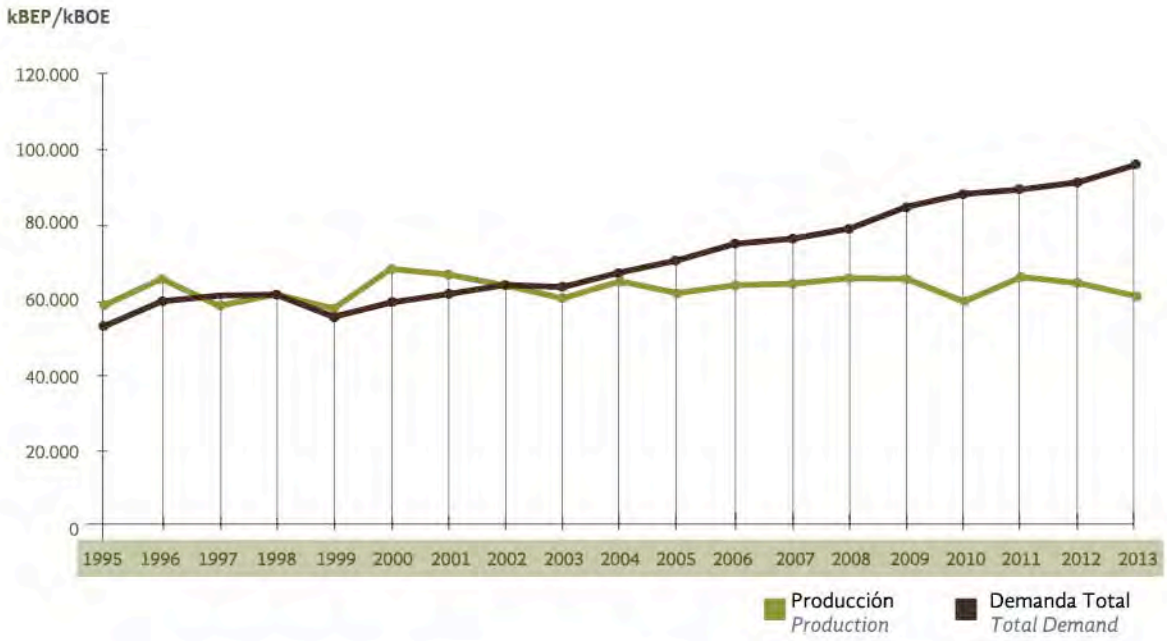
## 2.2.1 Derivados de hidrocarburos
*2.2.1 Oil products*

### Tabla 2-19 Oferta y demanda de derivados de hidrocarburos (kBEP)
*Table 2-19 Supply and demand of oil products (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Produccion *Production* | 54.949 | 60.142 | 56.463 | 58.924 | 59.371 | 61.050 | 60.811 | 53.925 | 61.383 | 59.572 | 55.580 | -6,7 |
| Importación *Imports* | 14.675 | 15.414 | 21.451 | 25.369 | 28.525 | 27.743 | 31.343 | 40.420 | 36.595 | 38.633 | 43.848 | 13,5 |
| Exportación *Exports* | 11.947 | 13.507 | 13.089 | 13.797 | 15.427 | 15.700 | 12.585 | 10.685 | 11.778 | 10.142 | 7.209 | -28,9 |
| Variación de inventario *Stock variation* | 633 | 757 | 1.672 | 979 | 585 | 3.039 | 3.125 | 2.928 | 1.791 | 2.117 | 3.273 | 54,6 |
| Oferta total *Total supply* | 58.309 | 62.806 | 66.496 | 71.475 | 73.053 | 76.132 | 82.694 | 86.588 | 87.991 | 90.180 | 95.492 | 5,9 |
| Transformación total *Total transformation* | 5.781 | 6.468 | 8.367 | 10.110 | 9.622 | 7.978 | 11.763 | 14.669 | 11.894 | 11.897 | 13.584 | 14,2 |
| Consumo propio *Own consumption* | 8.785 | 9.692 | 8.729 | 9.863 | 9.993 | 10.795 | 10.412 | 9.922 | 10.218 | 10.322 | 10.245 | -0,7 |
| Transporte *Transportation* | 27.851 | 30.379 | 32.368 | 34.491 | 36.798 | 39.288 | 40.791 | 42.108 | 45.114 | 45.993 | 48.544 | 5,5 |
| Industria *Industry* | 7.286 | 7.193 | 7.747 | 7.458 | 6.930 | 7.617 | 8.677 | 8.802 | 9.167 | 9.941 | 10.921 | 9,9 |
| Residencial *Residential* | 5.600 | 5.992 | 6.555 | 6.862 | 7.115 | 7.163 | 6.900 | 6.877 | 7.012 | 7.188 | 7.294 | 1,5 |
| Comercial, Ser. pub *Commercial, Pub. ser* | 163 | 146 | 147 | 156 | 154 | 135 | 149 | 151 | 200 | 117 | 112 | -3,9 |
| Agro,pesca,miner. *Agriculture, fishing, mining* | 266 | 288 | 348 | 414 | 454 | 547 | 625 | 691 | 731 | 796 | 878 | 10,3 |
| Construcción, otros *Construction, Others* | 1.300 | 1.356 | 1.079 | 860 | 699 | 839 | 674 | 874 | 1.023 | 1.101 | 1.132 | 2,8 |
| Consumo Energético *Energy Consumption* | 42.467 | 45.353 | 48.243 | 50.241 | 52.150 | 55.589 | 57.816 | 59.503 | 63.248 | 65.136 | 68.881 | 5,8 |
| No Energético *Non-energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |
| Consumo Final *Final Consumption* | 43.743 | 46.646 | 49.400 | 51.503 | 53.439 | 57.359 | 60.519 | 61.996 | 65.879 | 67.960 | 71.663 | 5,4 |
| **Demanda Total** *Total Demand* | 58.309 | 62.806 | 66.496 | 71.475 | 73.053 | 76.132 | 82.694 | 86.588 | 87.991 | 90.180 | 95.492 | 5,9 |

## Figura 2-15 Oferta y demanda de derivados de hidrocarburos

*Figure 2-15 Supply and demand of oil products*



## 2.2.2 Electricidad
*2.2.2 Electricity*

### Tabla 2-20 Balance de energía eléctrica (GWh)
*Table 2-20 Electricity balance*

| CONCEPTO / *CONCEPT* | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|
| Energía generada bruta (1)<br>*Gross generated energy (1)* | 10.612 | 11.050 | 11.888 | 11.546 |
| Energía importada desde Colombia<br>*Energy imported from Colombia* | - | 22 | 56 | 1.120 |
| Energía importada desde Perú<br>*Energy imported from Peru* | - | - | - | - |
| **Energía bruta total**<br>*Total gross energy* | **10.612** | **11.072** | **11.944** | **12.666** |
| Energía generada no disponible para servicio público (2)<br>*Energy generated and unavailable for public service (2)* | - | 49 | 287 | 338 |
| **Energía generada e importada para servicio público**<br>*Energy generated and imported for public service* | **10.612** | **11.023** | **11.656** | **12.328** |
| Autoconsumos en generación para servicio público (3)<br>*Own consumption in generation for public service(3)* | 174 | 204 | 234 | 238 |
| **Energía entregada para servicio público**<br>*Energy delivered for public service* | **10.439** | **10.819** | **11.422** | **12.090** |
| Pérdidas en transmisión (4)<br>*Transmission losses (4)* | 343 | 345 | 394 | 389 |
| **Energía disponible para servicio público**<br>*Energy available for public service* | 10.095 | 10.474 | 11.028 | 11.701 |
| Energía exportada a Colombia y Perú<br>*Energy exported to Colombia and Peru* | - | - | - | 67 |
| Energía entregada a Grandes Consumidores en Subtransmisión (5)<br>*Energy delivered to large customers in subtransmission(5)* | - | 11 | 129 | 128 |
| **Energía disponible en sistemas de distribución**<br>*Energy available in distribution systems* | **10.095** | **10.463** | **10.899** | **11.506** |
| Pérdidas totales de energía en sistemas de distribución<br>*Energy total losses in distribution systems* | 2.210 | 2.334 | 2.454 | 2.633 |
| **Energía facturada a clientes finales (6)**<br>*Energy billed to final customers* | **7.885** | **8.129** | **8.445** | **8.872** |
| Alumbrado Público<br>*Public lighting* | 620 | 634 | 664 | 675 |
| Comercial<br>*Commercial* | 1.362 | 1.432 | 1.497 | 1.805 |
| Industrial<br>*Industrial* | 2.218 | 2.139 | 2.460 | 2.590 |
| Otros<br>*Others* | 900 | 889 | 894 | 812 |
| Residencial<br>*Residential* | 2.803 | 2.916 | 3.098 | 3.270 |

(1)Es la energía eléctrica generada por todo el parque generador del país (Incorporado y No Incorporado al Sistema Nacional Interconectado, para Servicio Público y No Público) /*Is the electricity generated by all generators in the country (Incorporated and non-incorporated to the National Interconnected System, for public and non-public service.)*

(2)Corresponde a la energía utilizada internamente para procesos productivos y de explotación (es el total de la energía producida por las empresas autogeneradoras Andes Petro, Agip, OCP, Petrobras, Petroamazonas, Petroproducción, Repsol y SIPEC; y, una parte de la energía generada por Agua y Gas de Sillunchi, Ecoelectric, Ecudos, Ecoluz, EMAAP-Q, Lafarge, La Internacional, Molinos La Unión, Perlabi, San Carlos) / *Corresponds to the energy used for productive and exploitation processes of the oil industry (is the total of the electricity generated by autogeneration companies: Andes Petro, Agip, OCP, Petrobras, Petroamazonas, Petroproducción, Repsol and SIPEC; and also non-oil companies: Agua y Gas de Sillunchi, Ecoelectric, Ecudos, Ecoluz, EMAAP-Q, Lafarge, La Internacional, Molinos La Unión, Perlabi, San Carlos.*

| 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|
| 12.585 | 13.404 | 15.116 | 17.337 | 18.609 | 18.265 | 19.510 | 20.544 | 22.848 | 23.259 |
| 1.642 | 1.716 | 1.570 | 861 | 500 | 1.058 | 795 | 1.295 | 236 | 662 |
| - | 7 | - | - | - | 62 | 78 | - | 2 | - |
| **14.226** | **15.127** | **16.686** | **18.198** | **19.109** | **19.385** | **20.383** | **21.839** | **23.086** | **23.921** |
| 1.087 | 1.219 | 1.851 | 2.541 | 2.610 | 2.220 | 2.746 | 2.926 | 3.207 | 3.347 |
| **13.140** | **13.908** | **14.836** | **15.657** | **16.498** | **17.166** | **17.637** | **18.913** | **19.879** | **20.574** |
| 215 | 271 | 301 | 307 | 322 | 524 | 260 | 300 | 379 | 417 |
| **12.924** | **13.637** | **14.535** | **15.350** | **16.177** | **16.642** | **17.377** | **18.612** | **19.499** | **20.157** |
| 458 | 431 | 427 | 485 | 615 | 644 | 542 | 715 | 767 | 590 |
| 12.466 | 13.206 | 14.108 | 14.864 | 15.562 | 15.998 | 16.834 | 17.897 | 18.733 | 19.567 |
| 35 | 16 | 1 | 38 | 38 | 21 | 10 | 14 | 12 | 29 |
| 126 | 133 | 316 | 398 | 265 | - | - | - | - | - |
| **12.306** | **13.057** | **13.791** | **14.428** | **15.260** | **15.977** | **16.824** | **17.883** | **18.721** | **19.538** |
| 2.831 | 2.972 | 3.069 | 3.090 | 2.993 | 2.766 | 2.747 | 2.634 | 2.551 | 2.468 |
| **9.474** | **10.085** | **10.722** | **11.338** | **12.267** | **13.211** | **14.077** | **15.249** | **16.170** | **17.070** |
| 697 | 716 | 741 | 765 | 806 | 820 | 812 | 883 | 913 | 964 |
| 2.051 | 2.378 | 2.598 | 2.634 | 2.520 | 2.533 | 2.672 | 2.956 | 3.209 | 3.486 |
| 2.793 | 3.052 | 3.333 | 3.478 | 3.418 | 4.148 | 4.417 | 4.798 | 5.012 | 5.013 |
| 938 | 963 | 1.069 | 1.217 | 1.524 | 1.046 | 1.061 | 1.261 | 1.412 | 1.727 |
| 3.516 | 3.702 | 3.896 | 4.095 | 4.385 | 4.672 | 5.114 | 5.351 | 5.624 | 5.880 |

(3)Es la energía utilizada por las empresas generadoras, autogeneradoras y distribuidoras con generación, para los procesos de generación de energía eléctrica que estará disponible para el Servicio Público. / *Is the energy used by generation companies, autogenerators and distribution companies that generate electricity for public service.*

(4)Considera todo el transporte de energía a nivel nacional. Incluye aquella que no es transportada por el Sistema Nacional de Transmisión (SNT). / *Considers all electricity transportation in the country. Includes electricity that is not transported by the National Transmission System.*

(5)A Holcim Gye se le entregó energía en el periodo sep/05 - ago/08 y a Interagua en el periodo dic/01 - agos/08 / *Company Holcim Gye recieved electricity in the period Sep/05 – Aug/08, and the Company Interagua in the period Dec/01 – Aug/08.*

(6)Incluye clientes Regulados y No Regulados, excepto la energía exportada a Colombia y la entregada a los grandes consumidores en subtransmisión (Holcim Gye-> sep/05 - ago/08 e Interagua -> dic/01 - ago/08) / *Includes regulated and non-regulated clients, except the electricity exported to Colombia and delivered to great consumers in subtransmission stations.*

## Tabla 2-21 Oferta y demanda de electricidad[36] (GWh)

*Table 2-21 Supply and demand of electricity[36]*

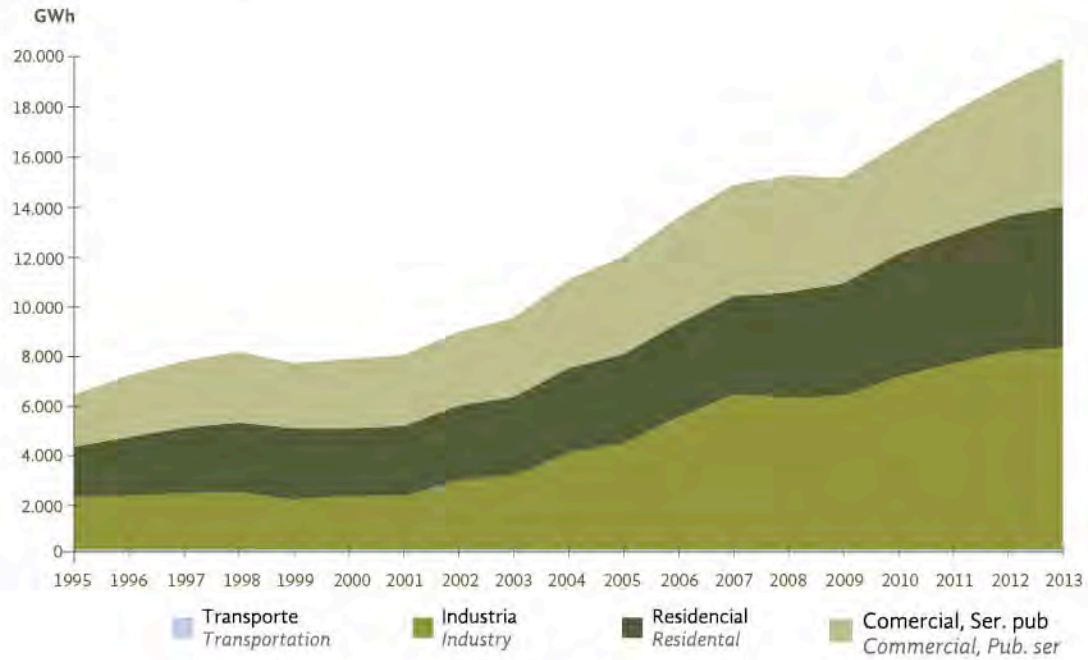
| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 11.546 | 12.585 | 13.404 | 15.116 | 17.337 | 18.609 | 18.265 | 19.510 | 20.544 | 22.848 | 23.259 | 1,8 |
| Importación (2) *Imports (2)* | 1.120 | 1.642 | 1.723 | 1.570 | 861 | 500 | 1.121 | 873 | 1.295 | 238 | 662 | 178,1 |
| Exportación (3) *Exports (3)* | 67 | 35 | 16 | 1 | 38 | 38 | 21 | 10 | 14 | 12 | 29 | 144,0 |
| Oferta total *Total supply* | 12.599 | 14.191 | 15.111 | 16.685 | 18.159 | 19.071 | 19.365 | 20.373 | 21.824 | 23.074 | 23.892 | 3,5 |
| Consumo propio (4) *Own consumption (4)* | 238 | 215 | 271 | 301 | 307 | 322 | 524 | 260 | 300 | 379 | 417 | 10,0 |
| Pérdidas (5) *Losses (5)* | 3.023 | 3.290 | 3.403 | 3.496 | 3.575 | 3.608 | 3.410 | 3.290 | 3.349 | 3.318 | 3.058 | -7,8 |
| Ajuste *Adjustment* | -279 | -520 | -725 | -914 | -851 | -387 | -7 | - | - | - | - | - |
| Transporte (6) *Transportation(6)* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| Industrial (7) *Industrial(7)* | 3.055 | 4.005 | 4.405 | 5.499 | 6.417 | 6.293 | 6.368 | 7.163 | 7.724 | 8.220 | 8.360 | 1,7 |
| Residencial *Residential* | 3.270 | 3.516 | 3.702 | 3.896 | 4.095 | 4.385 | 4.672 | 5.114 | 5.351 | 5.624 | 5.880 | 4,6 |
| Comercial, Ser. pub (8) *Commercial, Pub. ser (8)* | 3.282 | 3.676 | 4.046 | 4.398 | 4.606 | 4.840 | 4.388 | 4.536 | 5.090 | 5.523 | 6.167 | 11,6 |
| Consumo Energético *Energy Consumption* | 9.617 | 11.207 | 12.163 | 13.803 | 15.128 | 15.528 | 15.438 | 16.823 | 18.175 | 19.377 | 20.417 | 5,4 |
| **Consumo Final** *Final Consumption* | 9.617 | 11.207 | 12.163 | 13.803 | 15.128 | 15.528 | 15.438 | 16.823 | 18.175 | 19.377 | 20.417 | 5,4 |

(1) Electricidad generada bruta / *Gross generated electricity*
(2) Importación de Perú y Colombia / *Imports from Peru and Colombia*
(3) Exportación a Perú y Colombia / *Exports to Peru and Colombia*
(4) Autoconsumos en generación para servicio público / *Autoconsumption in generation for public service*
(5) Pérdidas en transmisión y distribución (incluye pérdidas técnicas y no técnicas) / *Transmission and distribution losses (technical and non-technical)*
(6) Considera un valor constante para el consumo eléctrico del Trolebús. El consumo eléctrico fue proporcionado por la Empresa Eléctrica Quito para el año 2012. / *Considers a constant value for the trolleybus consumption. The electric consumption was registered by the Electricity Company of Quito for year 2012.*
(7) Incluye la energía generada no disponible para servicio público y la energía entregada a grandes consumidores en subtransmisión / *Includes electricity not available for public service and the energy delivered to great consumers in subtransmission stations.*
(8) Incluye alumbrado público, segmento comercial y otros / *Includes public lighting, commercial sector and other.*

36. Para la construcción del Balance Energético se utilizó la información del balance eléctrico publicado por el CONELEC.
*For the elaboration of the energy balance, information from the electricity balance of CONELEC was used.*

## Figura 2-16 Electricidad

*Figure 2-16 Electricity*




## Tabla 2-22 Generación de energía eléctrica (GWh)

*Table 2-22 Electricity generation*

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Estruc.(%) 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hidraúlica / *Hydraulic* | | 7.007 | 7.206 | 6.678 | 6.918 | 8.789 | 11.026 | 9.225 | 8.636 | 11.133 | 12.238 | 11.039 | 46 |
| Térmica / *Thermal* | | 4.539 | 5.375 | 6.624 | 8.053 | 8.328 | 7.371 | 8.819 | 10.634 | 9.129 | 10.311 | 11.865 | 50 |
| | Biomasa *Biomass* | - | 3 | 103 | 146 | 219 | 208 | 217 | 236 | 278 | 296 | 296 | 1 |
| Otras renovables *Other renewables* | Eólica *Wind* | - | - | - | - | 1 | 3 | 3 | 3 | 3 | 2 | 57 | - |
| | Solar *Solar* | - | - | - | - | - | - | - | - | - | - | 4 | - |
| | Total *Total* | 0 | 3 | 103 | 146 | 220 | 211 | 220 | 239 | 282 | 299 | 356 | 1 |
| Interconexión / *Interconnection* | | 1.120 | 1.642 | 1.723 | 1.570 | 861 | 500 | 1.121 | 873 | 1.295 | 238 | 662 | 3 |
| **Total** / *Total* | | **12.666** | **14.226** | **15.127** | **16.686** | **18.198** | **19.109** | **19.385** | **20.383** | **21.839** | **23.086** | **23.923** | **100** |

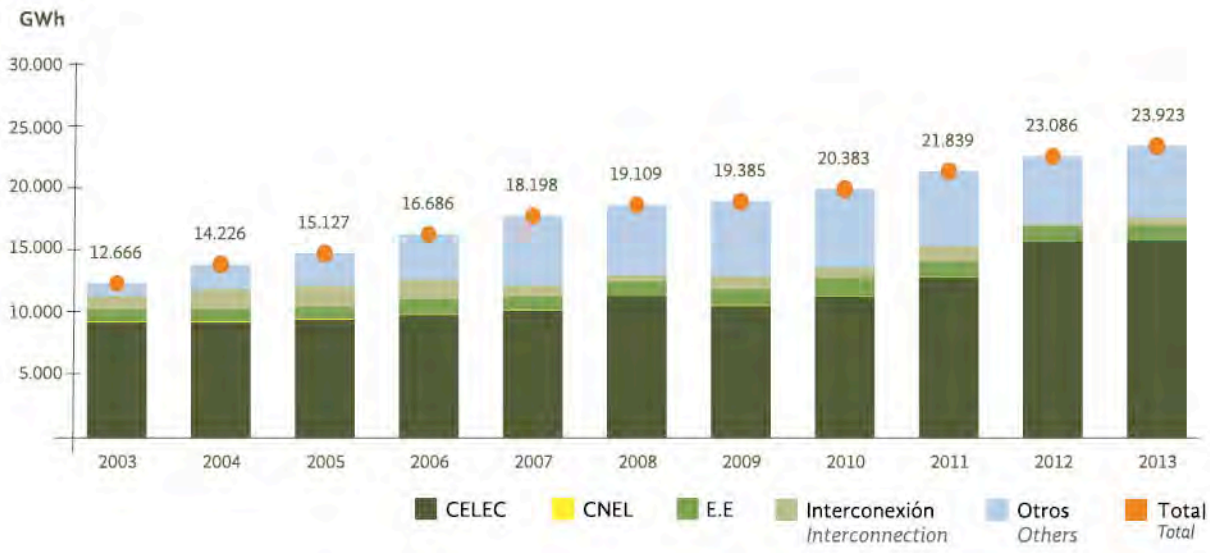
## Tabla 2-23 Generación de energía eléctrica por grupo de empresa (GWh)

*Table 2-23 Electricity generation by group companies*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CELEC | 9.487 | 9.541 | 9.749 | 10.087 | 10.431 | 11.679 | 10.828 | 11.624 | 13.172 | 16.145 | 16.241 |
| CNEL | 84 | 68 | 57 | 72 | 69 | 25 | 66 | 67 | 50 | 17 | - |
| E.E | 988 | 995 | 986 | 1.253 | 1.166 | 1.154 | 1.296 | 1.450 | 1.259 | 1.216 | 1.194 |
| Interconexión *Interconnection* | 1.120 | 1.642 | 1.723 | 1.570 | 861 | 500 | 1.121 | 873 | 1.295 | 238 | 662 |
| Otros *Others* | 988 | 1.981 | 2.612 | 3.704 | 5.672 | 5.751 | 6.075 | 6.369 | 6.063 | 5.470 | 5.825 |
| **Total General** *Overall Total* | **12.666** | **14.226** | **15.127** | **16.686** | **18.198** | **19.109** | **19.385** | **20.383** | **21.839** | **23.086** | **23.923** |

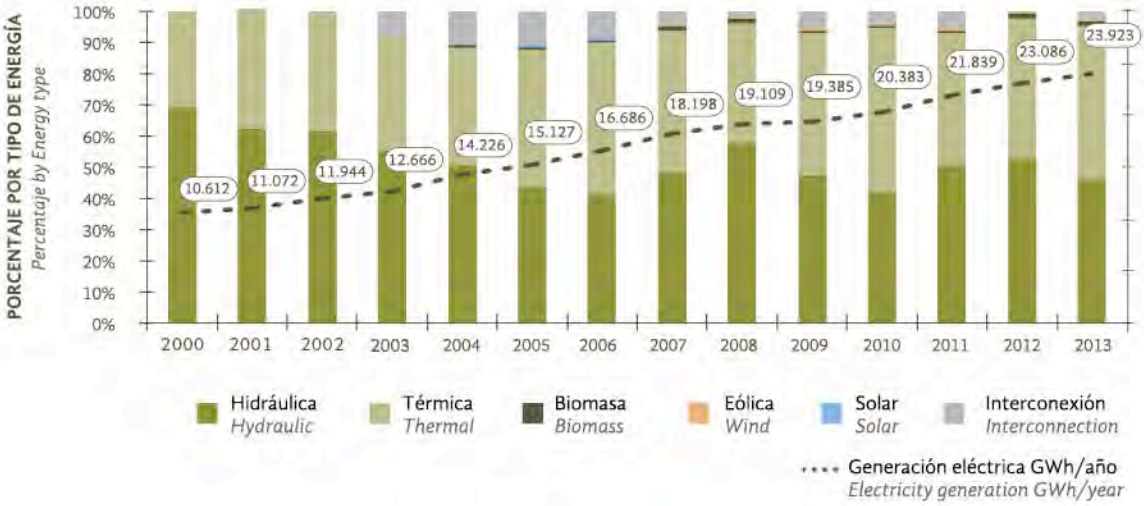
## Figura 2-17 Generación de energía eléctrica por grupo de empresa

*Figure 2-17 Electricity generation by group companies*



## Figura 2-18 Estructura porcentual de la Oferta de Energía Eléctrica

*Figure 2-18 Structure of electricity supply*




## Tabla 2-24 Potencia efectiva Nacional (MW)

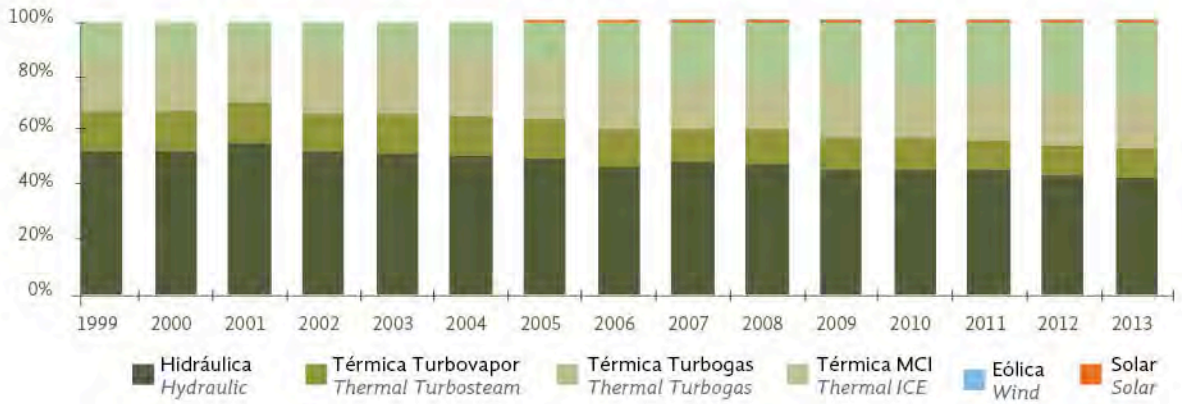
*Table 2-24 National effective capacity*

| Tipo Central / *Station Type* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hidráulica *Hydraulic* | 1.734,8 | 1.733,9 | 1.751,3 | 1.787,4 | 2.030,7 | 2.032,6 | 2.029,7 | 2.215,2 | 2.207,2 | 2.236,6 | 2.236,6 |
| Térmica Turbovapor (1) *Thermal Turbosteam* | 473,0 | 500,0 | 498,6 | 506,3 | 506,3 | 537,5 | 537,5 | 547,4 | 547,4 | 547,6 | 547,6 |
| Térmica Turbogas *Thermal Turbogas* | 762,0 | 766,0 | 752,5 | 753,5 | 752,5 | 756,2 | 896,2 | 897,5 | 897,5 | 973,9 | 973,9 |
| Térmica MCI (2) *Thermal ICE* | 358,2 | 372,7 | 477,7 | 722,6 | 855,8 | 858,6 | 926,6 | 1.098,5 | 1.138,7 | 1.302,3 | 1.321,8 |
| Eólica *Wind* | - | - | - | - | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 2,4 | 19,6 |
| Solar *Solar* | - | - | 0,018 | 0,018 | 0,018 | 0,018 | 0,018 | 0,018 | 0,042 | 0,078 | 3,899 |
| **Total** *Total* | **3.328** | **3.373** | **3.480** | **3.770** | **4.148** | **4.187** | **4.392** | **4.761** | **4.793** | **5.063** | **5.103** |

(1) Contempla también las empresas que generan con bagazo de caña.
*Contemplates also companies that generate with sugar cane bagasse.*
(2) MCI : Motor de combustión interna.
*ICE: Internal combustión engine.*

## Figura 2-19 Estructura porcentual de la Potencia Efectiva Nacional

*Figure 2-19 Structure of the national effective power capacity*



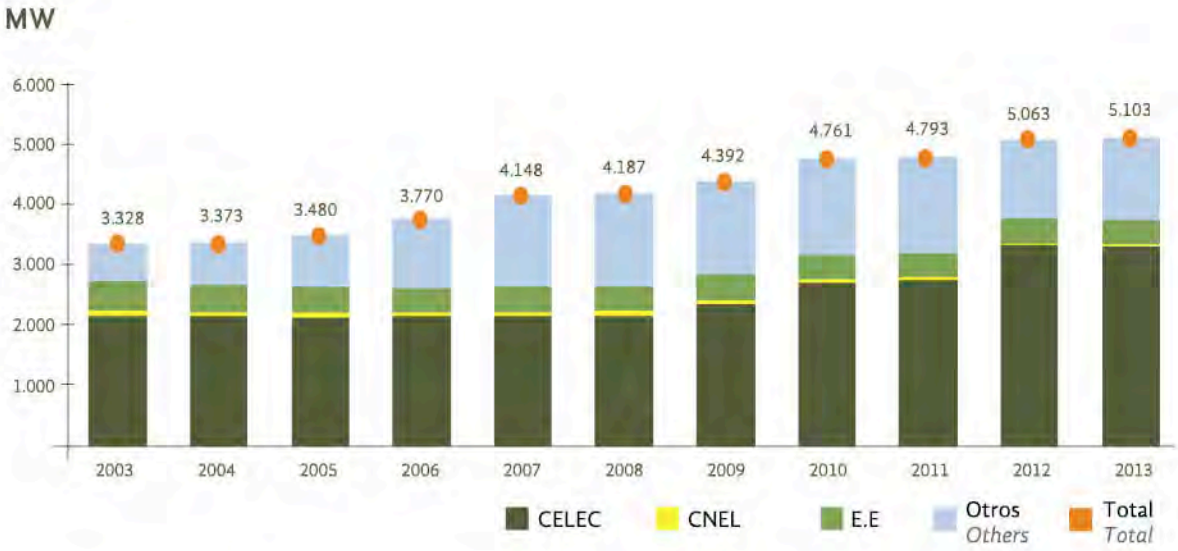

## Tabla 2-25 Potencia efectiva nacional por grupo de empresa (MW)

*Table 2-25 National effective capacity by group companies*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CELEC | 2.150 | 2.147 | 2.142 | 2.144 | 2.159 | 2.167 | 2.354 | 2.718 | 2.752 | 3.332 | 3.312 |
| CNEL | 85 | 82 | 68 | 68 | 66 | 67 | 74 | 34 | 34 | 14 | 16 |
| E.E | 487 | 457 | 427 | 421 | 423 | 428 | 421 | 418 | 422 | 417 | 416 |
| Otros *Others* | 605 | 687 | 843 | 1.137 | 1.500 | 1.525 | 1.544 | 1.590 | 1.586 | 1.300 | 1.359 |
| **Total General** *Overall Total* | **3.328** | **3.373** | **3.840** | **3.770** | **4.148** | **4.187** | **4.392** | **4.761** | **4.793** | **5.063** | **5.103** |

## Figura 2-20 Potencia efectiva nacional por grupo de empresa (MW)

*Figure 2-20 National effective capacity by group companies*




## Tabla 2-26 Combustibles para generación eléctrica (kBEP)

*Table 2-26 Fuels for electricity generation (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | - | 90 | 124 | 135 | 867 | 921 | 1.399 | 1.485 | 1.541 | 1.648 | 1.855 | 12,6 |
| Gas Natural *Natural Gas* | 1.510 | 1.917 | 2.083 | 2.662 | 2.787 | 2.436 | 3.269 | 3.394 | 2.999 | 3.935 | 4.380 | 11,3 |
| Bagazo de caña *Cane Bagasse* | - | - | 2.053 | 1.327 | 1.940 | 1.312 | 863 | 912 | 1.064 | 1.122 | 1.093 | -2,6 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | - | - | - | 121 | 120 | 15 | 121 | 124 | 113 | 100 | 94 | -6,9 |
| Gasolinas *Gasolines* | 48 | 123 | 564 | 733 | 85 | 169 | 212 | 311 | 313 | 2 | 58 | 2.881,5 |
| Diesel Oil *Diesel Oil* | 1.314 | 2.189 | 2.865 | 4.089 | 3.969 | 2.964 | 4.955 | 7.516 | 4.108 | 3.318 | 4.211 | 26,9 |
| Fuel Oil *Fuel Oil* | 4.419 | 4.156 | 4.938 | 5.167 | 5.418 | 4.708 | 5.520 | 5.776 | 6.523 | 7.671 | 8.434 | 10,0 |
| Residuo *Residue* | - | - | - | - | 17 | - | 956 | 943 | 837 | 806 | 788 | -2,2 |
| **Total** *Total* | **7.291** | **8.475** | **12.627** | **14.234** | **15.203** | **12.525** | **17.294** | **20.460** | **17.498** | **18.601** | **20.912** | **12,4** |

## Tabla 2-27 Combustibles para generación eléctrica (Unidades físicas)

*Table 2-27 Fuels for electricity generation (Physical units)*

| | Unidad/Unit | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | kbbl | - | 88 | 121 | 131 | 841 | 894 | 1.358 | 1.441 | 1.495 | 1.599 | 1.800 |
| Gas Natural *Natural Gas* | MMcf | 8.919 | 11.322 | 12.302 | 15.720 | 16.458 | 14.385 | 19.301 | 20.040 | 17.708 | 23.234 | 25.866 |
| Bagazo de caña *Cane Bagasse* | kt | - | - | 2.053 | 1.328 | 1.940 | 1.312 | 863 | 912 | 1.064 | 1.122 | 1.093 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg *thousand kg* | - | - | - | 15.866 | 15.782 | 1.949 | 15.860 | 16.215 | 14.782 | 13.165 | 12.262 |
| Gasolinas *Gasolines* | miles gal *thousand gall* | 2.279 | 5.783 | 26.504 | 34.440 | 4.004 | 7.936 | 9.953 | 14.640 | 14.711 | 91 | 2.706 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 55.100 | 91.781 | 120.139 | 171.486 | 166.469 | 124.308 | 207.797 | 315.196 | 172.274 | 139.158 | 176.577 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 180.106 | 169.401 | 201.289 | 210.605 | 220.853 | 191.901 | 225.009 | 235.416 | 265.898 | 312.667 | 343.779 |
| Residuo *Residue* | miles gal *thousand gall* | - | - | - | - | 680 | - | 38.948 | 38.432 | 34.129 | 32.849 | 32.114 |

## Figura 2-21 Combustibles para generación eléctrica

*Figure 2-21 Fuels for electricity generation*

## 2.2.3 Gas Licuado de Petróleo
*2.2.3 Liquefied petroleum gas (LPG)*

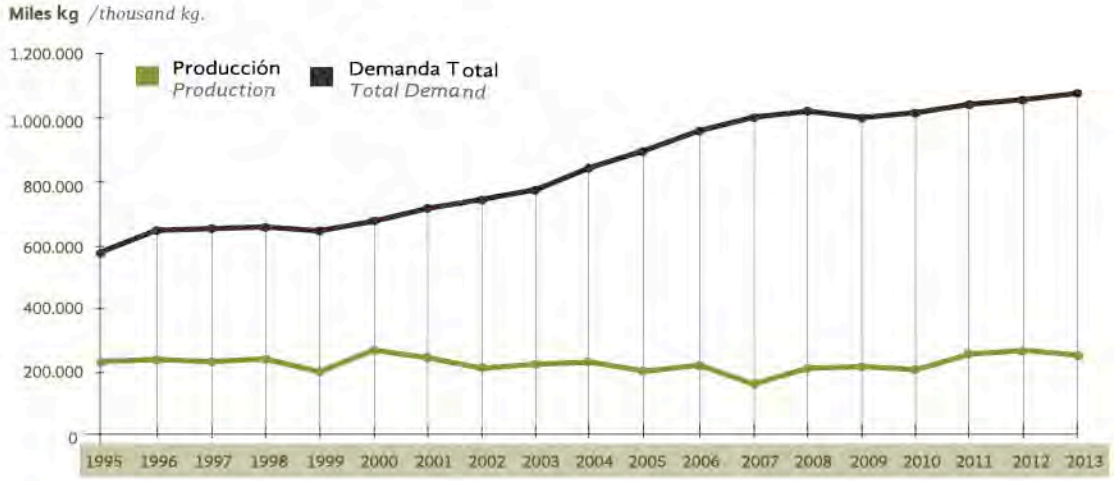
### Tabla 2-28 Oferta y demanda de GLP (miles kg)
*Table 2-28 Supply and demand of LPG (thousand kg)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production* | 222.910 | 229.248 | 200.011 | 219.845 | 159.076 | 210.118 | 215.527 | 205.248 | 255.170 | 266.381 | 250.633 | -5,9 |
| Importación *Imports* | 568.692 | 628.706 | 703.709 | 740.527 | 851.874 | 815.575 | 797.361 | 825.041 | 854.951 | 791.444 | 840.064 | 6,1 |
| Variación de inventario *Stock variation* | -11.440 | -6.927 | 1.707 | 8.098 | -103 | 4.483 | -3.130 | -4.714 | -57.025 | 10.093 | -2.535 | -125,1 |
| Oferta total *Total supply* | 780.162 | 851.028 | 905.428 | 968.470 | 1.010.848 | 1.030.176 | 1.009.759 | 1.025.576 | 1.053.096 | 1.067.918 | 1.088.162 | 1,9 |
| Transformación Total *Total Transformation* | - | - | - | 15.866 | 17.304 | 17.950 | 15.860 | 16.215 | 14.782 | 13.165 | 12.262 | -6,9 |
| Consumo popio (2) *Own Consumption* | 27.063 | 37.433 | 25.391 | 34.427 | 37.174 | 30.252 | 25.893 | 30.347 | 32.911 | 31.543 | 23.080 | -26,8 |
| Transporte *Transportation* | - | - | - | - | - | 1.046 | 9.518 | 11.108 | 11.474 | 10.714 | 9.590 | -10,5 |
| Industrial *Industrial* | 19.126 | 28.236 | 20.936 | 18.836 | 23.885 | 37.939 | 46.478 | 55.638 | 62.269 | 54.009 | 68.190 | 26,3 |
| Residencial *Residential* | 733.973 | 785.359 | 859.101 | 899.341 | 932.485 | 938.754 | 904.374 | 901.329 | 918.955 | 942.062 | 956.024 | 1,5 |
| Agro,pesca,miner. *Agriculture, fishing, mining* | - | - | - | - | - | 4.236 | 7.636 | 10.938 | 12.704 | 16.425 | 19.015 | 15,8 |
| Consumo Energético *Energy Consumption* | 753.099 | 813.595 | 880.037 | 918.177 | 956.370 | 981.974 | 968.006 | 979.013 | 1.005.403 | 1.023.210 | 1.052.820 | 2,9 |
| **Demanda total** *Total demand* | **780.162** | **851.028** | **905.428** | **968.470** | **1.010.848** | **1.030.176** | **1.009.759** | **1.025.576** | **1.053.095** | **1.067.918** | **1.088.162** | **1,9** |

*Se realizó un ajuste a la producción de GLP en el 2012, la cual registraba la producción neta (no incluye consumo interno de las refinerías). Actualmente se considera la producción bruta (producción bruta = producción neta + consumo interno). / *An adjustment to the LPG production was performed in 2012, which recorded net production (excluding domestic consumption of refineries). Currently considered gross production (gross production = net production + own consumption)*

1. Incluye producción en plantas topping / *Includes production of topping plants.*
2. Incluye autoconsumo de plantas topping / *Includes auto consumption in topping plants.*

### Figura 2-22 GLP
*Figure 2-22 LPG*



## 2.2.4 Gasolinas
*2.2.4 Gasoline*

### Tabla 2-29 Oferta y demanda de gasolinas y naftas (miles gal)

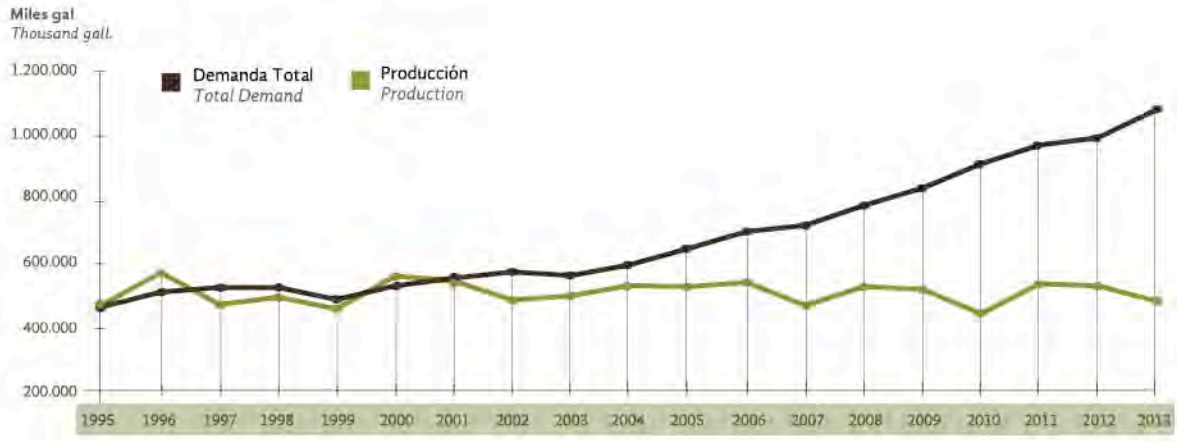
*Table 2-29 Supply and demand of gasoline and naphtha (thousand gall)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 478.261 | 511.727 | 508.180 | 522.317 | 445.929 | 508.013 | 499.896 | 419.160 | 517.959 | 511.152 | 459.613 | -10,1 |
| Importación *Imports* | 200.108 | 195.267 | 253.584 | 259.353 | 326.955 | 311.351 | 393.833 | 510.036 | 529.657 | 597.734 | 672.255 | 12,5 |
| Exportación *Exports* | 108.531 | 107.146 | 88.574 | 71.039 | 52.687 | 77.169 | 61.887 | 23.128 | 30.453 | 61.661 | 57.927 | -6,1 |
| Variación de inventario *Stock variation* | -24.859 | -20.060 | -39.911 | -20.882 | -10.349 | 33.656 | 983 | 6.400 | -43.185 | -49.352 | 16.366 | -133,2 |
| Oferta total *Total supply* | 544.979 | 579.787 | 633.279 | 689.749 | 709.848 | 775.851 | 832.824 | 912.467 | 973.978 | 997.873 | 1.090.307 | 9,3 |
| Transformación total *Total transformation* | 2.279 | 5.783 | 26.504 | 34.440 | 4.004 | 7.936 | 9.953 | 14.640 | 14.711 | 91 | 2.706 | 2.881,5 |
| Consumo propio (2) *Own consumption (2)* | 6.518 | 7.054 | 5.689 | 6.776 | 7.056 | 7.187 | 7.015 | 6.838 | 7.720 | 8.609 | 6.898 | -19,9 |
| Transporte *Transportation* | 514.666 | 545.856 | 576.585 | 621.788 | 670.461 | 729.738 | 781.991 | 855.029 | 914.911 | 950.889 | 1.039.057 | 9,3 |
| Industria *Industry* | 5.561 | 4.526 | 5.170 | 4.820 | 4.804 | 4.718 | 5.201 | 5.182 | 5.369 | 5.363 | 5.609 | 4,6 |
| Comercial, Ser. pub *Commercial, Pub. ser* | 1.850 | 1.558 | 1.546 | 1.512 | 1.372 | 1.188 | 1.264 | 1.197 | 1.271 | 1.227 | 1.542 | 25,7 |
| Agro,pesca,miner. *Agriculture, fishing, mining* | 12.482 | 13.520 | 16.344 | 19.467 | 21.357 | 24.211 | 26.634 | 28.542 | 29.830 | 31.531 | 34.465 | 9,3 |
| Construcción, otros (3) *Construction, Others (3)* | 1.623 | 1.491 | 1.439 | 947 | 795 | 874 | 765 | 1.039 | 776 | 778 | 816 | 4,8 |
| Consumo Energético *Energy Consumption* | 536.181 | 566.950 | 601.085 | 648.533 | 698.789 | 760.728 | 815.856 | 890.989 | 952.156 | 989.788 | 1.081.489 | 9,3 |
| **Demanda Total** *Total Demand* | **544.979** | **579.787** | **633.279** | **689.749** | **709.848** | **775.851** | **832.824** | **912.467** | **974.587** | **998.488** | **1.091.092** | **9,3** |

*Incluye los valores de producción y consumo propio de la planta topping de Repsol. / *Includes production values and own consumption of topping plant of Repsol.*
(1) Incluye producción en plantas topping y etanol / *Includes production in topping plants and ethanol.*
(2) Incluye autoconsumo de plantas topping. / *Includes own consumption of topping plants.*
(3) Incluye despachos a sector petrolero / *Includes dispatch to the oil sector.*

### Figura 2-23 Gasolinas y Naftas

*Figure 2-23 Gasoline and naphtha*



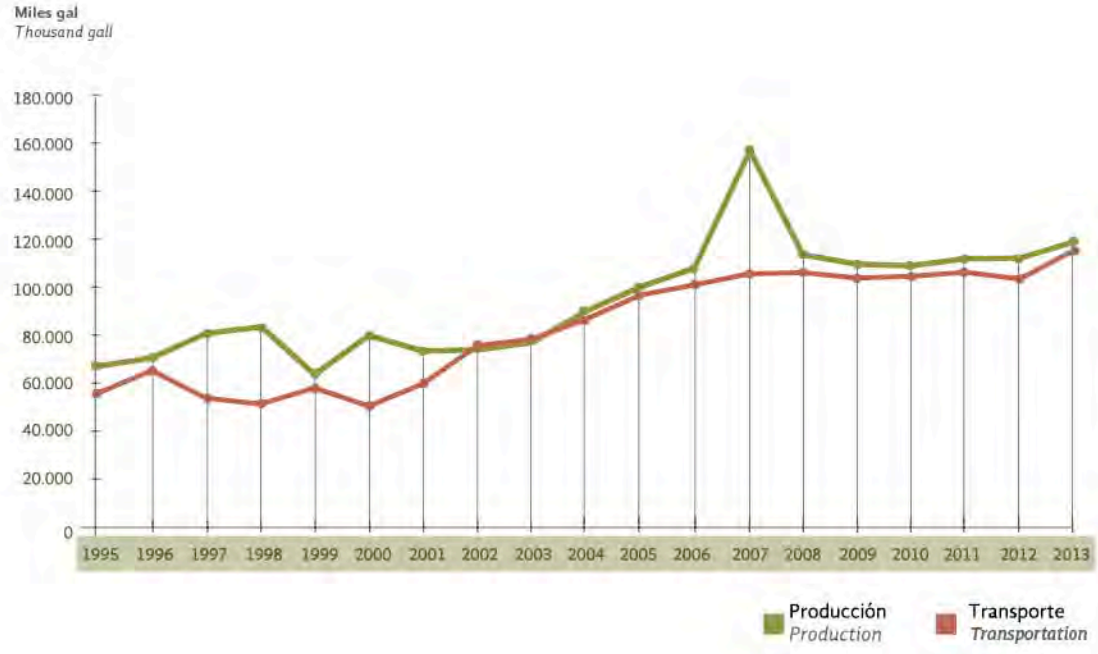
## 2.2.5 Jet Fuel
*2.2.5 Jet Fuel*

### Tabla 2-30 Oferta y demanda de jet fuel (miles gal)
*Table 2-30 Supply and demand of jet fuel (thousand gall)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 79.670 | 93.879 | 104.761 | 113.368 | 165.542 | 119.482 | 115.116 | 114.452 | 117.633 | 117.736 | 125.176 | 6,3 |
| Importación *Imports* | 1.222 | - | 39 | - | - | 3.153 | 3.841 | 3.734 | 1.223 | 1.144 | 4.745 | 314,9 |
| Exportación *Exports* | - | - | - | - | - | 2.941 | 3.393 | - | - | - | - | - |
| Variación de inventario *Stock variation* | 1.272 | -2.597 | -2.200 | -6.442 | -53.734 | -7.106 | -6.027 | -7.231 | -5.655 | -8.779 | -6.950 | -20,8 |
| Oferta total *Total supply* | 82.164 | 91.282 | 102.599 | 106.926 | 111.808 | 112.588 | 109.538 | 110.955 | 113.200 | 110.101 | 122.971 | 11,7 |
| Consumo propio (2) *Own consumption (2)* | 819 | 1.092 | 1.389 | 1.163 | 1.079 | 1.220 | 728 | 1.209 | 1.699 | 1.681 | 1.549 | -7,8 |
| Transporte (3) *Transportation (3)* | 81.345 | 90.190 | 101.210 | 105.763 | 110.729 | 111.368 | 108.810 | 109.746 | 111.502 | 108.420 | 121.422 | 12,0 |

(1)Incluye producción en plantas topping (Jet fuel y AVGAS) / *Includes production of topping plants (Jet fuel and AVGAS)*
(2)Incluye autoconsumo de plantas topping / *Includes own consumption in topping plants*
(3)Transporte aéreo / *Air transport*

### Figura 2-24 Jet Fuel
*Figure 2-24 Jet Fuel*



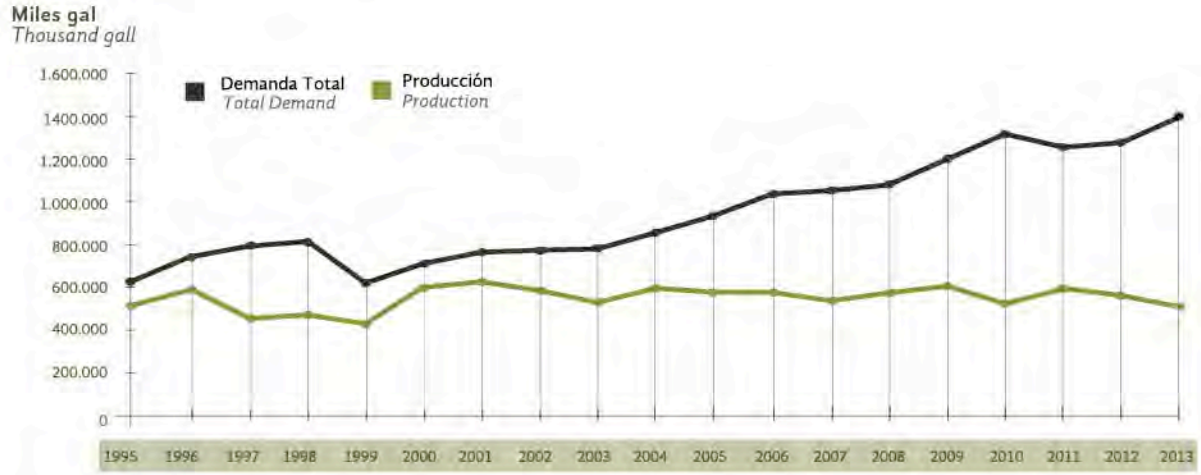
## 2.2.6 Diesel oil
*2.2.6 Diesel oil*

### Tabla 2-31Oferta y demanda de diesel oil (miles gal)
*Table 2-31 Supply and demand of diesel oil (thousand gall)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var.(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción (1) *Production (1)* | 518.938 | 591.651 | 571.246 | 570.763 | 528.147 | 568.106 | 602.010 | 512.716 | 590.759 | 554.079 | 496.164 | -10,5 |
| Importación *Imports* | 253.761 | 232.677 | 341.138 | 475.658 | 497.469 | 468.706 | 607.305 | 837.063 | 633.749 | 714.961 | 875.323 | 22,4 |
| Exportación *Exports* | - | - | 7.977 | - | 31.240 | - | - | - | - | - | - | - |
| Variación de inventario *Stock variation* | 18.594 | 48.318 | 53.770 | 22.855 | 91.255 | 78.187 | 35.311 | 23.484 | 81.068 | 59.297 | 87.368 | 47,3 |
| Oferta total *Total supply* | 791.294 | 872.646 | 958.177 | 1.069.276 | 1.085.631 | 1.114.999 | 1.244.626 | 1.373.263 | 1.305.577 | 1.328.338 | 1.458.855 | 9,8 |
| Transformación total *Total transformation* | 55.100 | 91.781 | 120.139 | 171.486 | 166.469 | 124.308 | 207.797 | 315.196 | 172.274 | 139.158 | 176.577 | 26,9 |
| Consumo propio (2) *Own consumption (2)* | 46.296 | 50.034 | 41.027 | 48.786 | 47.790 | 50.125 | 49.879 | 47.978 | 47.595 | 45.030 | 48.292 | 7,2 |
| Transporte (3) *Transportation (3)* | 446.940 | 487.284 | 544.463 | 600.594 | 651.000 | 702.038 | 718.223 | 732.030 | 788.780 | 821.890 | 870.645 | 5,9 |
| Industria *Industry* | 184.677 | 183.298 | 203.800 | 208.007 | 186.551 | 199.532 | 236.027 | 237.072 | 247.448 | 272.985 | 313.285 | 14,8 |
| Comercial, Ser. pub (4) *Commercial, Pub. ser (4)* | 5.198 | 4.726 | 4.782 | 5.187 | 5.217 | 4.593 | 5.104 | 5.259 | 7.272 | 3.798 | 3.325 | (12,5) |
| Construcción, otros (5) *Construction, Others (5)* | 53.083 | 55.523 | 43.965 | 35.216 | 28.605 | 34.403 | 27.597 | 35.727 | 42.208 | 45.478 | 46.730 | 2,8 |
| Consumo Energético *Energy Consumption* | 689.897 | 730.832 | 797.010 | 849.005 | 871.372 | 940.566 | 986.950 | 1.010.089 | 1.085.708 | 1.144.150 | 1.233.986 | 7,9 |
| **Demanda Total** *Total Demand* | **791.294** | **872.646** | **958.177** | **1.069.276** | **1.085.631** | **1.114.999** | **1.244.626** | **1.373.263** | **1.305.577** | **1.328.338** | **1.458.855** | **9,8** |

(1)Incluye producción en plantas topping / *Includes production in topping plants.*
(2)Incluye autoconsumo de plantas topping / *Includes own consumption of topping plants*
(3)Transporte terrestre y marino / *Land and sea transport*
(4)Despacho a FFAA / *Dispatch to the Army*
(5)Incluye despacho a sector petrolero / *Includes dispatch to the oil sector.*

### Figura 2-25 Diesel Oil
*Figure 2-25 Diesel Oil*



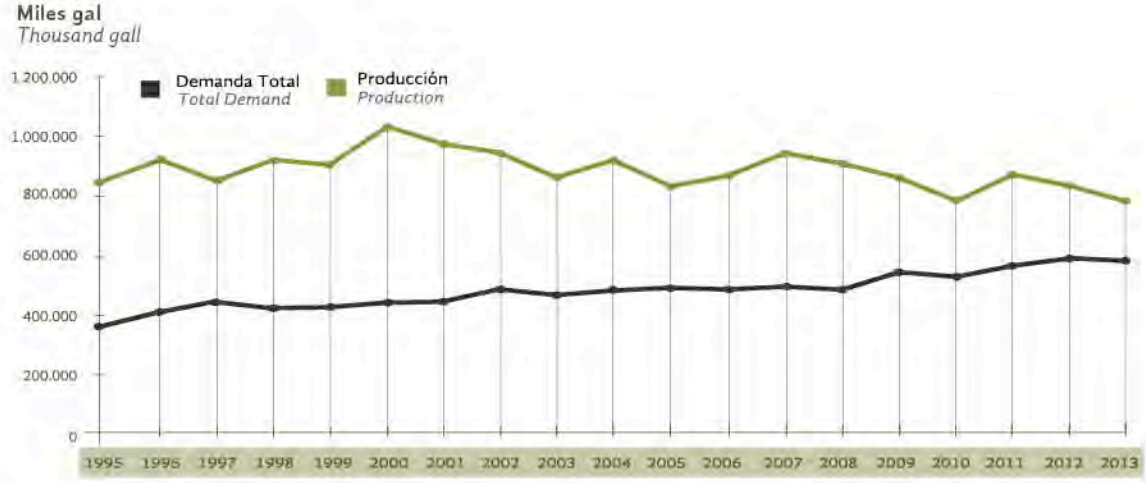
## 2.2.7 Fuel oil
*2.2.7 Fuel oil*

### Tabla 2-32 Oferta y demanda de fuel oil (miles gal)
*Table 2-32 Supply and demand of fuel oil (thousand gall)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var(%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Produccion *Production* | 882.067 | 955.323 | 845.058 | 889.796 | 984.549 | 941.525 | 880.837 | 782.693 | 894.656 | 845.806 | 779.650 | -7,8 |
| Importación (1) *Imports (1)* | - | 37.298 | 104.014 | 116.552 | 130.753 | 148.722 | 94.257 | 131.690 | 149.385 | 114.321 | 87.952 | -23,1 |
| Exportación (2) *Exports (2)* | 392.878 | 457.665 | 448.985 | 500.778 | 552.780 | 570.307 | 456.154 | 415.484 | 453.691 | 359.928 | 243.614 | -32,3 |
| Variación de inventario *Stock variation* | 31.643 | 5.868 | 52.004 | 39.280 | -5.871 | 23.930 | 98.798 | 99.170 | 54.652 | 76.470 | 41.557 | -45,7 |
| Oferta total *Total supply* | 520.832 | 540.824 | 552.092 | 544.850 | 556.650 | 543.870 | 617.738 | 598.069 | 645.002 | 676.668 | 665.545 | -1,6 |
| Transformación total (3) *Total transformation (3)* | 180.106 | 169.401 | 201.289 | 210.605 | 221.533 | 191.901 | 263.957 | 273.849 | 300.027 | 345.516 | 375.894 | 8,8 |
| Consumo propio *Own consumption* | 55.054 | 61.622 | 48.014 | 57.794 | 62.671 | 68.866 | 66.061 | 59.652 | 64.144 | 65.468 | 59.413 | -9,2 |
| Transporte *Transportation* | 178.941 | 207.489 | 196.091 | 184.667 | 182.879 | 182.458 | 182.418 | 157.999 | 171.711 | 147.249 | 115.669 | -21,4 |
| Industria *Industry* | 106.731 | 102.312 | 106.700 | 91.784 | 89.567 | 100.645 | 105.301 | 106.568 | 109.121 | 118.435 | 114.569 | -3,3 |
| Consumo Energético *Energy Consumption* | 285.671 | 309.801 | 302.791 | 276.450 | 272.446 | 283.103 | 287.720 | 264.567 | 280.831 | 265.683 | 230.239 | -13,3 |
| **Demanda Total** *Total Demand* | **520.832** | **540.824** | **552.093** | **544.850** | **556.650** | **543.870** | **617.738** | **598.069** | **645.002** | **676.668** | **665.545** | **-1,6** |

(1) Cutter stock
(2) Incluye SLOP
(3) Incluye residuo de fuel oil

### Figura 2-26 Fuel oil
*Figure 2-26 Fuel oil*



# 3

# Centros de Transformación
## *Transformation Centres*

En este capítulo se presenta la contabilización energética en cada uno de los centros de transformación del país (refinerías, centrales eléctricas, autogeneradoras, centros de gas y destilerías). Se refiere a la energía que ingresa a cada uno de los centros y la energía resultante luego del proceso de transformación de la misma.

*This chapter presents the energy flows of each of the transformation centres in the country (refineries, power stations, auto generators, gas centres and distilleries). The input of each centre and the corresponding output after the transformation process is shown.*

Foto: Refinería Estatal de Esmeraldas

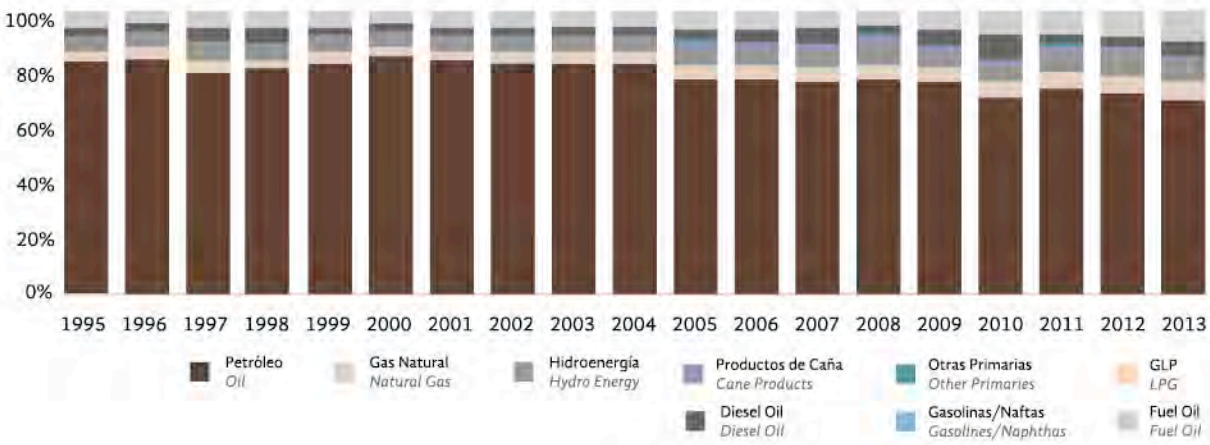
## Tabla 3-1 Carga a centros de transformación (kBEP)

*Table 3-1 Transformation centre inputs (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | 57.737 | 64.032 | 58.799 | 61.984 | 62.469 | 64.821 | 64.647 | 57.502 | 65.011 | 63.897 | 59.441 | -7,0 |
| Gas Natural *Natural Gas* | 3.001 | 3.505 | 3.600 | 3.930 | 4.135 | 3.906 | 4.362 | 4.715 | 4.327 | 5.359 | 6.142 | 14,6 |
| Hidroenergía *Hydro Energy* | 4.449 | 4.592 | 4.264 | 4.417 | 5.600 | 6.999 | 5.716 | 5.351 | 6.898 | 7.582 | 6.840 | -9,8 |
| Productos de Caña *Cane Products* | - | - | 2.053 | 1.328 | 1.940 | 1.312 | 836 | 912 | 1.090 | 1.148 | 1.127 | -1,9 |
| Otras Primarias *Other Primaries* | - | - | - | - | 1 | 2 | 2 | 2 | 2 | 2 | 36 | 2.058 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | - | - | - | 121 | 132 | 137 | 121 | 124 | 113 | 100 | 94 | -6,9 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 48 | 123 | 564 | 733 | 85 | 169 | 212 | 311 | 313 | 2 | 58 | 2.881 |
| Diesel Oil *Diesel Oil* | 1.314 | 2.189 | 2.865 | 4.089 | 3.969 | 2.964 | 4.955 | 7.516 | 4.108 | 3.318 | 4.211 | 26,9 |
| Fuel Oil *Fuel Oil* | 4.419 | 4.156 | 4.938 | 5.167 | 5.435 | 4.708 | 6.476 | 6.718 | 7.361 | 8.477 | 9.222 | 8,8 |
| Total transformación *Total transformation* | 70.968 | 78.597 | 77.083 | 81.768 | 83.767 | 85.018 | 87.327 | 83.151 | 89.223 | 89.885 | 87.169 | -3 |

## Figura 3-1 Estructura de transformación

*Figure 3-1 Energy transformation structure*



## 3.1 Refinerías / *Refeniries*

### Tabla 3-2 Carga y producción en refinerías (kBEP)

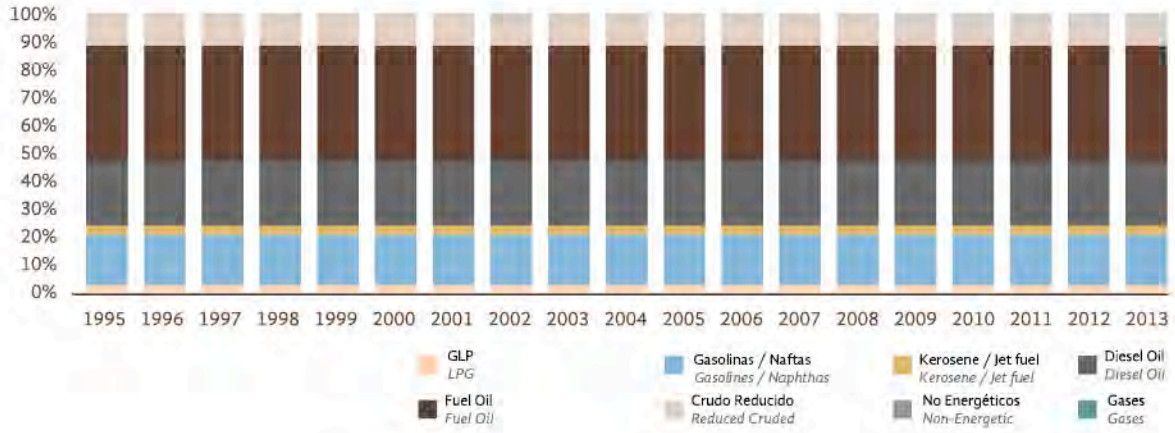
*Table 3-2 Refinery inputs and outputs (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | -57.572 | -63.713 | -58.429 | -61.431 | -61.221 | -63.472 | -63.305 | -56.077 | -63.470 | -62.249 | -57.586 | -7,5 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 1.146 | 1 200 | 1.033 | 1.253 | 874 | 1.176 | 1.125 | 1.023 | 1.365 | 1.417 | 1.123 | -20,8 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 9.725 | 10.403 | 10.400 | 10.786 | 9.218 | 10.487 | 10.273 | 8.557 | 10.656 | 10.505 | 9.280 | -11,7 |
| Kerosene/Jet fuel *Kerosene/Jet fuel* | 1.818 | 2.142 | 2.390 | 2.587 | 3.777 | 2.726 | 2.627 | 2.611 | 2.684 | 2.686 | 2.856 | 6,3 |
| Diesel Oil *Diesel Oil* | 12.374 | 14.108 | 13.622 | 13.610 | 12.594 | 13.547 | 14.355 | 12.226 | 14.087 | 13.212 | 11.831 | -10,5 |
| Fuel Oil *Fuel Oil* | 21.640 | 23.437 | 20.732 | 21.830 | 24.154 | 23.099 | 21.610 | 19.202 | 21.949 | 20.750 | 19.127 | -7,8 |
| Crudo Reducido *Reduced crude* | 5.771 | 6.294 | 6.014 | 6.628 | 6.667 | 7.286 | 7.019 | 6.663 | 6.811 | 6.910 | 6.971 | 0,9 |
| Gases *Gases* | 12 | 13 | 10 | 12 | 12 | 17 | 26 | 36 | 34 | 20 | 30 | 52,5 |
| No Energético *Non-Energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |

*El signo negativo muestra la cantidad de energía que entra a un centro de transformaciòn. El resto de energéticos, con signo positivo, son los producidos por el centro de transformación. / *The negative signs show inputs, while positive signs show output energy of transformation centre.*

### Figura 3-2 Estructura de refinación

*Figure 3-2 Output refining structure*



## Tabla 3-3 Carga y producción en refinerías (unidades físicas)

*Table 3-3 Refinery inputs and outputs (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | "Var. (%) 2013/2012" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | miles bls *thousand bls* | -55.874 | -61.833 | -56.705 | -59.618 | -59.414 | -61.599 | -61.437 | -54.422 | -61.597 | -60.412 | -55.886 | -7,5 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg. *thousand kg.* | 150.235 | 157.324 | 135.415 | 164.275 | 114.530 | 154.095 | 147.380 | 134.027 | 178.945 | 185.654 | 147.123 | -20,8 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 457.197 | 489.079 | 488.942 | 507.078 | 433.356 | 492.999 | 482.960 | 402.263 | 500.944 | 493.873 | 436.266 | -11,7 |
| Kerosene/Jet fuel *Kerosene/Jet fuel* | miles gal *thousand gall* | 79.670 | 93.879 | 104.761 | 113.368 | 165.542 | 119.482 | 115.116 | 114.452 | 117.633 | 117.736 | 125.176 | 6,3 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 518.938 | 591.651 | 571.246 | 570.763 | 528.147 | 568.106 | 602.010 | 512.716 | 590.759 | 554.079 | 496.164 | -10,5 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 882.067 | 955.323 | 845.058 | 889.796 | 984.549 | 941.525 | 880.837 | 782.693 | 894.656 | 845.806 | 779.650 | -7,8 |
| Crudo Reducido *Reduced crude* | miles gal *thousand gall* | 235.235 | 256.567 | 245.138 | 270.158 | 271.748 | 296.975 | 286.115 | 271.571 | 277.614 | 281.641 | 284.128 | 0,9 |
| Gases *Gases* | MMcf | 87 | 96 | 76 | 93 | 92 | 126 | 199 | 273 | 253 | 150 | 229 | 52,5 |
| No Energético *Non-Energetic* | miles gal *thousand gall* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |

### 3.1.1 Refinería Esmeraldas
*3.1.1 Refinery of Esmeraldas*

## Tabla 3-4 Carga y producción a refinería Esmeraldas (kBEP)

*Table 3-4 Input and output of refinery Esmeraldas (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | "Var. (%) 2013/2012" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | -32.795 | -37.316 | -33.918 | -34.703 | -34.474 | -35.999 | -35.023 | -30.205 | -36.799 | -33.937 | -29.591 | -12,8 |
| Diesel Oil *Diesel Oil* | 6.541 | 8.042 | 7.625 | 7.742 | 6.774 | 7.895 | 8.440 | 6.914 | 8.643 | 7.625 | 6.342 | -16,8 |
| Fuel Oil *Fuel Oil* | 13.749 | 14.972 | 12.710 | 13.546 | 15.527 | 14.372 | 12.546 | 10.925 | 13.488 | 11.706 | 10.267 | -12,3 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 1.022 | 1.063 | 924 | 1.116 | 725 | 1.032 | 971 | 877 | 1.228 | 1.289 | 1.002 | -22,2 |
| Kerosene / Jet fuel *Kerosene / Jet fuel* | 1.109 | 1.526 | 1.627 | 1.714 | 2.024 | 1.924 | 1.756 | 1.798 | 1.735 | 1.830 | 1.872 | 2,3 |
| Gasolinas / Naftas *Gasoline / Naphtha* | 6.387 | 6.834 | 6.833 | 7.173 | 5.811 | 6.848 | 6.467 | 5.183 | 7.182 | 6.632 | 5.597 | -15,6 |
| No Energético *Non Energetic* | 1.205 | 1.168 | 996 | 1.034 | 1.000 | 1.430 | 2.361 | 2.145 | 2.261 | 2.409 | 2.386 | -0,9 |

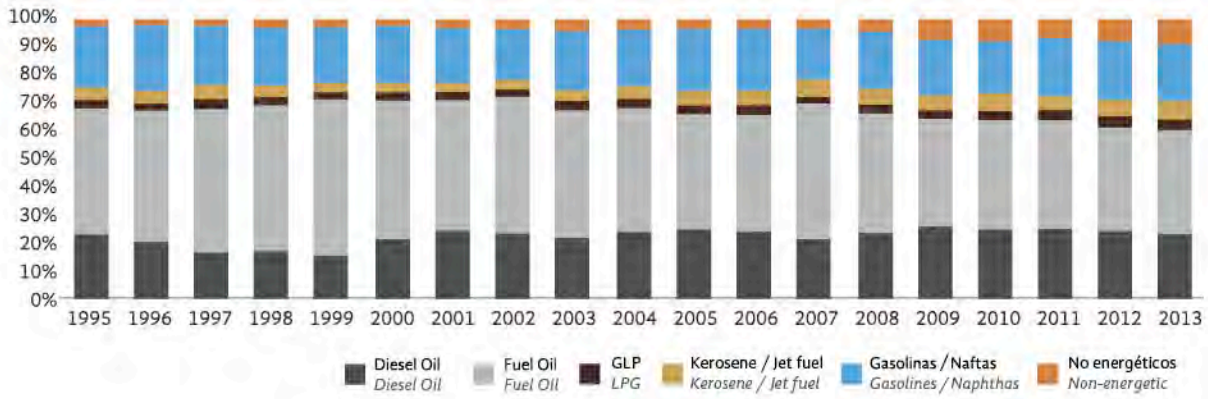
## Tabla 3-5 Carga y producción a refinería Esmeraldas (unidades Físicas)

*Table 3-5 Input and output of refinery Esmeraldas (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | "Var. (%) 2013/2012" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | miles bls | -31.827 | -36.215 | -32.917 | -33.679 | -33.457 | -34.937 | -33.990 | -29.314 | -35.714 | -32.936 | -28.718 | -12,8 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 274.305 | 337.258 | 319.786 | 324.688 | 284.100 | 331.098 | 353.931 | 289.952 | 362.453 | 319.782 | 265.977 | -16,8 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 560.438 | 610.284 | 518.089 | 552.148 | 632.909 | 585.835 | 511.385 | 445.301 | 549.795 | 477.166 | 418.488 | -12,3 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg. *thousand kg.* | 133.880 | 139.288 | 121.069 | 146.212 | 94.985 | 135.239 | 127.315 | 114.985 | 160.902 | 168.932 | 131.369 | -22,2 |
| Kerosene/Jet fuel *Kerosene/Jet fuel* | miles gal *thousand gall* | 48.614 | 66.902 | 71.318 | 75.141 | 88.717 | 84.326 | 76.956 | 78.821 | 76.044 | 80.194 | 82.042 | 2,3 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 300.269 | 321.274 | 321.211 | 337.225 | 273.170 | 321.925 | 304.041 | 243.674 | 337.641 | 311.800 | 263.106 | -15,6 |
| No Energético *Non Energetic* | miles gal *thousand gall* | 51 | 49 | 42 | 43 | 42 | 60 | 99 | 90 | 95 | 101 | 100 | -0,9 |

## Figura 3-3 Estructura de refinación de Esmeraldas

*Figure 3-3 Output structure of the Refinery of Esmeraldas*



## 3.1.2 Refinería La Libertad
*3.1.2 Refinery of La Libertad*

### Tabla 3-6 Carga y producción a refinería La Libertad (kBEP)
*Table 3-6 Input and output of refinery La Libertad (kBOE)*

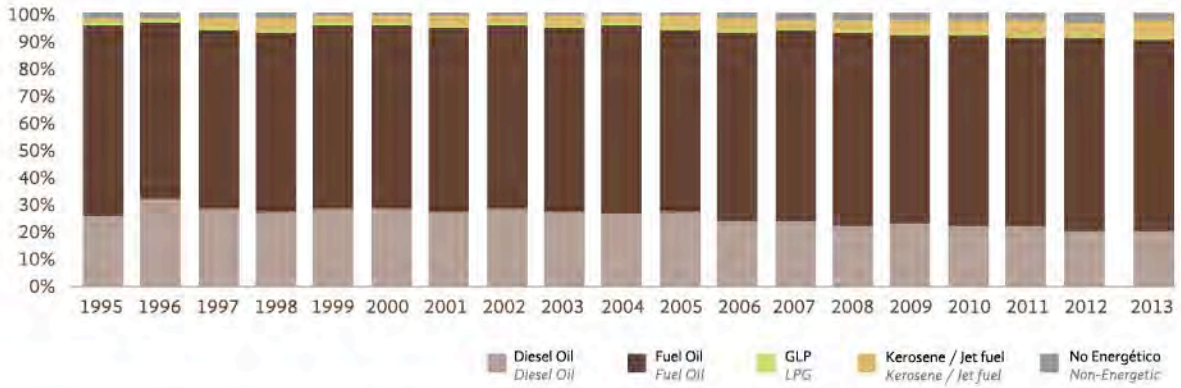
| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | -14.460 | -15.131 | -14.701 | -14.808 | -15.179 | -15.149 | -16.239 | -14.604 | -15.138 | -15.953 | -16.007 | 0,3 |
| Diesel Oil *Diesel Oil* | 3.205 | 3.295 | 3.271 | 2.978 | 3.026 | 2.749 | 3.014 | 2.643 | 2.743 | 2.589 | 2.595 | 0,2 |
| Fuel Oil *Fuel Oil* | 7.891 | 8.465 | 8.022 | 8.284 | 8.627 | 8.726 | 9.064 | 8.277 | 8.461 | 9.044 | 8.861 | -2,0 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 2.151 | 2.271 | 2.181 | 2.183 | 2.135 | 2.227 | 2.477 | 2.193 | 2.260 | 2.465 | 2.426 | -1,6 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 4 | 4 | 4 | 9 | 10 | 9 | 20 | 14 | 14 | 15 | 16 | 6,4 |
| Kerosene/Jetfuel *Kerosene/Jetfuel* | 583 | 457 | 562 | 680 | 524 | 589 | 684 | 625 | 720 | 760 | 802 | 5,6 |
| No Energéticos *Non-Energetics* | 71 | 126 | 157 | 227 | 292 | 340 | 342 | 348 | 370 | 416 | 396 | -4,8 |

### Tabla 3-7 Carga y producción a refinería La Libertad (unidades Físicas)
*Table 3-7 Input and output of refinery La Libertad (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | kbbl | -14.034 | -14.684 | -14.267 | -14.371 | -14.731 | -14.702 | -15.760 | -14.173 | -14.692 | -15.482 | -15.535 | 0,3 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 134.401 | 138.192 | 137.163 | 124.869 | 126.921 | 115.284 | 126.408 | 110.824 | 115.040 | 108.565 | 108.816 | 0,2 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 321.628 | 345.039 | 326.969 | 337.648 | 351.640 | 355.690 | 369.452 | 337.392 | 344.861 | 368.640 | 361.162 | -2,0 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 101.134 | 106.780 | 102.518 | 102.612 | 100.368 | 104.693 | 116.446 | 103.102 | 106.250 | 115.899 | 114.054 | -1,6 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles gal *thousand gall* | 516 | 501 | 503 | 1.161 | 1.262 | 1.195 | 2.660 | 1.837 | 1.897 | 1.944 | 2.068 | 6,4 |
| Kerosene/Jetfuel *Kerosene/Jetfuel* | miles gal *thousand gall* | 25.530 | 20.022 | 24.625 | 29.805 | 22.984 | 25.822 | 29.970 | 27.411 | 31.537 | 33.305 | 35.169 | 5,6 |
| No Energéticos *Non-Energetics* | miles gal *thousand gall* | 3 | 5 | 7 | 10 | 12 | 14 | 14 | 15 | 16 | 17 | 17 | -4,8 |

**Figura 3-4 Estructura de refinación de La Libertad**

*Figure 3-4 Output structure of the Refinery of La Libertad*




## 3.1.3 Refinería Shushufindi

*3.1.3 Refinery of Shushufindi*

**Tabla 3-8 Carga y producción a refinería Shushufindi (kBEP)**

*Table 3-8 Input and output of Refinery of Shushufindi (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | -5.811 | -6.301 | -5.225 | -7.118 | -6.889 | -7.487 | -7.295 | -6.550 | -6.754 | -7.383 | -7.313 | -0,9 |
| Diesel Oil *Diesel Oil* | 1.618 | 1.673 | 1.843 | 1.830 | 1.757 | 1.815 | 1.821 | 1.621 | 1.663 | 2.020 | 1.838 | -9,0 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 1.048 | 1.148 | 1.266 | 1.286 | 1.122 | 1.259 | 1.180 | 1.035 | 1.049 | 1.224 | 1.111 | -9,3 |
| Kerosene/Jetfuel *Kerosene/Jetfuel* | 107 | 134 | 169 | 166 | 161 | 185 | 170 | 160 | 191 | 58 | 146 | 151,0 |
| Crudo Reducido *Reduced Crude* | 2.700 | 2.948 | 3.342 | 3.383 | 3.404 | 3.953 | 3.791 | 3.460 | 3.550 | 3.723 | 3.792 | 1,9 |

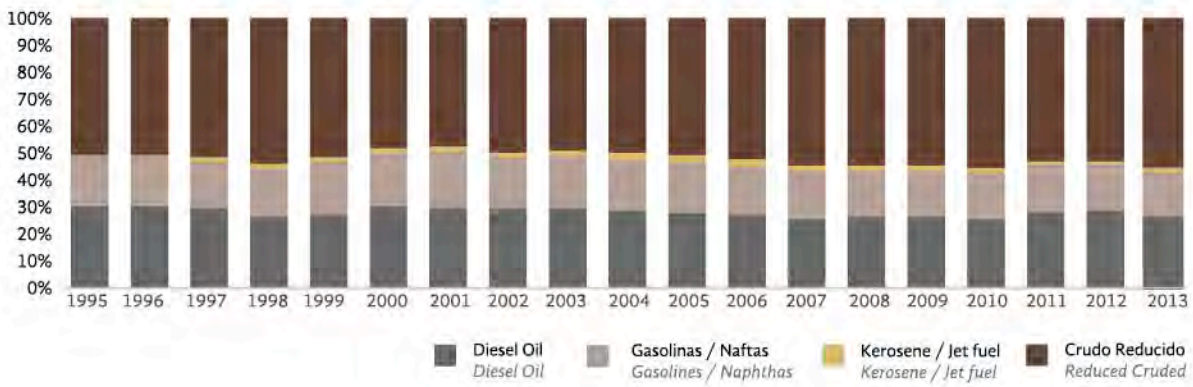
## Tabla 3-9 Carga y producción a refinería Shushufindi (unidades físicas)

*Table 3-9 Input and output of Refinery of Shushufindi (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | miles bls *thousand bls* | -5.639 | -6.115 | -5.071 | -6.908 | -6.686 | -7.266 | -7.080 | -6.357 | -6.555 | -7.165 | -7.097 | -0,9 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 67.867 | 70.179 | 77.293 | 76.753 | 73.684 | 76.127 | 76.383 | 67.995 | 69.735 | 84.700 | 77.076 | -9,0 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 49.276 | 53.971 | 59.523 | 60.465 | 52.762 | 59.193 | 55.457 | 48.649 | 49.333 | 57.565 | 52.207 | -9,3 |
| Kerosene/Jetfuel *Kerosene/Jetfuel* | miles gal *thousand gall* | 4.706 | 5.863 | 7.428 | 7.259 | 7.038 | 8.114 | 7.462 | 7.012 | 8.354 | 2.556 | 6.416 | 151,0 |
| Crudo Reducido *Reduced Crude* | miles gal *thousand gall* | 110.045 | 120.169 | 136.208 | 137.880 | 138.738 | 161.139 | 154.532 | 141.047 | 144.684 | 151.744 | 154.568 | 1,9 |

## Figura 3-5 Estructura de refinación de Shushufindi

*Figure 3-5 Output structure of the Refinery of Shushufindi*



## 3.1.4 Otras Refinerías (plantas topping)
*3.1.4 Other refineries (topping)*

### Tabla 3-10 Carga y producción en otras refinerías (kBEP)

*Table 3-10 Input and output in other refineries (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | -4.507 | -4.965 | -4.005 | -4.801 | -4.678 | -4.837 | -4.747 | -4.718 | -4.779 | -4.976 | -4.674 | -6,1 |
| Diesel Oil *Diesel Oil* | 1.010 | 1.097 | 882 | 1.060 | 1.036 | 1.087 | 1.080 | 1.048 | 1.038 | 978 | 1.056 | 7,9 |
| Gases *Gases* | 12 | 13 | 10 | 12 | 12 | 17 | 26 | 36 | 34 | 20 | 30 | 52,5 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 139 | 150 | 121 | 144 | 150 | 153 | 149 | 145 | 164 | 183 | 147 | -19,9 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 121 | 134 | 106 | 129 | 140 | 135 | 133 | 131 | 123 | 111 | 104 | -6,0 |
| Jet Fuel *Jet Fuel* | 19 | 25 | 32 | 27 | 25 | 28 | 17 | 28 | 39 | 38 | 35 | -7,8 |
| Crudo Reducido *Reduced crude* | 3.071 | 3.346 | 2.672 | 3.245 | 3.263 | 3.333 | 3.228 | 3.202 | 3.261 | 3.187 | 3.179 | -0,3 |

Incluye Lago Agrio, Andes Petroleum, Petroamazonas and Repsol
*Includes topping plants of Lago Agrio, Andes Petroleum, Petroamazonas and Repsol*

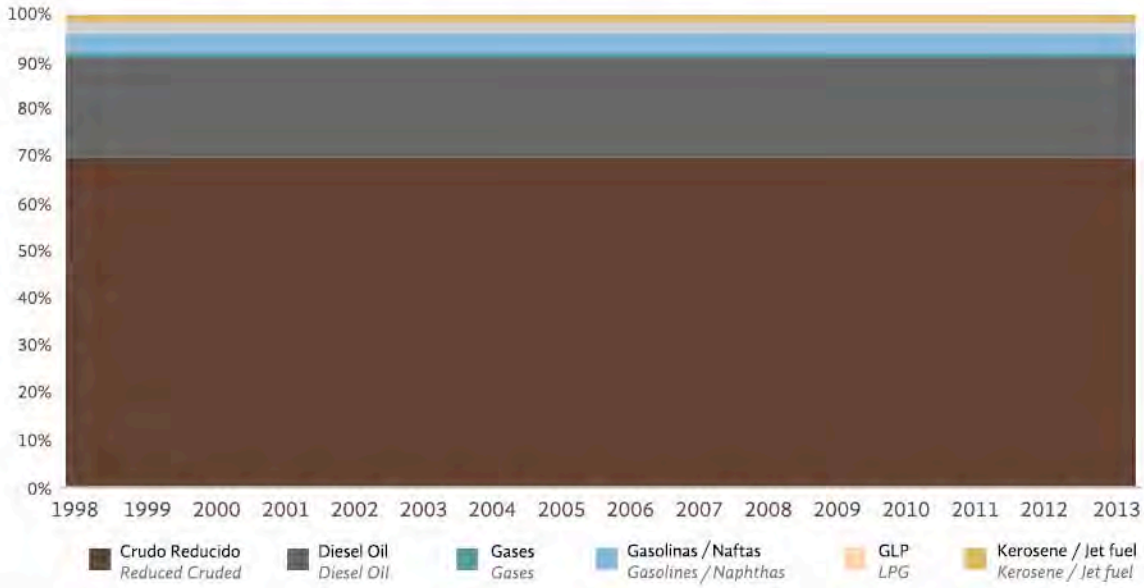
### Tabla 3-11 Carga y producción en otras refinerías (unidades físicas)

*Table 3-11 Input and output in other refineries (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | kbbl | 4.374 | 4.819 | 3.887 | 4.659 | 4.540 | 4.694 | 4.607 | 4.579 | 4.638 | 4.829 | 4.536 | -6,1 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 42.364 | 46.021 | 37.005 | 44.453 | 43.441 | 45.597 | 45.286 | 43.945 | 43.530 | 41.033 | 44.295 | 7,9 |
| Gases *Gases* | MMcf | 87 | 96 | 76 | 93 | 92 | 126 | 199 | 273 | 253 | 150 | 229 | 52,5 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 6.518 | 7.054 | 5.689 | 6.776 | 7.056 | 7.187 | 7.015 | 6.838 | 7.720 | 8.609 | 6.898 | -19,9 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg *thousand gall* | 15.839 | 17.535 | 13.843 | 16.902 | 18.283 | 17.661 | 17.405 | 17.205 | 16.146 | 14.561 | 13.686 | -6,0 |
| Jet Fuel *Jet Fuel* | miles gal *thousand gall* | 819 | 1.092 | 1.389 | 1.163 | 1.079 | 1.220 | 728 | 1.209 | 1.699 | 1.681 | 1.549 | -7,8 |
| Crudo Reducido *Reduced crude* | miles gal *thousand gall* | 125.191 | 136.398 | 108.930 | 132.278 | 133.010 | 135.836 | 131.583 | 130.523 | 132.930 | 129.896 | 129.560 | -0,3 |

## Figura 3-6 Estructura de refinación de otras refinerías (topping)

*Figure 3-6 Output refining structure of other refineries (topping)*




## 3.2 Centrales Eléctricas / *Power stations*

## Tabla 3-12 Carga y producción de energía en Centrales eléctricas (kBEP)

*Table 3-12 Input and output of power stations (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | -1.487 | -1.438 | -1.566 | -1.675 | -1.766 | -1.489 | -1.769 | -1.979 | -1.435 | -2.370 | -2.745 | 15,8 |
| Hidroenergía *Hidro Energy* | -4.363 | -4.499 | -4.168 | -4.237 | -5.288 | -6.607 | -5.414 | -5.068 | -6.585 | -7.266 | -6.521 | -10,2 |
| Otras Primarias *Other Primaries* | - | - | - | - | -1 | -2 | -2 | -2 | -2 | -2 | -36 | 2.058,1 |
| Gasolinas/Naftas *Gasoline/Naphtha* | -48 | -123 | -564 | -733 | -85 | -169 | -212 | -311 | -313 | -2 | -58 | 2.882 |
| Diesel Oil *Diesel Oil* | -1.060 | -1.354 | -2.059 | -3.005 | -2.291 | -1.149 | -3.125 | -5.736 | -2.458 | -1.680 | -2.460 | 46,4 |
| Fuel Oil (1) *Fuel Oil* | -4.419 | -4.123 | -4.938 | -5.161 | -5.418 | -4.708 | -6.090 | -6.284 | -6.985 | -8.137 | -8.986 | 10,4 |
| Electricidad *Electricity* | 6.935 | 7.106 | 7.509 | 8.065 | 8.869 | 9.524 | 9.430 | 10.072 | 10.597 | 11.761 | 12.000 | 2,0 |

(1) Incluye Residuo de Fuel Oil / *Includes Fuel Oil residue*

## Tabla 3-13 Carga y producción de energía en Centrales eléctricas (unidades físicas)

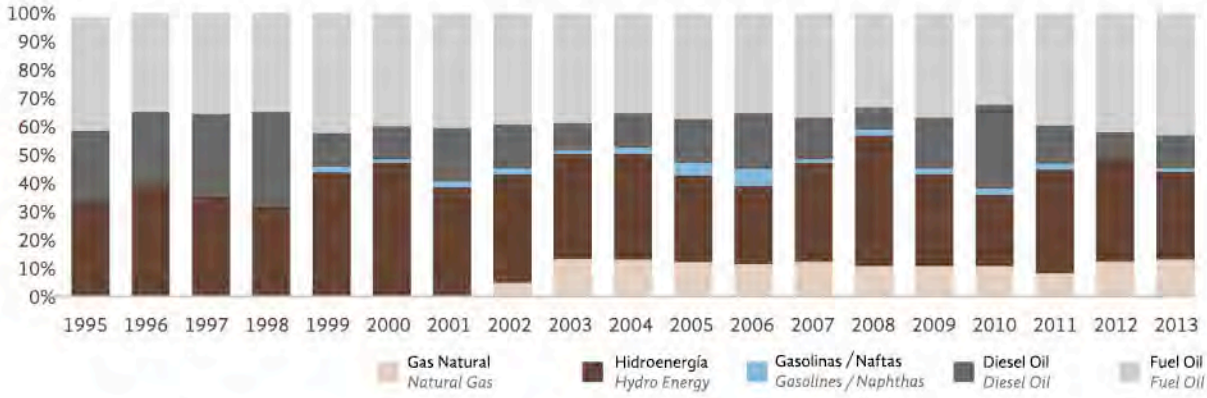
*Table 3-13 Input and output of power stations (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | * Var. (%) 2013/2012 * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | MMcf | -8.782 | -8.489 | -9.245 | -9.892 | -10.427 | -8.794 | -10.449 | -11.688 | -8.474 | -13.997 | -16.206 | 15,8 |
| Hidroenergía *Hydro Energy* | GWh | -7.042 | -7.261 | -6.727 | -6.838 | -8.534 | -10.663 | -8.737 | -8.179 | -10.628 | -11.727 | -10.525 | -10,2 |
| Otras Primarias *Other Primaries* | kBEP *kBOE* | - | - | - | - | -1 | -2 | -2 | -2 | -2 | -2 | -36 | 2.058 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | -2.279 | -5.783 | -26.504 | -34.440 | -4.004 | -7.936 | -9.953 | -14.640 | -14.711 | -91 | -2.706 | 2.882 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | -44.471 | -56.787 | -86.328 | -126.031 | -96.088 | -48.169 | -131.034 | -240.571 | -103.062 | -70.464 | -103.176 | 46,4 |
| Fuel Oil (1) *Fuel Oil* | miles gal *thousand gall* | -180.106 | -168.059 | -201.289 | -210.376 | -220.853 | -191.901 | -248.231 | -256.155 | -284.710 | -331.664 | -366.292 | 10,4 |
| Electricidad *Electricity* | GWh | 11.193 | 11.468 | 12.119 | 13.017 | 14.314 | 15.371 | 15.219 | 16.256 | 17.103 | 18.981 | 19.367 | 2,0 |

(1) Incluye Residuo de Fuel Oil / *Includes Fuel Oil residue.*

## Figura 3-7 Carga de energía a centrales eléctricas

*Figure 3-7 Input energy in power stations*



## 3.3 Autoproductores de electricidad / *Electricity autoproducers*

### Tabla 3-14 Carga y producción en centros autoproductores (kBEP)

*Table 3-14 Input and output of autoproducer power stations (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petroleo *Oil* | -165 | -319 | -369 | -553 | -1.248 | -1.349 | -1.342 | -1.424 | -1.541 | -1.648 | -1.855 | 12,6 |
| Gas Natural *Natural Gas* | -23 | -480 | -661 | -987 | -1.346 | -1.234 | -1.296 | -1.414 | -1.564 | -1.564 | -1.636 | 4,6 |
| Hidroenergía *Hydro Energy* | -85 | -93 | -97 | -180 | -313 | -392 | -303 | -283 | -313 | -316 | -318 | 0,6 |
| Productos de Caña *Cane Products* | - | - | -2.053 | -1.328 | -1.940 | -1.312 | -836 | -912 | -1.064 | -1.122 | -1.093 | -2,6 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | - | - | - | -121 | -132 | -137 | -121 | -124 | -113 | -100 | -94 | -6,9 |
| Diesel Oil *Diesel Oil* | -253 | -834 | -806 | -1.084 | -1.678 | -1.816 | -1.830 | -1.779 | -1.650 | -1.638 | -1.750 | 6,9 |
| Fuel Oil (1) *Fuel Oil* | - | -33 | - | -6 | -17 | - | -386 | -434 | -376 | -340 | -236 | -30,7 |
| Electricidad *Electricity* | 219 | 692 | 796 | 1.300 | 1.873 | 2.006 | 1.887 | 2.016 | 2.132 | 2.396 | 2.411 | 0,7 |

(1) Incluye Residuo de Fuel Oil / *Includes Fuel Oil residue.*

## Tabla 3-15 Carga y producción en centros autoproductores (unidades físicas)

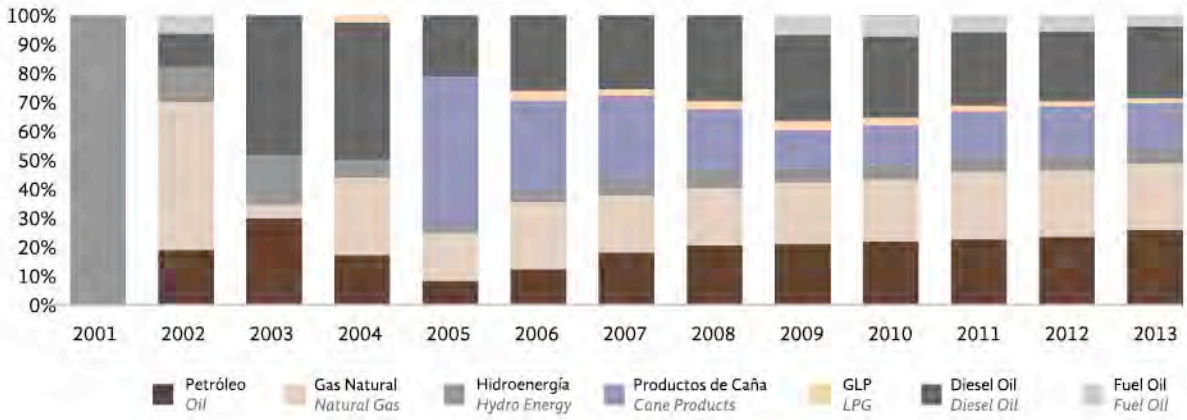
*Table 3-15 Input and output of autoproducer power stations (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petroleo *Oil* | kbbl | -160 | -309 | -359 | -537 | -1.309 | -1.309 | -1.302 | -1.382 | -1.495 | -1.599 | -1.800 | 12,6 |
| Gas Natural *Natural Gas* | MMcf | -137 | -2.832 | -3.904 | -5.828 | -7.286 | -7.286 | -7.652 | -8.352 | -9.234 | -9.237 | -9.660 | 4,6 |
| Hidroenergía *Hydro Energy* | GWh | -138 | -151 | -156 | -291 | -633 | -633 | -488 | -457 | -505 | -511 | -514 | 0,6 |
| Bagazo de Caña *Cane bagasse* | kt | - | - | -2.053 | -1.328 | -1.312 | -1.312 | -863 | -912 | -1.064 | -1.122 | -1.093 | - 2,6 |
| Melaza *Molasses* | kt | - | - | - | - | - | - | - | - | -5,98 | -6,04 | -7,72 | 27,7 |
| Jugo de Caña *Cane Juice* | kt | - | - | - | - | - | - | - | - | -40,67 | -41,06 | -52,45 | 27,7 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg *thousand kg.* | - | - | - | -15.866 | -17.950 | -17.950 | -15.860 | -16.215 | -14.782 | -13.165 | -12.262 | - 6,9 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | -10.629 | -34.993 | -33.811 | -45.455 | -76.139 | -76.139 | -76.763 | -74.626 | -69.211 | -68.694 | -73.401 | 6,9 |
| Fuel Oil (1) *Fuel Oil* | miles gal *thousand gall* | - | -1.341 | - | -229 | - | - | -15.726 | -17.694 | -15.317 | -13.852 | -9.601 | - 30,7 |
| Electricidad *Electricity* | miles gal *thousand gall* | 353 | 1.117 | 1.285 | 2.099 | 3.237 | 3.237 | 3.045 | 3.254 | 3.441 | 3.866 | 3.892 | 0,7 |

(1) Incluye Residuo de Fuel Oil / *Includes Fuel Oil residue.*

## Figura 3-8 Carga a centros autoproductores

*Figure 3-8 Input energy in autoproducer power stations*




## 3.4 Centros de Gas / *Gas Centres*

### Tabla 3-16 Carga y producción en Centros de gas Shushufindi (kBEP)

*Table 3-16 Input and output in gas centre of Shushufindi (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | -1.491 | -1.588 | -1.373 | -1.268 | -1.024 | -1.182 | -1.297 | -1.321 | -1.328 | -1.424 | -1.761 | 23,7 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 555 | 549 | 493 | 424 | 340 | 427 | 520 | 543 | 582 | 616 | 790 | 28,2 |
| Gasolinas/Naftas *Gasoline/Naphtha* | 448 | 482 | 409 | 324 | 267 | 319 | 360 | 359 | 336 | 341 | 463 | 35,7 |
| Gases (1) *Gases* | 314 | 375 | 344 | 356 | 306 | 338 | 338 | 377 | 374 | 431 | 482 | 11,7 |

(1) Propano y gas combustible / *Propane and combustible gas*

## Tabla 3-17 Carga y producción en Centros de gas Shushufindi (Unidades Físicas)

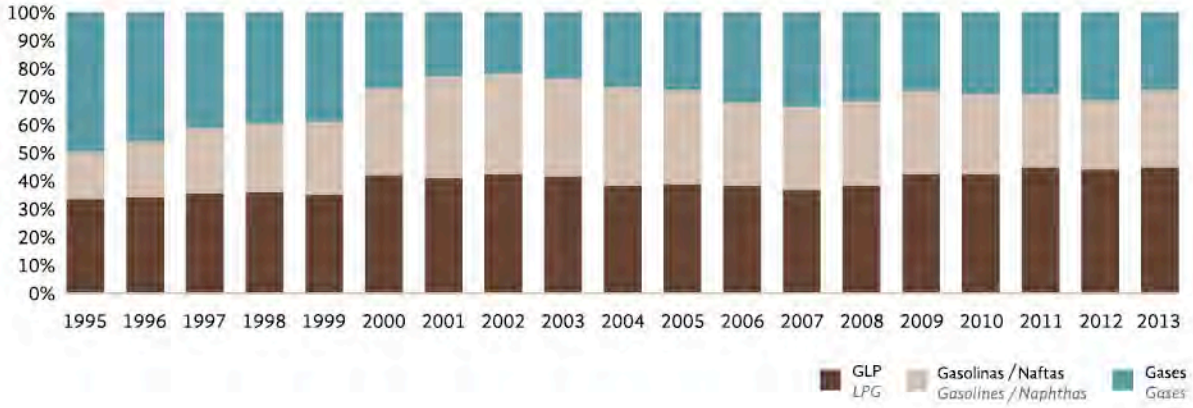
*Table 3-17 Input and output in gas centre of Shushufindi (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | " Var. (%) 2013/2012 " |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | MMcf | -8.803 | -9.375 | -8.108 | -7.485 | -6.044 | -6.982 | -7.659 | -7.800 | -7.842 | -8.408 | -10.400 | 23,7 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg *thousand kg.* | 72.676 | 71.924 | 64.596 | 55.570 | 44.546 | 56.022 | 68.148 | 71.222 | 76.225 | 80.728 | 103.510 | 28,2 |
| Gasolinas/Naftas *Gasoline/Naphtha* | miles gal *thousand gall* | 21.065 | 22.648 | 19.238 | 15.239 | 12.573 | 15.015 | 16.936 | 16.897 | 15.798 | 16.051 | 21.779 | 35,7 |
| Gases *Gases* (1) | MMcf | 2.357 | 2.816 | 2.585 | 2.673 | 2.299 | 2.541 | 2.543 | 2.832 | 2.811 | 3.243 | 3.622 | 11,7 |

(1) Propano y gas combustible / *Propane and combustible gas.*

## Figura 3-9 Carga en Centros de gas Shushufindi

*Figure 3-9 Input energy in gas centre of Shushufindi*



## 3.5 Destilerías / *Distilleries*

### Tabla 3-18 Carga y producción de energía en Destilerías (kBEP)

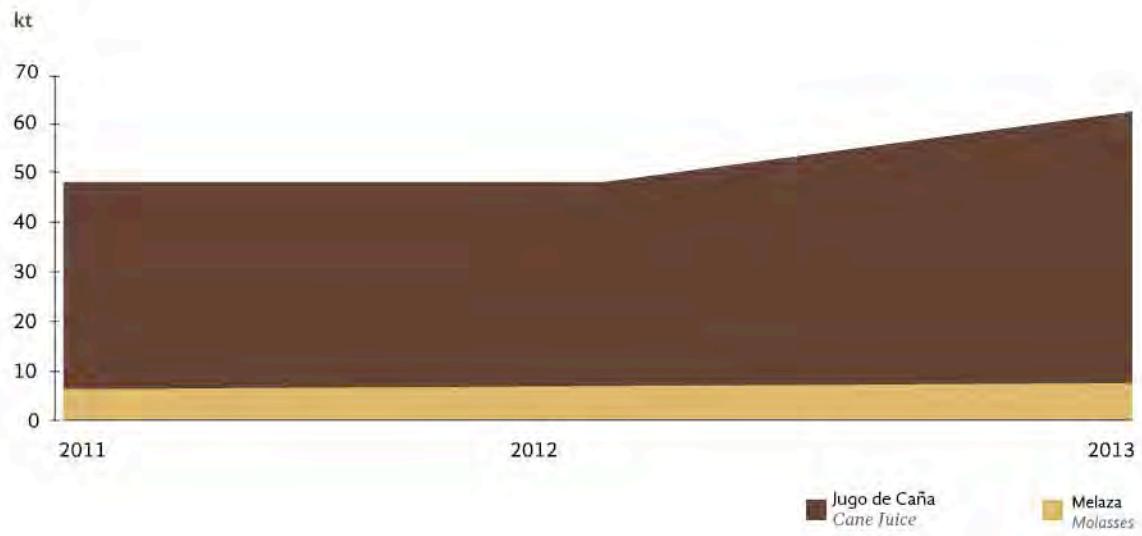
*Table 3-18 Input and output in distilleries (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Productos de Caña<br>*Cane Products* | - | - | - | - | - | - | - | - | -25,87 | -26,12 | -33,37 |
| Jugo de Caña<br>*Cane Juice* | - | - | - | - | - | - | - | - | -18,11 | -18,29 | -23,36 |
| Melaza<br>*Molasses* | - | - | - | - | - | - | - | - | -7,76 | -7,84 | -10,01 |
| Gasolinas/Naftas<br>*Gasoline/Naphtha* | - | - | - | - | - | - | - | - | 25,87 | 26,12 | 33,37 |

*Estimados a partir del etanol utilizado en la producción de gasolina ecopais. Considera una composición de 70% de juego de caña y 30% de melaza. *Estimates for the ethanol used for the production of "ecopais" E5 gasoline. The ethanol is considered to come from 70% sugar cane and 30% molasses composition.*

### Figura 3-10 Carga en Destilerías

*Figure 3-10 Input in distilleries*



## Tabla 3-19 Carga y producción en Destilerías (Unidades físicas)

*Table 3-19 Input and output in distilleries (physical units)*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Productos de Caña *Cane Products* | kt | - | - | - | - | - | - | - | - | -46,66 | -47,10 | -60,17 |
| Jugo de Caña *Cane Juice* | kt | - | - | - | - | - | - | - | - | -40,67 | -41,06 | -52,45 |
| Melaza *Molasses* | kt | - | - | - | - | - | - | - | - | -5,98 | -6,04 | -7,72 |
| Gasolinas/Naftas *Gasoline/Naphtha* | kbbl | - | - | - | - | - | - | - | - | 43,45 | 43,87 | 56,04 |

# 4

# Consumo de energía por sector y fuente
## *Energy consumption by sector and source*

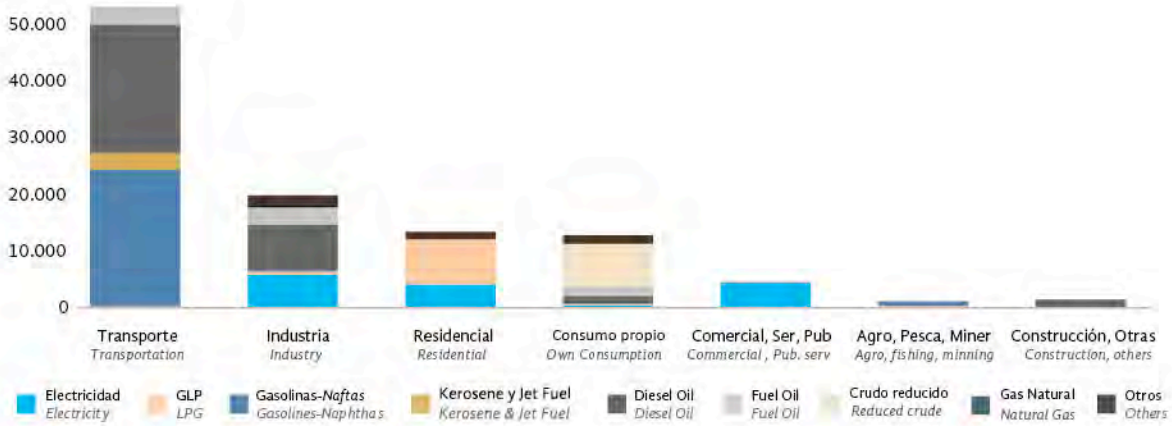
En este capítulo se presentan los consumos energéticos de cada uno de los sectores socioeconómicos del país (transporte, industria, residencial, entre otros) desagregados por cada una de las fuentes energéticas. Así mismo se presentan resultados de tipo estructural para conocer la composición en el consumo energético de cada uno de los sectores.

*This chapter presents energy consumption for each of the socioeconomic sectors of the country (transport, industry, residential, etc.) disaggregated by energy sources. The structure of energy consumption is also presented.*

Foto: Proyecto Hidroeléctrico Paute

## Figura 4-1 Consumo por sector y fuente

*Figure 4-1 Consumption by sector and energy source*




## Tabla 4-1 Consumo por sector (kBEP)

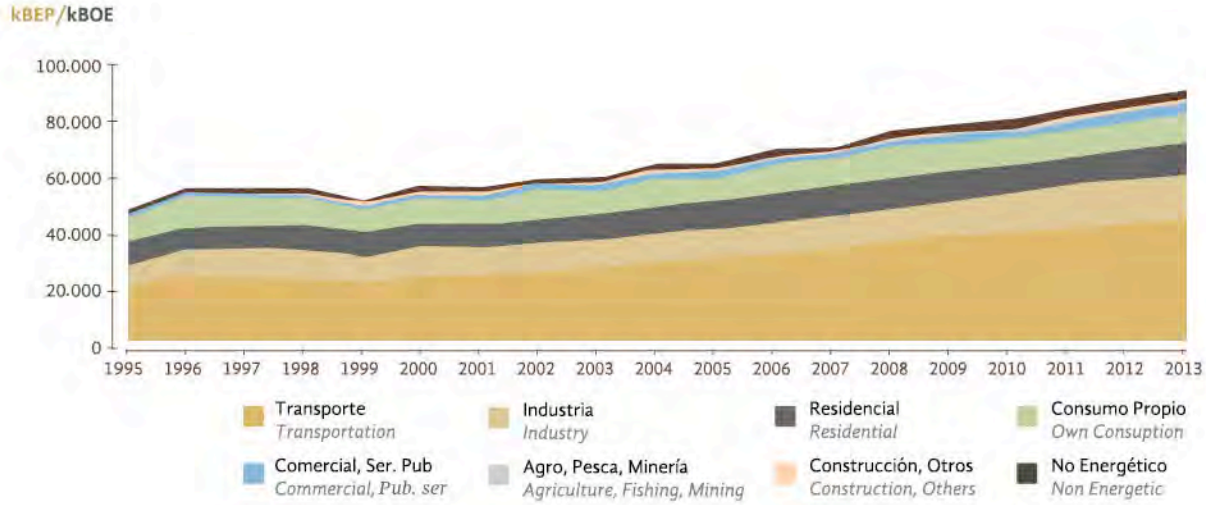
*Table 4-1 Consumption by sector (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte *Transportation* | 27.857 | 30.385 | 32.374 | 34.497 | 36.804 | 39.294 | 40.797 | 42.114 | 45.121 | 45.999 | 48.551 | 5,5 |
| Industria *Industry* | 11.470 | 12.017 | 10.895 | 12.025 | 11.607 | 12.609 | 14.216 | 14.756 | 15.577 | 16.819 | 18.050 | 7,3 |
| Residencial *Residential* | 10.076 | 10.590 | 11.291 | 11.635 | 11.909 | 1.976 | 11.659 | 11.760 | 11.661 | 12.291 | 12.127 | -1,3 |
| Consumo propio *Own Consumption* | 9.728 | 10.597 | 9.676 | 10.891 | 10.966 | 11.852 | 11.616 | 10.985 | 11.287 | 11.499 | 11.519 | 0,2 |
| Comercial, Ser.pub *Commercial, Pub. ser* | 2.197 | 2.424 | 2.654 | 2.881 | 3.007 | 3.134 | 2.867 | 2.961 | 3.354 | 3.539 | 3.933 | 11,1 |
| Agro, pesca, minería *Agriculture, fishing, mining* | 266 | 288 | 348 | 414 | 454 | 547 | 625 | 691 | 731 | 796 | 878 | 10,3 |
| Construcción,otras *Construction,others* | 1.300 | 1.356 | 1.079 | 860 | 699 | 839 | 674 | 874 | 1.023 | 1.101 | 1.132 | 2,8 |
| No energético *Non-energetic* | 1.277 | 1.294 | 1.157 | 1.262 | 1.289 | 1.770 | 2.703 | 2.493 | 2.631 | 2.825 | 2.782 | -1,5 |
| Consumo final *Final consumption* | 64.171 | 68.949 | 69.472 | 74.466 | 76.736 | 82.022 | 85.157 | 86.635 | 91.385 | 94.868 | 98.970 | 4,3 |

Nota: Incluye fuentes energéticas y no energéticas. / *Includes energy and non-energy sources*

## Figura 4-2 Consumo por sector

*Figure 4-2 Consumption by sector*



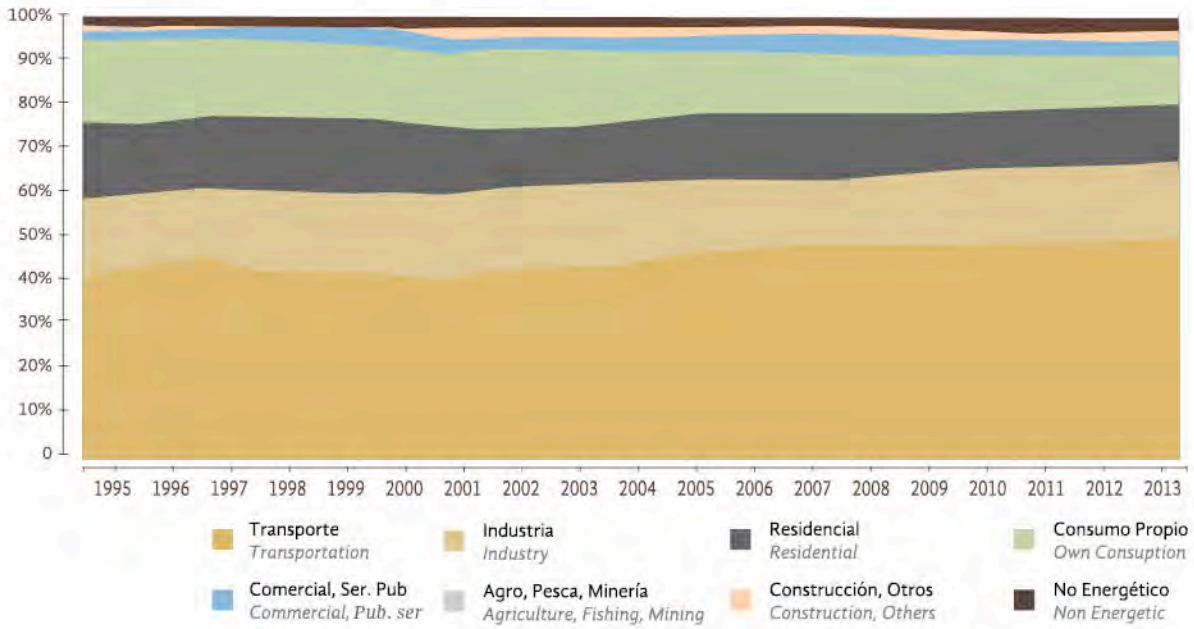

## Tabla 4-2 Estructura porcentual del consumo por sector (%)

*Table 4-2 Structure of consumption by sector (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte *Transportation* | 43,4 | 44,1 | 46,6 | 46,3 | 48,0 | 47,9 | 47,9 | 48,6 | 49,4 | 48,5 | 49,1 |
| Industria *Industry* | 17,9 | 17,4 | 15,7 | 16,1 | 15,1 | 15,4 | 16,7 | 17,0 | 17,0 | 17,7 | 18,2 |
| Residencial *Residential* | 15,7 | 15,4 | 16,3 | 15,6 | 15,5 | 14,6 | 13,7 | 13,6 | 12,8 | 13,0 | 12,3 |
| Consumo propio *Own Consumption* | 15,2 | 15,4 | 13,9 | 14,6 | 14,3 | 14,4 | 13,6 | 12,7 | 12,4 | 12,1 | 11,6 |
| Comercial, Ser.pub *Commercial, Pub.ser* | 3,43 | 0,5 | 3,83 | 0,9 | 3,93 | 0,8 | 3,43 | 3,4 | 0,7 | 3,74 | 4,0 |
| Agro,pesca,minería *Agriculture,fishing, mining* | 0,40 | 0,4 | 0,50 | 0,6 | 0,60 | 0,7 | 0,70 | 0,8 | 0,8 | 0,80 | 0,9 |
| Construccion,otras *Construction,others* | 2,02 | 2,0 | 1,61 | 0,2 | 0,91 | 1,0 | 0,81 | 1,0 | 0,1 | 1,21 | 1,1 |
| No energético *Non-energetic* | 2,01 | 0,9 | 1,71 | 0,7 | 1,72 | 0,2 | 3,22 | 2,9 | 0,9 | 3,02 | 2,8 |
| Consumo final *Final consumption* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 4-3 Estructura porcentual del consumo por sector

*Figure 4-3 Structure of consumption by sector*




## Tabla 4-3 Consumo de electricidad por sector (kBEP)

*Table 4-3 Electricity consumption by sector (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte *Transportation* | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | - |
| Industria *Industry* | 1.893 | 2.481 | 2.729 | 3.407 | 3.976 | 3.899 | 3.945 | 4.438 | 4.786 | 5.093 | 5.180 | 1,7 |
| Residencial *Residential* | 2.026 | 2.178 | 2.294 | 2.414 | 2.537 | 2.717 | 2.895 | 3.169 | 3.315 | 3.484 | 3.643 | 4,6 |
| Comercial, Ser, pub *Commercial, Ser. pub* | 2.034 | 2.278 | 2.507 | 2.725 | 2.854 | 2.999 | 2.719 | 2.810 | 3.154 | 3.422 | 3.821 | 11,6 |
| Consumo Energético *Energy Consumption* | 5.959 | 6.944 | 7.536 | 8.552 | 9.373 | 9.621 | 9.565 | 10.423 | 11.261 | 12.006 | 12.650 | 5,4 |

## Tabla 4-4 Consumo de electricidad por sector (GWh)

*Table 4-4 Electricity consumption by sector*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | * Var. (%) 2013/2012 * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte (1) *Transportation* | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| Industria *Industry* (2) | 3.055 | 4.005 | 4.405 | 5.499 | 6.417 | 6.293 | 6.368 | 7.163 | 7.724 | 8.220 | 8.360 | 1,7 |
| Residencial *Residential* | 3.270 | 3.516 | 3.702 | 3.896 | 4.095 | 4.385 | 4.672 | 5.114 | 5.351 | 5.624 | 5.880 | 4,6 |
| Comercial, Ser, pub (3) *Commercial, Pub. serv* | 3.282 | 3.676 | 4.046 | 4.398 | 4.606 | 4.840 | 4.388 | 4.536 | 5.090 | 5.523 | 6.167 | 11,6 |
| Consumo Energético *Energy Consumption* | 9.617 | 11.207 | 12.163 | 13.803 | 15.128 | 15.528 | 15.438 | 16.823 | 18.175 | 19.377 | 20.417 | 5,4 |

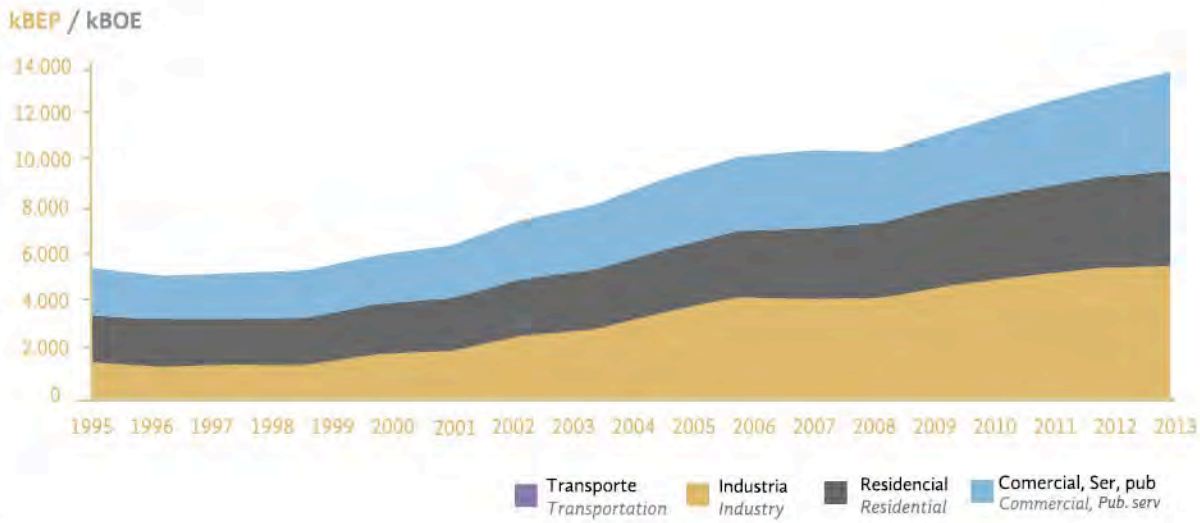
(1) El consumo eléctrico del Trolebús, para el año 2013, fue obtenido de la Empresa Eléctrica Quito. / *Electricity consumption for the Quito trolleybus was obtained from the Electricity Company of Quito.*

(2)Para el consumo industrial, se incluye la energía generada no disponible para servicio público y la energía entregada a grandes consumidores. / *Industrial consumption comprises electricity generated that is not available for public service and electricity delivered to great consumers.*

(3)El sector comercial, servicios y administración pública, comprende la demanda de alumbrado público, comercial y otros / *The commercial sector, services and public administration comprises the demand of public lighting, commercial and others.*

## Figura 4-4 Consumo de electricidad por sector

*Figure 4-4 Electricity consumption by sector*



## Tabla 4-5 Estructura porcentual del consumo de electricidad (%)

*Table 4-5 Structure of electricity consumption by sector (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte *Transportation* | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,1 | 0,05 |
| Industria *Industry* | 31,8 | 35,7 | 36,2 | 39,8 | 42,4 | 40,5 | 41,2 | 42,6 | 42,5 | 42,4 | 40,9 |
| Residencial *Residential* | 34,0 | 31,4 | 30,4 | 28,2 | 27,1 | 28,2 | 30,3 | 30,4 | 29,4 | 29,0 | 28,8 |
| Comercial, Ser. Pub *Commercial, Pub. serv* | 34,1 | 32,8 | 33,3 | 31,9 | 30,4 | 31,2 | 28,4 | 27,0 | 28,0 | 28,5 | 30,2 |
| Consumo Energético *Energy Consumption* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## 4.1 Transporte / *Transportation*

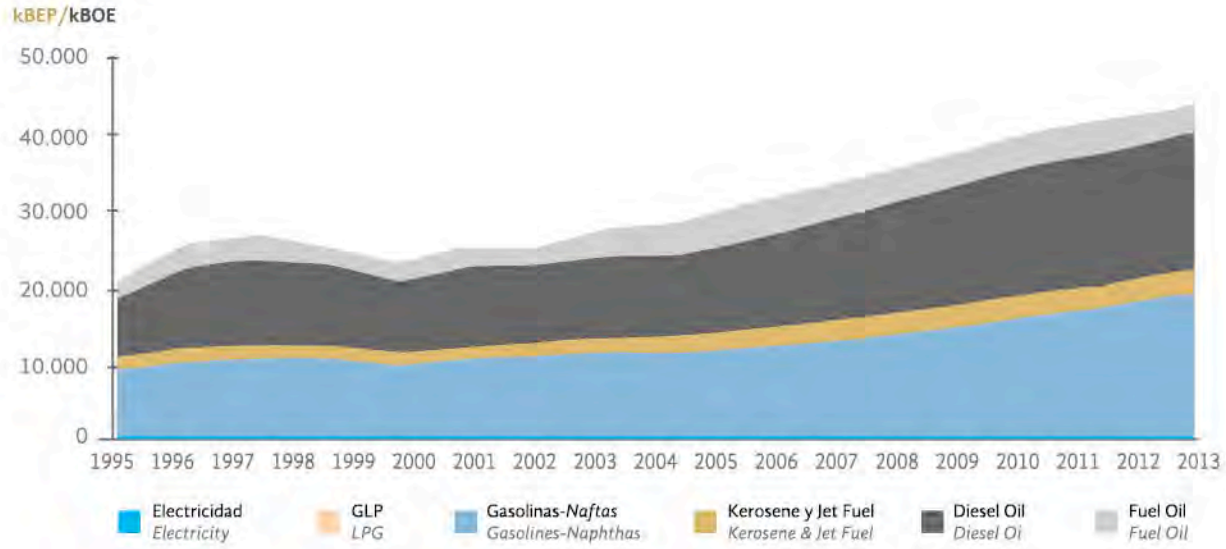
## Tabla 4-6 Sector transporte (kBEP)

*Table 4-6 Transportation sector (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad (1) *Electricity* | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | - |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | - | - | - | - | - | 8 | 73 | 85 | 88 | 82 | 73 | -10,5 |
| Gasolinas y Naftas *Gasolines / Naphtas* | 10.948 | 11.611 | 12.265 | 13.226 | 14.262 | 15.523 | 16.634 | 18.188 | 19.461 | 20.227 | 22.102 | 9,3 |
| Kerosene y Jet Fuel *Kerosene and Jet fuel* | 1.856 | 2.058 | 2.309 | 2.413 | 2.526 | 2.541 | 2.483 | 2.504 | 2.544 | 2.474 | 2.770 | 12,0 |
| Diesel Oil *Diesel Oil* | 10.657 | 11.619 | 12.983 | 14.321 | 15.523 | 16.740 | 17.126 | 17.455 | 18.809 | 19.598 | 20.761 | 5,9 |
| Fuel Oil *Fuel Oil* | 4.390 | 5.090 | 4.811 | 4.530 | 4.487 | 4.476 | 4.475 | 3.876 | 4.213 | 3.612 | 2.838 | -21,4 |
| Total / *Total* | 27.857 | 30.385 | 32.374 | 34.497 | 36.804 | 39.294 | 40.797 | 42.114 | 45.121 | 45.999 | 48.551 | 5,5 |

## Figura 4-5 Sector transporte

*Figure 4-5 Transportation sector*




## Tabla 4-7 Sector transporte (unidades físicas)

*Table 4-7 Transportation sector (physical units)*

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 13/12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad (1) *Electricity* | GWh | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | - |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | miles kg *thousand kg* | - | - | - | - | - | 1.046 | 9.518 | 11.108 | 11.474 | 10.714 | 9.590 | -10,5 |
| Gasolinas *Gasolines* | miles gal *thousand gall* | 514.666 | 545.856 | 576.585 | 621.788 | 670.461 | 729.738 | 781.991 | 855.029 | 914.911 | 950.889 | 1.039.057 | 9,3 |
| Kerosene y Jet Fuel *Kerosene and Jet fuel* | miles gal *thousand gall* | 81.345 | 90.190 | 101.210 | 105.763 | 110.729 | 111.368 | 108.810 | 109.746 | 111.502 | 108.420 | 121.422 | 12,0 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 446.940 | 487.284 | 544.463 | 600.594 | 651.000 | 702.038 | 718.223 | 732.030 | 788.780 | 821.890 | 870.645 | 5,9 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 178.941 | 207.489 | 196.091 | 184.667 | 182.879 | 182.458 | 182.418 | 157.999 | 171.711 | 147.249 | 115.669 | -21,4 |

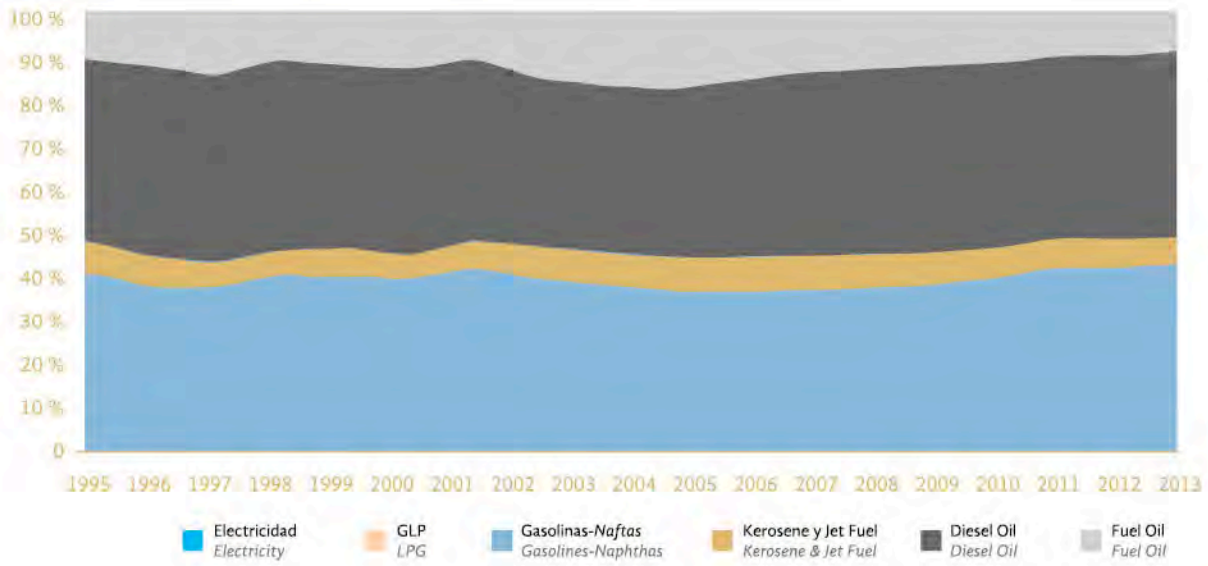
## Tabla 4-8 Estructura porcentual del sector transporte (%)

*Table 4-8 Structure of transportation sector (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,02 | 0,01 | 0,01 | 0,01 | 0,01 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | - | - | - | - | - | - | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Gasolinas *Gasolines* | 39,3 | 38,2 | 37,9 | 38,3 | 38,8 | 39,5 | 40,8 | 43,2 | 43,1 | 44,0 | 45,5 |
| Kerosene y Jet Fuel *Kerosene and Jet fuel* | 6,7 | 6,8 | 7,1 | 7,0 | 6,9 | 6,5 | 6,1 | 5,9 | 5,6 | 5,4 | 5,7 |
| Diesel Oil *Diesel Oil* | 38,3 | 38,2 | 40,1 | 41,5 | 42,2 | 42,6 | 42,0 | 41,4 | 41,7 | 42,6 | 42,8 |
| Fuel Oil *Fuel Oil* | 15,8 | 16,8 | 14,9 | 13,1 | 12,2 | 11,4 | 11,0 | 9,2 | 9,3 | 7,9 | 5,8 |
| Total / *Total* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

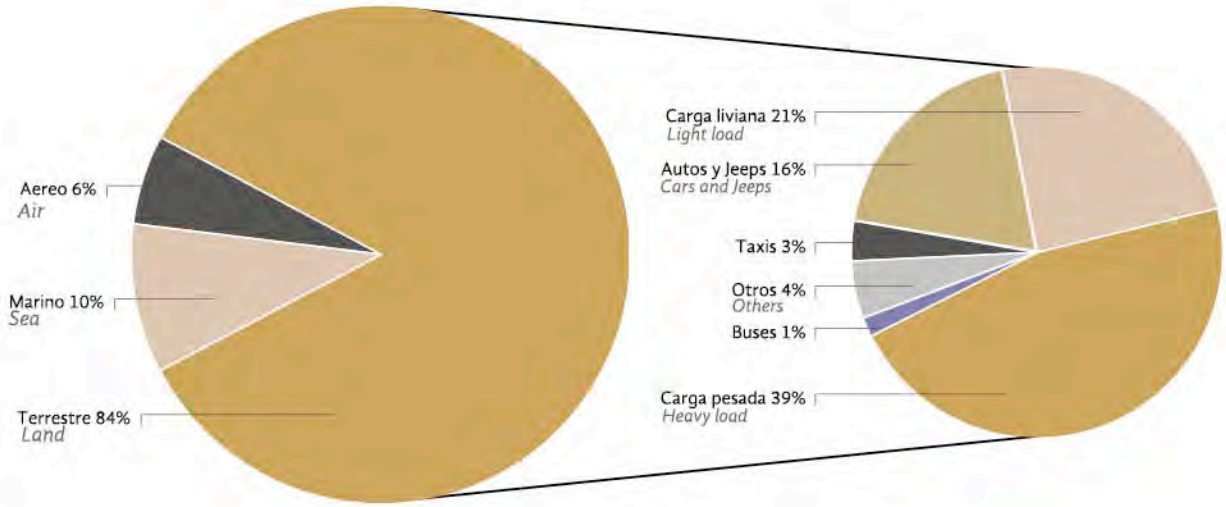
## Figura 4-6 Estructura porcentual del sector transporte

*Figure 4-6 Structure of transport sector*



## Figura 4-7 Consumo por tipo de transporte[37]

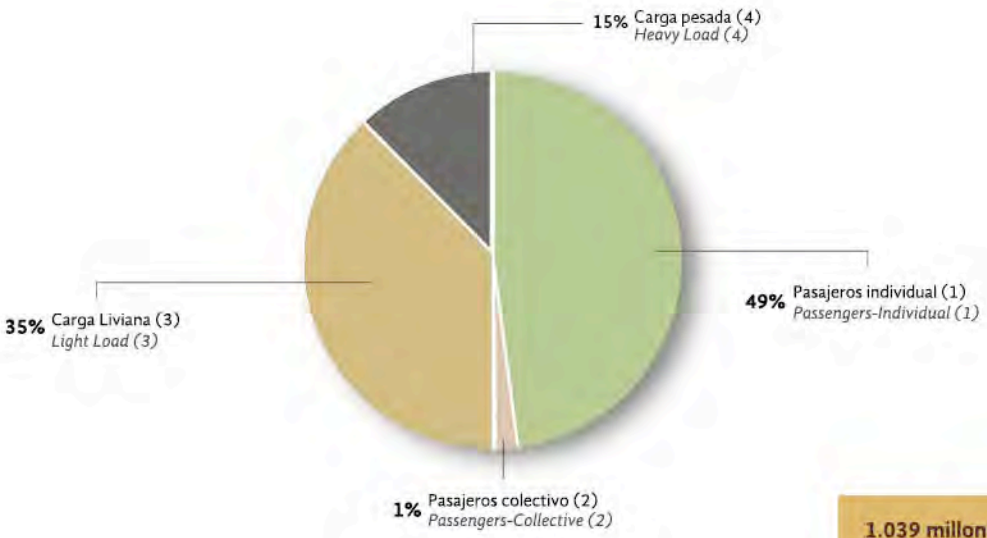
*Figure 4-7 Consumption by transport type*[37]




37. Incorpora nueva metodología, considerando un recorrido promedio por vehículo de 20 mil kilómetros anuales. Metodología realizada en apoyo del Instituto Nacional de Eficiencia Energética y Energía Renovable
*Incorporates new methodolgy that considers an average travelled distance for standard vehicles of 20 thousand kilometres per year. The methodology was developed and revised by the National Institute of Energy Efficiency and Renewable Energy.*

## Figura 4-8 Consumo de gasolinas por tipo de vehiculo

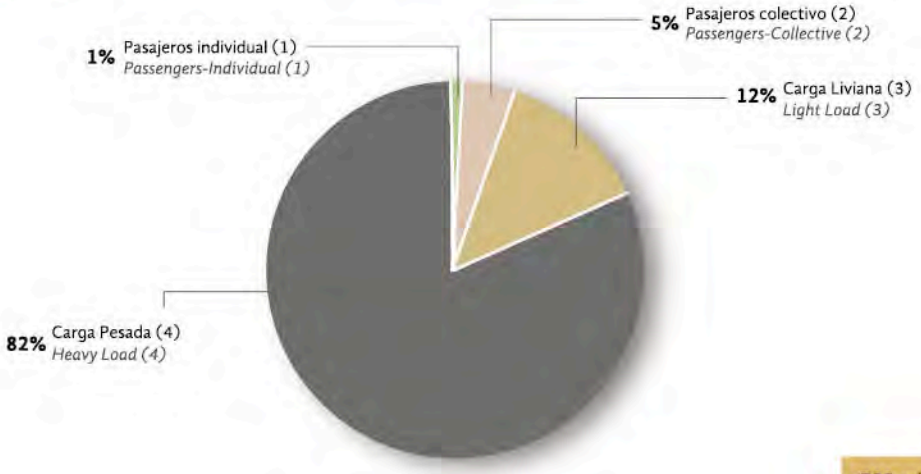
*Figure 4-8 Gasoline consumption by vehicle type*




**1.039 millones galones**
*1.039 million gall.*

## Figura 4-9 Consumo de diesel por tipo de vehiculo

*Figure 4-9 Diesel consumption by vehicle type*




**793 millones galones**
*793 million gall.*

(1) Incluye: autos, jeeps, taxis y motos / *Includes. Cars, jeeps, taxis and motorcycles*
(2) Incluye: furgoneta de pasajeros y buses / *Includes. vans and buses*
(3) Incluye: camionetas hasta 3 Ton y furgonetas de carga / *Includes. pick-ups (up to 3 tons) and small trucks*
(4) Incluye: camiones hasta 15 ton, camiones de más de 15 ton, trailers y volquetas / *Includes: trucks bigger than 15 tons and pick-ups (up to 3 tons) and small trucks.*

## 4.2 Industria / *Industry*

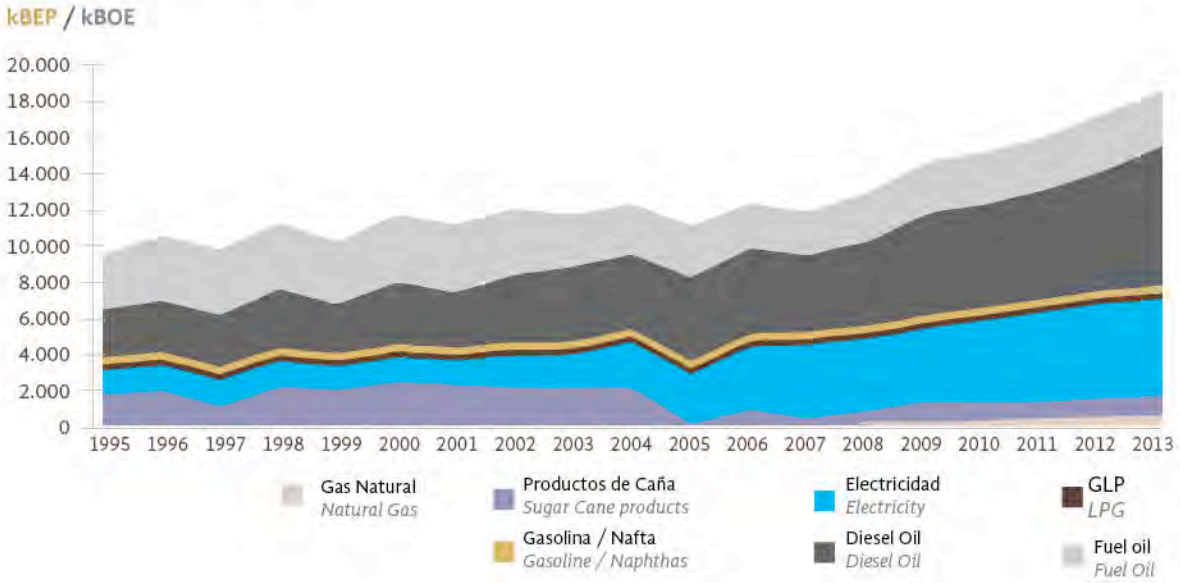
### Tabla 4-9 Sector industrial (kBEP)

*Table 4-9 Industry sector (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | - | - | - | - | - | - | - | - | 4 | 150 | 236 | 57 |
| Leña *Firewood* | 314 | 311 | 303 | 291 | 283 | 277 | 272 | 278 | 284 | 290 | 296 | 2 |
| Productos de Caña *Cane Products* | 1.976 | 2.032 | 115 | 869 | 418 | 816 | 1.322 | 1.238 | 1.336 | 1.344 | 1.417 | 5 |
| Total Primarias *Total Primaries* | 2.291 | 2.343 | 418 | 1.160 | 701 | 1.09 | 1.594 | 1.516 | 1.624 | 1.785 | 1.949 | 9 |
| Electricidad *Electricity* | 1.893 | 2.481 | 2.729 | 3.407 | 3.976 | 3.899 | 3.945 | 4.438 | 4.786 | 5.093 | 5.180 | 2 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 146 | 215 | 160 | 144 | 182 | 289 | 355 | 425 | 475 | 412 | 520 | 26 |
| Gasolinas y Naftas *Gasolines / Naphtas* | 118 | 96 | 110 | 103 | 102 | 100 | 111 | 110 | 114 | 114 | 119 | 5 |
| Diesel Oil *Diesel Oil* | 4.404 | 4.371 | 4.860 | 4.960 | 4.448 | 4.758 | 5.628 | 5.653 | 5.900 | 6.509 | 7.470 | 15 |
| Fuel Oil *Fuel Oil* | 2.618 | 2.510 | 2.618 | 2.252 | 2.197 | 2.469 | 2.583 | 2.614 | 2.677 | 2.906 | 2.811 | -3 |
| Total Secundarias *Total Secondaries* | 9.179 | 9.674 | 10.476 | 10.865 | 10.906 | 11.516 | 12.622 | 13.240 | 13.953 | 15.034 | 16.101 | 7 |
| Total / *Total* | 11.470 | 12.017 | 10.895 | 12.025 | 11.607 | 12.609 | 14.216 | 14.756 | 15.577 | 16.819 | 18.050 | 7 |

## Figura 4-10 Sector industrial

*Figure 4-10 Industry sector*




## Tabla 4-10 Sector industrial (unidades físicas)

*Table 4-10 Industry sector (physical units)*

| | Unidad / *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | * Var. (%) 2013/2012* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural *Natural Gas* | MMcf | - | - | - | - | - | - | - | - | 27 | 887 | 1.393 | 57,0 |
| Leña *Firewood* | kt | 121 | 120 | 117 | 112 | 109 | 107 | 105 | 107 | 109 | 112 | 114 | 2,2 |
| Productos de Caña *Cane Products* | kt | 1.507 | 1.550 | 88 | 663 | 319 | 622 | 1.008 | 944 | 1.019 | 1.025 | 1.080 | 5,4 |
| Electricidad *Electricity* | GWh | 3.055 | 4.005 | 4.405 | 5.499 | 6.417 | 6.293 | 6.368 | 7.163 | 7.724 | 8.220 | 8.360 | 1,7 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | Miles Kg *thousand kg* | 19.126 | 28.236 | 20.936 | 18.836 | 23.885 | 37.939 | 46.478 | 55.638 | 62.269 | 54.009 | 68.190 | 26,3 |
| Gasolinas y Naftas *Gasolines / Naphthas* | Miles Kg *thousand kg* | 5.561 | 4.526 | 5.170 | 4.820 | 4.804 | 4.718 | 5.201 | 5.182 | 5.369 | 5.363 | 5.609 | 4,6 |
| Diesel Oil *Diesel Oil* | Miles gal *thousand gall* | 184.677 | 183.298 | 203.800 | 208.007 | 186.551 | 199.532 | 236.027 | 237.072 | 247.448 | 272.985 | 313.285 | 14,8 |
| Fuel Oil *Fuel Oil* | Miles gal *thousand gall* | 106.731 | 102.312 | 106.700 | 91.784 | 89.567 | 100.645 | 105.301 | 106.568 | 109.121 | 118.435 | 114.569 | 0,6 |

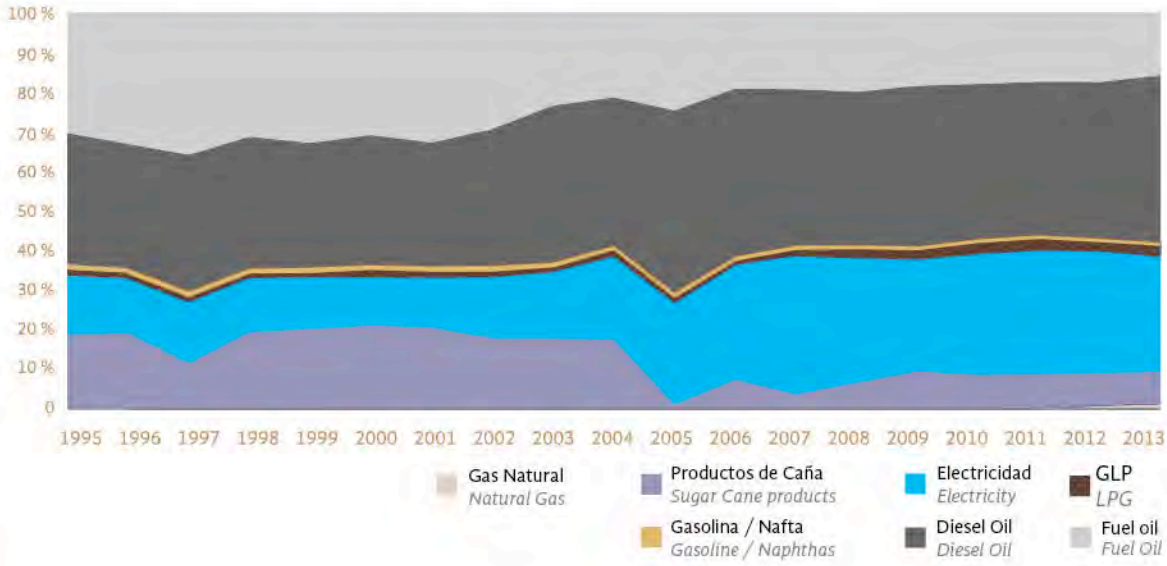
## Tabla 4-11 Estructura porcentual de consumo del sector industrial (%)

*Table 4-10 Industry sector (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gas Natural<br>*Natural Gas* | - | - | - | - | - | - | - | - | - | 0,9 | 1,3 |
| Leña<br>*Firewood* | 2,7 | 2,6 | 2,8 | 2,4 | 2,4 | 2,2 | 1,9 | 1,9 | 1,8 | 1,7 | 1,6 |
| Productos de Caña<br>*Cane Products* | 17,2 | 16,9 | 1,1 | 7,2 | 3,6 | 6,5 | 9,3 | 8,4 | 8,6 | 8,0 | 7,8 |
| Total Primarias<br>*Total Primaries* | 20,0 | 19,5 | 3,8 | 9,7 | 6,0 | 8,7 | 11,2 | 10,3 | 10,4 | 10,6 | 10,8 |
| Electricidad<br>*Electricity* | 16,5 | 20,6 | 25,1 | 28,3 | 34,3 | 30,9 | 27,8 | 30,1 | 30,7 | 30,3 | 28,7 |
| Gas Licuado de Petróleo<br>*Liquefied Petroleum Gas* | 1,3 | 1,8 | 1,5 | 1,2 | 1,6 | 2,3 | 2,5 | 2,9 | 3,1 | 2,5 | 2,9 |
| Gasolinas y Naftas<br>*Gasolines / Naphtas* | 1,0 | 0,8 | 1,0 | 0,9 | 0,9 | 0,8 | 0,8 | 0,7 | 0,7 | 0,7 | 0,7 |
| Diesel Oil<br>*Diesel Oil* | 38,4 | 36,4 | 44,6 | 41,2 | 38,3 | 37,7 | 39,6 | 38,3 | 37,9 | 38,7 | 41,4 |
| Fuel Oil<br>*Fuel Oil* | 22,8 | 20,9 | 24,0 | 18,7 | 18,9 | 19,6 | 18,2 | 17,7 | 17,2 | 17,3 | 15,6 |
| Total Secundarias<br>*Total Secondaries* | 80,0 | 80,5 | 96,2 | 90,3 | 94,0 | 91,3 | 88,8 | 89,7 | 89,6 | 89,4 | 89,2 |
| Total / *Total* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 4-11 Estructura porcentual de consumo del sector industrial

*Figure 4-11 Structure of industry sector consumption*



## 4.3 Residencial / *Residential*

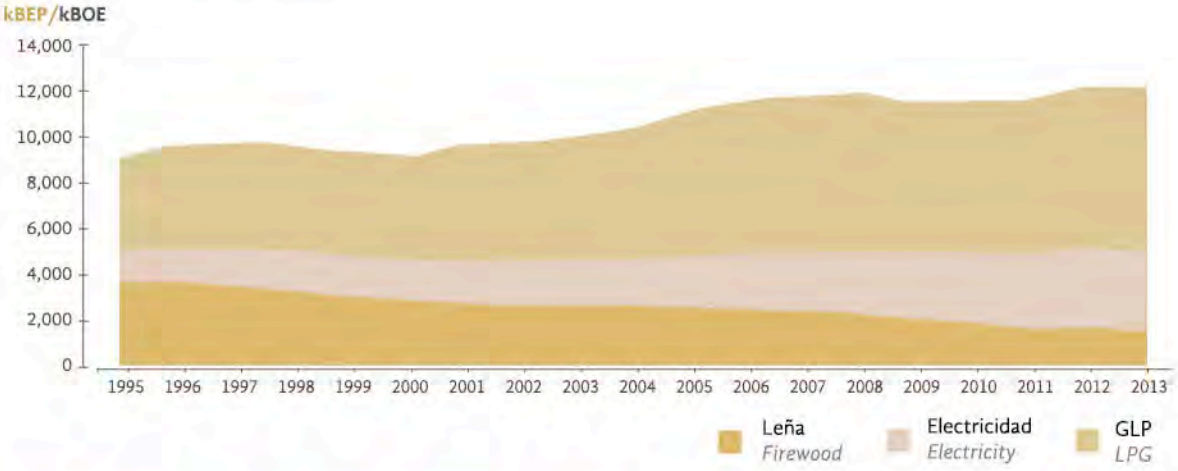
### Tabla 4-12 Sector residencial (kBEP)

*Table 4-12 Residential sector (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leña *Firewood* | 2.450 | 2.419 | 2.442 | 2.359 | 2.257 | 2.097 | 1.864 | 1.714 | 1.334 | 1.619 | 1.189 | -26,5 |
| Total Primarias *Total Primaries* | 2.450 | 2.419 | 2.442 | 2.359 | 2.257 | 2.097 | 1.864 | 1.714 | 1.334 | 1.619 | 1.189 | -26,5 |
| Electricidad *Electricity* | 2.026 | 2.178 | 2.294 | 2.414 | 2.537 | 2.717 | 2.895 | 3.169 | 3.315 | 3.484 | 3.643 | 4,6 |
| Gas Licuado de petróleo *Liquefied Petroleum Gas* | 5.600 | 5.992 | 6.555 | 6.862 | 7.115 | 7.163 | 6.900 | 6.877 | 7.012 | 7.188 | 7.294 | 1,5 |
| Total Secundarias *Total Secondaries* | 7.626 | 8.171 | 8.849 | 9.276 | 9.652 | 9.880 | 9.795 | 10.046 | 10.327 | 10.672 | 10.938 | 2,5 |
| TOTAL / TOTAL | 10.076 | 10.590 | 11.221 | 11.635 | 11.909 | 11.976 | 11.659 | 11.760 | 11.661 | 12.291 | 12.127 | -1,3 |

### Figura 4-12 Sector residencial

*Figure 4-12 Residential sector*




### Tabla 4-13 Sector residencial (unidades físicas)

*Table 4-13 Residential Sector (physical units)*

| | Unidad /Unit | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leña *Firewood* | kt | 945 | 933 | 941 | 909 | 870 | 808 | 719 | 661 | 514 | 624 | 459 | -26,5 |
| Electricidad *Electricity* | GWh | 3.270 | 3.516 | 3.702 | 3.896 | 4.095 | 4.385 | 4.672 | 5.114 | 5.351 | 5.624 | 5.880 | 4,6 |
| Gas Licuado de petróleo *Liquefied Petroleum Gas* | miles kg *thousand kg* | 733.973 | 785.359 | 859.101 | 899.341 | 932.485 | 938.754 | 904.374 | 901.329 | 918.955 | 942.062 | 956.024 | 1,5 |

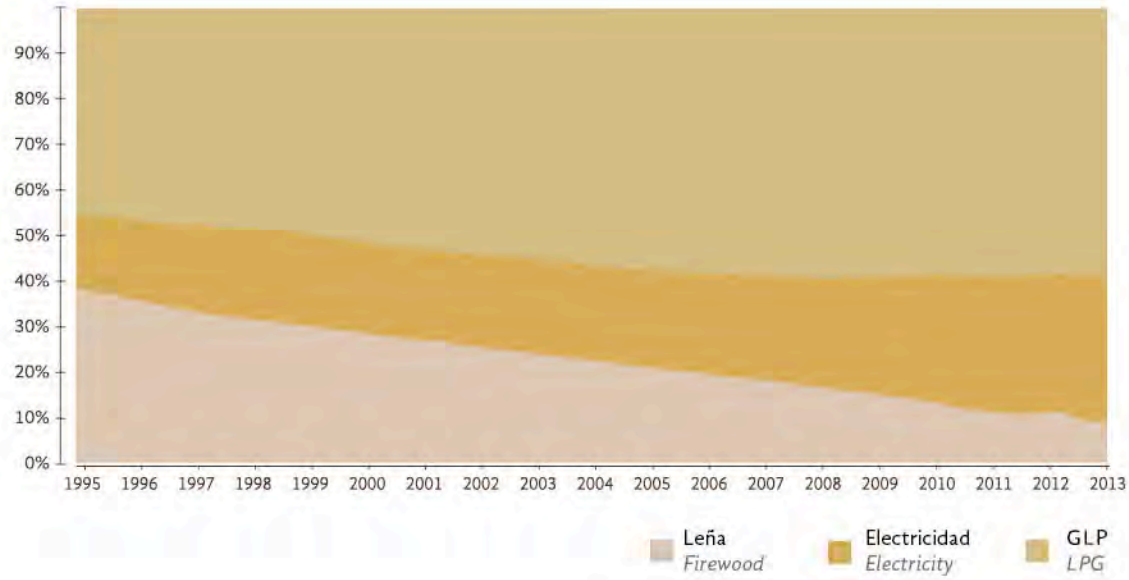
## Tabla 4-14 Estructura porcentual de consumo del sector residencial (%)

*Table 4-14 Structure of residential sector consumption (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Leña *Firewood* | 24,3 | 22,8 | 21,6 | 20,3 | 19,0 | 17,5 | 16,0 | 14,6 | 11,4 | 13,2 | 9,8 |
| Total Primarias *Total Primaries* | 24,3 | 22,8 | 21,6 | 20,3 | 19,0 | 17,5 | 16,0 | 14,6 | 11,4 | 13,2 | 9,8 |
| Electricidad *Electricity* | 20,1 | 20,6 | 20,3 | 20,7 | 21,3 | 22,7 | 24,8 | 26,9 | 28,4 | 28,3 | 30,0 |
| Gas Licuado de petróleo *Liquefied Petroleum Gas* | 55,6 | 56,6 | 58,1 | 59,0 | 59,7 | 59,8 | 59,2 | 58,5 | 60,1 | 58,5 | 60,2 |
| Total Secundarias *Total Secondaries* | 75,7 | 77,2 | 78,4 | 79,7 | 81,0 | 82,5 | 84,0 | 85,4 | 88,6 | 86,8 | 90,2 |
| TOTAL / TOTAL | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 4-13 Estructura porcentual de consumo del sector residencial

*Figure 4-13 Structure of residential sector consumption*



## 4.4 Comercial, Servicios y Administración pública / *Commercial, Services and Public administration*

### Tabla 4-15 Sector comercial, servicios y administración pública (kBEP)

*Table 4-15 Commercial sector, services and public administration (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | 2.034 | 2.278 | 2.507 | 2.725 | 2.854 | 2.999 | 2.719 | 2.810 | 3.154 | 3.422 | 3.821 | 11,6 |
| Gasolinas - Naftas *Gasolines - Naphthas* | 39 | 33 | 33 | 32 | 29 | 25 | 27 | 25 | 27 | 26 | 33 | 25,7 |
| Diesel Oil *Diesel Oil* | 124 | 113 | 114 | 124 | 124 | 110 | 122 | 125 | 173 | 91 | 79 | -12,5 |
| **Total** *Total* | **2.197** | **2.424** | **2.654** | **2.881** | **3.007** | **3.134** | **2.867** | **2.961** | **3.354** | **3.539** | **3.933** | **11,1** |

### Tabla 4-16 Sector comercial, servicios y administración pública (unidades físicas)

*Table 4-16 Commercial sector, services and public administration (physical units)*

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | **GWh** | 3.282 | 3.676 | 4.046 | 4.398 | 4.606 | 4.840 | 4.388 | 4.536 | 5.090 | 5.523 | 6.167 | 11,6 |
| Gasolinas - Naftas *Gasolines - Naphthas* | **miles gal** *thousand gall.* | 1.850 | 1.558 | 1.546 | 1.512 | 1.372 | 1.188 | 1.264 | 1.197 | 1.271 | 1.227 | 1.542 | 25,7 |
| Diesel Oil *Diesel Oil* | **miles gal** *thousand gall.* | 5.198 | 4.726 | 4.782 | 5.187 | 5.217 | 4.593 | 5.104 | 5.259 | 7.272 | 3.798 | 3.325 | -12,5 |

*1)Alumbrado público, comercial y otros (descontado sector transporte) / Public lighting, commercial and others.*
*2)Incluye FFAA / Includes Army.*

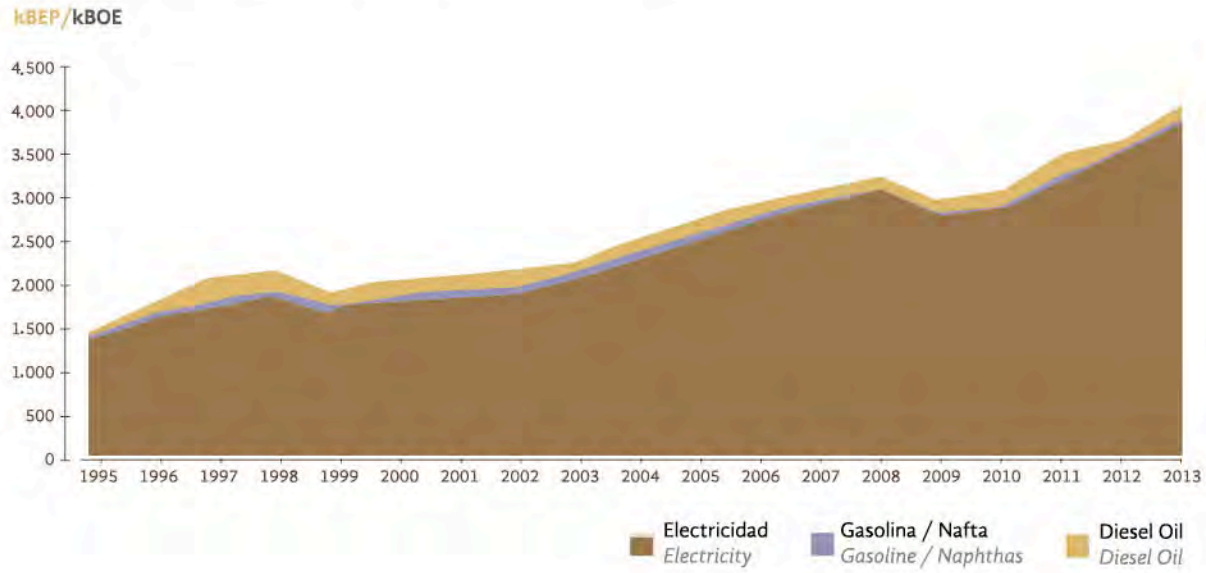
### Tabla 4-17 Estructura de consumo del sector comercial, servicios y administración pública (%)

*Table 4-17 Structure of commercial sector, services and public administration consumption (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | 92,6 | 94 | 94,5 | 94,6 | 94,9 | 95,7 | 94,8 | 94,9 | 94 | 96,7 | 97,2 |
| Gasolinas - Naftas *Gasolines - Naphthas* | 1,8 | 1,4 | 1,2 | 1,1 | 1 | 0,8 | 0,9 | 0,9 | 0,8 | 0,7 | 0,8 |
| Diesel Oil *Diesel Oil* | 5,6 | 4,7 | 4,3 | 4,3 | 4,1 | 3,5 | 4,2 | 4,2 | 5,2 | 2,6 | 2 |
| **Total** *Total* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

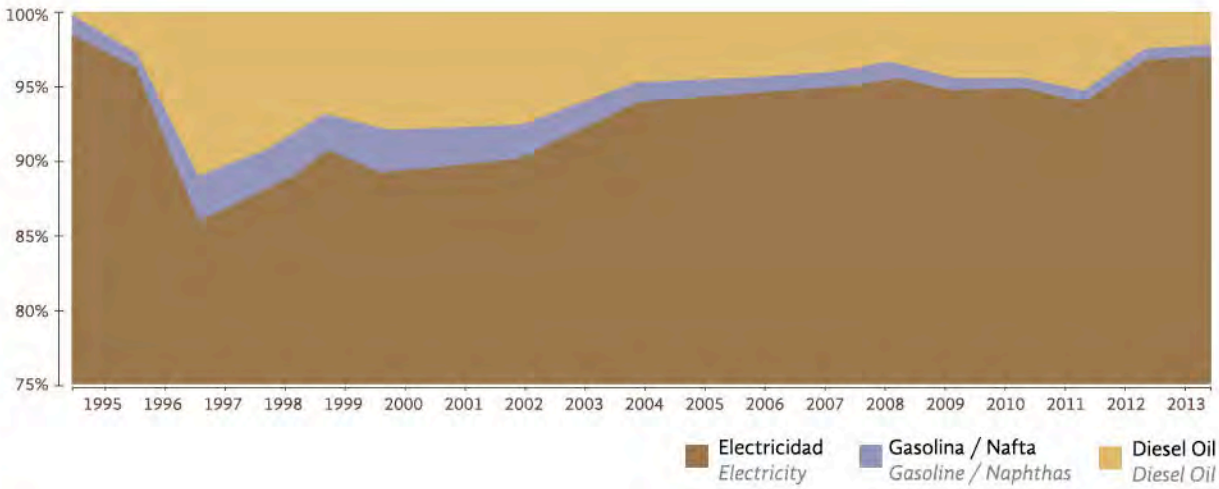
## Figura 4-14 Sector comercial, servicios y administración pública

*Figure 4-14 Commercial sector, services and public administration*




## Figura 4-15 Estructura porcentual del consumo comercial, Ser. pub

*Figure 4-15 Structure of consumption commercial, Pub. serv*



## 4.5 Agro, pesca y minería / *Agriculture, Fishing and Mining*

### Tabla 4-18 Sector agro, pesca y minería (kBEP)

*Table 4-18 Agriculture, Fishing and Mining (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gas Licuado de Petróleo** *Liquefied Gas Petroleum* | - | - | - | - | - | 32 | 58 | 83 | 97 | 125 | 145 | 15,8 |
| **Gasolinas/Naftas** *Gasolines/Naphthas* | 266 | 288 | 348 | 414 | 454 | 515 | 567 | 607 | 635 | 671 | 733 | 9,3 |
| **TOTAL** *TOTAL* | **266** | **288** | **348** | **414** | **454** | **547** | **625** | **691** | **731** | **796** | **878** | **10,3** |

### Tabla 4-19 Sector agro, pesca y minería (unidades físicas)

*Table 4-19 Agriculture, Fishing and Mining (physical units)*

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gas Licuado de Petróleo** *Liquefied Gas Petroleum* | miles kg *thousand kg* | - | - | - | - | - | 4.236 | 7.636 | 10.938 | 12.704 | 16.425 | 19.015 | 15,8 |
| **Gasolinas/Naftas** *Gasolines/Naphthas* | miles gal *thousand gall* | 12.482 | 13.520 | 16.344 | 19.647 | 21.357 | 24.211 | 26.634 | 28.542 | 29.830 | 31.531 | 34.465 | 9,3 |

## 4.6 Otros Sectores / *Other Sectors*

### Tabla 4-20 Otros sectores (kBEP)

*Table 4-20 Other Sectors (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gasolinas / Naftas** *Gasolines / Naphthas* | 35 | 32 | 31 | 20 | 17 | 19 | 16 | 22 | 17 | 17 | 17 | 4,8 |
| **Diesel Oil** *Diesel Oil* | 1.266 | 1.324 | 1.048 | 840 | 682 | 820 | 658 | 852 | 1.006 | 1.084 | 1.114 | 2,8 |
| **TOTAL** *TOTAL* | 1.300 | 1.356 | 1.079 | 860 | 699 | 839 | 674 | 874 | 1.023 | 1.101 | 1.132 | 2,8 |

## Tabla 4-21 Otros sectores (unidades físicas)

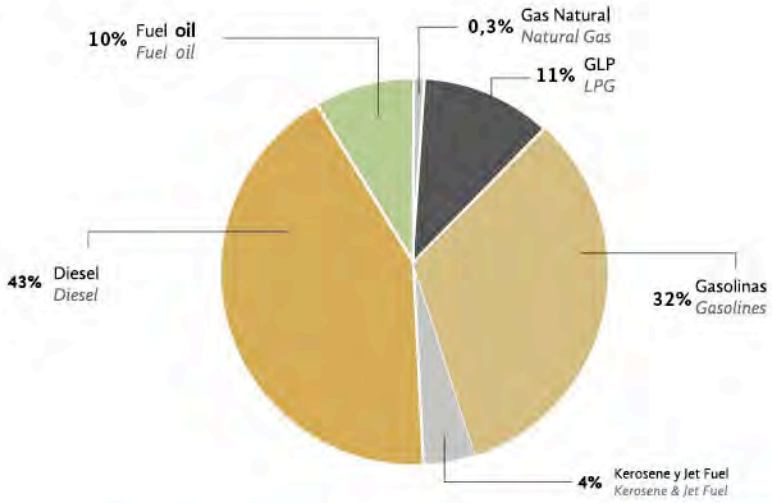
*Table 4-21 Other sectors (physical units)*

| | Unidad *Units* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gasolinas / Naftas** *Gasolines / Naphthas* | **miles gal.** *thousand gall* | 1.623 | 1.491 | 1.439 | 947 | 795 | 874 | 765 | 1.039 | 776 | 778 | 816 | 4,8 |
| **Diesel Oil** *Diesel Oil* | **miles gal.** *thousand gall* | 53,083 | 55.523 | 43.965 | 35.216 | 28.605 | 34.403 | 27.597 | 35.727 | 42.208 | 45.478 | 46.730 | 2,8 |

## 4.7 Consumo por fuentes / *Consumption by sources*

### Figura 4-16 Consumo energético por combustible

*Figure 4-16 Consumption by fuel type*




72 millones de BEP / *million BOE*

### Tabla 4-22 Consumo energético por combustible (kBEP)

*Table 4-22 Consumption by fuel type (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gas Natural** *Natural Gas* | - | - | - | - | - | - | - | - | 4 | 150 | 236 |
| **Gas Licuado Petróleo** *Liquefied Petroleum Gas* | 5.953 | 6.493 | 6.908 | 7.268 | 7.581 | 7.723 | 7.583 | 7.701 | 7.922 | 8.048 | 8.209 |
| **Gasolinas / Naftas** *Gasolines / Naphtas* | 11.544 | 12.210 | 12.907 | 13.939 | 15.014 | 16.335 | 17.504 | 19.098 | 20.418 | 21.237 | 23.152 |
| **Kerosene y Jet fuel** *Kerosene and Jet fuel* | 1.875 | 2.083 | 2.341 | 2.440 | 2.551 | 2.569 | 2.499 | 2.532 | 2.583 | 2.512 | 2.806 |
| **Diésel oil** *Diesel oil* | 17.555 | 18.620 | 19.983 | 21.408 | 21.918 | 23.623 | 24.723 | 25.230 | 27.024 | 28.356 | 30.576 |
| **Fuel oil** *Fuel oil* | 8.359 | 9.112 | 8.606 | 8.200 | 8.222 | 8.635 | 8.679 | 7.954 | 8.463 | 8.124 | 7.106 |

## Tabla 4-23 Crecimiento anual del consumo de combustibles

*Table 4-23 Annual growth rate of fuel consumption*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Crecimiento promedio anual 2003-2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Gas Natural** *Natural Gas* | - | - | - | - | - | - | - | - | - | 3241.6% | 57.0% | - |
| **Gas Licuado Petróleo** *Liquefied Petroleum Gas* | 4.2% | 9.1% | 6.4% | 5.2% | 4.3% | 1.9% | -1.8% | 1.6% | 2.9% | 1.6% | 2.0% | 3.4% |
| **Gasolinas / Naftas** *Gasolines /Naphtas* | -1.3% | 5.8% | 5.7% | 8.0% | 7.7% | 8.8% | 7.2% | 9.1% | 6.9% | 4.0% | 9.0% | 6.4% |
| **Kerosene y Jet fuel** *Kerosene and Jet fuel* | 3.6% | 11.1% | 12.4% | 4.2% | 4.6% | 0.7% | -2.7% | 1.3% | 2.0% | -2.7% | 11.7% | 4.2% |
| **Diésel oil** *Diesel oil* | 4.4% | 6.1% | 7.3% | 7.1% | 2.4% | 7.8% | 4.7% | 2.0% | 7.1% | 4.9% | 7.8% | 5.6% |
| **Fuel Oil** *Fuel Oil* | -4.1% | 9.0% | -5.6% | -4.7% | 0.3% | 5.0% | 0.5% | -8.4% | 6.4% | -4.0% | -12.5% | -1.6% |

## Tabla 4-24 Consumo energético por fuente (kBEP)

*Table 4-24 Consumption by source (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | *Var (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | 666 | 616 | 637 | 696 | 655 | 715 | 733 | 736 | 719 | 761 | 810 | 6,5 |
| Gas Natural *Natural Gas* | - | - | - | - | - | - | - | - | 4 | 150 | 38 | 57,0 |
| Leña *Firewood* | 2.765 | 2.730 | 2.745 | 2.650 | 2.540 | 2.374 | 2.136 | 1.992 | 1.618 | 1.909 | 1.486 | -22,2 |
| Productos de Caña *Cane Products* | 1.976 | 2.032 | 115 | 869 | 418 | 816 | 1.322 | 1.238 | 1.336 | 1.344 | 1.417 | 5,4 |
| Electricidad *Electricity* | 6.106 | 7.077 | 7.704 | 8.739 | 9.564 | 9.821 | 9.890 | 10.585 | 11.447 | 12.241 | 12.909 | 5,5 |
| Gas Licuado de petróleo *Liquefied Petroleum Gas* | 5.953 | 6.493 | 6.908 | 7.268 | 7.581 | 7.723 | 7.583 | 7.701 | 7.922 | 8.048 | 8.209 | 2,0 |
| Gasolinas/Naftas *Gasolines / Naphthas* | 11.544 | 12.210 | 12.907 | 13.939 | 15.104 | 16.335 | 17.504 | 19.098 | 20.418 | 21.237 | 23.152 | 9,0 |
| Kerosene y Jet fuel *Kerosene and Jet fuel* | 1.875 | 2.083 | 2.341 | 2.440 | 2.551 | 2.569 | 2.499 | 2.532 | 2.583 | 2.512 | 2.806 | 11,7 |
| Diesel Oil *Diesel Oil* | 17.555 | 18.620 | 19.983 | 21.408 | 21.918 | 23.623 | 24.723 | 25.230 | 27.024 | 28.356 | 30.576 | 7,8 |
| Fuel Oil *Fuel Oil* | 8.359 | 9.112 | 8.606 | 8.200 | 8.222 | 8.635 | 8.679 | 7.954 | 8.463 | 8.124 | 7.106 | -12,5 |
| Otros Sectores *Other sectors* | 6.096 | 6.682 | 6.368 | 6.996 | 6.985 | 7.641 | 7.384 | 7.076 | 7.218 | 7.361 | 7.483 | 1,7 |
| **Consumo Final Energético** *Final Energy Consumption* | **62.894** | **67.655** | **68.315** | **73.204** | **75.447** | **80.251** | **82.454** | **84.142** | **88.754** | **92.044** | **96.189** | **4,5** |

## Tabla 4-25 Consumo energético por fuente (unidades físicas)

*Table 4-25 Consumption by source (physical units)*

| | Unidades *Units* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | bls | 646 | 598 | 618 | 674 | 636 | 694 | 711 | 715 | 698 | 738 | 786 | 6,5 |
| Gas Natural *Natural Gas* | MMcf | - | - | - | - | - | - | - | - | 27 | 887 | 1.393 | 57,0 |
| Leña *Firewood* | kt | 1.066 | 1.052 | 1.058 | 1.022 | 979 | 915 | 823 | 768 | 624 | 736 | 573 | -22,2 |
| Productos de Caña *Cane Products* | kt | 1.507 | 1.550 | 1.654 | 1.675 | 1.798 | 1.623 | 1.646 | 1.640 | 1.914 | 1.966 | 2.022 | 2,9 |
| Electricidad *Electricity* | GWh | 9.855 | 11.422 | 12.434 | 14.104 | 15.435 | 15.850 | 15.962 | 17.083 | 18.475 | 19.756 | 20.834 | 5,5 |
| Gas Licuado de petróleo *Liquefied Petroleum Gas* | miles kg. *thousand kg.* | 780.162 | 851.028 | 905.428 | 952.604 | 993.543 | 1.012.226 | 993.898 | 1.009.360 | 1.038.314 | 1.054.753 | 1.075.900 | 2,0 |
| Gasolinas/Naftas *Gasolines / Naphthas* | miles gal *thousand gall* | 542.700 | 574.005 | 606.774 | 655.309 | 705.845 | 767.915 | 822.871 | 897.827 | 959.876 | 998.397 | 1.088.387 | 9,0 |
| Kerosene y Jet fuel *Kerosene and Jet fuel* | miles gal *thousand gall* | 82.164 | 91.282 | 102.599 | 106.926 | 111.808 | 112.588 | 109.538 | 110.955 | 113.200 | 110.101 | 122.971 | 11,7 |
| Diesel Oil *Diesel Oil* | miles gal *thousand gall* | 736.194 | 780.865 | 838.038 | 897.790 | 919.163 | 990.691 | 1.036.829 | 1.058.067 | 1.133.303 | 1.189.180 | 1.282.278 | 7,8 |
| Fuel Oil *Fuel Oil* | miles gal *thousand gall* | 340.725 | 371.423 | 350.805 | 334.245 | 335.117 | 351.969 | 353.781 | 324.220 | 344.975 | 331.152 | 289.652 | -12,5 |
| Otros Sectores *Other sectors* | kBEP *kBOE* | 6.096 | 6.682 | 6.368 | 6.996 | 6.985 | 7.641 | 7.384 | 7.076 | 7.218 | 7.361 | 7.483 | 1,7 |
| Consumo Final Energético *Final Energy Consumption* | | 18.827 | 20.466 | 22.340 | 25.088 | 27.832 | 29.667 | 31.107 | 33.052 | 33.903 | 33.420 | 35.942 | 7,5 |

## 4.8 Despacho por provincia / *Fuel dispatch in provinces*

### Tabla 4-26 Despacho de hidrocarburos por provincia 2012 (bbl)

*Table 4-26 Fuel dispatch in provinces 2012*

| PROVINCIAS *PROVINCES* | Gasolina Extra *Extra Gasoline* | Gasolina Super *Super Gasoline* | Pesca-artesana *Artisanal Fisheries* | Diesel 1 | Diesel 2 | Diesel Premium | Fuel Oil | Mineral Turpentine | Rubber Solvent |
|---|---|---|---|---|---|---|---|---|---|
| **Región Sierra**/*Highland Region* | 9.094.159 | 2.356.711 | | 5.664 | 1.954.856 | 9.014.268 | 759.758 | 47.809 | 54.312 |
| Azuay | 1.215.128 | 182.673 | - | 306 | 263.812 | 1.077.327 | 178.739 | 12.893 | 11.129 |
| Bolivar | 156.394 | 16.551 | - | 377 | 28.117 | 163.836 | - | - | - |
| Cañar | 255.364 | 52.859 | - | - | 74.290 | 354.019 | 50.397 | - | - |
| Carchi | 179.761 | 6.952 | - | - | 10.071 | 167.238 | - | - | - |
| Chimborazo | 573.029 | 86.084 | - | - | 52.070 | 545.599 | - | 190 | 857 |
| Cotopaxi | 563.788 | 63.453 | - | - | 189.677 | 596.810 | 100.077 | - | - |
| Imbabura | 528.592 | 92.421 | - | - | 68.301 | 695.780 | 5.900 | - | - |
| Loja | 537.048 | 73.471 | - | 189 | 71 | 744.611 | 278 | - | - |
| Pichincha | 3.711.564 | 1.417.239 | - | 4.509 | 1.054.276 | 3.262.503 | 394.550 | 34.726 | 42.327 |
| Sto. Dgo. Tsachilas | 522.170 | 148.711 | - | - | 152.804 | 700.913 | 15.421 | - | - |
| Tungurahua | 851.321 | 216.298 | - | 283 | 61.366 | 705.631 | 14.395 | - | - |
| **Región Costa**/*Coast Region* | 7.778.591 | 2.607.156 | 750.735 | 32.327 | 5.992.852 | 7.691.157 | 8.178.332 | 13.572 | 31.446 |
| El Oro | 791.908 | 215.503 | 13.504 | 24 | 292.696 | 1.227.715 | 24.152 | - | - |
| Esmeraldas | 459.023 | 130.117 | 291.265 | - | 119.322 | 482.511 | 8.972 | - | - |
| Guayas | 4.160.007 | 1.595.354 | 59.691 | 27.055 | 3.848.040 | 3.507.096 | 6.207.490 | 13.558 | 31.351 |
| Los Ríos | 735.390 | 132.676 | - | 330 | 292.145 | 1.023.388 | 7.204 | - | - |
| Manabí | 1.311.629 | 449.544 | 184.093 | 3.863 | 1.147.377 | 1.150.706 | 1.009.444 | - | 95 |
| Santa Elena | 320.634 | 83.962 | 202.183 | 1.055 | 293.272 | 299.741 | 921.069 | 14 | - |
| **Región Oriental**/*Amazonian Region* | 856.483 | 110.929 | - | 143 | 2.802.650 | 1.177.758 | - | - | - |
| Morona | 127.992 | 20.237 | - | - | 18.871 | 161.886 | - | - | - |
| Napo | 94.393 | 19.274 | - | - | 115.155 | 205.583 | - | - | - |
| Orellana | 166.349 | 18.857 | - | - | 790.888 | 224.627 | - | - | - |
| Pastaza | 115.060 | 23.560 | - | - | 46.603 | 143.476 | - | - | - |
| Sucumbios | 267.510 | 20.286 | - | 143 | 1.831.038 | 260.075 | - | - | - |
| Zamora Chinchipe | 85.180 | 8.716 | - | - | 95 | 182.109 | - | - | - |
| **Región Insular**/*Galapagos Region* | 11.613 | - | - | - | 8.022 | 208.555 | - | - | - |
| Galápagos | 11.613 | - | - | - | 8.022 | 208.555 | - | - | - |
| **2012** | 17.740.846 | 5.074.797 | 750.735 | 38.134 | 10.758.380 | 18.091.736 | 8.938.091 | 61.381 | 85.758 |

*En el caso del GLP considera los despachos a envasadoras; por tal razón no se registran valores en todas las provincias. /
*LPG considers dispatch values to bottling companies, therefore dispatch is not present in some provinces.*

| Spray Oil | Asfalto Ac-20 *Asphalt Ac-20* | Asfalto Rc-250 *Asphalt Rc-250* | Jet A-1 | Avgas | Nafta Base *Naphtha Base* | Residuo *Residue* | Absorver | GLP *LPG* | Gas Natural (Miles Pc) *Natural Gas (Thousand Cf)* |
|---|---|---|---|---|---|---|---|---|---|
| 22.286 | 1.084.902 | 72.778 | 2.364.082 | 1.156 | | 1.383.393 | | 5.562.808 | 887.258 |
| - | 25.696 | 6.947 | 23 | - | - | 93.171 | - | 642.426 | 654.754 |
| - | 92.571 | 10.611 | - | - | - | - | - | | |
| 1.429 | 8.074 | 1.334 | - | - | - | 178.021 | - | | |
| - | 15.123 | - | - | - | - | - | - | | |
| - | 39.137 | 3.859 | - | - | - | 142.726 | - | 169.380 | |
| - | 43.329 | 7.851 | - | - | - | - | - | 307.399 | |
| - | 2.836 | 1.151 | - | - | - | 711.391 | - | 398.996 | |
| - | 86.087 | 11.539 | - | - | - | - | - | 342.232 | |
| 20.048 | 635.427 | 19.435 | 2.363.959 | 1.148 | - | 258.083 | - | 2.432.804 | 232.504 |
| 143 | 40.778 | 1.114 | 100 | 8 | - | - | - | 452.625 | |
| 667 | 95.844 | 8.938 | - | - | - | - | - | 816.946 | |
| 228.333 | 847.708 | 85.299 | 135.126 | 19.910 | - | 3.759.087 | 952 | 5.871.498 | - |
| 63.429 | 53.164 | 8.361 | 16.083 | 4.017 | - | - | - | 523.444 | |
| 95 | 25.571 | 5.725 | - | 534 | - | 1.254.843 | - | 26.951 | |
| 125.786 | 488.277 | 30.464 | 97.746 | 11.606 | - | 1.053.841 | - | 3.997.904 | |
| 37.023 | 44.472 | 4.003 | 20.811 | 3.169 | - | 631.892 | - | 488.525 | |
| - | 203.935 | 32.988 | 486 | 584 | - | 818.510 | - | 411.603 | |
| 2.000 | 32.289 | 3.758 | - | - | - | - | 952 | 423.071 | |
| | | | | | | | | | - |
| - | 286.327 | 14.893 | 25.564 | 31.526 | - | 346.361 | - | 205.006 | |
| - | 20.787 | 2.447 | 547 | 3.194 | - | 0 | - | | |
| - | 130.717 | 4.134 | - | - | - | 0 | - | | |
| - | 2.688 | 155 | 13.489 | 22.714 | - | 106.062 | - | | |
| - | 9.518 | 120 | - | 5.618 | - | 0 | - | | |
| - | 60.548 | 4.466 | 11.433 | - | - | 240.299 | - | 205.006 | |
| - | 62.070 | 3.571 | 95 | - | - | - | - | | |
| - | 1.235 | - | 2.776 | 1.287 | - | - | - | 11.327 | - |
| - | 1.235 | - | 2.776 | 1.287 | - | - | - | 11.327 | |
| 250.618 | 2.220.173 | 172.970 | 2.527.549 | 53.879 | - | 5.488.842 | 952 | 11.650.639 | 887.258 |

## Tabla 4-27 Despacho de hidrocarburos por provincia 2012 (kBEP)

*Table 4-27 Fuel dispatch in provinces 2012 (kBOE)*

| PROVINCIAS *PROVINCES* | Gas Natural *Natural Gas* | GLP *LPG* | Gasolinas *Gasolines* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* |
|---|---|---|---|---|---|
| **Región Sierra**/*highland Region* | 150 | 3.727 | 10.230 | 10.991 | 782 |
| Azuay | 110 | 430 | 1.248 | 1.343 | 184 |
| Bolivar | - | - | 154 | 192 | - |
| Cañar | - | - | 275 | 428 | 51 |
| Carchi | - | - | 166 | 177 | - |
| Chimborazo | - | 113 | 588 | 598 | - |
| Cotopaxi | - | 205 | 560 | 787 | 103 |
| Imbabura | - | 267 | 554 | 765 | 6 |
| Loja | - | 229 | 545 | 745 | - |
| Pichincha | 39 | 1.630 | 4.582 | 4.327 | 406 |
| Sto. Dgo. Tsachilas | - | 303 | 599 | 855 | 15 |
| Tungurahua | - | 547 | 953 | 768 | 14 |
| **Región Costa**/*Coast Region* | - | 3.934 | 9.932 | 13.736 | 8.426 |
| El Oro | - | 350 | 912 | 1.522 | 24 |
| Esmeraldas | - | 18 | 786 | 602 | 9 |
| Guayas | - | 2.679 | 5.178 | 7.393 | 6.396 |
| Los Ríos | - | 327 | 775 | 1.317 | 7 |
| Manabí | - | 275 | 1.737 | 2.305 | 1.040 |
| Santa Elena | - | 283 | 542 | 594 | 949 |
| **Región Oriental**/*Amazonian Region* | - | 137 | 864 | 3.986 | - |
| Morona | - | - | 132 | 181 | - |
| Napo | - | - | 101 | 321 | - |
| Orellana | - | - | 165 | 1.017 | - |
| Pastaza | - | - | 123 | 190 | - |
| Sucumbios | - | 137 | 257 | 2.094 | - |
| Zamora Chinchipe | - | - | 83 | 182 | - |
| **Región Insular**/*Galapagos Region* | - | 7 | 10 | 216 | - |
| Galápagos | - | 7 | 10 | 216 | - |
| **2012** | 150 | 7.807 | 21.037 | 28.931 | 9.209 |

*En el caso del GLP considera los despachos a envasadoras; por tal razón no se registran valores en todas las provincias.
*LPG considers dispatch values to bottling companies, therefore dispatch is not present in some provinces.*

| Kerosene y Jet fuel<br>*Kerosene and Jet fuel* | Crudo Reducido<br>*Reduced Crude* | No energético<br>*Non-Energetic* | Total<br>*Total* | Estructura %<br>*Structure %* |
|---|---|---|---|---|
| 2.266 | 1.425 | 1.282 | 30.856 | 39 |
| - | 96 | 56 | 3.470 | 4 |
| - | - | 103 | 450 | - |
| - | 183 | 10 | 950 | 1 |
| - | - | 15 | 359 | - |
| - | 147 | 44 | 1.492 | 1 |
| - | - | 51 | 1.708 | 2 |
| - | 733 | 3 | 2.330 | 2 |
| - | - | 97 | 1.618 | 2 |
| 2.266 | 265.93 | 751 | 14.270 | 18 |
| - | - | 42 | 1.815 | 2 |
| - | - | 105 | 2.389 | 3 |
| | | | | |
| 148 | 3.873 | 1.207 | 41.260 | 52 |
| 19 | - | 124 | 2.954 | 3 |
| - | 1.292 | 31 | 2.741.49 | 3 |
| 104 | 1.085 | 689 | 23.527 | 30 |
| 22 | 651 | 85 | 3.187 | 4 |
| 1 | 843 | 237 | 6.440 | 8 |
| - | - | 39 | 2.408 | 3 |
| | | | | |
| 54 | 356 | 301 | 5.701 | 7 |
| 3 | - | 23 | 340 | - |
| - | - | 134 | 557 | - |
| 34 | 109 | 2 | 1.329 | 1 |
| 5 | - | 9 | 329 | - |
| 10 | 247 | 65 | 2.812 | 3 |
| - | - | 65 | 332 | - |
| | | | | |
| 3 | - | 1 | 240 | - |
| 3 | - | 1 | 240 | - |
| | | | | |
| 2.473 | 5.655 | 2.791 | 78.057 | 100 |

## Tabla 4-28 Despacho de hidrocarburos por provincia 2013 (bbl)

*Table 4-28 Fuel dispatch in provinces 2013*

| PROVINCIAS *PROVINCES* | Gasolina Extra *Extra Gasoline* | Gasolina Super *Super Gasoline* | Pesca-artesana *Artisanal Fisheries* | Diesel 1 | Diesel 2 | Diesel Premium | Fuel Oil | Mineral Turpentine | Rubber Solvent |
|---|---|---|---|---|---|---|---|---|---|
| **Región Sierra** /*Highland Region* | 10.028.402 | 2.475.473 | - | 4 343 | 2.232.667 | 9.707.470 | 736.155 | 55.952 | 50.262 |
| Azuay | 1.262.058 | 166.287 | | 283 | 272.310 | 1.093.173 | 184.974 | 18.190 | 9.214 |
| Bolivar | 181.583 | 15.718 | - | 424 | 14.605 | 195.813 | - | - | - |
| Cañar | 276.539 | 49.967 | - | 1.037 | 119.639 | 438.938 | 48.083 | - | - |
| Carchi | 285.664 | 13.060 | - | - | 34.629 | 225.761 | - | - | - |
| Chimborazo | 613.571 | 80.413 | - | - | 47.653 | 567.342 | - | 667 | 524 |
| Cotopaxi | 621.584 | 60.601 | - | - | 175.443 | 662.147 | 99.860 | - | - |
| Imbabura | 581.240 | 89.871 | - | - | 111.525 | 772.810 | 6.702 | - | - |
| Loja | 566.190 | 65.068 | - | - | - | 733.248 | - | - | - |
| Pichincha | 4.148.005 | 1.604.575 | - | 2.598 | 1.249.622 | 3.513.677 | 374.410 | 37.095 | 40.524 |
| Sto. Dgo. Tsachilas | 585.169 | 133.616 | - | - | 151.682 | 759.251 | 11.908 | - | - |
| Tungurahua | 906.798 | 196.298 | - | - | 55.560 | 745.310 | 10.219 | - | - |
| **Región Costa**/*Coast Region* | 8.706.564 | 2.588.455 | 820.584 | 59.304 | 6.867.087 | 8.341.950 | 7.913.183 | 22.281 | 39.276 |
| El Oro | 905.215 | 200.717 | 14.418 | - | 296.572 | 1.225.300 | 26.941 | - | - |
| Esmeraldas | 528.791 | 124.859 | 319.493 | - | 120.326 | 522.446 | 14.352 | - | - |
| Guayas | 4.626.878 | 1.637.734 | 60.630 | 45.111 | 4.381.990 | 3.982.339 | 5.795.226 | 22.262 | 39.133 |
| Los Ríos | 795.316 | 117.032 | - | 1.084 | 353.000 | 1.016.734 | 6.736 | - | - |
| Manabí | 1.494.838 | 425.096 | 194.156 | 11.414 | 1.385.821 | 1.265.469 | 939.199 | - | 143 |
| Santa Elena | 355.525 | 83.017 | 231.887 | 1.694 | 329.377 | 3.029.662 | 1.130.728 | 19 | - |
| **Región Oriental**/*Amazonian Region* | 944.815 | 106.089 | - | 803 | 3.231.148 | 1.264.297 | - | - | - |
| Morona | 145.791 | 17.938 | - | 613 | 59.809 | 173.741 | - | - | - |
| Napo | 123.464 | 20.631 | - | - | 122.472 | 257.738 | - | - | - |
| Orellana | 188.388 | 21.286 | - | - | 902.426 | 249.775 | - | - | - |
| Pastaza | 126.464 | 20.512 | - | - | 12.917 | 147.548 | - | - | - |
| Sucumbios | 273.436 | 19.262 | - | 190 | 2.133.525 | 270.965 | - | - | - |
| Zamora Chinchipe | 87.271 | 6.460 | - | - | - | 164.529 | - | - | - |
| **Región Insular**/*Galapagos Region* | 79.355 | - | - | - | 6.557 | 220.383 | - | - | - |
| Galápagos | 79.355 | - | - | - | 6.557 | 220.383 | - | - | - |
| **2013** | 19.759.136 | 5.170.017 | 820.584 | 64.450 | 12.337.458 | 19.534.100 | 8.649.337 | 78.233 | 89.538 |

*En el caso del GLP considera los despachos a envasadoras; por tal razón no se registran valores en todas las provincias.
*LPG considers dispatch values to bottling companies, therefore dispatch is not present in some provinces.*

| Spray Oil | Asfalto Ac-20 *Asphalt Ac-20* | Asfalto Rc-250 *Asphalt Rc-250* | Jet A-1 | Avgas | Nafta Base *Naphtha Base* | Residuo *Residue* | Absorver | GLP *LPG* | Gas Natural (Miles Pc) *Natural Gas (Thousand Cf)* |
|---|---|---|---|---|---|---|---|---|---|
| 21.143 | 1.068.587 | 71.248 | 1.168.501 | 1.438 | - | 1.430.843 | - | 5.725.544 | 1.380.959 |
| - | 48.554 | 8.029 | 40.715 | - | - | 152.000 | - | 672.141 | 944.777 |
| - | 47.269 | 9.129 | - | - | - | - | - | - | |
| - | 53.574 | 4.538 | - | - | - | 194.750 | - | - | |
| - | 5.974 | - | - | - | - | - | - | - | |
| - | 82.733 | 9.633 | - | - | - | 125.988 | - | 166.021 | 89.642 |
| - | 31.956 | 5.797 | 147.556 | - | - | - | - | 434.366 | |
| - | 36.698 | 1.705 | - | - | - | 622.670 | - | 396.279 | |
| - | 16.378 | 6.477 | 6.080 | - | - | - | - | 365.860 | |
| 19.262 | 555.549 | 15.901 | 973.912 | 1.430 | - | 335.436 | - | 2.404.863 | 346.540 |
| 71 | 29.187 | 867 | 238 | 8 | - | - | - | 455.297 | |
| 1.810 | 160.715 | 9.174 | - | - | - | - | - | 830.717 | |
| 195.998 | 910.085 | 116.137 | 1.659.476 | 27.261 | 64.485 | 4.237.001 | 714 | 6.038.054 | 11.628 |
| 32.881 | 82.255 | 12.744 | 17.593 | 2.888 | - | - | - | 559.908 | |
| - | 35.170 | 3.602 | 8.042 | 502 | - | 1.217.850 | - | 26.169 | |
| 142.903 | 402.185 | 35.014 | 1.524.810 | 21.369 | 64.485 | 1.212.086 | - | 4.126.185 | 11.628 |
| 18.500 | 63.723 | 6.366 | 16.640 | 2.059 | - | 551.790 | - | 546.705 | |
| - | 299.548 | 55.088 | 92.391 | 442 | - | 1.255.274 | - | 430.710 | |
| 1.714 | 27.203 | 3.323 | - | - | - | - | 714 | 348.378 | |
| - | 177.667 | 13.168 | 26.404 | 6.859 | - | 500.977 | - | 218.402 | - |
| - | 34.324 | 4.550 | - | 1.925 | - | - | - | 1.716 | |
| - | 9.300 | 1.002 | - | - | - | - | - | - | |
| - | 4.577 | 230 | 21.190 | - | - | 136.393 | - | - | |
| - | 18.939 | 1.604 | 94 | 4.934 | - | - | - | - | |
| - | 107.247 | 5.350 | 5.119 | - | - | 364.584 | - | 216.687 | |
| - | 3.280 | 432 | - | - | - | - | - | - | |
| - | 2.596 | 425 | - | 1.201 | - | - | - | 5.783 | - |
| - | 2.596 | 425 | - | 1.201 | - | - | - | 5.783 | |
| 217.141 | 2.158.935 | 200.978 | 2.854.381 | 36.759 | 64.485 | 6.168.821 | 714 | 11.987.784 | 1.392.588 |

## Tabla 4-29 Despacho de hidrocarburos por provincia 2013 (kBEP)

*Table 4-29 Fuel dispatch in provinces 2013 (kBOE)*

| PROVINCIAS *PROVINCES* | Gas Natural *Natural Gas* | GLP *LPG* | Gasolinas *Gasolines* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* |
|---|---|---|---|---|---|
| **Región Sierra**/*Highland Region* | 233 | 3.836 | 11.170 | 11.962 | 758 |
| Azuay | 160 | 450 | 1.276 | 1.367 | 190 |
| Bolivar | - | - | 176 | 211 | - |
| Cañar | - | - | 291 | 560 | 49 |
| Carchi | - | - | 266 | 260 | - |
| Chimborazo | 15 | 111 | 620 | 615 | - |
| Cotopaxi | - | 291 | 609 | 838 | 102 |
| Imbabura | - | 265 | 599 | 885 | 6 |
| Loja | - | 245 | 563 | 734 | - |
| Pichincha | 58 | 1.611 | 5.139 | 4.773 | 385 |
| Sto. Dgo. Tsachilas | - | 305 | 642 | 912 | 12 |
| Tungurahua | - | 556 | 985 | 802 | 10 |
| **Región Costa**/*Coast Region* | 1 | 4.046 | 10.881 | 15.291 | 8.153 |
| El Oro | - | 375 | 1.000 | 1.524 | 27 |
| Esmeraldas | - | 17 | 869 | 643 | 14 |
| Guayas | 1 | 2.764 | 5.708 | 8.422 | 5.971 |
| Los Ríos | - | 366 | 815 | 1.372 | 6 |
| Manabí | - | 288 | 1.888 | 2.666 | 967 |
| Santa Elena | - | 233 | 598 | 661 | 1.165 |
| **Región Oriental**/*Amazonian Region* | - | 146 | 938 | 4.502 | - |
| Morona | - | 1 | 146 | 234 | - |
| Napo | - | - | 128 | 380 | - |
| Orellana | - | - | 187 | 1.153 | - |
| Pastaza | - | - | 131 | 160 | - |
| Sucumbios | - | 145 | 261 | 2.408 | - |
| Zamora Chinchipe | - | - | 83 | 164 | - |
| **Región Insular**/*Galapagos Region* | - | 3 | 70 | 227 | - |
| Galápagos | - | 3 | 70 | 227 | - |
| **2013** | 235 | 8.033 | 23.062 | 31.983 | 8.912 |

*En el caso del GLP considera los despachos a envasadoras; por tal razón no se registran valores en todas las provincias.
*LPG considers dispatch values to bottling companies, therefore dispatch is not present in some provinces.*

| Kerosene y Jet fuel<br>*Kerosene and Jet fuel* | Crudo Reducido<br>*Reduced Crude* | No energético<br>*Non-Energetic* | Total<br>*Total* | Estructura %<br>*Structure %* |
|---|---|---|---|---|
| 1.121 | 1.474 | 1.267 | 31.825 | 37 |
| 39 | 156 | 83 | 3.724 | 4 |
| - | - | 56 | 443 | 1 |
| - | 200 | 58 | 1.160 | 1 |
| - | - | 5 | 533 | 1 |
| - | 129 | 93 | 1.585 | 1 |
| 141 | - | 37 | 2.021 | 2 |
| - | 641 | 38 | 2.437 | 2 |
| 5 | - | 22 | 1.572 | 1 |
| 934 | 345 | 668 | 13.917 | 16 |
| - | - | 30 | 1.902 | 2 |
| - | - | 171 | 2.526 | 3 |
| 1.616 | 4.365 | 1.284 | 45.641 | 54 |
| 19 | - | 127 | 3.075 | 3 |
| 8 | 1.254 | 38 | 2.847 | 3 |
| 1.481 | 1.248 | 641 | 26.241 | 31 |
| 17 | 568 | 88 | 3.236 | 3 |
| 88 | 1.293 | 354 | 7.548 | 8 |
| - | - | 32 | 2.692 | 3 |
| 31 | 516 | 190 | 6.327 | 7 |
| 1 | - | 38 | 422 | 1 |
| - | - | 10 | 519 | 1 |
| 20 | 140 | 4 | 1.506 | 1 |
| 4 | - | 20 | 317 | - |
| 4 | 375 | 112 | 3.308 | 3 |
| - | - | 3 | 252 | - |
| 1 | - | 3 | 306 | - |
| 1 | - | 3 | 306 | - |
| 2.770 | 6.356 | 2.745 | 84.099 | 100 |

## Tabla 4-30 Ventas de GLP por provincia 2013 (miles kg)

*Table 4-30 LPG sales in provinces 2013 (thousand kg)*

| PROVINCIA *PROVINCE* | Agrícola *Agricultural* | Doméstico *Domestic* | Industrial *Industrial* | Vehicular *Vehicular* | Total *Total* |
|---|---|---|---|---|---|
| Azuay | 74 | 79.070 | 4.550 | - | 83.694 |
| Bolívar | 247 | 11.357 | 50 | - | 11.654 |
| Cañar | 5 | 18.324 | 113 | - | 18.442 |
| Carchi | - | 14.427 | 229 | - | 14.656 |
| Chimborazo | - | 28.902 | 592 | - | 29.494 |
| Cotopaxi | 7 | 27.634 | 3.962 | - | 31.604 |
| El Oro | 381 | 38.148 | 1.864 | - | 40.393 |
| Esmeraldas | 162 | 27.527 | 624 | - | 28.313 |
| Galápagos | - | 1.311 | 271 | - | 1.581 |
| Guayas | 6.203 | 205.101 | 31.114 | 9.584 | 252.002 |
| Imbabura | - | 26.650 | 1.618 | - | 28.268 |
| Loja | 557 | 28.396 | 919 | - | 29.872 |
| Los Ríos | 10.500 | 48.348 | 654 | - | 59.502 |
| Manabí | 153 | 70.947 | 1.435 | - | 72.536 |
| Morona Santiago | - | 4.148 | 87 | - | 4.236 |
| Napo | - | 5.411 | 102 | - | 5.514 |
| Orellana | - | 5.135 | 141 | - | 5.277 |
| Pastaza | - | 4.886 | 53 | - | 4.939 |
| Pichincha | 142 | 206.314 | 22.327 | - | 228.782 |
| Santa Elena | 60 | 18.108 | 375 | - | 18.543 |
| Santo Domingo | 523 | 29.982 | 1.287 | - | 31.793 |
| Sucumbíos | - | 12.809 | 1.014 | - | 13.823 |
| Tungurahua | - | 47.828 | 1.845 | - | 49.673 |
| Zamora Chinchipe | - | 5.210 | 49 | - | 5.259 |
| **Total Nacional** / *Total National* | 19.015 | 965.974 | 75.276 | 9.584 | 1.069.849 |

## Tabla 4-31 Demanda de energía y potencia por provincia 2013

*Table 4-31 Power and electricity demand in provinces 2013*

| PROVINCIA *PROVINCE* | POTENCIA MÁXIMA *(MW) MAXIMUM CAPACITY* | ENERGÍA FACTURADA *(GWh) BILLED ENERGY* | PÉRDIDAS ENERGÍA *(GWh) ENERGY LOSSES* |
|---|---|---|---|
| Azuay | 142.6 | 776 | 56 |
| Bolívar | 17 | 68 | 8 |
| Cañar | 35 | 178 | 17 |
| Carchi | 19 | 85 | 11 |
| Chimborazo | 63 | 296 | 34 |
| Cotopaxi | 90 | 470 | 32 |
| El Oro | 139 | 712 | 135 |
| Esmeraldas | 95 | 433 | 114 |
| Galápagos | 6 | 37 | 3 |
| Guayas | 1.236 | 6.300 | 1.005 |
| Imbabura | 62 | 298 | 37 |
| Loja | 54 | 254 | 32 |
| Los Ríos | 127 | 533 | 152 |
| Manabí | 256 | 1.183 | 373 |
| Morona Santiago | 13 | 63 | 5 |
| Napo | 15 | 82 | 5 |
| Orellana | 19 | 93 | 25 |
| Pastaza | 10 | 51 | 3 |
| Pichincha | 720 | 3.958 | 261 |
| Santa Elena | 66 | 287 | 57 |
| Sucumbíos | 28 | 126 | 34 |
| Tungurahua | 86 | 433 | 29 |
| Zamora Chinchipe | 2 | 13 | 2 |
| Santo Domingo | 65 | 339 | 40 |
| **Total Nacional** / *Total National* | 3.374 | 17.068 | 2.470 |

* Datos estimados. Energía facturada a clientes finales / *Estimated figures according to electricity billed to final users.*

5

# Exportaciones e importaciones de energía

## *Energy exports and imports*

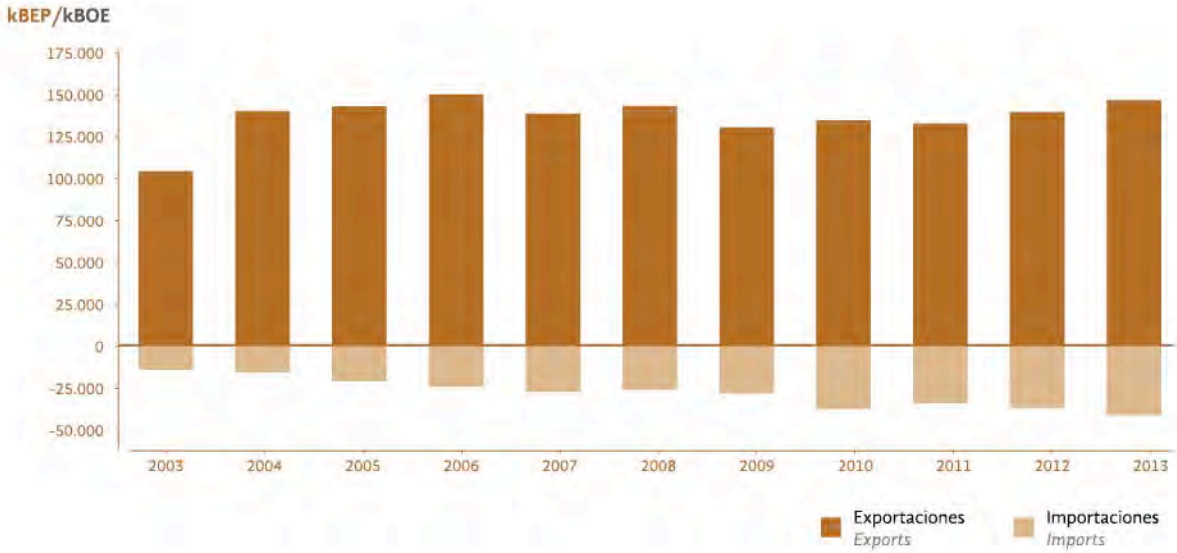
A continuación se reflejan los resultados obtenidos de los flujos comerciales energéticos del Ecuador con los mercados internacionales medidos a través de las exportaciones e importaciones. El saldo (diferencia entre exportaciones e importaciones) muestra la posición comercial del país; es decir, en caso de existir un superávit de energía (saldo positivo) se cataloga al país como exportador neto, mientras que si se obtiene un déficit de energía (saldo negativo) el país será importador neto de energía.

*This chapter presents commercial energy flows in international markets, both exports and imports. The difference between these two shows the commercial position of the country, meaning that in case of having energy surplus the country is defined as a net exporter and when a deficit is registered the country is defined as a net energy importer.*

Foto: Plataforma de Gas Natural en Campo Amistad

## Figura 5-1 Exportaciones e Importaciones

*Figure 5-1 Exports and imports*




## Tabla 5-1 Exportaciones e Importaciones (kBEP)

*Table 5-1 Exports and imports (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exportaciones Exports | 107.275 | 146.873 | 148.696 | 154.586 | 143 323 | 147.144 | 135.791 | 138.941 | 137 221 | 143.603 | 151 736 | 5,7 |
| Importaciones Imports | 15.368 | 16.431 | 22 518 | 26 342 | 29.058 | 28.053 | 32 037 | 40.961 | 37.397 | 38.780 | 44.258 | 14,1 |
| Exportaciones Netas (1) Net Exports (1) | 91.907 | 130.442 | 126.177 | 128 245 | 114.265 | 119 091 | 103.754 | 97 980 | 99.824 | 104.823 | 107.478 | 2,5 |

(1) Exportaciones menos importaciones / *Exports minus imports*

## 5.1 Exportaciones / *Exports*

### Tabla 5-2 Exportaciones (kBEP)

*Table 5-2 Structure of exports (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | 95.286 | 133.345 | 135.596 | 140.789 | 127.872 | 131.420 | 123.193 | 128.249 | 125.433 | 133.454 | 144.510 | 8,3 |
| Electricidad *Electricity* | 42 | 22 | 10 | 1 | 24 | 23 | 13 | 6 | 9 | 7 | 18 | 144,0 |
| Gasolinas-Naftas *Gasolines-Naphthas* | 2.309 | 2.279 | 1.884 | 1.511 | 1.121 | 1.641 | 1.316 | 492 | 648 | 1.312 | 1.232 | -6,1 |
| Kerosene/ Jet fuel *Kerosene/ Jet fuel* | - | - | - | - | - | 67 | 77 | - | - | - | - | - |
| Diesel Oil *Diesel Oil* | - | - | 190 | - | 745 | - | - | - | - | - | - | - |
| Fuel Oil *Fuel Oil* | 9.639 | 11.228 | 11.015 | 12.286 | 13.562 | 13.992 | 11.191 | 10.193 | 11.131 | 8.830 | 5.977 | -32,3 |
| Total *Total* | 107.275 | 146.873 | 148.696 | 154.586 | 143.323 | 147.144 | 135.791 | 138.941 | 137.221 | 143.603 | 151.736 | 5,7 |

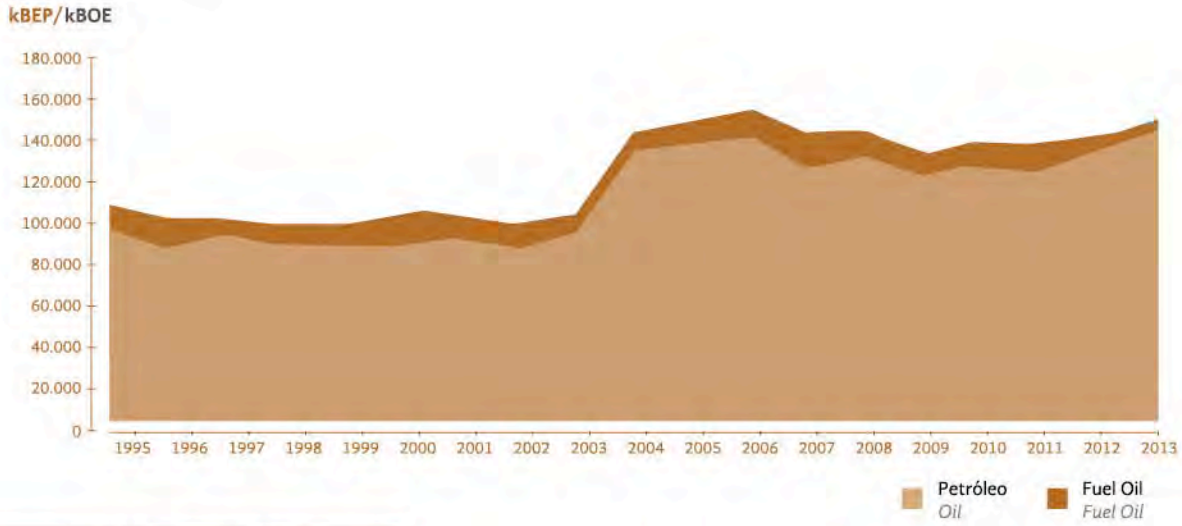
### Tabla 5-3 Estructura de las exportaciones (%)

*Table 5-3 Structure of exports (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Petróleo *Oil* | 88,8 | 90,8 | 91,2 | 91,1 | 89,2 | 89,3 | 90,7 | 92,3 | 91,4 | 92,9 | 95,2 |
| Electricidad *Electricity* | 0,04 | 0,01 | 0,01 | 0,0004 | 0,02 | 0,02 | 0,01 | 0,004 | 0,01 | 0,01 | 0,01 |
| Gasolinas-Naftas *Gasolines-Naphthas* | 2,2 | 1,6 | 1,3 | 1,0 | 0,8 | 1,1 | 1,0 | 0,4 | 0,5 | 0,9 | 0,8 |
| Kerosene/ Jet fuel *Kerosene/ Jet fuel* | - | - | - | - | - | 0,05 | 0,1 | - | - | - | - |
| Diesel Oil *Diesel Oil* | - | - | 0,1 | - | 0,5 | - | - | - | - | - | - |
| Fuel Oil *Fuel Oil* | 9,0 | 7,6 | 7,4 | 7,9 | 9,5 | 9,5 | 8,2 | 7,3 | 8,1 | 6,1 | 3,9 |
| Total *Total* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 5-2 Exportaciones

*Figure 5-2 Exports*




### 5.1.1 Por país de destino

*5.1.1 Destination countries*

## Tabla 5-4 Exportación por país de destino 2013

*Table 5-4 Exports according to destination country 2013*

| | Fuel Oil *Fuel Oil* | Nafta *Naphtha* | Petróleo *Oil* | Electricidad *Electricity* | Fuel Oil *Fuel Oil* | Nafta *Naphtha* | Petróleo *Oil* | Electricidad *Electricity* | Total *Total* | Estructura % *Structure %* |
|---|---|---|---|---|---|---|---|---|---|---|
| | kbbl | kbbl | kbbl | GWh (1) | kBEP | kBEP | kBEP | kBEP(1)/kBOE | | |
| Chile | - | - | 21.002 | - | - | - | 21.641 | - | 21.641 | 14,26 |
| China | - | - | 3.641 | - | - | - | 3.752 | - | 3.752 | 2,47 |
| El Salvador | 1.116 | - | - | - | 1.150 | - | - | - | 1.150 | 0,76 |
| España | - | - | 1.798 | - | - | - | 1.853 | - | 1.853 | 1,22 |
| Guatemala | 951 | - | - | - | 980 | - | - | - | 980 | 0,65 |
| Honduras | 904 | - | - | - | 932 | - | - | - | 932 | 0,61 |
| Japón | - | - | 5.931 | - | - | - | 6.111 | - | 6.111 | 4,03 |
| Panamá | 2.830 | 157 | 1.493 | - | 2.916 | 140 | 1.538 | - | 4.594 | 3,03 |
| Perú | - | - | 13.848 | 29 | - | | 14.269 | 18 | 14.287 | 9,42 |
| U.S.A. | - | 1.222 | 92.532 | - | - | 1.092 | 95.346 | - | 96.438 | 63,56 |
| **Total** | 5.800 | 1.379 | 140.245 | 29 | 5.977 | 1.232 | 144.510 | 18 | 151.736 | 100,00 |

(1) Incluye Colombia / *Includes Colombia*

## 5.2 Importaciones / *Imports*

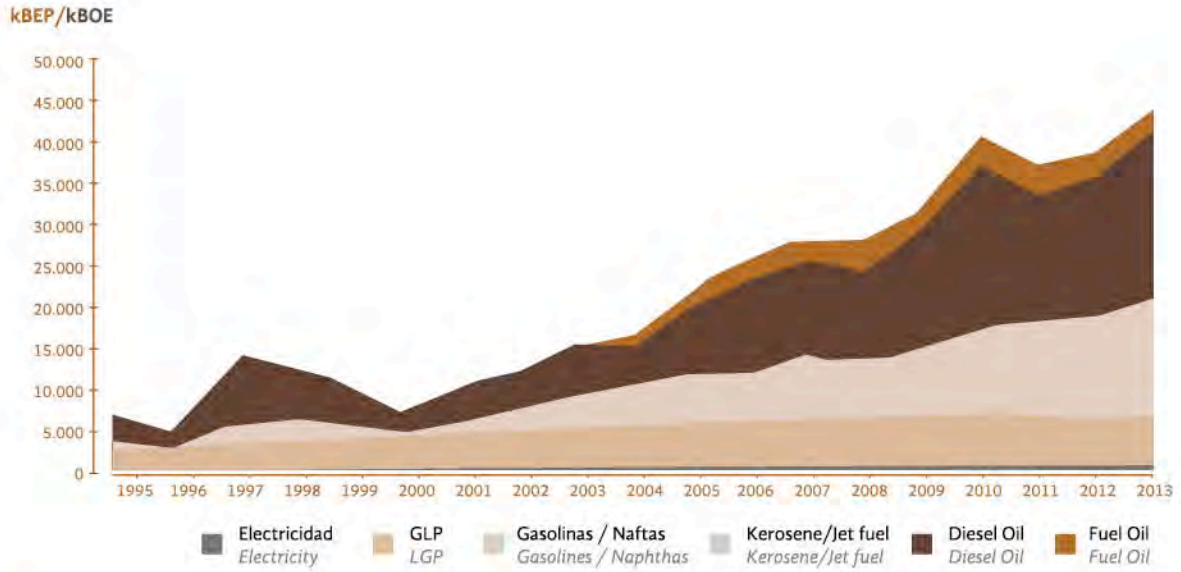
### Tabla 5-5 Importaciones (kBEP)

*Table 5-5 Imports (kBOE)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad *Electricity* | 694 | 1.017 | 1.068 | 973 | 533 | 310 | 694 | 541 | 802 | 148 | 410 | 178,1 |
| Gas Licuado de Petróleo *Liquefied Petroleum Gas* | 4.339 | 4.797 | 5.369 | 5.650 | 6.500 | 6.223 | 6.084 | 6.295 | 6.523 | 6.039 | 6.410 | 6,1 |
| Gasolinas/Naftas *Gasolines/Naphthas* | 4.257 | 4.154 | 5.394 | 5.517 | 6.955 | 6.623 | 8.377 | 10.849 | 11.267 | 12.715 | 14.300 | 12,5 |
| Kerosene y Jet fuel *Kerosene / Jet fuel* | 28 | - | 1 | - | - | 72 | 88 | 85 | 28 | 26 | 108 | 314,9 |
| Diesel Oil *Diesel Oil* | 6.051 | 5.548 | 8.135 | 11.342 | 11.862 | 11.176 | 14.481 | 19.960 | 15.112 | 17.048 | 20.872 | 22,4 |
| Fuel Oil *Fuel Oil* | - | 915 | 2.552 | 2.859 | 3.208 | 3.649 | 2.312 | 3.231 | 3.665 | 2.805 | 2.158 | -23,1 |
| **Total Secundarias** *Total Secondaries* | **15.368** | **16.431** | **22.518** | **26.342** | **29.058** | **28.053** | **32.037** | **40.961** | **37.397** | **38.780** | **44.258** | **14,1** |

### Figura 5-3 Importaciones

*Figure 5-3 Imports*



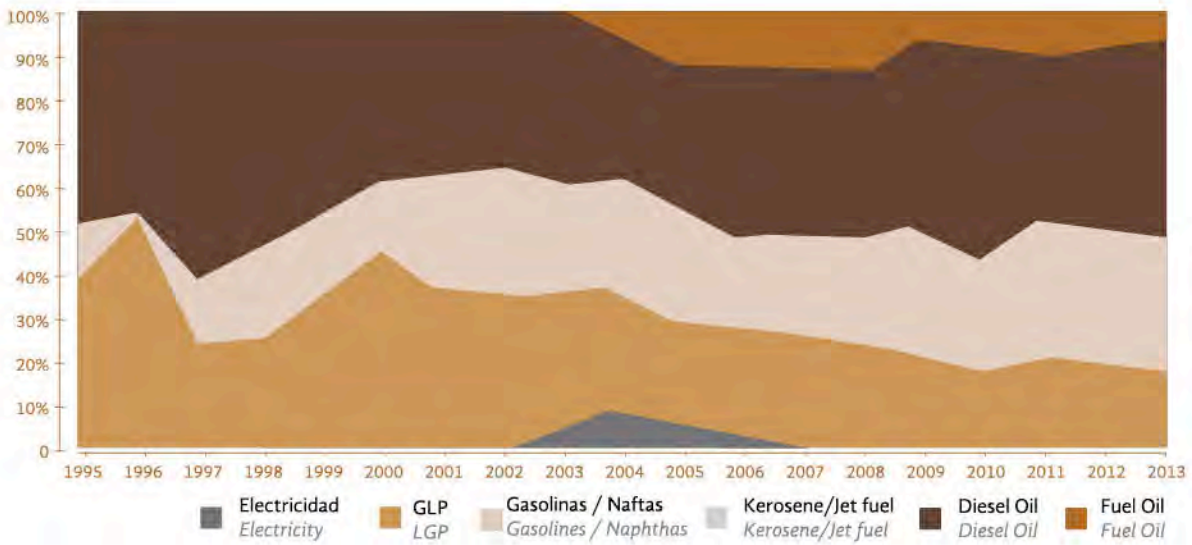
## Tabla 5-6 Estructura porcentual de las importaciones (%)

*Table 5-6 Structure of imports (%)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Electricidad<br>*Electricity* | 4,5 | 6,2 | 4,7 | 3,7 | 1,8 | 1,1 | 2,2 | 1,3 | 2,1 | 0,4 | 0,9 |
| Gas Licuado de Petróleo<br>*Liquefied Petroleum Gas* | 28,2 | 29,2 | 23,8 | 21,4 | 22,4 | 22,2 | 19,0 | 15,4 | 17,4 | 15,6 | 14,5 |
| Gasolinas/Naftas<br>*Gasolines/Naphthas* | 27,7 | 25,3 | 24,0 | 20,9 | 23,9 | 23,6 | 26,1 | 26,5 | 30,1 | 32,8 | 32,3 |
| Kerosene y Jet fuel<br>*Kerosene / Jet fuel* | 0,2 | - | - | - | - | 0,3 | 0,3 | 0,2 | 0,1 | 0,1 | 0,2 |
| Diesel Oil<br>*Diesel Oil* | 39,4 | 33,8 | 36,1 | 43,1 | 40,8 | 39,8 | 45,2 | 48,7 | 40,4 | 44,0 | 47,2 |
| Fuel Oil<br>*Fuel Oil* | - | 5,6 | 11,3 | 10,9 | 11,0 | 13,0 | 7,2 | 7,9 | 9,8 | 7,2 | 4,9 |
| **Total Secundarias**<br>*Total Secondaries* | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Figura 5-4 Estructura porcentual de las importaciones de energía

*Figure 5-4 Structure of energy imports*



## 5.2.1 Por país de destino
*5.2.1 Destination countries*

### Tabla 5-7 Importaciones por país de origen (kbbl)
*Table 5-7 Imports according to country of origin (kbbl)*

| | NAO | Cutter Stock | Diesel Oil | Diesel Premium | AVGAS | Jet | Butano *Butane* | Propano *Propane* | Electricidad *Electricity* GWh |
|---|---|---|---|---|---|---|---|---|---|
| India | 953,13 | - | - | 741,19 | - | - | - | - | - |
| U.S.A. | 5.974,21 | 629,18 | 3.401,44 | 11.842,86 | 32,89 | 80,09 | 380,99 | 1.769,43 | - |
| Perú | - | - | - | - | - | - | 741,30 | 1.531,89 | - |
| Panamá | 2.075,17 | 1.464,92 | 1.511,88 | 2.042,93 | - | - | 916,32 | 2.265,47 | - |
| Reino Unido | 1.828,08 | - | - | - | - | - | - | - | - |
| Holanda | 526,07 | - | - | - | - | - | - | - | - |
| España | 2.692,04 | - | - | - | - | - | - | - | - |
| India | 697,89 | - | - | - | - | - | - | - | - |
| Corea del Sur | 257,32 | - | 488,78 | 553,80 | - | - | - | - | - |
| Colombia | - | - | 258,14 | - | - | - | - | - | 662,34 |
| Bahamas | 1.002,17 | - | - | - | - | - | - | - | - |
| Aruba | - | - | - | - | - | - | 427,39 | 1.532,49 | - |
| **TOTAL** | **16.006,08** | **2.094,10** | **5.660,24** | **15.180,78** | **32,89** | **80,09** | **2.466,00** | **7.099,28** | **662,34** |

### Tabla 5-8 Importaciones por país de origen (kBEP)
*Table 5-8 Imports according to country of origin. (kBOE)*

| | NAO | Cutter Stock | Diesel Oil | Diesel Premium | AVGAS | Jet | Butano *Butane* | Propano *Propane* | Electricidad *Electricity* | Total *Total* | Estructura % *Structure %* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| India | 852 | - | - | 742 | - | - | - | - | - | 1.594 | 3,6 |
| U.S.A. | 5.337 | 648 | 3.407 | 11.861 | 32 | 77 | 255 | 1.186 | - | 22.802 | 51,5 |
| Perú | - | - | - | - | - | - | 497 | 1.027 | - | 1.523 | 3,4 |
| Panamá | 1.854 | 1.509 | 1.514 | 2.046 | - | - | 614 | 1.518 | - | 9.056 | 20,5 |
| Reino Unido | 1.633 | - | - | - | - | - | - | - | - | 1.633 | 3,7 |
| Holanda | 470 | - | - | - | - | - | - | - | - | 470 | 1,1 |
| España | 2.405 | - | - | - | - | - | - | - | - | 2.405 | 5,4 |
| India | 623 | - | - | - | - | - | - | - | - | 623 | 1,4 |
| Corea del Sur | 230 | - | 490 | 555 | - | - | - | - | - | 1.274 | 2,9 |
| Colombia | - | - | 259 | - | - | - | - | - | 410 | 669 | 1,5 |
| Bahamas | 895 | - | - | - | - | - | - | - | - | 895 | 2,0 |
| Aruba | - | - | - | - | - | - | 286 | 1.027 | - | 1.313 | 3,0 |
| **TOTAL** | **14.300** | **2.158** | **5.669** | **15.204** | **32** | **77** | **1.652** | **4.757** | **410** | **44.258** | **100,0** |

# 6

# Emisiones de gases de efecto invernadero
## *Emission of greenhouse gases*

En este capítulo se presentan las estimaciones de emisiones del sector energético de los gases de efecto invernadero (GEI): Dióxido de Carbono (CO2), Metano (CH4) y Óxido Nitroso (N2O). Los resultados son expresados en toneladas de CO2 equivalentes, con el fin de poder comparar la generación de GEI por fuente, contaminante y tipo de actividad para el periodo comprendido entre los años 2003 y 2013.

*This chapter presents the estimations for the emission of greenhouse gases (GHG): carbon dioxide (CO2), Methane (CH4) and Nitrous oxide (N2O). Results are expressed in tons of CO2 equivalent, with the purpose of comparing GHG according to source, pollutant and activity type for the period 2003 – 2013.*

Foto: Proyecto Multipropósito Baba

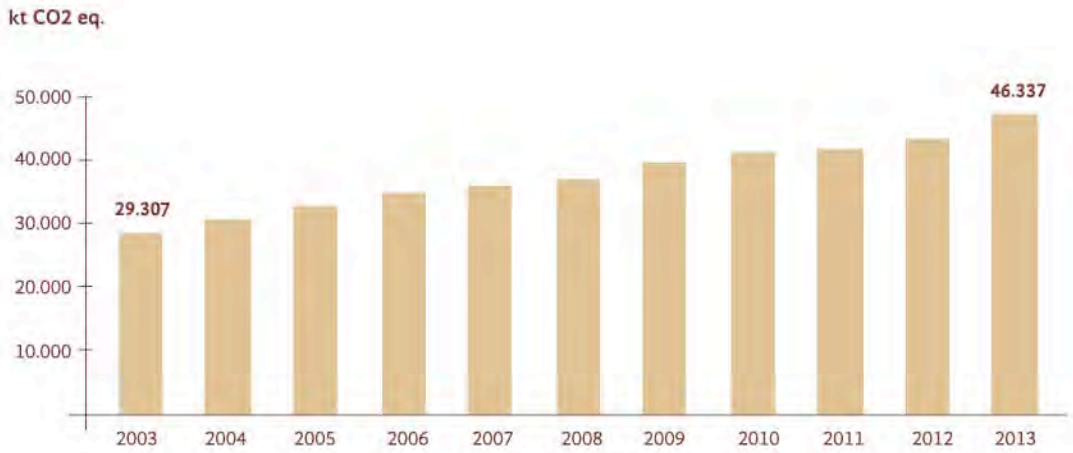
## Tabla 6-1 Emisiones de GEI[38] por contaminante (kt CO2 equivalentes)

*Table 6-1 GHG emissions by pollutant (kt CO2 equivalent)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO2 | 29.013 | 31.151 | 32.838 | 35.075 | 36.080 | 37.097 | 39.941 | 41.611 | 41.997 | 43.614 | 45.977 |
| N2O | 108 | 113 | 120 | 127 | 131 | 133 | 140 | 144 | 146 | 152 | 158 |
| CH4 | 186 | 194 | 200 | 202 | 203 | 202 | 199 | 201 | 194 | 209 | 203 |
| **Total emisiones** *Total emissions* | **29.307** | **31.459** | **33.158** | **35.404** | **36.414** | **37.432** | **40.280** | **41.956** | **42.337** | **43.975** | **46.337** |

## Figura 6-1 Emisiones de GEI por contaminante (kt CO2 equivalentes)

*Figure 6-1 GHG emissions by pollutant (kt CO2 equivalent)*




38. Para los inventarios de gases de efecto invernadero se utilizaron las directrices del IPCC de 2006. Para transformar el CH4 y el N2O a CO2 equivalentes se utiliza el índice GWP (potencial de calentamiento global por sus siglas en inglés). Este índice es una medida relativa de cuánto calor puede ser atrapado por un determinado gas de efecto invernadero, en comparación con un gas de referencia, por lo general CO2. El índice GWP utilizado para el CH4 es de 21 y para el N2O de 310 / *Guidelines of the IPCC 2006 were used for the estimation of GHG emissions. To transform CH4 and N2O to CO2 the Global Warming Potential was used. GWP used for CH4 is 21 and N2O is 310.*

## Tabla 6- 2 Emisiones de GEI por fuente (kt CO2 equivalentes)

*Table 6-2 GHG emissions by source (kt CO2 equivalent)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Leña *Firewood* | Prod.Caña *Cane Products* | GLP *LPG* | Gasolinas/naftas *Gasoline/Naphtas* | Kerosene *Kerosene* | Diesel *Diesel* | Fuel oil *Fuel oil* | Gases *Gases* | Otras *Others* | No energéticos *Non-Energetic* | Total *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2003 | 482 | 1.010 | 1.909 | 1.169 | 2.186 | 4.729 | 787 | 8.154 | 5.763 | 109 | 2.465 | 545 | 29.307 |
| 2004 | 559 | 1.178 | 1.885 | 1.202 | 2.384 | 5.031 | 874 | 8.992 | 5.985 | 130 | 2.688 | 553 | 31.459 |
| 2005 | 591 | 1.214 | 1.895 | 1.283 | 2.536 | 5.493 | 982 | 9.873 | 6.109 | 119 | 2.568 | 494 | 33.158 |
| 2006 | 695 | 1.321 | 1.830 | 1.299 | 2.713 | 5.982 | 1.024 | 11.018 | 6.029 | 123 | 2.831 | 539 | 35.404 |
| 2007 | 968 | 1.385 | 1.754 | 1.395 | 2.832 | 6.160 | 1.071 | 11.187 | 6.160 | 107 | 2.847 | 550 | 36.414 |
| 2008 | 1.035 | 1.309 | 1.639 | 1.259 | 2.886 | 6.732 | 1.078 | 11.491 | 6.018 | 119 | 3.112 | 756 | 37.432 |
| 2009 | 1.033 | 1.457 | 1.473 | 1.276 | 2.829 | 7.226 | 1.049 | 12.825 | 6.835 | 122 | 2.998 | 1.154 | 40.280 |
| 2010 | 1.070 | 1.572 | 1.373 | 1.272 | 2.873 | 7.917 | 1.062 | 14.150 | 6.617 | 138 | 2.845 | 1.065 | 41.956 |
| 2011 | 1.117 | 1.447 | 1.114 | 1.420 | 2.951 | 8.446 | 1.084 | 13.454 | 7.137 | 136 | 2.909 | 1.124 | 42.337 |
| 2012 | 1.181 | 1.834 | 1.315 | 1.459 | 2.992 | 8.654 | 1.054 | 13.689 | 7.487 | 151 | 2.951 | 1.206 | 43.975 |
| 2013 | 1.298 | 2.120 | 1.021 | 1.485 | 3.049 | 9.455 | 1.178 | 15.033 | 7.363 | 172 | 2.977 | 1.188 | 46.337 |

## Tabla 6-3 Emisiones de GEI por fuente y contaminantes 2013 (kt CO2 equivalentes)

*Table 6-3 GHG emissions by source and pollutant (kt CO2 equivalent)*

| | 2012 | | | | 2013 | | | |
|---|---|---|---|---|---|---|---|---|
| | CO2 | N2O | CH4 | TOTAL | CO2 | N2O | CH4 | TOTAL |
| Petróleo *Oil* | 1.155 | 3 | 24 | **1.181** | 1.270 | 3 | 25 | **1.298** |
| Gas Natural *Natural Gas* | 1.832 | 1 | 2 | **1.834** | 2.116 | 1 | 2 | **2.120** |
| Leña *Firewood* | 1.241 | 14 | 60 | **1.315** | 966 | 11 | 45 | **1.021** |
| Prod. Caña *Cane Products* | 1.432 | 18 | 9 | **1.459** | 1.457 | 18 | 9 | **1.485** |
| Gas Licuado de Petróleo *Liquified petroleum gas* | 2.985 | 1 | 5 | **2.992** | 3.042 | 2 | 5 | **3.049** |
| Gasolinas/Naftas *Gasoline/Naphtas* | 8.536 | 36 | 82 | **8.654** | 9.326 | 39 | 90 | **9.455** |
| Kerosene y Jet fuel *Kerosene / Jet fuel* | 1.049 | 5 | 0 | **1.054** | 1.171 | 6 | 0 | **1.178** |
| Diesel oil *Diesel oil* | 13.628 | 46 | 15 | **13.689** | 14.968 | 50 | 16 | **15.033** |
| Fuel oil *Fuel oil* | 7.461 | 18 | 8 | **7.487** | 7.338 | 18 | 7 | **7.363** |
| Gases *Gases* | 151 | 0 | 0 | **151** | 171 | 0 | 0 | **172** |
| Otras *Others* | 2.941 | 7 | 3 | **2.951** | 2.967 | 8 | 3 | **2.977** |
| No energéticos *Non-Energetic* | 1.202 | 3 | 1 | **1.206** | 1.184 | 3 | 1 | **1.188** |
| **Total** *Total* | 43.614 | 152 | 209 | **43.975** | 45.977 | 158 | 203 | **46.337** |

## Tabla 6-4 Emisiones de GEI por actividad (kt CO2 equivalentes)

*Table 6-4 GHG emissions by activity (kt CO2 equivalent)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción *Production* | 159 | 195 | 201 | 202 | 191 | 188 | 182 | 182 | 186 | 191 | 200 |
| Centrales elect. *Power Stations* | 2.955 | 2.962 | 3.853 | 4.466 | 4.042 | 3.172 | 4.757 | 6.081 | 4.805 | 5.168 | 6.032 |
| Autoproductor *Autoproducer* | 187 | 668 | 1.936 | 1.858 | 2.900 | 2.589 | 2.499 | 2.618 | 2.721 | 2.775 | 2.868 |
| Centro de gas *Gas center* | 486 | 518 | 448 | 413 | 334 | 386 | 423 | 431 | 433 | 464 | 574 |
| Consumo propio *Own consumption* | 4.083 | 4.453 | 4.046 | 4.557 | 4.594 | 4.971 | 4.817 | 4.607 | 4.726 | 4.793 | 4.787 |
| Transporte *Transportation* | 11.838 | 12.925 | 13.761 | 14.650 | 15.620 | 16.665 | 17.285 | 17.804 | 19.069 | 19.420 | 20.457 |
| Industrial *Industrial* | 4.560 | 4.544 | 3.650 | 3.957 | 3.454 | 3.980 | 4.731 | 4.736 | 4.954 | 5.353 | 5.842 |
| Residencial *Residential* | 3.757 | 3.879 | 4.102 | 4.157 | 4.179 | 4.085 | 3.827 | 3.715 | 3.501 | 3.763 | 3.504 |
| Comercial *Commercial* | 69 | 62 | 63 | 66 | 65 | 57 | 63 | 64 | 86 | 50 | 47 |
| Agro-pesca *Agriculture-Fishery* | 107 | 116 | 141 | 168 | 184 | 220 | 251 | 276 | 292 | 317 | 350 |
| Construcción *Construction* | 560 | 584 | 465 | 370 | 301 | 361 | 291 | 377 | 441 | 475 | 488 |
| No energético *Non-Energetic* | 545 | 553 | 494 | 539 | 550 | 756 | 1.154 | 1.065 | 1.124 | 1.206 | 1.188 |
| **Total Emisiones** *Total Emissions* | **29.307** | **31.459** | **33.158** | **35.404** | **36.414** | **37.432** | **40.280** | **41.956** | **42.337** | **43.975** | **46.337** |

## Tabla 6-5 Emisiones de GEI por actividad y contaminante (kt CO2 equivalentes)

*Table 6-5 GHG emissions by activity and pollutant (kt CO2 equivalent)*

| | 2012 | | | | 2013 | | | |
|---|---|---|---|---|---|---|---|---|
| | CO2 | NO2 | CH4 | TOTAL | CO2 | NO2 | CH4 | TOTAL |
| Producción<br>*Production* | 167 | - | 24 | **191** | 174 | - | 25 | **200** |
| Centrales elect.<br>*Electric Power Stations* | 5.153 | 11 | 4 | **5.168** | 6.014 | 13 | 5 | **6.032** |
| Autoproductor<br>*Autoproducer* | 2.757 | 12 | 6 | **2.775** | 2.851 | 12 | 6 | **2.868** |
| Consumo propio<br>*Own consumption* | 4.777 | 12 | 4 | **4.793** | 4.772 | 12 | 4 | **4.787** |
| Centro de gas<br>*Gas center* | 464 | - | - | **464** | 574 | - | - | **574** |
| Transporte<br>*Transportation* | 19.247 | 78 | 94 | **19.420** | 20.272 | 83 | 102 | **20.457** |
| Industrial<br>*Industrial* | 5.322 | 22 | 10 | **5.353** | 5.808 | 24 | 10 | **5.842** |
| Residencial<br>*Residential* | 3.687 | 13 | 64 | **3.763** | 3.446 | 10 | 48 | **3.504** |
| Comercial<br>*Commercial* | 49 | - | - | **50** | 47 | - | - | **47** |
| Agro-pesca<br>*Agriculture-Fishery* | 316 | 1 | 1 | **317** | 348 | 1 | 1 | **350** |
| Construcción<br>*Construction* | 473 | - | 1 | **475** | 486 | - | 1 | **488** |
| No energético<br>*Non-Energetic* | 1.202 | 3 | 1 | **1.206** | 1.184 | 3 | 1 | **1.188** |
| **Total Emisiones**<br>*Total Emissions* | 43.614 | 152 | 209 | **43.975** | 45.977 | 158 | 203 | **46.337** |

# Energía y socioeconomía
## *Energy and socioeconomy*

A continuación se visualizan indicadores del sector energético, como la intensidad energética total y sectorial, consumos energéticos per cápita, entre otros. Además, se relaciona al sector energético en el ámbito económico. Se muestran resultados del Producto Interno Bruto (PIB) energético del país, de la participación ingresos energéticos en el presupuesto del Gobierno Central y de la balanza comercial petrolera entre los principales.

*This chapter presents indexes of the energy sector, such as the total and sectorial energy intensity, energy consumption per capita, etc. The energy sector is related to the economic sector. Results of the energy gross domestic product (GDP) are presented, as well as the importance of energy revenue for the national budget and the oil trade balance.*

Foto: Central Térmica Esmeraldas II

## 7.1 Producto interno bruto por industria / *GDP by industry*

### Tabla 7-1 Producto interno bruto por industria

*Table 7-1 GDP by industry*

**Millones de dólares**/*Million dollars*

| Industrias / *Industries* | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIB Petróleo**/*Oil GDP* | 4.893 | 4.893 | 4.745 | 4.977 | 6.866 | 6.940 | 7.270 | 6.751 | 6.801 | 6.829 | 6.591 | 6.892 | 6.844 | 7.016 |
| **Extracción de petróleo, gas natural y actividades de servicio relacionadas** *Oil and Natural Gas extraction and related service activities* | 3.722 | 3.828 | 3.695 | 4.101 | 5.858 | 5.984 | 6.316 | 5.824 | 5.793 | 5.780 | 5.787 | 5.985 | 6.064 | 6.382 |
| **Refinación de Petróleo** *Oil refining* | 1.171 | 1.065 | 1.049 | 876 | 1.007 | 956 | 954 | 927 | 1.008 | 1.050 | 804 | 907 | 780 | 633 |
| **PIB No Petrolero** *Non-Oil GDP* | 30.963 | 32.377 | 33.870 | 34.886 | 36.291 | 38.544 | 40.312 | 41.760 | 44.703 | 45.522 | 47.133 | 50.893 | 53.774 | 57.091 |
| **Agricultura, ganadería, silvicultura y pesca** *Agriculture, livestock, silviculture and fishing* | 3.544 | 3.720 | 3.786 | 4.036 | 4.132 | 4.424 | 4.614 | 4.772 | 4.852 | 4.935 | 5.013 | 5.282 | 5.343 | 5.627 |
| **Explotación de minas y canteras** *Mines and quarries exploitation* | 111 | 108 | 120 | 126 | 132 | 136 | 142 | 146 | 178 | 171 | 171 | 188 | 201 | 210 |
| **Manufactura (excepto refinación de petróleo)** *Manufacturing (except oil refining)* | 4.581 | 4.818 | 4.938 | 5.100 | 5.231 | 5.565 | 5.835 | 6.077 | 6.635 | 6.534 | 6.712 | 7.029 | 7.389 | 7.945 |
| **Suministro de electricidad y agua** *Electricity and water supply* | 512 | 513 | 545 | 552 | 494 | 500 | 500 | 586 | 761 | 685 | 689 | 885 | 924 | 1.292 |
| **Construcción**/*Construction* | 2.254 | 2.779 | 3.361 | 3.329 | 3.502 | 3.802 | 3.977 | 4.017 | 4.372 | 4.495 | 4.710 | 5.726 | 6.527 | 6.998 |
| **Comercio**/*Trade* | 4.234 | 4.434 | 4.527 | 4.667 | 4.855 | 5.148 | 5.346 | 5.356 | 5.933 | 5.700 | 6.162 | 6.532 | 6.727 | 6.651 |
| **Alojamiento y servicios de comida** *Accommodation and food services* | 591 | 634 | 685 | 707 | 742 | 786 | 847 | 865 | 910 | 990 | 1.064 | 1.210 | 1.312 | 1.352 |
| **Transporte**/*Transportation* | 2.691 | 2.787 | 2.808 | 2.870 | 2.930 | 3.003 | 3.167 | 3.231 | 3.409 | 3.632 | 3.752 | 4.032 | 4.264 | 4.463 |
| **Correo y Comunicaciones** *Post and communications* | 476 | 520 | 563 | 647 | 753 | 985 | 1.105 | 1.241 | 1.501 | 1.622 | 1.655 | 1.837 | 1.965 | 2.346 |
| **Actividades de servicios financieros** *Financial services activities* | 783 | 732 | 793 | 789 | 865 | 1.056 | 1.266 | 1.303 | 1.386 | 1.419 | 1.495 | 1.669 | 1.740 | 1.832 |
| **Actividades profesionales, técnicas y administrativas** *Professional, technical and administrative activities* | 1.945 | 2.170 | 2.470 | 2.584 | 2.676 | 2.893 | 3.027 | 3.241 | 3.464 | 3.360 | 3.527 | 3.767 | 3.956 | 4.122 |
| **Adm. pública, defensa; planes de seguridad social obligatoria** *Public adm. and defence; compulsory social security plans* | 2.236 | 2.273 | 2.330 | 2.405 | 2.490 | 2.543 | 2.619 | 2.784 | 2.839 | 3.165 | 3.235 | 3.388 | 3.704 | 3.968 |
| **Enseñanza, Servicios sociales y de salud** *Education and social and health services* | 3.205 | 3.275 | 3.242 | 3.327 | 3.446 | 3.611 | 3.762 | 3.932 | 4.157 | 4.479 | 4.487 | 4.700 | 4.989 | 5.571 |
| **Servicio doméstico** *Domestic service* | 132 | 136 | 139 | 145 | 151 | 144 | 148 | 149 | 148 | 172 | 179 | 170 | 149 | 154 |
| **Otros Servicios** * *Other services** | 3.667 | 3.476 | 3.564 | 3.604 | 3.892 | 3.948 | 3.955 | 4.059 | 4.159 | 4.162 | 4.281 | 4.480 | 4.585 | 4.560 |
| **Otros elementos del PIB** *Other elements of GDP* | 1.871 | 1.972 | 2.234 | 2.098 | 2.250 | 2.325 | 2.333 | 2.497 | 2.746 | 2.206 | 2.445 | 2.785 | 3.054 | 2.773 |
| **TOTAL PIB** / Total GDP | 37.726 | 39.241 | 40.849 | 41.961 | 45.407 | 47.809 | 49.915 | 51.008 | 54.250 | 54.558 | 56.169 | 60.569 | 63.673 | 66.879 |

(1) Incluye actividades inmobiliarias, entretenimiento, recreación y otras actividades de servicios
*Includes real state, entertainment, recreation and other service activities.*

## 7.2 Ingresos petroleros / *Oil income*

### Tabla 7-2 Ingresos del petróleo en el presupuesto General del Estado

*Table 7-2 Oil income in the national budget*

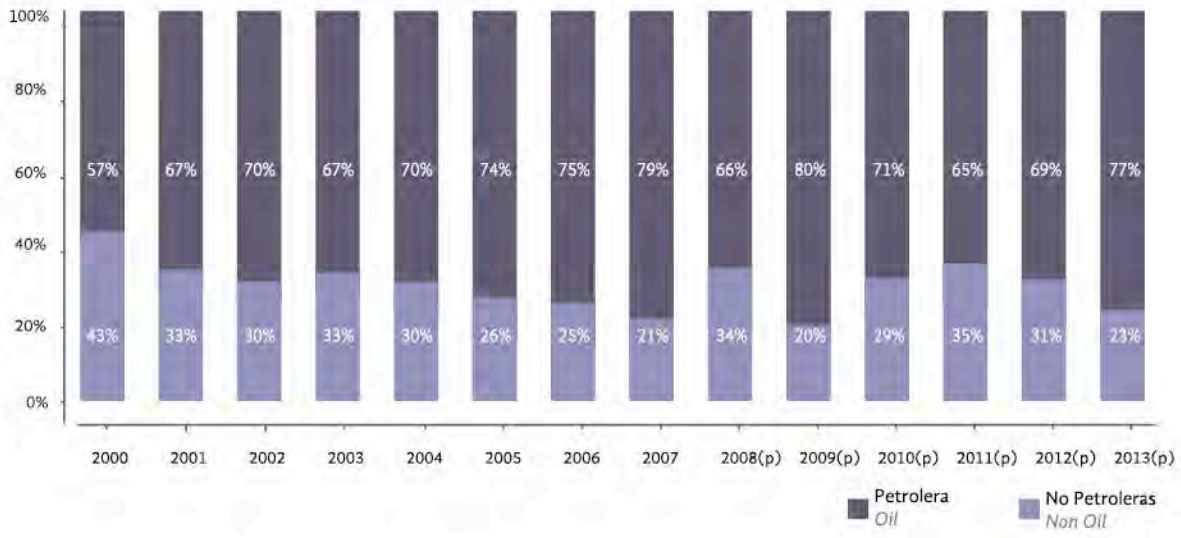
**Millones de dólares**/*Million dollars*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008(p) | 2009(p) | 2010(p) (1) | 2011(p) | 2012(p) | 2013(p) | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Ingresos *Total Income* | 4.770,7 | 5.178,6 | 6.051,6 | 6.895,0 | 8.490,2 | 13.799,0 | 11.582,9 | 15.075,7 | 17.198,4 | 19.522,8 | 20.400,0 | 4% |
| Petroleros *by Oil* | 1.561,2 | 1.557,9 | 1.567,3 | 1.718,6 | 1.764,3 | 4.641,7 | 2.298,2 | 4.411,0 | 5.971,4 | 6.085,6 | 4.676,8 | -23% |
| Por exportaciones *by Exports* | 993,1 | 1 080,3 | 1.488,9 | 1.718,6 | 1.764,3 | 4.641,7 | 2.298,2 | 4.411,0 | 5.971,4 | 6.085,6 | 4.676,8 | – |
| Por ventas derivados *by Oil products* | 568,1 | 477,6 | 78,4 | – | – | – | – | – | – | – | – | – |
| No Petroleros *Non-Oil* | 3.209,5 | 3.620,7 | 4.484,3 | 5.176,3 | 6.725,9 | 9.157,2 | 9.284,8 | 10.664,7 | 11.227,0 | 13.437,3 | 15.723,2 | 17% |

(1) A partir del 2010 los datos corresponden al Presupuesto General del Estado -PGE-, los mismos que no son comparables porque se incorporan los datos de las Entidades Autónomas. / *Since 2010, data are from the National Budget, they are not comparable because the data of the Local Governments are incorporated.*
(p) Cifras provisionales. / *Provisional data*

### Figura 7-1 Estructura porcentual de los ingresos del Gobierno Central

*Figure 7-1 Structure of the national budget*



## 7.3 Exportaciones petroleras / *Oil exports*

### Tabla 7-3 Exportaciones petroleras

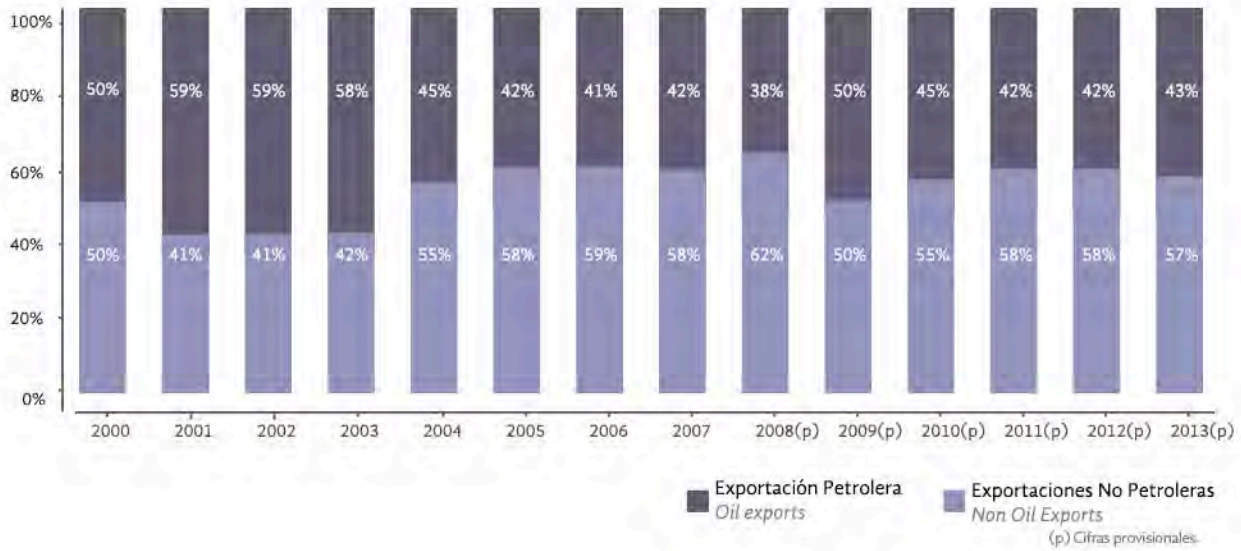
*Table 7-3 Oil exports*

**Millones de dólares**/*Million dollars*

| | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | Var. (%) 2013/2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petroleras/*Oil* | **TOTAL** | 2.606 | 4.234 | 5.869 | 7.544 | 8.328 | 11.720 | 6.964 | 9.673 | 12.944 | 13.792 | 14.107 | 2,29 |
| | Petróleo crudo *Crude oil* | 2.372 | 3.898 | 5.396 | 6.934 | 7.428 | 10.567 | 6.284 | 8.951 | 11.800 | 12.711 | 13.411 | 5,51 |
| | Derivados *Oil products* | 234 | 335 | 473 | 610 | 900 | 1.152 | 680 | 721 | 1.144 | 1.080 | 696 | -35,60 |
| No Petroleras/ *Non Oil* | | 3.615 | 3.518 | 4.230 | 5.183 | 5.992 | 7.097 | 6.898 | 7.816 | 9.377 | 9.972 | 10.849 | 8,80 |
| **Total Exportaciones** *Total Exports* | | 6.222 | 7.752 | 10.100 | 12.728 | 14.321 | 18.818 | 13.863 | 17.489 | 22.322 | 23.764 | 24.957 | 5,02 |

### Figura 7-2 Estructura porcentual de las exportaciones

*Figure 7-2 Structure of total exports*



## 7.4 Balanza Comercial / *Trade balance*

### Tabla 7-4 Balanza Comercial

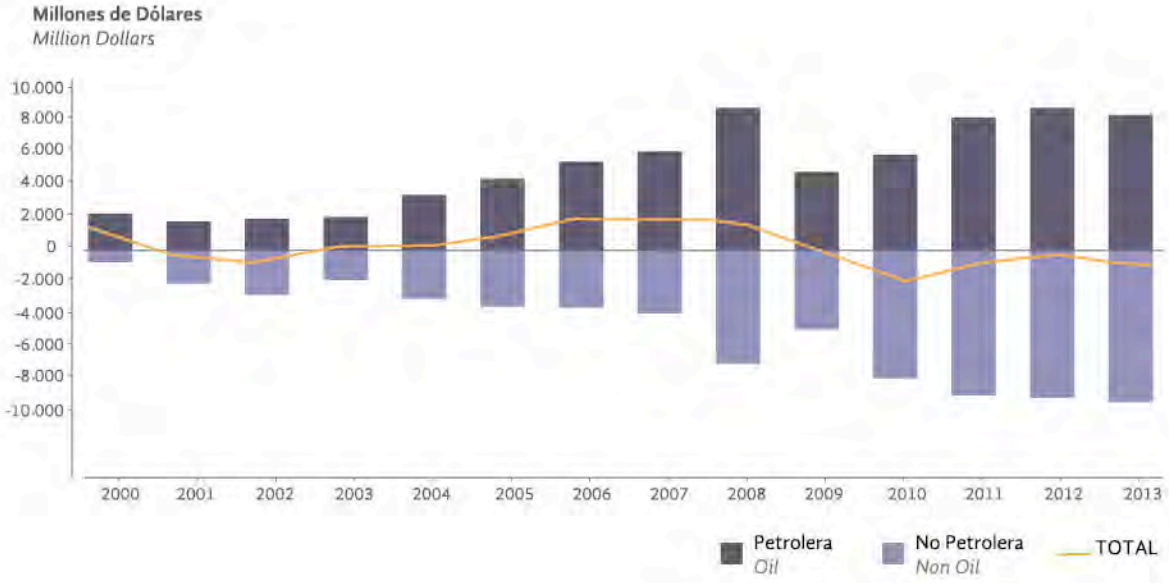
*Table 7-4 Trade balance*

**Millones de dólares**/*Million dollars*

| Año *Year* | Balanza Comercial/*Trade Balance* | | Exportaciones/*Exports* | | Importaciones/*Imports* | |
|---|---|---|---|---|---|---|
| | Petrolera/*Oil* | No petrolera/*Non-Oil* | Petrolera/*Oil* | No petrolera/*Non-Oil* | Petrolera/*Oil* | No petrolera/*Non-Oil* |
| 2003 | 1.874,0 | -1.794,5 | 2.606,8 | 3.839,0 | 732,8 | 5.633,5 |
| 2004 | 3.238,9 | -2.954,9 | 4.234,0 | 3.733,8 | 995,1 | 6.688,7 |
| 2005 | 4.154,9 | -3.396,5 | 5.869,9 | 4.597,8 | 1.715,0 | 7.994,4 |
| 2006 | 5.163,6 | -3.395,2 | 7.544,5 | 5.631,6 | 2.380,9 | 9.026,8 |
| 2007 | 5.750,2 | -3.927,2 | 8.328,6 | 6.541,6 | 2.578,3 | 10.468,8 |
| 2008 | 8.362,8 | -6.814,1 | 11.720,6 | 7.740,2 | 3.357,8 | 14.554,3 |
| 2009 | 4.626,3 | -4.860,2 | 6.964,6 | 7.447,4 | 2.338,3 | 11.930,1 |
| 2010 | 5.630,4 | -7.609,1 | 9.673,2 | 8.463,9 | 4.042,8 | 15.598,3 |
| 2011 | 7.858,3 | -8.687,8 | 12.944,9 | 10.137,5 | 5.086,5 | 18.156,1 |
| 2012 | 8.350,7 | -8.791,3 | 13.791,9 | 10.861,7 | 5.441,1 | 19.143,5 |
| 2013 | 8.027,6 | -9.111,5 | 14.107,7 | 10.849,9 | 6.080,2 | 19.961,4 |

### Figura 7-3 Balanza Comercial

*Figure 7-3 Trade balance*



## Tabla 7-5 Balance internacional de hidrocarburos

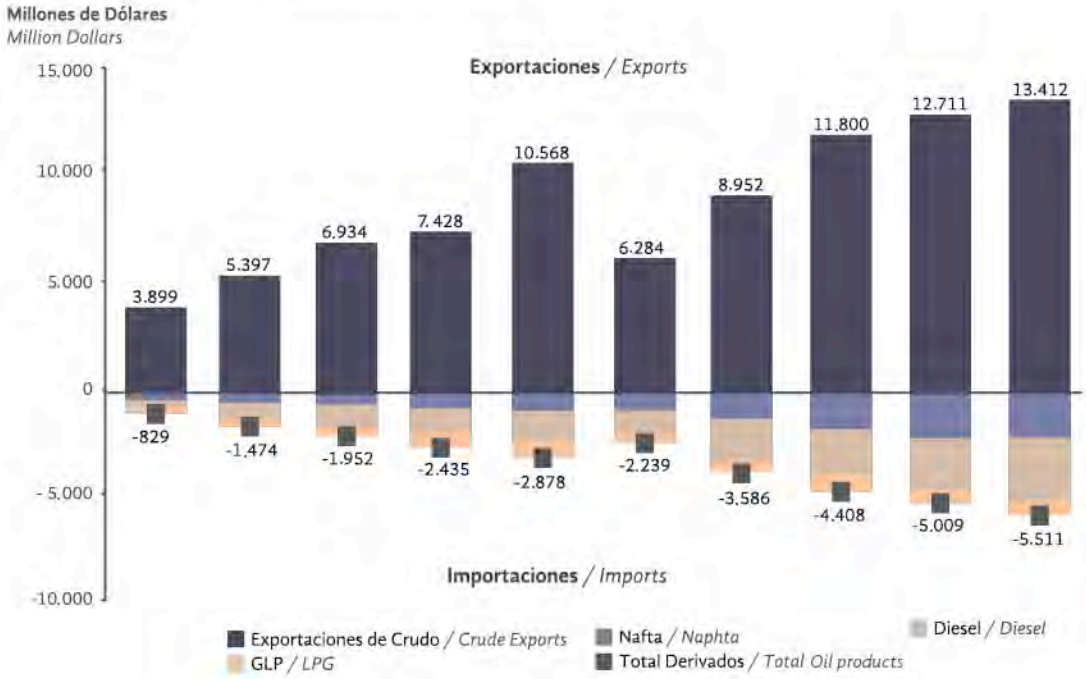
*Table 7-5 International trade balance of fuels*

**Millones de dólares** *Million dollars*

| Año *Year* | Exportaciones de Crudo *Crude Exports* | Importaciones deDerivados/*Oil products Imports* | | | |
|---|---|---|---|---|---|
| | | Nafta/*Naphtha* | Diésel/*Diesel* | GLP/*LPG* | Total |
| 2004 | 3.899 | -256 | -296 | -277 | -829 |
| 2005 | 5.397 | -451 | -648 | -375 | -1.474 |
| 2006 | 6.934 | -524 | -950 | -478 | -1.952 |
| 2007 | 7.428 | -718 | -1.083 | -635 | -2.435 |
| 2008 | 10.568 | -806 | -1.406 | -666 | -2.878 |
| 2009 | 6.284 | -753 | -1.074 | -411 | -2.239 |
| 2010 | 8.952 | -1.194 | -1.875 | -517 | -3.586 |
| 2011 | 11.800 | -1.663 | -1.974 | -771 | -4.408 |
| 2012 | 12.711 | -2.048 | -2.318 | -644 | -5.009 |
| 2013 | 13.412 | -2.108 | -2.746 | -658 | -5.511 |

## Figura 7-4 Balance Internacional de hidrocarburos

*Figure 7-4 International trade balance of fuels*



## Tabla 7-6 Balance internacional de hidrocarburos (MM bbl)

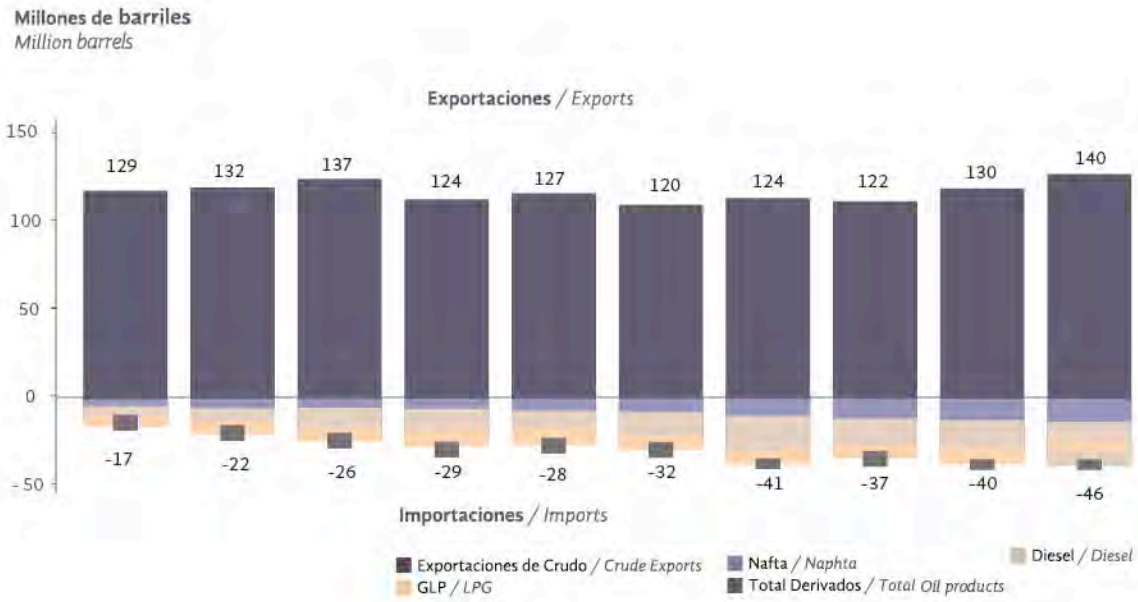
*Table 7-6 International trade balance of fuels*

**Millones de barriles**/*Million barrels*

| Exportaciones de Crudo *Crude Exports* | Importaciones deDerivados/*Oil products Imports* | | | |
|---|---|---|---|---|
| | Nafta/*Naphtha* | Diésel/*Diesel* | GLP/*LPG* | Total |
| 129 | -5 | -6 | -7 | -17 |
| 132 | -6 | -8 | -8 | -22 |
| 137 | -6 | -11 | -8 | -26 |
| 124 | -8 | -12 | -10 | -29 |
| 127 | -7 | -11 | -9 | -28 |
| 120 | -9 | -14 | -9 | -32 |
| 124 | -12 | -19 | -9 | -41 |
| 122 | -13 | -15 | -10 | -37 |
| 130 | -14 | -17 | -9 | -40 |
| 140 | -16 | -21 | -10 | -46 |

## Figura 7-5 Balance internacional de hidrocarburos (MM bbl)

*Figure 7-5 International trade balance of fuels*



## 7.5 Indicadores energéticos / *Energy indicators*

### Tabla 7-7 Intensidad energética

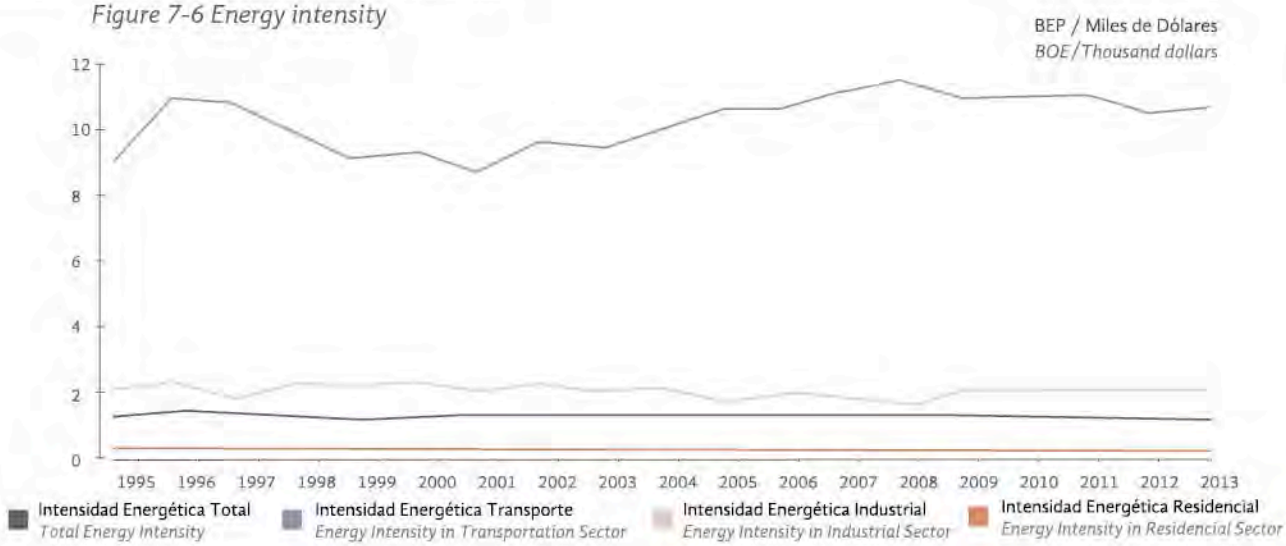
*Table 7-7 Energy intensity*

| | | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consumo Energético Total (1) | kBEP | 58.865 | 59.345 | 62.522 | 62.894 | 67.655 | 68.315 | 73.204 | 75.447 | 80.251 | 82.454 | 84.142 | 88.754 | 92.044 | 96.189 |
| *Total Energy Consumption (1)* | *kBOE* | | | | | | | | | | | | | | |
| PIB Total | USD millones 2007 | 37.726 | 39.241 | 40.849 | 41.961 | 45.407 | 47.809 | 49.915 | 51.008 | 54.250 | 54.558 | 56.169 | 60.569 | 63.673 | 66.879 |
| *Total GDP* | *USD millions 2007* | | | | | | | | | | | | | | |
| Intensidad Energética Total | BEP/USD miles | 1,56 | 1,51 | 1,53 | 1,50 | 1,49 | 1,43 | 1,47 | 1,48 | 1,48 | 1,51 | 1,50 | 1,47 | 1,45 | 1,44 |
| *Total Energy Intensity* | *BOE/USD thousand* | | | | | | | | | | | | | | |
| Consumo Energético Transporte | kBEP | 25.069 | 24.690 | 27.151 | 27.857 | 30.385 | 32.374 | 34.497 | 36.804 | 39.294 | 40.797 | 42.114 | 45.121 | 45.999 | 48.551 |
| *Energy Consum. In Trans.. Sector* | *kBOE* | | | | | | | | | | | | | | |
| PIB Transporte | USD millones 2007 | 2.691 | 2.787 | 2.808 | 2.870 | 2.930 | 3.003 | 3.167 | 3.231 | 3.409 | 3.632 | 3.752 | 4.032 | 4.264 | 4.463 |
| *Transportation GDP* | *USD millions 2007* | | | | | | | | | | | | | | |
| Intensidad Energética Trans. | BEP/USD miles | 9,32 | 8,86 | 9,67 | 9,71 | 10,37 | 10,78 | 10,89 | 11,39 | 11,53 | 11,2 | 11,22 | 11,19 | 10,79 | 10,88 |
| *Energy Intensity In Transport. Sect.* | *BOE/USD thousand* | | | | | | | | | | | | | | |
| Consumo Energético Indus. | kBEP | 11.476 | 10.978 | 11.775 | 11.470 | 12.017 | 10.895 | 12.025 | 11.607 | 12.609 | 14.216 | 14.756 | 15.577 | 16.819 | 18.050 |
| *Energy Consum. In Industrial Sect.* | *kBEP* | | | | | | | | | | | | | | |
| PIB Industria (Manufactura) (2) | USD millones 2007 | 4.581 | 4.818 | 4.938 | 5.100 | 5.231 | 5.565 | 5.835 | 6.077 | 6.635 | 6.534 | 6.712 | 7.029 | 7.389 | 7.945 |
| *Industry GDP (Manufacturing) (2)* | *USD millions 2007* | | | | | | | | | | | | | | |
| Intensidad Energética Industrial | BEP/USD miles | 2,51 | 2,28 | 2,38 | 2,25 | 2,30 | 1,96 | 2,06 | 1,91 | 1,90 | 2,18 | 2,20 | 2,22 | 2,28 | 2,27 |
| *Energy Intensity In Industrial Sec.* | *BOE/USD thousand* | | | | | | | | | | | | | | |
| Consumo Energético Residencial | kBEP | 9.228 | 9.509 | 9.732 | 10.076 | 10.590 | 11.291 | 11.635 | 11.909 | 11.976 | 11.659 | 11.760 | 11.661 | 12.291 | 12.127 |
| *Energy Consum. In Residential Sec.* | *kBOE* | | | | | | | | | | | | | | |
| PIB Residencial (3) | USD millones 2007 | 23.167 | 24.899 | 26.661 | 27.462 | 29.229 | 30.523 | 31.852 | 33.201 | 34.995 | 34.648 | 37.321 | 39.539 | 41.235 | 42.629 |
| *Residential GDP (3)* | *USD millions 2007* | | | | | | | | | | | | | | |
| Intensidad Energética Residencial | BEP/USD miles | 0,40 | 0,38 | 0,37 | 0,37 | 0,36 | 0,37 | 0,37 | 0,36 | 0,34 | 0,34 | 0,32 | 0,29 | 0,30 | 0,28 |
| *Energy Intensity In Residential Sec.* | *BOE/USD thousand* | | | | | | | | | | | | | | |

(1) Incluye consumo propio / *Includes own consumption*
(2) No incluye Refinación de Petróleo / *Does not include oil refining*
(3) Gasto de consumo final de Hogares Residentes / *Final consumption of residential households*

### Figura 7-6 Intensidad energética

*Figure 7-6 Energy intensity*



## Tabla 7-8 Índice de Suficiencia energética - Índice de Renovabilidad

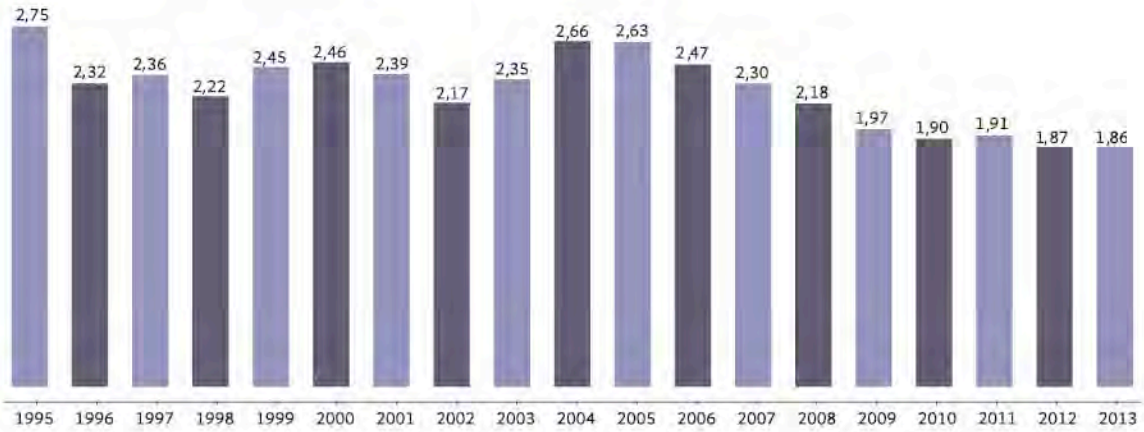
*Table 7-8 Sufficiency and renewability index*

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Prod. de Energía Primaria<br>*Primary Energy Production* | 167.032 | 167.051 | 162.839 | 175.100 | 216.183 | 218.876 | 220.712 | 211.707 | 210.389 | 201.467 | 200.731 | 207.521 | 211.126 | 218.599 |
| Oferta total de energía<br>*Total Energy Supply* | 67.914 | 69.903 | 74.888 | 74.606 | 81.166 | 83.304 | 89.395 | 91.950 | 96.313 | 102.318 | 105.646 | 108.407 | 112.900 | 117.837 |
| Indice de Suficiencia Energét (1)<br>*Energy Sufficiency Index (1)* | 2,46 | 2,39 | 2,17 | 2,35 | 2,66 | 2,63 | 2,47 | 2,30 | 2,18 | 1,97 | 1,90 | 1,91 | 1,87 | 1,86 |
| Oferta de Ener. Renovable (2)<br>*Renewably Energy Supply (2)* | 10.086 | 9.504 | 9.530 | 9.189 | 9.354 | 9.177 | 9.264 | 10.497 | 11.501 | 10.009 | 9.493 | 10.942 | 11.984 | 10.868 |
| Oferta Total de Energía<br>*Total Energy Supply* | 67.914 | 69.903 | 74.888 | 74.606 | 81.166 | 83.304 | 89.395 | 91.950 | 96.313 | 102.318 | 105.646 | 108.407 | 112.900 | 117.837 |
| Índice de Renovabilidad (3)<br>*Renewability Index (3)* | 14,9% | 13,6% | 12,7% | 12,3% | 11,5% | 11,0% | 10,4% | 11,4% | 11,9% | 9,8% | 9,0% | 10,1% | 10,6% | 9,2% |

(1) Producción de energía primaria / Oferta total de energía / *Primary energy production / Total energy supply*
(2) Incluye hidroenergía, leña , productos de caña y otras primarias / *Includes hydro energy, firewood, sugar cane products and other primary energy*
(3) Oferta de energía renovable / Oferta total de energía / *Renewable energy supply / total energy supply*

## Figura 7-7 Índice de suficiencia Energética

*Figure 7-7 Energy sufficiency index*

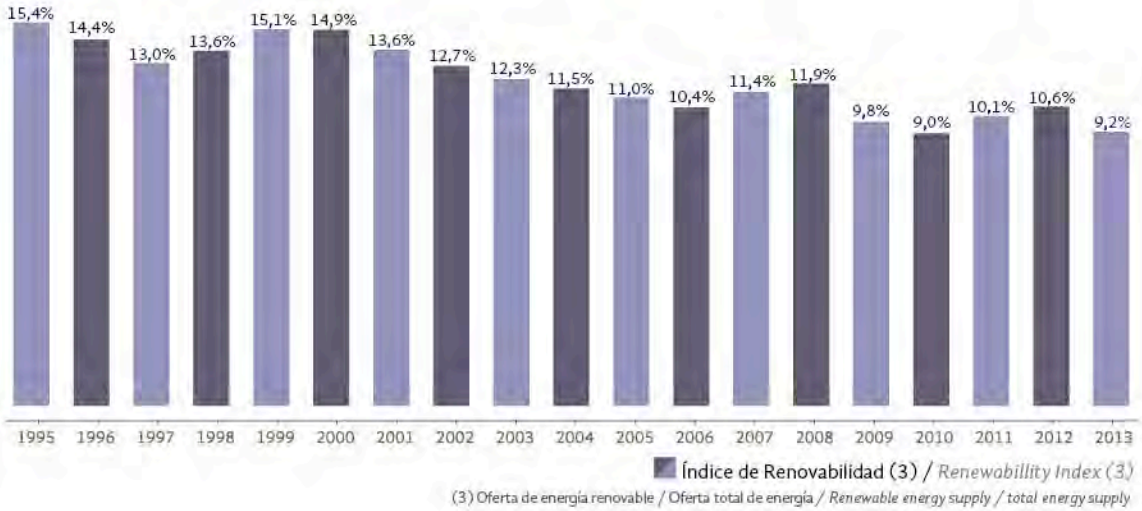



Índice de Suficiencia Energética (1) / *Energy Sufficiency Index (1)*

(1) Producción de energía primaria / Oferta total de energía / *Primary energy production / Total energy supply*

## Figura 7-8 Índice de Renovabilidad

*Figure 7-8 Renewability index*




(3) Oferta de energía renovable / Oferta total de energía / *Renewable energy supply / total energy supply*

## Tabla 7-9 Oferta interna – PIB Población

*Table 7-9 Internal supply GDP - Population*

| | Unidad/ Unit | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013* | Var. (%) 2013/2012* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oferta interna de energía *Internal energy supply* | kBEP *kBOE* | 74.606 | 81.167 | 83.305 | 89.395 | 91.951 | 96.313 | 102.319 | 105.646 | 108.407 | 112.900 | 117.838 | 4,4 |
| Prod. interno bruto (PIB) *Gross domestic prod. (GDP)* | MILLONES USD (2007) *million USD* | 41.961 | 45.407 | 47.809 | 49.915 | 51.008 | 54.250 | 54.558 | 56.169 | 60.569 | 63.673 | 66.879 | 5,0 |
| Población *Population* | miles hab. *thousand hab.* | 13.320 | 13.552 | 13.721 | 13.965 | 14.214 | 14.473 | 14.738 | 15.012 | 15.266 | 15.521 | 15.775 | 1,6 |
| Oferta / PIB *Supply/GDP* | kBEP/ millones hab. *kBOE/ million hab.* | 1,78 | 1,79 | 1,74 | 1,79 | 1,80 | 1,78 | 1,88 | 1,88 | 1,79 | 1,77 | 1,76 | -0,6 |
| Oferta interna per-cápita *Internal supply per capita* | BEP/ hab. *BOE/ hab.* | 5,60 | 5,99 | 6,07 | 6,40 | 6,47 | 6,65 | 6,94 | 7,04 | 7,10 | 7,27 | 7,47 | 2,7 |

## Tabla 7-10 Consumo final de energía per cápita (BEP / habitante)

*Table 7-10 Final energy consumption per capita (BOE / hab.)*

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | * Var. (%) 2013/2012 * |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Transporte *Transportation* | 2,09 | 2,24 | 2,36 | 2,47 | 2,59 | 2,72 | 2,77 | 2,81 | 2,96 | 2,96 | 3,08 | 3,8 |
| Industria *Industry* | 0,86 | 0,89 | 0,79 | 0,86 | 0,82 | 0,87 | 0,96 | 0,98 | 1,02 | 1,08 | 1,14 | 5,6 |
| Residencial *Residential* | 0,76 | 0,78 | 0,82 | 0,83 | 0,84 | 0,83 | 0,79 | 0,78 | 0,76 | 0,79 | 0,77 | -2,9 |
| Comercial, Ser. pub *Commercial, Pub. ser* | 0,16 | 0,18 | 0,19 | 0,21 | 0,21 | 0,22 | 0,19 | 0,20 | 0,22 | 0,23 | 0,25 | 9,3 |
| Agro,pesca,miner. *Agri./Fishing/Mining* | 0,02 | 0,02 | 0,03 | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,06 | 8,5 |
| Construccion,otr. *Construction,others* | 0,10 | 0,10 | 0,08 | 0,06 | 0,05 | 0,06 | 0,05 | 0,06 | 0,07 | 0,07 | 0,07 | 1,1 |
| Consumo Energético *Energy Consumtpion* | 3,99 | 4,21 | 4,27 | 4,46 | 4,54 | 4,73 | 4,81 | 4,87 | 5,07 | 5,19 | 5,37 | 3,4 |
| No Energético *Non-energetic* | 0,10 | 0,10 | 0,08 | 0,09 | 0,09 | 0,12 | 0,18 | 0,17 | 0,17 | 0,18 | 0,18 | -3,1 |
| Consumo Final *Final Consumption* | 4,82 | 5,09 | 5,06 | 5,33 | 5,40 | 5,67 | 5,78 | 5,77 | 5,99 | 6,11 | 6,27 | 2,6 |

## Tabla 7-11 Consumo de energía eléctrica per cápita

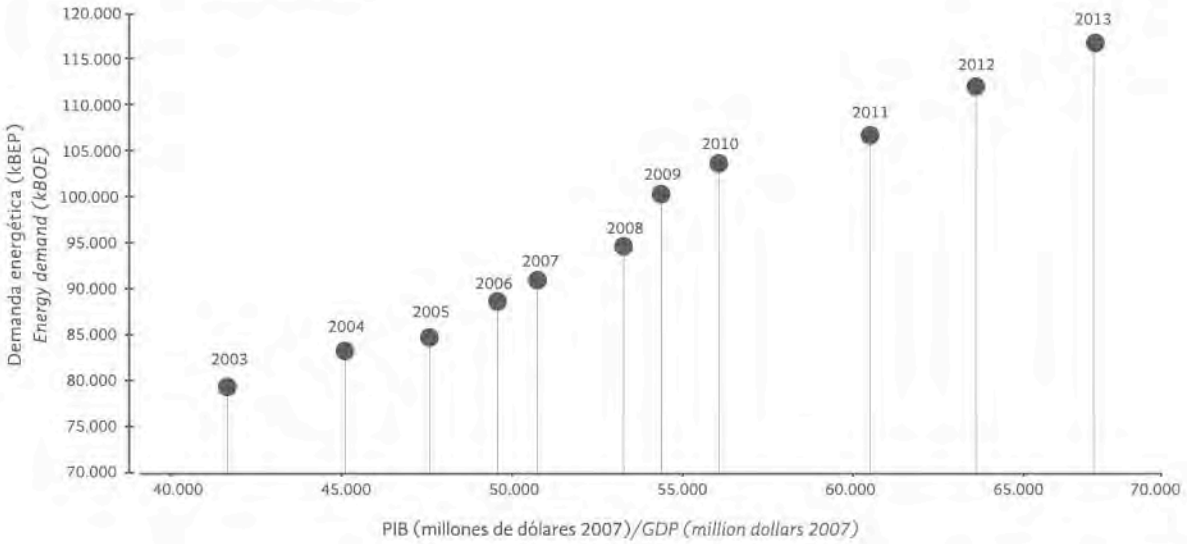
*Table 7-11 Electricity consumption per capita*

| | Unidad/ *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consumo Eléctrico (1) *Electric Energy Consumption (1)* | GWh | 9.855 | 11.422 | 12.434 | 14.104 | 15.435 | 15.850 | 15.962 | 17.083 | 18.475 | 19.756 | 20.834 |
| Población *Population* | Mil hab *thousand hab* | 13.320 | 13.552 | 13.721 | 13.965 | 14.214 | 14.473 | 14.738 | 15.012 | 15.266 | 15.521 | 15.775 |
| Consumo per Cápita *Consumption per Capita* | kWh/hab | 739 | 842 | 906 | 1.010 | 1.085 | 1.095 | 1.083 | 1.137 | 1.210 | 1.272 | 1.320 |

(1) Incluye consumo propio / *Includes own consumption*

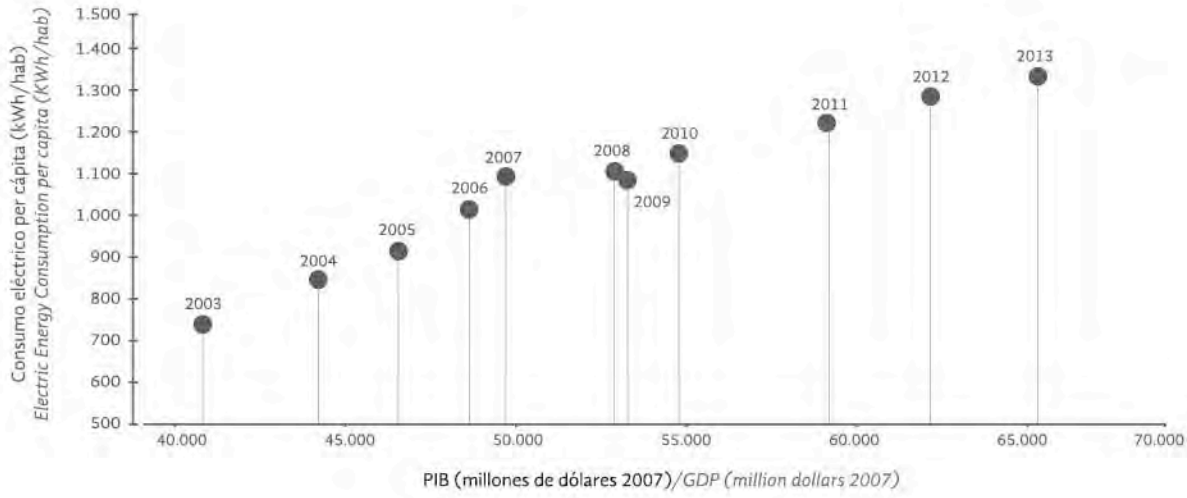
## Figura 7-9 Demanda energética y PIB

*Figure 7-9 Energy demand and GDP*




## Figura 7-10 Consumo eléctrico per cápita y PIB

*Figure 7-10 Internal supply GDP - Population*



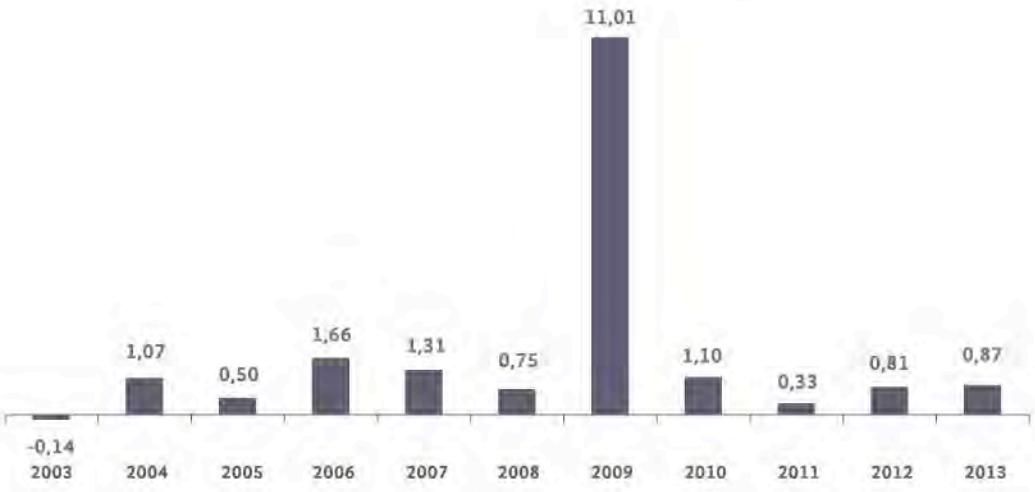
## Tabla 7-12 Elasticidad demanda energética – PIB

*Table 7-12 Energy demand – GDP elasticity*

| | Unidad *Unit* | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIB real *Real GDP* | millones USD 2007 *million USD 2007* | 41.961 | 45.407 | 47.809 | 49.915 | 51.008 | 54.250 | 54.558 | 56.169 | 60.569 | 63.673 | 66.879 |
| Demanda total de energía *Total Energy Demand* | kBEP *kBOE* | 74.606 | 81.167 | 83.305 | 89.395 | 91.951 | 96.313 | 102.319 | 105.646 | 108.407 | 112.900 | 117.838 |
| Var. PIB *GDP Variation* | % | 2,7% | 8,2% | 5,3% | 4,4% | 2,2% | 6,4% | 0,6% | 3,0% | 7,8% | 5,1% | 5,0% |
| Var. Demanda *Demand Variation* | % | -0,4% | 8,8% | 2,6% | 7,3% | 2,9% | 4,7% | 6,2% | 3,3% | 2,6% | 4,1% | 4,4% |
| Elasticidad *Elasticity* | | -0,14 | 1,07 | 0,50 | 1,66 | 1,31 | 0,75 | 11,01 | 1,10 | 0,33 | 0,81 | 0,87 |

## Figura 7-11 Elasticidad demanda energética – PIB[39]

*Figure 7-11 Energy demand – GDP elasticity*[39]




39. Este indicador permite identificar el grado de estabilidad que tiene el sector energético, respecto a variaciones en las condiciones económicas del país. Un índice alto de elasticidad, indica que pequeñas variaciones en el ingreso nacional del país producirán grandes variaciones en la demanda de energía, mientras que un índice pequeño de elasticidad, indica que la demanda de energía es un parámetro rígido respecto a la variación del ingreso.(Olade M-2, 2004)
*This indicator identifies the degree of stability that the energy sector has, regarding changes in economic conditions. A high indicator of elasticity, indicates that small changes in the national income of the country will produce large variations in energy demand, while a small elasticity indicator indicates that energy demand is a rigid parameter for the change in income*

GLP
PETROECUADOR
GERENCIA DE TRANSPORTE
TCH-TQ-3213
CAPACIDAD: 5.945 m³
CAP. MAX: 3.200.789 Kg
GLP
PETROECUADOR

# 8

# Matrices y Diagramas
## *Matrixes and diagrams*

A continuación se presentan las matrices correspondientes a los Balances Energéticos Nacionales del Ecuador, expresados en unidades energéticas kbep, y las tablas de Emisiones de Gases de Efecto Invernadero calculadas en kt CO2 equivalentes, del periodo comprendido entre el 2003 y el 2013. Además se muestra algunos diagramas, que reflejan los resultados de los flujos energéticos y tablas de hidrocarburos y electricidad.

*This chapter presents the energy balance matrixes, expressed in energy units BOE, and the tables regarding GHG emissions in thousand ton CO2 equivalent for the 2003 – 2013 periods. Also several diagrams showing the flows of energy and hydrocarbons are presented.*

Foto: Terminal de Abastecimiento de GLP Monteverde - El Chorrillo

## 8.1 Matrices del BEN 2003-2013

*8.1 National energy balance matrixes 2003 - 2013*

### Tabla 8-1 Balance Energético Nacional 2003 (kBEP)

*Table 8-1 National energy balance 2003 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Total primarias *Total Primaries* | Electricidad *Electricity* | Gas Licuado *LPG* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 158.208,2 | 7.702,9 | 4.449,0 | 2.764,5 | 1.976,2 | 175.100,8 | 7.154,0 | 1.700,8 |
| Importación / *Imports* | - | - | - | - | - | - | 693,7 | 4.339,1 |
| Exportación / *Exports* | 95.286,2 | - | - | - | - | 95.286,2 | 41,6 | - |
| Variación de Inventario *Stock Variation* | -4.518,7 | - | - | - | - | -4.518,7 | - | -87,3 |
| No Aprovechado *Non-utilized* | - | 4.701,7 | - | - | - | 4.701,7 | - | - |
| Oferta Total *Total Supply* | 58.403,3 | 3.001,2 | 4.449,0 | 2.764,5 | 1.976,2 | 70.594,1 | 7.806,1 | 5.952,6 |
| Refinería / *Refinery* | -57.572,5 | - | - | - | - | -57.572,5 | - | 1.146,3 |
| Centrales Eléctricas *Electric Power Stations* | - | -1.487,3 | -4.363,5 | - | - | -5.850,8 | 6.935,0 | - |
| Autoproductores *Autoproducers* | -164,6 | -23,1 | -85,5 | - | - | -273,3 | 219,0 | - |
| Centro de Gas *Gas Center* | - | -1.490,8 | - | - | - | -1.490,8 | - | 554,5 |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -57.737,1 | -3,001,2 | -4.449,0 | - | - | -65.187,3 | - | - |
| Consumo Propio *Own Consumption* | 666,1 | - | - | - | - | 666,1 | 147,5 | 206,5 |
| Pérdidas / *Losses* | - | - | - | - | - | - | 1.872,9 | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | -172,8 | - |
| Transporte *Transportation* | - | - | - | - | - | - | 6,2 | - |
| Industria / *Industry* | - | - | - | - | - | 2.290,6 | 1.892,9 | 145,9 |
| Residencial / *Residential* | - | - | - | 314,5 | 1.976,2 | 2.450,0 | 2.025,9 | 5.600,2 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 2.450,0 | - | - | 2.033,6 | - |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | 2.764,5 | 1.976,2 | 4.740,7 | 5.959,5 | 5.746,1 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final *Final Consumption* | - | - | - | 2.764,5 | 1.976,2 | 4.740,7 | 5.959,5 | 5.746,1 |

| Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|
| 10.173,3 | 1.817,8 | 12.374,2 | 21.640,0 | 5.771,1 | 325,2 | 1.276,6 | 62.233,0 | 175.100,8 |
| 4.339,1 | 27,9 | 6.051,0 | - | - | - | - | 15.368,3 | 15.368,3 |
| - | - | - | 9.638,6 | - | - | - | 11.988,9 | 107.275,1 |
| -87,3 | 29,0 | 443,4 | 776,3 | - | - | - | 632,6 | -3.886,0 |
| - | - | - | - | - | - | - | - | 4.701,7 |
| 5.952,6 | 1.874,7 | 18.868,6 | 12.777,7 | 5.771,1 | 325,2 | 1.276,6 | 66.245,1 | 74.606,2 |
| 1.146,3 | 1.8178 | 12.374,2 | 21.640,0 | 5.771,1 | 11,6 | 1.276,6 | 53.762,8 | -3.809,7 |
| - | - | -1.060,4 | -4.418,6 | - | - | - | 6.935,0 | -4.443,3 |
| - | - | -253,4 | | - | - | - | 219.0 | -307,7 |
| 554,5 | - | - | - | - | 313,6 | - | 1.316,2 | -174,6 |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| - | - | -1.313,9 | -4.418,6 | - | - | - | -5.781,0 | -8.735,3 |
| 206,5 | 18,7 | 1.103,9 | 1.350,7 | 5.771,1 | 325,2 | - | 9.062,2 | 9.728,4 |
| - | - | - | - | - | - | - | 1.872,9 | 1.872,9 |
| - | - | - | - | - | - | - | -172,8 | -172,8 |
| 10.947,7 | 1.856,0 | 10.657,4 | 4.390,0 | - | - | - | 27.857,3 | 27.857,3 |
| 118,3 | | 4.403,7 | 2.618,5 | - | - | - | 9.179,2 | 11.469,8 |
| | - | - | - | - | - | - | 7.26,1 | 10.076,1 |
| 39,4 | - | 123,9 | - | - | - | - | 2.196,9 | 2.196,9 |
| 265,5 | - | - | - | - | - | - | 265,5 | 265,5 |
| 34,5 | - | 1.265,8 | - | - | - | - | 1.300,3 | 1.300,3 |
| 11.405,3 | 1.856,0 | 16.450,8 | 7.008,5 | - | - | - | 48.425,3 | 53.165,9 |
| - | - | - | - | - | - | 1.276,6 | 1.276,6 | 1.276,6 |
| 11.405,3 | 1.856,0 | 16.450,8 | 7.008,5 | - | - | 1.276,6 | 49.701,8 | 54.442,5 |

## Tabla 8-2 Balance Energético Nacional 2004 (kBEP)

*Table 8-2 National energy balance 2004 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energi* | Leña *Firewood* | Productos de Caña *Cane Products* | Total primarias *Total Primaries* | Electricidad *Electricity* | Gas Licuado *LPG* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 198.321,1 | 8.508,3 | 4.592,30 | 2.730,1 | 2.032,1 | 216.183,9 | 7.797,6 | 1.749,2 |
| Importación / *Imports* | - | - | - | - | - | - | 1.017,1 | 4.797,0 |
| Exportación / *Exports* | 133.344,6 | - | - | - | - | 133.344,6 | 21,7 | - |
| Variación de Inventario *Stock Variation* | -328,7 | - | - | - | - | -328,7 | - | -52,9 |
| No Aprovechado *Non-utilized* | - | 5.003,3 | - | - | - | 5.003,3 | - | - |
| Oferta Total *Total Supply* | 64.64,7,8 | 3.505,0 | 4.592,3 | 2.730,1 | 2.032,1 | 77.507,2 | 8.793,0 | 6.493,3 |
| Refinería / *Refinery* | -63.712,9 | - | - | - | - | -63.712,9 | - | 1.200,4 |
| Centrales Eléctricas *Electric Power Stations* | - | -1.437,7 | -4.498,8 | - | - | -5.936,5 | 7.105,5 | - |
| Autoproductores *Autoproducers* | -318,8 | -479,7 | -93,5 | - | - | -891,9 | 692,0 | - |
| Centro de Gas *Gas Center* | - | -1.587,6 | - | - | - | -1.587,6 | - | 548,8 |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -64.037,7 | -3505,0 | -4.592,3 | - | - | -72.129,0 | - | - |
| Consumo Propio *Own Consumption* | 616,0 | - | - | - | - | 616,0 | 133,4 | 285,6 |
| Pérdidas / *Losses* | - | - | - | - | - | - | 2.038,3 | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | -322,2 | - |
| Transporte *Transportation* | - | - | - | - | - | - | 6,2 | - |
| Industria / *Industry* | - | - | - | - | - | 2.343,1 | 2.481,5 | 215,4 |
| Residencial / *Residential* | - | - | - | 311,0 | 2.032,1 | 2.419,1 | 2.178,3 | 5.992,3 |
| Comercial. Ser. Pub *Commercial Pub. Serv* | - | - | - | 2.419,1 | - | - | 2.277,7 | - |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction others* | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | 2.730,1 | 2.032,1 | 4.762,2 | 6.943,7 | 6.207,7 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final *Final Consumption* | - | - | - | 2.730,1 | 2.032,1 | 4.762,2 | 6.943,7 | 6.207,7 |

| Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|
| 10.885,2 | 2.142,0 | 14.108,1 | 23.437,2 | 6.294,4 | 387,4 | 1.293,8 | 68.094,9 | 216.183,9 |
| 4.153,6 | | 5.548,2 | 915,1 | - | - | - | 16.431,1 | 16.431,1 |
| 2.279,1 | - | - | 11.228,1 | - | - | - | 13.528,9 | 146.873,5 |
| -426,7 | -59,2 | 1.152,1 | 144,0 | - | - | - | 757,3 | 428,6 |
| - | - | - | - | - | - | - | - | 5.003,3 |
| 12.332,9 | 2.082,7 | 20.808,4 | 13.268,2 | 6.294,4 | 387,4 | 1.293,8 | 71.754,4 | 81.166,7 |
| 10.403,4 | 2.142,0 | 14.108,1 | 23.437,2 | 6.294,4 | 12,8 | 1.293,8 | 58.892,2 | -4.820,8 |
| -123,0 | - | -1.354,4 | -4.123,1 | - | - | - | 7.105,5 | -4.431,2 |
| - | - | -834,4 | -32,9 | - | - | - | 692,0 | -1.067,2 |
| 481,7 | - | - | - | - | 374,6 | - | 1.405,1 | -182,5 |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |
| -123,0 | - | -2.188,5 | -4.156,0 | - | - | - | -6.467,5 | -10.501,6 |
| 150,1 | 24,9 | 1.193,1 | 1.511,8 | 6.294,4 | 387,4 | - | 9.980,7 | 10.596,7 |
| - | - | - | - | - | - | - | 1.2.038,3,9 | 2.038,3 |
| - | - | - | - | - | - | - | -322,2 | -322,2 |
| 11.611,1 | 2.057,8 | 11.619,4 | 5.090,4 | - | - | - | 30.384,9 | 30.384,9 |
| 96,3 | | 4.370,8 | 2.510,1 | - | - | - | 9.674,0 | 12.017,1 |
| | - | - | - | - | - | - | 8.170,6 | 10.589,7 |
| 33,2 | - | 112,7 | - | - | - | - | 2.423,5 | 2.423,5 |
| 287,6 | - | - | - | - | - | - | 287,6 | 287,6 |
| 31,7 | - | 1.324,0 | - | - | - | - | 1.355,7 | 1.355,7 |
| 12.059,8 | 2.057,8 | 17.426,9 | 7.600,4 | - | - | - | 52.296,4 | 57.058,5 |
| - | - | - | - | - | - | 1.293,8 | 1.293,8 | 1.293,8 |
| 12.059,8 | 2.057,8 | 17.426,9 | 7.600,4 | - | - | 1.293,8 | 53.590,1 | 58.352 |

## Tabla 8-3 Balance Energético Nacional 2005 (kBEP)

*Table 8-3 National energy balance 2005 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 200.066,0 | 9.632,3 | 4.264,5 | 2.745,0 | 2.168,5 | 0,01 | 218.876,3 | 8.305,1 |
| Importación / *Imports* | - | - | - | - | - | - | - | 1.067,8 |
| Exportación / *Exports* | 135.596,2 | - | - | - | - | - | 135.596,2 | 9,9 |
| Variación de Inventario *Stock Variation* | -5.034,0 | - | - | - | - | - | -5.034,0 | - |
| No Aprovechado *Non-utilized* | - | 6.032,5 | - | - | - | - | 6.032,5 | - |
| Oferta Total *Total Supply* | 59.435,8 | 3.599,9 | 4.264,5 | 2.745,0 | 2.168,5 | - | 72.213,6 | 9.363,0 |
| Refinería / *Refinery* | -58.429,4 | - | - | - | - | - | -58.429,4 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.565,6 | -4.167,8 | - | - | -0,01 | -5.733,4 | 7.508,7 |
| Autoproductores *Autoproducers* | -369,4 | -661,2 | -96,7 | - | -2.053,2 | - | -3.180,5 | 796,4 |
| Centro de Gas *Gas Center* | - | -1.373,1 | - | - | - | - | -1.373,1 | - |
| Carbonera *Cooling Station* | - | - | - | - | - | - | - | - |
| Coquería/a. Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -58.798,8 | -3.599,9 | -4.264,5 | - | -2.053,2 | -0,01 | -68.716,4 | - |
| Consumo Propio *Own Consumption* | 637,0 | - | - | - | - | - | 637,0 | 167,9 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.108,3 |
| Ajuste *Adjustment* | - | - | - | - | - | - | - | -449,5 |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 418,3 | 2.729,3 |
| Residencial / *Residential* | - | - | - | 303,1 | 115,3 | - | 2.441,9 | 2.293,9 |
| Comercial, Ser Pub *Commercial, Pub. Serv* | - | - | - | 2.745,0 | - | - | - | 2.507,0 |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,others* | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | 2.745,0 | 115,3 | - | 2.860,2 | 7.536,4 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final *Final Consumption* | - | - | - | 2.745,0 | 115,3 | - | 2.860,2 | 7.536,4 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.526,1 | 10.809,7 | 2.390,3 | 13.621,5 | 20.732,1 | 6.014,0 | 354,1 | 1.156,6 | 64.909,5 | 218.876,3 |
| 5.369,3 | 5.394,1 | 0,9 | 8.134,5 | 2.551,8 | - | - | - | 22.518,5 | 22.513,5 |
| - | 1.884,1 | - | 190,2 | 11.015,1 | - | - | - | 13.099,3 | 148.695,6 |
| 13,0 | -849,0 | -50,2 | 1.282,2 | 1.275,8 | - | - | - | 1.671,9 | -3.362,2 |
| - | - | - | - | - | - | - | - | - | 6.032,5 |
| 6.908,4 | 13.470,7 | 2.341,0 | 22.848,0 | 13.544.7 | 6.014,0 | 354,1 | 1.156,6 | 76.005 | 83.304,6 |
| 1.033,2 | 10.400,5 | 2.390,3 | 13.621,5 | 20.732,1 | 6.014,0 | 10,1 | 1.156,6 | 55.358,3 | -3.071 |
| - | -563,8 | - | -2.058,5 | -4.938,3 | - | - | - | 7.508,7 | -5.785,3 |
| - | - | - | -806,2 | - | - | - | - | 796,4 | -3.190,3 |
| 492,9 | 409,2 | - | - | - | - | 343,9 | - | 1.246,0 | -127,1 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | -563,8 | - | -2.864,8 | -4.938,3 | - | - | - | -8.366,8 | 12.173,7 |
| 193,7 | 121,0 | 31,7 | 978,3 | 1.177,9 | 6.014,0 | 354,1 | - | 9.038,7 | 9.675,6 |
| - | - | - | - | - | - | - | - | 2.108,3 | 2.108,3 |
| - | - | - | - | - | - | - | - | -449,5 | -449,5 |
| - | 12.264,8 | 2.309,3 | 12.982,8 | 4.810,8 | - | - | - | 32.373,9 | 32.373,9 |
| 159,7 | 110,0 | - | 4.859,7 | 2.617,7 | - | - | - | 10.476,4 | 10.894,7 |
| 6.554,9 | - | - | - | - | - | - | - | 8.848,8 | 11.290,7 |
| - | 32,9 | - | 114,0 | - | - | - | - | 2.653,9 | 2.653,9 |
| - | 347,7 | - | - | - | - | - | - | 347,7 | 347,7 |
| - | 30,6 | - | 1.048,4 | - | - | - | - | 1.079,0 | 1.079,0 |
| 6.714,7 | 12.785,9 | 2.309,3 | 19.004,9 | 7.428,5 | - | - | - | 55.779,6 | 58.639,8 |
| - | - | - | - | - | - | - | 1.156,6 | 1.156,6 | 1.156,6 |
| 6.714,7 | 12.785,9 | 2.309,3 | 19.004,9 | 7.428,5 | - | - | 1.156,6 | 56.936,2 | 59.796,4 |

## Tabla 8-4 Balance Energético Nacional 2006 (kBEP)

*Table 8-4 National energy balance 2006 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 201.908,8 | 9,632,3 | 4.417,4 | 2.649,9 | 2.196,9 | 0.01 | 220.712,2 | 9.365,8 |
| Importación / *Imports* | - | - | - | - | - | - | | 973,1 |
| Exportación / *Exports* | 140.788,9 | - | - | - | - | - | 140.788,9 | 0,7 |
| Variación de Inventario *Stock Variation* | 1.558,2 | - | - | - | - | - | 1.558,2 | - |
| No Aprovechado *Non-Harnessed* | - | 5.609,5 | - | - | - | - | 5.609,5 | - |
| Oferta Total *Total Supply* | 62.678,1 | 3.929,7 | 4.417,4 | 2.649,9 | 2.196,9 | 0,01 | 75.872,1 | 10.338,2 |
| Refinería / *Refinery* | -61.430,6 | - | - | - | - | - | -61.430,6 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.675,2 | -4.237,1 | - | - | -0,01 | -5.912,3 | 8.065,4 |
| Autoproductores *Autoproducers* | -552,9 | -987,0 | -180,4 | - | -1.327,5 | - | -3.047,8 | 1.300,4 |
| Centro de Gas *Gas Center* | - | -1.267,5 | - | - | - | - | -1.267,5 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -61.983,5 | -3.929,7 | -4.417,4 | - | -1.327,5 | -0,01 | -7.1658,2 | - |
| Consumo Propio *Own Consumption* | 694,6 | - | - | - | - | - | 694,6 | 186,4 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.165,9 |
| Ajuste / | - | - | - | - | - | - | - | 566,5 |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.160,5 | 3.407,0 |
| Residencial / *Residential* | - | - | - | 291,1 | 869,4 | - | 2.358,8 | 2.414,0 |
| Comercial, Ser, Pub *Commercial, Ser, Pub* | - | - | - | 2.358,8 | - | - | - | 2.725,1 |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | - | - | 2.649,9 | 869,4 | - | 3.519,3 | 8.552,4 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | - | - | 2.649,9 | 869,4 | - | 3.519,3 | 8.552,4 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.677,4 | 11.110,4 | 2.586,7 | 13.610,0 | 21.829,7 | 6.627,9 | 368,0 | 1.261,7 | 68.437,5 | 220.712,2 |
| 5.650,2 | 5.516,8 | - | 11.342,2 | 2.859,4 | - | - | - | 26.341,7 | 26.341,7 |
| - | 1.511,1 | - | - | 12.285,8 | - | - | - | 13.797,5 | 154.586,4 |
| 61,8 | -444,2 | -147,0 | 545,0 | 963,7 | - | - | - | 979,3 | 2.537,5 |
| - | - | - | - | - | - | - | - | - | 5.609,5 |
| 7.389,4 | 14.671,9 | 2.439,7 | 25.497,1 | 13.367,0 | 6.627,9 | 368,0 | 1.261,7 | 81.960,9 | 89.395,5 |
| 1.253,4 | 10.786,3 | 2.586,7 | 13.610,0 | 21.829,7 | 6.627,9 | 12,4 | 1.261,7 | 57.967,9 | -3.462,7 |
| - | -732,6 | - | -3.005,2 | -5.161,2 | - | - | - | 8.065,4 | -6.745,9 |
| -121,1 | - | - | -1.083,9 | -5,6 | - | - | - | 1.300,4 | -2.958,0 |
| 424,0 | 324,1 | - | - | - | - | 355,6 | - | 1.103,8 | -163,8 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -121,1 | -732,6 | - | -4.089,1 | -5.166,8 | - | - | - | -10.109,6 | -13.330,3 |
| 262,7 | 144,1 | 26,5 | 1.163,1 | 1.417,9 | 6,627,9 | 368,0 | - | 10.196,8 | 10.891,4 |
| - | - | - | - | - | - | - | - | 2.165,9 | 2.165,9 |
| - | - | - | - | - | - | - | - | -566,5 | -566,5 |
| - | 13.226,3 | 2.413,2 | 14.321,3 | 4.530,5 | - | - | - | 34.497,5 | 34.497,5 |
| 143,7 | 102,5 | | 4.960,0 | 2.251,8 | - | - | - | 10.865,0 | 12.025,5 |
| 6.862,0 | - | - | - | - | - | - | - | 9.276,0 | 11.634,8 |
| - | 32,2 | - | 123,7 | - | - | - | - | 2.881,0 | 2.881,0 |
| - | 414,1 | - | - | - | - | - | - | 414,1 | 414,1 |
| - | 20,1 | - | 839,7 | - | - | - | - | 859,9 | 859,9 |
| 7.005,7 | 13.795,2 | 2.413,2 | 20.2447 | 6.782,2 | - | - | - | 58.793,4 | 62.312,7 |
| - | - | - | - | - | - | - | 1.261,7 | 1.261,7 | 1,261,7 |
| 7.005,7 | 13.795,2 | 2.413,2 | 20.2447 | 6.782,2 | - | - | 1.261,7 | 60.055,1 | 63.574,4 |

## Tabla 8-5 Balance Energético Nacional 2007 (kBEP)

*Table 8-5 National energy balance 2007 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 192,334.2 | 8.874,8 | 5.600,3 | 2.539,9 | 2.357,6 | 0,61 | 211.707,5 | 10.741,8 |
| Importación / *Imports* | - | - | - | - | - | - | | 533,4 |
| Exportación / *Exports* | 127,871,8 | - | - | - | - | - | 127.871,8 | 23,8 |
| Variación de Inventario *Stock Variation* | -1,337,6 | - | - | - | - | - | -1.337,6 | - |
| No Aprovechado *Non-utilized* | - | 4.739,6 | - | - | - | - | 4.739,6 | - |
| Oferta Total *Total Supply* | 63.124,8 | 4.135,2 | 5.600,3 | 2.539,9 | 2.357,6 | 0,61 | 77.758,5 | 11.251,4 |
| Refinería / *Refinery* | -61.221.0 | - | - | - | - | - | -61.221,0 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.765,8 | -5.287,7 | - | - | -0,61 | -7.054,0 | 8.868,8 |
| Autoproductores *Autoproducers* | -1.248,5 | -1.345,9 | -312,7 | - | -1.939,7 | - | -4.846,7 | 1.873,0 |
| Centro de Gas *Gas Center* | - | -1.023,6 | - | - | - | - | -1.023,6 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a. Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -62.469,5 | -4.135,2 | -5.600,3 | - | -1.939,7 | -0,61 | -74.145,3 | - |
| Consumo Propio *Own Consumption* | 655,3 | - | - | - | - | - | 655,3 | 190,4 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.215,3 |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | -527,4 |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 701,0 | 3.975,9 |
| Residencial / *Residential* | - | - | - | 2.831,1 | 417,9 | - | 2.256,9 | 2.537,4 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 2.256,9 | - | - | - | 2.853,7 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | 2.539,9 | 417,9 | - | 2.957,8 | 9.373,2 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final *Final Consumption* | - | - | - | 2.539,9 | 417,9 | - | 2.957,8 | 9.373,2 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| 1.213,8 | 9.485,5 | 3.777,1 | 12.593,8 | 24.154,3 | 6.666,9 | 318,1 | 1.288,6 | 70.239,9 | 211.707,5 |
| 6.499,8 | 6.954,8 | - | 11.862,3 | 3.207,8 | - | - | - | 29.058,1 | 29.058,1 |
| - | 1.120,7 | - | 744,9 | 13.561,5 | - | - | - | 15.451,0 | 143.322,8 |
| -0,8 | -220,1 | -1.226,0 | 2.176,0 | -144,0 | - | - | - | 585,0 | -752,6 |
| - | - | - | - | - | - | - | - | - | 4.739,6 |
| 7712,8 | 15.099,5 | 2.551,1 | 25.887,1 | 13.656,5 | 6.666,9 | 318,1 | 1.288,6 | 84.432,0 | 91.950,6 |
| 1.213,8 | 9.218,1 | 3.777,1 | 12.593,8 | 24.154,3 | 6.666,9 | 12,3 | 1.288,6 | 58.584,9 | -2.636,1 |
| - | -85,2 | - | -2.291,2 | -5.418,3 | - | - | - | 8.868,8 | -5.979,9 |
| -132,0 | - | - | -1.678,2 | -16,7 | - | - | - | 1.873,0 | -4.800,7 |
| 339,9 | 267,5 | - | - | - | - | 305,9 | - | 913,2 | -110,4 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -132,0 | -85,2 | - | -3.969,5 | -5.434,9 | - | - | - | -9.621,6 | -13.527,1 |
| 283.6 | 150.1 | 24.6 | 1.139,6 | 1.537,5 | 6.666,9 | 318,1 | - | 10.310,8 | 10.966,2 |
| - | - | - | - | - | - | - | - | 2.215,3 | 2.215,3 |
| - | - | - | - | - | - | - | - | 527,4 | 527,4 |
| - | 14.261,7 | 2.526,5 | 15.523,2 | 4.486,6 | - | - | - | 36.804,2 | 36.804,2 |
| 182,2 | 102,2 | - | 4.448,3 | 2.197,4 | - | - | - | 10.906,0 | 11.607,0 |
| 7.114,9 | - | - | - | - | - | - | - | 9.652.2 | 11.634,8 |
| - | 29,2 | - | 124,4 | - | - | - | - | 3.007,3 | 3.007,3 |
| - | 454,3 | - | - | - | - | - | - | 454,3 | 454,3 |
| - | 16,9 | - | 682,1 | - | - | - | - | 699,0 | 699,0 |
| 7.297,1 | 14.864,2 | 2.526,5 | 20.778,1 | 6.684,0 | - | - | - | 61.523,1 | 64.480,9 |
| - | - | - | - | - | - | - | 1.288,6 | 1.288,6 | 1.288,6 |
| 7.297,1 | 14.864,2 | 2.526,5 | 20.778,1 | 6.684,0 | - | - | 1.288,6 | 62.811,7 | 65.769,5 |

## Tabla 8-6 Balance Energético Nacional 2008 (kBEP)

*Table 8-6 National energy balance 2008 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 190.368,3 | 8.518,6 | 6.999,0 | 2.373,9 | 2.128,2 | 1,68 | 210.389,8 | 11.529,8 |
| Importación / *Imports* | - | - | - | - | - | - | - | 309,9 |
| Exportación / *Exports* | 131.420,5 | - | - | - | - | - | 131.420,5 | 23,3 |
| Variación de Inventario *Stock Variation* | -6.588,3 | - | - | - | - | - | 6.588,3 | - |
| No Aprovechado *Non-utilized* | - | 4.613,0 | - | - | - | - | 4.613,0 | - |
| Oferta Total *Total Supply* | 65.536,1 | 3.905,6 | 6.999,0 | 2.373,9 | 2.128,2 | 1,68 | 80.844,7 | 11.816,5 |
| Refinería / *Refinery* | -63.471,8 | - | - | - | - | - | -63.471,6 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.489,3 | -6.607,0 | - | - | -1,68 | -8.098,0 | 9.524,0 |
| Autoproductores *Autoproducers* | -1.349,2 | -1.233,9 | -392,0 | - | -1.312,4 | - | -4.287,6 | 2.005,9 |
| Centro de Gas *Gas Center* | - | -1.182,4 | - | - | - | - | -1182,4 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -64.821 | -3.905,6 | -6.999,0 | - | -1.312,4 | -1,68 | -77.039,8 | - |
| Consumo Propio *Own Consumption* | 715,1 | - | - | - | - | - | 715,1 | 199,4 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.235,4 |
| Ajuste / | - | - | - | - | - | - | - | -239,7 |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.093,2 | 3.899,4 |
| Residencial / *Residential* | - | - | - | 277,4 | 815,8 | - | 2.096,6 | 2.716,9 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 2.096,6 | - | - | - | 2.999,0 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | - | - | 2.373,9 | 815,8 | - | 3.189,8 | 9.621,4 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | - | - | 2.373,9 | 815,8 | - | 3.189,8 | 9.621,4 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.603,2 | 10.806,2 | 2.726,2 | 13.546,6 | 23.098,7 | 7.285,8 | 354,9 | 1.770,3 | 72.721,7 | 210.389,8 |
| 6.222,8 | 6.622,9 | 71,9 | 11.176,4 | 3.648,6 | - | - | - | 28.052,6 | 28.052,6 |
| - | 1.641,5 | 67,1 | - | 13.991,5 | - | - | - | 15.723,4 | 147.143,9 |
| 34,2 | 715,9 | -162,1 | 1.864,4 | 587,1 | - | - | - | 3.039,4 | 9.627,8 |
| - | - | - | - | - | - | - | - | - | 4.613,0 |
| 7.860,2 | 16.503,5 | 2.568,9 | 26.587,4 | 13.342,9 | 7.285,8 | 354,9 | 1.770,3 | 88.090,4 | 96.313,3 |
| 1.175,7 | 10.486,8 | 2.726,2 | 13.546,6 | 23.098,7 | 7.285,8 | 16,8 | 1.770,3 | 60.107,0 | -3.364,8 |
| - | -168,8 | - | -1.148,6 | -4.708,0 | - | - | - | 9.524,0 | -4.599,4 |
| -137,0 | - | - | -1.815,5 | - | - | - | - | 2.005,9 | -4.232,2 |
| 427,4 | 319,4 | - | - | - | - | 338,0 | - | 1.084.9 | -97,5 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -137,0 | -168,8 | - | -2.964,1 | -4.708,0 | - | - | - | -7.977,9 | -12.295,9 |
| 230,8 | 152,9 | 27,8 | 1.195,2 | 1.689,5 | 7.285,8 | 354,9 | - | 11.136,4 | 11.851,5 |
| - | - | - | - | - | - | - | - | 2.235,4 | 2.235,4 |
| - | - | - | - | - | - | - | - | -239,7 | -239,7 |
| 8,0 | 15.522,6 | 2.541,0 | 16.740,3 | 4.476,3 | - | - | - | 39.294,3 | 39.294,3 |
| 289,5 | 100,3 | - | 4.757,9 | 2.469,2 | - | - | - | 11.516,2 | 12.609,4 |
| 7.162,7 | - | - | - | - | - | - | - | 9.879,5 | 11.976,1 |
| - | 25,3 | - | 109,5 | - | - | - | - | 3.133,8 | 3.133,8 |
| 32,3 | 515,0 | - | - | - | - | - | - | 547,3 | 547,3 |
| - | 18,6 | - | 820,3 | - | - | - | - | 838,9 | 838,9 |
| 7.492,5 | 16.181,8 | 2.541,0 | 22.428,0 | 6.945,5 | - | - | - | 65.210,2 | 68.399,9 |
| - | - | - | - | - | - | - | 1.770,3 | 1.770,3 | 1.770,3 |
| 7.492,5 | 16.181,8 | 2.541,0 | 22.428,0 | 6.945,5 | - | - | 1.770,3 | 66.980,5 | 70.170,2 |

## Tabla 8-7 Balance Energético Nacional 2009 (kBEP)

*Table 8-7 National energy balance 2009 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 183.021,5 | 8.434,4 | 5.716,2 | 2.135,6 | 2.158,0 | 1,99 | 201.467,6 | 11.316,8 |
| Importación / *Imports* | - | - | - | - | - | - | - | 694,4 |
| Exportación / *Exports* | 123.193,2 | - | - | - | - | - | 123.193,2 | 12,9 |
| Variación de Inventario *Stock Variation* | 5.551,5 | - | - | - | - | - | 5.551,5 | - |
| No Aprovechado *Non-utilized* | - | 4.071,9 | - | - | - | - | 4.071,9 | - |
| Oferta Total *Total Supply* | 63.379,8 | 4.362,5 | 5.716,1 | 2.135,6 | 2.158,0 | 1,99 | 79.754,0 | 11.998,3 |
| Refinería / *Refinery* | -63.304,7 | - | - | - | - | - | -63.304,7 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.769,5 | -5.413,6 | - | - | -1,99 | -7.185,0 | 9.429,8 |
| Autoproductores *Autoproducers* | -1.342,0 | -1.295,9 | -302,5 | - | -836,1 | - | -3.776,5 | 2.886,9 |
| Centro de Gas *Gas Center* | - | -1.297,1 | - | - | - | - | -1297,1 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -64.646,7 | -4.362,5 | -5.716,1 | - | -836,1 | -1,99 | -75.563,48 | - |
| Consumo Propio *Own Consumption* | 733,1 | - | - | - | - | - | 733,1 | 324,8 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.113,0 |
| Ajuste / | - | - | - | - | - | - | - | -4,6 |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.593,7 | 3.945,3 |
| Residencial / *Residential* | - | - | - | 271,8 | 1.321,9 | - | 2.863,8 | 2.894,9 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 1.863,8 | - | - | - | 2.718,7 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | - | - | 2.135,6 | 1.321,9 | - | 3.457,5 | 9.569,1 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | - | - | 2.135,6 | 1.321,9 | - | 3.457,5 | 9.569,1 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.644,5 | 10.633,5 | 2.626,6 | 14.355,1 | 21.609,9 | 7.019,4 | 364,8 | 2.703,0 | 72.273,4 | 201.467,6 |
| 6.083,9 | 8.377,4 | 87,6 | 14.481,3 | 2.312,4 | - | - | - | 32.037,1 | 32,037,1 |
| - | 1.316,4 | 77,4 | - | 11.191,0 | - | - | - | 12.597,7 | 135.790,8 |
| -23,9 | 20,9 | -137,5 | 842,0 | 2.423,8 | - | - | - | 3.125,4 | 8.676,9 |
| - | - | - | - | - | - | - | - | - | 4.071,9 |
| 7.704,5 | 17.715,4 | 2.499,3 | 29.678,4 | 15.155,2 | 7.019,4 | 364,8 | 2.703,0 | 94.838,2 | 102.318,8 |
| 1.124,5 | 10.273,3 | 2.626,6 | 14.355,1 | 21.609,9 | 7.019,4 | 26,5 | 2.703,0 | 59.738,1 | -3.566,7 |
| - | -211,7 | - | -3.124,5 | -6.089,9 | - | - | - | 9.429,8 | -7.181,4 |
| -121,0 | - | - | -1.830,4 | -385,8 | - | - | - | 1.886,9 | -4.226,8 |
| 520,0 | 360,2 | - | - | - | - | 338,3 | - | 1.218,5 | -78,5 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -121,0 | -211,7 | - | -4.955,0 | -6.475,7 | - | - | - | -11.763,4 | -15.053,4 |
| 197,6 | 149,2 | 16,6 | 1.189,4 | 1.620,7 | 7.019,4 | 364,8 | - | 10.8824 | 11.615,5 |
| - | - | - | - | - | - | - | - | 2.113,0 | 2.113,0 |
| - | - | - | - | - | - | - | - | -1,6 | -1,6 |
| 72,6 | 16.634,1 | 2.482,7 | 17.126,2 | 4.475,3 | - | - | - | 40.797,1 | 40.797,1 |
| 354,6 | 110,6 | - | 5.628,1 | 2.583,4 | - | - | - | 12.622,1 | 14.215,8 |
| 6.900,4 | - | - | - | - | - | - | - | 9.795,3 | 11.659,1 |
| - | 26,9 | - | 121,7 | - | - | - | - | 2.867,3 | 2.867,3 |
| 58,3 | 566,5 | - | - | - | - | - | - | 624,8 | 624,8 |
| - | 16,3 | - | 658,0 | - | - | - | - | 674,3 | 674,3 |
| 7.385,9 | 17.354,4 | 2.482,7 | 23.534,1 | 7.0587 | - | - | - | 67.380,9 | 70.838,4 |
| - | - | - | - | - | - | - | 2.703,0 | 2.703,0 | 2.703,0 |
| 7.385,9 | 17.354,4 | 2.482,7 | 23.534,1 | 7.0587 | - | - | 2.703,0 | 70.083,9 | 73.541,4 |

## Tabla 8-8 Balance Energético Nacional 2010 (kBEP)

*Table 8-8 National energy balance 2010 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 182.842,3 | 8.393,6 | 5.351,1 | 1.991,8 | 2.150,7 | 2,13 | 200.731,6 | 12.088,3 |
| Importación / *Imports* | - | - | - | - | - | - | - | 540,8 |
| Exportación / *Exports* | 128.249,1 | - | - | - | - | - | 128.249,1 | 6,2 |
| Variación de Inventario *Stock Variation* | 3.644,9 | - | - | - | - | - | 3.644,9 | - |
| No Aprovechado *Non-utilized* | - | 3.679,0 | - | - | - | - | 3.679,0 | - |
| Oferta Total *Total Supply* | 58.238,0 | 4.714,7 | 5.351,1 | 1.991,8 | 2.150,7 | 2,13 | 72.448,4 | 12.622,9 |
| Refinería / *Refinery* | -56.077,3 | - | - | - | - | - | -56.077,3 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.979,4 | -5.4067,9 | - | - | -2,13 | -7.049,4 | 10.072,0 |
| Autoproductores *Autoproducers* | -1.424,3 | -1.414,4 | -283,3 | - | -912,3 | - | -4.034,3 | 2.016,3 |
| Centro de Gas *Gas Center* | - | -1.320,9 | - | - | - | - | -1.320,9 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -57.501,6 | -4.714,7 | -5.351,1 | - | -836,1 | -2,13 | -68.481,8 | - |
| Consumo Propio *Own Consumption* | 736,4 | - | - | - | - | - | 736,4 | 161,2 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.038,4 |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.516,1 | 4.438,1 |
| Residencial / *Residential* | - | - | - | 277,7 | 1.238,4 | - | 1.714,1 | 3.168,7 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 1.714,1 | - | - | - | 2.810,3 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | 1991,8 | 1.238,4 | - | 3.230,1 | 10.423,3 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final *Final Consumption* | - | - | - | 1991,8 | 1.238,4 | - | 3.230,1 | 10.423,3 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.566,0 | 8.916,1 | 2.611,4 | 12.225,8 | 19.202,1 | 6.662,5 | 413,0 | 2.492,9 | 66.178,2 | 200.731,6 |
| 6.295,1 | 10.849,2 | 85,2 | 19.960,0 | 3.230,8 | - | - | - | 40.961,0 | 40.961,0 |
| - | 492,0 | | - | 10.193,2 | - | - | - | 10.691,4 | 138.940,5 |
| -36,0 | 136,1 | -165,0 | 560,0 | 2.433,0 | - | - | - | 1.928,1 | 6.573,0 |
| - | - | - | - | - | - | - | - | - | 3.679,0 |
| 7.825,1 | 19.409,5 | 2.531,6 | 32.745,8 | 14.672,6 | 6.662,5 | 413,0 | 2.492,9 | 99.376,0 | 105.646,2 |
| 1.022,6 | 8.5567 | 2.611,4 | 12.225,8 | 19.202,1 | 6.662,5 | 36,3 | 2.492,9 | 52.810,4 | -3.266,9 |
| - | -311,4 | - | -5.736,5 | -6.284,3 | - | - | - | 10.072,0 | -9.309,6 |
| -123,7 | - | - | -1.779,5 | -434,1 | - | - | - | 2.016,3 | -4.355,2 |
| 543,4 | 359,4 | - | - | - | - | 376,7 | - | 1.279,6 | -41,3 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -123,7 | -311,4 | - | -7.515,9 | -6.718,4 | - | - | - | -14.669,5 | -16.973,1 |
| 231,5 | 145,5 | 27,6 | 1.144,0 | 1.463,5 | 6.662,5 | 413,0 | - | 10.248,8 | 10.985,2 |
| - | - | - | - | - | - | - | - | 2.038,4 | 2.038,4 |
| - | - | - | - | - | - | - | - | - | - |
| 84,8 | 18.187,7 | 2.504,0 | 17.455,4 | 3.876,2 | - | - | - | 42.114,4 | 42.114,4 |
| 424,5 | 110,2 | - | 5.653,0 | 2.614,5 | - | - | - | 13.240,3 | 14.756,4 |
| 6.877,1 | - | - | - | - | - | - | - | 10.045,9 | 11.760,0 |
| - | 25,5 | - | 125,4 | - | - | - | - | 2.961,2 | 2.961,2 |
| 83,5 | 607,1 | - | - | - | - | - | - | 690,6 | 690,6 |
| - | 22,1 | - | 851,9 | - | - | - | - | 874,0 | 874,0 |
| 7.469,9 | 18.952,6 | 2.504,0 | 24.085,8 | 6.490,7 | - | - | - | 69.926,4 | 73.156,5 |
| - | - | - | - | - | - | - | 2.492,9 | 2.492,9 | 2.492,9 |
| 7.469,9 | 18.952,6 | 2.504,0 | 24.085,8 | 6.490,7 | - | - | 2.492,9 | 72.419,3 | 75.649,5 |

## Tabla 8-9 Balance Energético Nacional 2011 (kBEP)

*Table 8-9 National energy balance 2011 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 188.173,8 | 8.403,4 | 6.898,1 | 1.618,0 | 2.426,1 | 2,11 | 207.521,4 | 12.729,2 |
| Importación / *Imports* | - | - | - | - | - | - | - | 802,1 |
| Exportación / *Exports* | 125.433,5 | - | - | - | - | - | 125.433,5 | 8,9 |
| Variación de Inventario *Stock Variation* | 2.990,5 | - | - | - | - | - | 2.990,5 | - |
| No Aprovechado *Non-utilized* | - | 4.072,0 | - | - | - | - | 4.072,0 | - |
| Oferta Total *Total Supply* | 65.730,8 | 4.331,4 | 6.898,1 | 1.618,0 | 2.426,1 | 2,11 | 81.006,5 | 13.522,4 |
| Refinería / *Refinery* | -63.470,5 | - | - | - | - | - | -63.470,5 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -1.435,1 | -6.585,1 | - | - | -2,11 | -8.022,3 | 10.597,3 |
| Autoproductores *Autoproducers* | -1.540,9 | -1.563,8 | -313,0 | - | -1.064,3 | - | -4.481,9 | 2.131,9 |
| Centro de Gas *Gas Center* | - | -1.328,0 | - | - | - | - | -1.328,0 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | -25,87 | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -65.011,3 | -4.326,9 | -6.898,1 | - | -1.090,1 | -2,11 | -77.328,6 | - |
| Consumo Propio *Own Consumption* | 719,4 | - | - | - | - | - | 719,4 | 186,1 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.075,2 |
| Ajuste / | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.624,2 | 4.785,7 |
| Residencial / *Residential* | - | 4,5 | - | 283,7 | 1.336,0 | - | 1.334,3 | 3.315,4 |
| Comercial. Ser. Pub *Commercial.Pub. Serv* | - | - | - | 1.334,3 | - | - | - | 3.153,8 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | 4,5 | - | 1.618,0 | 1.336,0 | - | 2.958,5 | 11.261,1 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | 4,5 | - | 1.618,0 | 1.336,0 | - | 2.958,5 | 11.261,1 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.946,9 | 11.017,7 | 2.684,0 | 14.086,8 | 21.948,9 | 6.810,8 | 407,6 | 2.630,8 | 74.262,7 | 207.521,4 |
| 6.523,3 | 11.266,6 | 27,9 | 15.111,9 | 3.664,9 | - | - | - | 37.369,7 | 37.396,7 |
| - | 647,8 | - | - | 11.130,6 | - | - | - | 11.787,2 | 137.220,7 |
| -435,1 | -918,6 | -129,0 | 1.933,1 | 1.340,8 | - | - | - | 1.791,2 | 4.781,7 |
| - | - | - | - | - | - | - | - | - | 4.072,0 |
| 8.035,1 | 20.717,9 | 2.582,9 | 31.131,8 | 15.824,0 | 6.810,8 | 407,6 | 2.630,8 | 101.663,3 | 108.407,1 |
| 1.365,3 | 10.655,8 | 2.684,0 | 14.086,8 | 21.948,9 | 6.810,8 | 33,6 | 2.630,8 | 60.216,0 | -3.254,5 |
| - | -312,9 | - | -2.457,5 | -6.984,9 | - | - | - | 10.597,3 | -7.180,4 |
| -112,8 | - | - | -1.650,4 | -375,8 | - | - | - | 2.131,9 | -4.489,0 |
| 581,6 | 336,1 | - | - | - | - | 374,0 | - | 1.291,6 | -36,3 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | 25,9 | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -112,8 | -312,9 | - | -4.107,9 | -7.360,7 | - | - | - | -11.894,3 | -14.960,1 |
| 251,1 | 164,2 | 38,8 | 1.134,9 | 1.573,7 | 6.810,8 | 07,6 | - | 10.567,2 | 11.286,6 |
| - | - | - | - | - | - | - | - | 2.075,2 | 2.075,2 |
| - | - | - | - | - | - | - | - | - | - |
| 87,5 | 19.461,5 | 2.544,1 | 18.808,6 | 4.212,6 | - | - | - | 45.120,6 | 45.120,6 |
| 475,1 | 114,2 | - | 5.900,5 | 2.677,1 | - | - | - | 13.952,5 | 15.576,7 |
| 7.011,6 | - | - | - | - | - | - | - | 10.327,1 | 11.661,4 |
| - | 27,0 | - | 173,4 | - | - | - | - | 3.354,2 | 3.354,2 |
| 96,9 | 634,5 | - | - | - | - | - | - | 731,5 | 731,5 |
| - | 16,5 | - | 1.006,5 | - | - | - | - | 1.023,0 | 1.023,0 |
| 7.671,2 | 20.253,7 | 2.544,1 | 25.889,0 | 6.889,7 | - | - | - | 74.508,8 | 77.467,3 |
| - | - | - | - | - | - | - | 2.630,8 | 2.630,8 | 2.630,8 |
| 7.671,2 | 20.253,7 | 2.544,1 | 25.889,0 | 6.889,7 | - | - | 2.630,8 | 77.139,6 | 80.098,1 |

## Tabla 8-10 Balance Energético Nacional 2012 (kBEP)

*Table 8-10 National energy balance 2012 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 189.926,1 | 9.214,1 | 7.582,5 | 1.908,9 | 2.492,9 | 1,69 | 211.126,1 | 14.156,4 |
| Importación / *Imports* | - | - | - | - | - | - | - | 147,6 |
| Exportación / *Exports* | 133.454,2 | - | - | - | - | - | 133.454,2 | 7,4 |
| Variación de Inventario *Stock Variation* | 8.185,4 | - | - | - | - | - | 8.185,4 | - |
| No Aprovechado *INon-utilized* | - | 3.705,1 | - | - | - | - | 3.705,1 | - |
| Oferta Total *Total Supply* | 64.657,3 | 5.509,0 | 7.582,5 | 1.908,9 | 2.4492.9 | 1,69 | 82.152,2 | 14.296,7 |
| Refinería / *Refinery* | -62.249,1 | - | - | - | - | - | -62.249,1 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -2.370,4 | -7.266,1 | - | - | -1,69 | -9.638,2 | 11.769,9 |
| Autoproductores *Autoproducers* | -1.647,6 | -1.564,3 | -316,4 | - | -1.122,3 | - | -4.650,7 | 2.395,5 |
| Centro de Gas *Gas Center* | - | -1.424,0 | - | - | - | - | -1.424,0 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | -26,12 | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -63.896,6 | -5.358,7 | -7.582,5 | - | -1.148,5 | -1,69 | -77.988,0 | - |
| Consumo Propio *Own Consumption* | 760,7 | - | - | - | - | - | 760,7 | 234,9 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 2.055,8 |
| Ajuste / | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.784,5 | 5.093,0 |
| Residencial / *Residential* | - | 150,5 | - | 289,8 | 1.334,4 | - | 1.619,0 | 3.484,5 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 1.619,0 | - | - | - | 3.422,3 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | 150.5 | - | 1.908,9 | 1.334,4 | - | 3.403,5 | 12.006,0 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | 150.5 | - | 1.908,9 | 1.334,4 | - | 3.403,5 | 12.006,0 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 2.032,5 | 10.872,9 | 2.686,3 | 13.212,2 | 20.750,4 | 6.909,6 | 451,4 | 2.824,6 | 73.896,4 | 211.126,1 |
| 6.038,7 | 12.714,7 | 26,1 | 17.048,4 | 2.804,7 | - | - | - | 38.780,1 | 38.780,1 |
| - | 1.311,6 | - | - | 8.830,2 | - | - | - | 10.149,2 | 143.603,4 |
| 77,0 | -1.049,8 | -200,3 | 1.414,0 | 1.876,1 | - | - | - | 2.116,9 | 10.302,3 |
| - | - | - | - | - | - | - | - | - | 3.705,1 |
| 8.148,2 | 21.226,2 | 2.512,1 | 31.674,5 | 16.600,9 | 6.909,6 | 451,4 | 2.824,6 | 104.644,2 | 112.900,1 |
| 1.416,5 | 10.505,4 | 2.686,3 | 13.212,2 | 20.750,4 | 6.909,6 | 20,0 | 2.824,6 | 58.325,0 | -3.924,0 |
| - | -1,9 | - | -1.680,2 | -8.136,8 | - | - | - | 11.760,9 | -7.696,2 |
| -100,4 | - | - | -1.638,0 | -339,8 | - | - | - | 2.395,5 | -4.333,4 |
| 616,0 | 341,4 | - | - | - | - | 431,4 | - | 1.388,8 | -35,2 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | 26,1 | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| -100,4 | -1,9 | - | -3.318,3 | -8.476,7 | - | - | - | -11.897,3 | -15.988,9 |
| 240,7 | 183,1 | 38,3 | 1.073,7 | 1.606,2 | 6.909,6 | 451,4 | - | 10.737,9 | 11.498,6 |
| - | - | - | - | - | - | - | - | 2.055,8 | 2.055,8 |
| - | - | - | - | - | - | - | - | - | - |
| 81,8 | 20.226,8 | 2.473,8 | 19.598,2 | 3.612,5 | - | - | - | 45.999,2 | 45.999,2 |
| 412,1 | 114,1 | - | 6.509,4 | 2.905,6 | - | - | - | 15.034,1 | 16.818,6 |
| 7.187,9 | - | - | - | - | - | - | - | 10.672,4 | 12.291,5 |
| - | 26,1 | - | 90,6 | - | - | - | - | 3.539,0 | 3.539,0 |
| 125,3 | 670,7 | - | - | - | - | - | - | 796,0 | 796,0 |
| - | 16,6 | - | 1.084,4 | - | - | - | - | 1.101,0 | 1.101,0 |
| 7.807,1 | 21.054,2 | 2.473,8 | 27.282,5 | 6.518,1 | - | - | - | 77.141,7 | 80.545,2 |
| - | - | - | - | - | - | - | 2.824,6 | 2.824,6 | 2.824,6 |
| 7.807,1 | 21.054,2 | 2.473,8 | 27.282,5 | 6.518,1 | - | - | 2.824,6 | 79.966,3 | 83.369,8 |

## Tabla 8-11 Balance Energético Nacional 2013 (kBEP)

*Table 8-11 National energy balance 2013 (kBOE)*

| | Petróleo *Oil* | Gas Natural *Natural Gas* | Hidroenergía *Hydro energy* | Leña *Firewood* | Productos de Caña *Cane Products* | Otras primarias *Other Primaries* | Total primarias *Total Primaries* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 197.962,0 | 9.732,4 | 6.839,7 | 1.485,5 | 2.543,4 | 36,4 | 218.599,3 | 14,411,1 |
| Importación / *Imports* | - | - | - | - | - | - | - | 410,4 |
| Exportación / *Exports* | 144.509,6 | - | - | - | - | - | 144.509,6 | 18,0 |
| Variación de Inventario *Stock Variation* | 6.798,5 | - | - | - | - | - | 6.798,5 | - |
| No Aprovechado *Non-utilized* | - | 3.355,0 | - | - | - | - | 3.355,0 | - |
| Oferta Total *Total Supply* | 60.250,9 | 6.377,5 | 6.839,7 | 1.485,5 | 2.543,4 | 36,4 | 77.533,3 | 14.803,5 |
| Refinería / *Refinery* | -57.585,6 | - | - | - | - | - | -57.585,6 | - |
| Centrales Eléctricas *Electric Power Stations* | - | -2.744,6 | -6.521,4 | - | - | -36,4 | -9.302,3 | 11.999,8 |
| Autoproductores *Autoproducers* | -1.855,1 | -1.635,9 | -318,3 | - | -1.093,4 | - | -4.902,6 | 2.411,2 |
| Centro de Gas *Gas Center* | - | -1.761,2 | - | - | - | - | -1.761,2 | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - |
| Coquería/a, Horno *Coke Oven* | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | -33,37 | - | -33,4 | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | -59.444,7 | -6.141,6 | -6.839,7 | - | -1.126,7 | -36,4 | -73.585,1 | - |
| Consumo Propio *Own Consumption* | 810.2 | - | - | - | - | - | 810,2 | 258,4 |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | 1.894,7 |
| Ajuste / | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | 6,2 |
| Industria / *Industry* | - | - | - | - | - | - | 1.948,6 | 5.180,2 |
| Residencial / *Residential* | - | 235,8 | - | 296,1 | 1.416,7 | - | 1.189,4 | 3.643,1 |
| Comercial. Ser. Pub *Commercial. Pub. Serv* | - | - | - | 1.189,4 | - | - | - | 3.820,1 |
| Agro. Pesca. Minería *Agriculture. Fishing. Mining* | - | - | - | - | - | - | - | - |
| Construcción.otros *Construction.others* | - | - | - | - | - | - | - | - |
| Consumo Energético | - | 235,8 | - | 1.485,5 | 1.416,7 | - | 3.138,0 | 12.550,4 |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - |
| Consumo Final | - | 235,8 | - | 1.485,5 | 1.416,7 | - | 3.138,0 | 12.550,4 |

| Gas Licuado *LPG* | Gasolinas Naftas *Gasolines Naphthas* | Kerosene Turbo *Kerosene Turbo* | Diesel Oil *Diesel Oil* | Fuel Oil *Fuel Oil* | Crudo Reducido *Reduced Crude* | Gases *Gases* | No Energético *Non Energetic* | Total Secundarias *Total Secondaries* | TOTAL *TOTAL* |
|---|---|---|---|---|---|---|---|---|---|
| 1.912,3 | 9.776,6 | 2.856,1 | 11.831,1 | 19.127,4 | 6.970,6 | 512,4 | 2.781,5 | 70.179,2 | 218.599,3 |
| 6.409,7 | 14.299,8 | 108,3 | 20.872,3 | 2.157,2 | - | - | - | 44.258,2 | 44.258,2 |
| - | 1.232,2 | - | - | 5.976,7 | - | - | - | 7.226,8 | 151.736,4 |
| -19,3 | 348,1 | -158,6 | 2.083,3 | 1.019,5 | - | - | - | 3.273,1 | 10.071,5 |
| - | - | - | - | - | - | - | - | - | 3.355,0 |
| 8.302,7 | 23.192,4 | 2.805,8 | 34.786,7 | 16.328,0 | 6.970,6 | 512,4 | 2.781,5 | 110.483,7 | 117.837,8 |
| 1.122,5 | 9.280,0 | 2.856,1 | 11.831,1 | 19.127,4 | 6.970,6 | 30,5 | 2.781,5 | 53999,8 | -3.585,8 |
| - | -57,6 | - | -2.460,3 | -8.986,4 | - | - | - | 11.999,8 | -8.806,7 |
| -93,6 | - | - | -1.750,3 | -235,6 | - | - | - | 2.411,2 | -4.570,7 |
| 789,8 | 463,3 | - | - | - | - | 481,9 | - | 1.735,0 | -26,2 |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | 33,37 | - | - | - | - | - | - | 33,4 | - |
| - | - | - | - | - | - | - | - | - | - |
| -93,6 | -57,6 | - | -4.210,5 | -9.221,9 | - | - | - | -13.583,6 | -16.989,4 |
| 176,1 | 146,7 | 35,3 | 1.151,5 | 1.457,6 | 6.970,6 | 512,4 | - | 10.708,7 | 11.518,9 |
| - | - | - | - | - | - | - | - | 1.894,7 | 1.894,7 |
| - | - | - | - | - | - | - | - | - | - |
| 73,2 | 22.102,3 | 2.770,4 | 20.760,5 | 2.837,8 | - | - | - | 48.550,6 | 48.550,6 |
| 520,3 | 119,3 | - | 7.470,4 | 2.810,8 | - | - | - | 16,100,9 | 18.049,5 |
| 7.294,5 | - | - | - | - | - | - | - | 10.937,6 | 12.127,0 |
| - | 32,8 | - | 79,3 | - | - | - | - | 3.932,9 | 3.932,9 |
| 145,1 | 733,1 | - | - | - | - | - | - | 878,2 | 878,2 |
| - | 17,4 | - | 1.114,3 | - | - | - | - | 1.131,7 | 1.131,7 |
| 8.033,0 | 23.004,8 | 2.770,4 | 29.474,7 | 5.648,5 | - | - | - | 81.531,9 | 84.669,9 |
| - | - | - | - | - | - | - | 2.781,5 | 2.781,5 | 2.781,5 |
| 8.033,0 | 23.004,8 | 2.770,4 | 29.474,7 | 5.648,5 | - | - | 2.781,5 | 84.313,4 | 87.451,4 |

## 8.2 Emisiones Gases de Efecto Invernadero 2013 (CO2 eq.)

*8.2 GHG emissions 2013*

### Tabla 8-12 Emisiones Gases de Efecto Invernadero 2013 (CO2 eq.)

*Table 8-12 GHG emissions 2013*

| Miles Toneladas *Thousand Tonnes* | Petróleo *Oil* | Gas *Gas* | Carbón *Coke* | Hidro *Hydro* | Geotermia *Geothermal* | Nuclear *Nuclear* | Leña *Firewood* | Prod. caña *Cane Product* | Otras *Others* | Total Prim *Total Prim* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 159 | 40 | - | - | - | - | - | - | - | - | - |
| Importación / *Imports* | - | - | - | - | - | - | - | - | - | - | - |
| Exportación / *Exports* | - | - | - | - | - | - | - | - | - | - | - |
| Inventario *Stock* | - | - | - | - | - | - | - | - | - | - | - |
| No Aprovechado *Non-utilized* | - | - | - | - | - | - | - | - | - | - | - |
| Oferta Total *Total Supply* | - | - | - | - | - | - | - | - | - | - | - |
| Refinería / *Refinery* | - | - | - | - | - | - | - | - | - | - | - |
| Centrales Eléctricas *Electric Power Stations* | - | 894 | - | - | - | - | - | - | - | - | - |
| Autoproductores *Autoproducers* | 792 | 533 | - | - | - | - | - | 646 | - | - | - |
| Centro de Gas *Gas Center* | - | 574 | - | - | - | - | - | - | - | - | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - | - | - | - |
| Coquería/a Horno *Coke Oven* | - | - | - | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | - | - | - | - | - | - | - | - | - | - | - |
| Consumo Propio *Own Consumption* | 346 | - | - | - | - | - | - | - | - | - | - |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | - | - | - | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | - | - | - | - |
| Industria / *Industry* | - | 76 | - | - | - | - | 195 | 837 | - | - | - |
| Residencial / *Residential* | - | - | - | - | - | - | 825 | - | - | - | - |
| Comercial, Ser, Pub *Commercial, Pub. Serv* | - | - | - | - | - | - | - | - | - | - | - |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,others* | - | - | - | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | - | - | - | - | - | - | - | - |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - | - | - | - |
| Total Emisiones *Total Emissions* | 1297 | 2119 | - | - | - | - | 1021 | 1484 | - | - | - |

Nota: Los gases de efecto invernadero que contribuyen al calentamiento global son: Dióxido de Carbono, Metano y Óxidos de Nitrógeno

*Para el cálculo de GEI en CO2 equivalentes se utilizan los factores Poteciales de Calentamiento Global siguientes: CH4*21=CO2 eq y NO*310=CO2 eq

| GLP *LPG* | Gasol/Alcohol *Gasol/Alcohol* | Kerosene *Kerosene* | Diesel *Diesel* | Fuel Oil *Fuel Oil* | Coque *Coke* | Carbón Veg *Charcoal* | Gases *Gases* | Otras *Others* | No Energ *Non Energ* | Total *Total* |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | 199 |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | 23,24 | - | 1062 | 4051 | - | - | - | - | - | 6031 |
| 34,31 | - | - | 755 | 106 | - | - | - | - | - | 2868 |
| - | - | - | - | - | - | - | - | - | - | 574 |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| 64,57 | 59,25 | 14,73 | 497 | 657 | - | - | 171,53 | 2976 | - | 4787 |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| 27,39 | 9007,33 | 1162,79 | 8978 | 1280 | - | - | - | - | - | 20.456 |
| 190,79 | 48,19 | - | 3225 | 1267 | - | - | - | - | - | 5841 |
| 2678,41 | - | - | - | - | - | - | - | - | - | 3503 |
| - | 13,27 | - | 34 | - | - | - | - | - | - | 47 |
| 53,27 | 296,69 | - | - | - | - | - | - | - | - | 349 |
| - | 7,02 | - | 480 | - | - | - | - | - | - | 487 |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | 1187 | 1187 |
| 3048 | 9454 | 1177 | 15033 | 7363 | - | - | 171 | 2976 | 1187 | 46337 |

| | |
|---|---|
| Emisiones Biomasa | 2.506 |
| Emisiones Combustibles Fósiles | 43.831 |
| Total Emisiones | 46.337 |

## Tabla 8-13 Emisiones de Dióxido de Carbono 2013 (kBEP)

*Table 8-13 Carbon dioxide emissions 2013 (kBOE)*

| Miles Toneladas *Thousand Tonnes* | Petróleo *Oil* | Gas *Gas* | Carbón *Coke* | Hidro *Hydro* | Geotermia *Geothermal* | Nuclear *Nuclear* | Leña *Firewood* | Prod. caña *Cane Product* | Otras *Others* | Total Prim *Total Prim* |
|---|---|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 135 | 39. | - | - | - | - | - | - | - | - |
| Importación / *Imports* | - | - | - | - | - | - | - | - | - | - |
| Exportación / *Exports* | - | - | - | - | - | - | - | - | - | - |
| Inventario *Stock* | - | - | - | - | - | - | - | - | - | - |
| No Aprovechado *Non-utilized* | - | - | - | - | - | - | - | - | - | - |
| Oferta Total *Total Supply* | - | - | - | - | - | - | - | - | - | - |
| Refinería / *Refinery* | - | - | - | - | - | - | - | - | - | - |
| Centrales Eléctricas *Electric Power Stations* | - | 894 | - | - | - | - | - | - | - | - |
| Autoproductores *Autoproducers* | 789 | 532 | - | - | - | - | - | 634 | - | - |
| Centro de Gas *Gas Center* | - | 573 | - | - | - | - | - | - | - | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - | - | - |
| Coquería/a Horno *Coke Oven* | - | - | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | - | - | - | - | - | - | - | - | - | - |
| Consumo Propio *Own Consumption* | 344 | - | - | - | - | - | - | - | - | - |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | - | - | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | - | - | - |
| Industria / *Industry* | - | 76 | - | - | - | - | 192 | 822 | - | - |
| Residencial / *Residential* | - | - | - | - | - | - | 773 | - | - | - |
| Comercial, Ser, Pub *Commercial,Pub. Serv* | - | - | - | - | - | - | - | - | - | - |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,others* | - | - | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | - | - | - | - | - | - | - |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - | - | - |
| Total Emisiones *Total Emissions* | 1.269 | 2.116 | - | - | - | - | 966 | 1.457 | - | - |

| Electricidad *Electricity* | GLP *LPG* | Gasol/Alcohol *Gasol/Alcohol* | Kerosene *Kerosene* | Diesel *Diesel* | Fuel Oil *Fuel Oil* | Coque *Coke* | Carbón Veg *Charcoal* | Gases *Gases* | Otras *Others* | No Energ *Non Energ* |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | 23 | - | 1.058 | 4.032 | - | - | - | - | - |
| - | 34 | - | - | 753 | 105 | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | 64 | 59 | 14 | 495 | 655 | - | - | 171 | 2.966 | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | 26 | 8.880 | 1.156 | 8.932 | 1.275 | - | - | - | - | - |
| - | 190 | 48 | - | 321 | 1.263 | - | - | - | - | - |
| - | 2.672 | - | - | - | - | - | - | - | - | - |
| - | - | 13 | - | 34 | - | - | - | - | - | - |
| - | 53 | 295 | - | - | - | - | - | - | - | - |
| - | - | 6.98 | - | 479 | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | 1.183 |
| - | 3.042 | 9.325 | 1.171 | 14.967 | 7.338 | - | - | 171 | 2.966 | 1.183 |

| | |
|---|---|
| Emisiones Biomasa | 2.424 |
| Emisiones Combustibles Fósiles | 43.553 |
| Total Emisiones | 45.977 |

## Tabla 8-14 Emisiones de Metano 2013 (CO2 equivalentes)

*Table 8-14 Methane emissions 2013*

| Miles Toneladas *Thousand Tonnes* | Petróleo *Oil* | Gas *Gas* | Carbón *Coke* | Hidro *Hydro* | Geotermia *Geothermal* | Nuclear *Nuclear* | Leña *Firewood* | Prod. caña *Cane Product* | Otras *Others* | Total Prim *Total Prim* |
|---|---|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | 24,1 | 1,2 | - | - | - | - | - | - | - | - |
| Importación / *Imports* | - | - | - | - | - | - | - | - | - | - |
| Exportación / *Exports* | - | - | - | - | - | - | - | - | - | - |
| Inventario *Stock* | - | - | - | - | - | - | - | - | - | - |
| No Aprovechado *Non-utilized* | -, | - | - | - | - | - | - | - | - | - |
| Oferta Total *Total Supply* | - | - | - | - | - | - | - | - | - | - |
| Refinería / *Refinery* | - | - | - | - | - | - | - | - | - | - |
| Centrales Eléctricas *Electric Power Stations* | - | 0,3 | - | - | - | - | - | - | - | - |
| Autoproductores *Autoproducers* | 0,7 | 0,2 | - | - | - | - | - | 4,0 | - | - |
| Centro de Gas *Gas Center* | - | 0,2 | - | - | - | - | - | - | - | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - | - | - |
| Coquería/a. Horno *Coke Oven* | - | - | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | - | - | - | - | - | - | - | - | - | - |
| Consumo Propio *Own Consumption* | 0,3 | - | - | - | - | - | - | - | - | - |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | - | - | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | - | - | - |
| Industria / *Industry* | - | - | - | - | - | - | 1,1 | 5,2 | - | - |
| Residencial / *Residential* | - | - | - | - | - | - | 43,5 | - | - | - |
| Comercial, Ser, Pub *Commercial,Pub. Serv* | - | - | - | - | - | - | - | - | - | - |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,o thers* | - | - | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | - | - | - | - | - | - | - |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - | - | - |
| Total Emisiones *Total Emissions* | 25,1 | 2,0 | - | - | - | - | 46,6 | 9,2 | - | - |

| Electricidad *Electricity* | GLP *LPG* | Gasol/Alcohol *Gasol/Alcohol* | Kerosene *Kerosene* | Diesel *Diesel* | Fuel Oil *Fuel Oil* | Coque *Coke* | Carbón Veg *Charcoal* | Gases *Gases* | Otras *Others* | No Energ *Non Energ* |
|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | 0,9 | 3,3 | - | - | - | - | - |
| - | - | - | - | 0,6 | 0,1 | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | 0,1 | - | 0,4 | 0,5 | - | - | 0,1 | 2,5 | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | 0,6 | 88,8 | 0,2 | 9,9 | 2,4 | - | - | - | - | - |
| - | 0,1 | - | - | 2,7 | 1,0 | - | - | - | - | - |
| - | 4,4 | - | - | - | - | - | - | - | - | - |
| - | - | - | - | 0,1 | - | - | - | - | - | - |
| - | 0,1 | 1 | 0,9 | - | - | - | - | - | - | - |
| - | - | - | - | 1,4 | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - | 1,0 |
| - | 5,2 | 89,9 | 0,2 | 16 | 7,4 | - | - | 0,1 | 2,5 | 1,0 |

| | |
|---|---|
| Emisiones Biomasa | 53,8 |
| Emisiones Combustibles Fósiles | 149,3 |
| Total Emisiones | 203,1 |

## Tabla 8-15 Emisiones de Óxido Nitroso 2013 (CO2 equivalentes)

*Table 8-15 Nitrous oxide emissions 2013 (CO2 equivalent)*

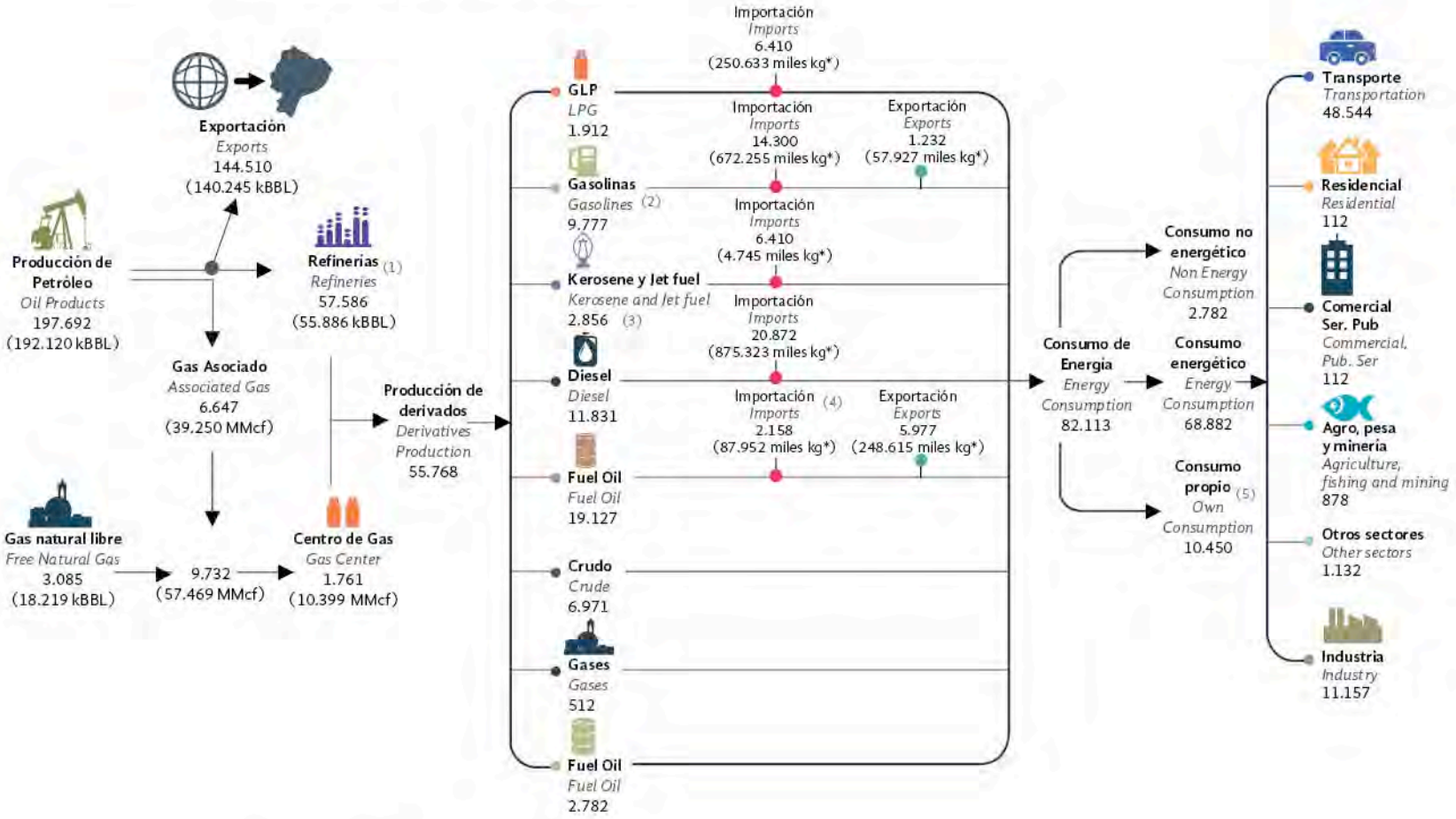
| Miles Toneladas *Thousand Tonnes* | Petróleo *Oil* | Gas *Gas* | Carbón *Coke* | Hidro *Hydro* | Geotermia *Geothermal* | Nuclear *Nuclear* | Leña *Firewood* | Prod. caña *Cane Product* | Otras *Others* | Total Prim *Total Prim* | Electricidad *Electricity* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Producción / *Production* | - | - | - | - | - | - | - | - | - | - | - |
| Importación / *Imports* | - | - | - | - | - | - | - | - | - | - | - |
| Exportación / *Exports* | - | - | - | - | - | - | - | - | - | - | - |
| Inventario *Stock* | - | - | - | - | - | - | - | - | - | - | - |
| No Aprovechado *Non-utilized* | - | - | - | - | - | - | - | - | - | - | - |
| Oferta Total *Total Supply* | - | - | - | - | - | - | - | - | - | - | - |
| Refinería / *Refinery* | - | - | - | - | - | - | - | - | - | - | - |
| Centrales Eléctricas *Electric Power Stations* | - | - | - | - | - | - | - | - | - | - | - |
| Autoproductores *Autoproducers* | 2 | - | - | - | - | - | - | 8 | - | - | - |
| Centro de Gas *Gas Center* | - | - | - | - | - | - | - | - | - | - | - |
| Carbonera *Coaling Station* | - | - | - | - | - | - | - | - | - | - | - |
| Coquería/a. Horno *Coke Oven* | - | - | - | - | - | - | - | - | - | - | - |
| Destilería / *Distillery* | - | - | - | - | - | - | - | - | - | - | - |
| Otros Centros *Other Centers* | - | - | - | - | - | - | - | - | - | - | - |
| Transformación Total *Total Transformation* | - | - | - | - | - | - | - | - | - | - | - |
| Consumo Propio *Own Consumption* | 1 | - | - | - | - | - | - | - | - | - | - |
| Pérdidas / *Losses* | - | - | - | - | - | - | - | - | - | - | - |
| Ajuste / *Adjustment* | - | - | - | - | - | - | - | - | - | - | - |
| Transporte *Transportation* | - | - | - | - | - | - | - | - | - | - | - |
| Industria / *Industry* | - | - | - | - | - | - | 2 | 10 | - | - | - |
| Residencial / *Residential* | - | - | - | - | - | - | 9 | - | - | - | - |
| Comercial, Ser, Pub *Commercial,Pub. Serv* | - | - | - | - | - | - | - | - | - | - | - |
| Agro, Pesca, Minería *Agriculture, Fishing, Mining* | - | - | - | - | - | - | - | - | - | - | - |
| Construcción,otros *Construction,o thers* | - | - | - | - | - | - | - | - | - | - | - |
| Consumo Energético *Energy Consumption* | - | - | - | - | - | - | - | - | - | - | - |
| No Energético *Non-Energetic* | - | - | - | - | - | - | - | - | - | - | - |
| Total Emisiones *Total Emissions* | 3 | 1 | - | - | - | - | 11 | 18 | - | - | - |

| GLP *LPG* | Gasol/Alcohol *Gasol/Alcohol* | Kerosene *Kerosene* | Diesel *Diesel* | Fuel Oil *Fuel Oil* | Coque *Coke* | Carbón Veg *Charcoal* | Gases *Gases* | Otras *Others* | No Energ *Non Energ* |
|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | 3 | 10 | - | - | - | - | - |
| - | - | - | 2 | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | 1 | 2 | - | - | - | 8 | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | 38 | 6 | 36 | 3 | - | - | - | - | - |
| - | - | - | 8 | 3 | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| 1 | 1 | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - | 3 |
| 2 | 39 | 6 | 50 | 18 | - | - | - | 8 | 3 |

| | |
|---|---|
| Emisiones Biomasa | 29 |
| Emisiones Combustibles Fósiles | 129 |
| Total Emisiones | 158 |

## Cadena Energética de derivados hidrocarburos 2013 (kBEP)

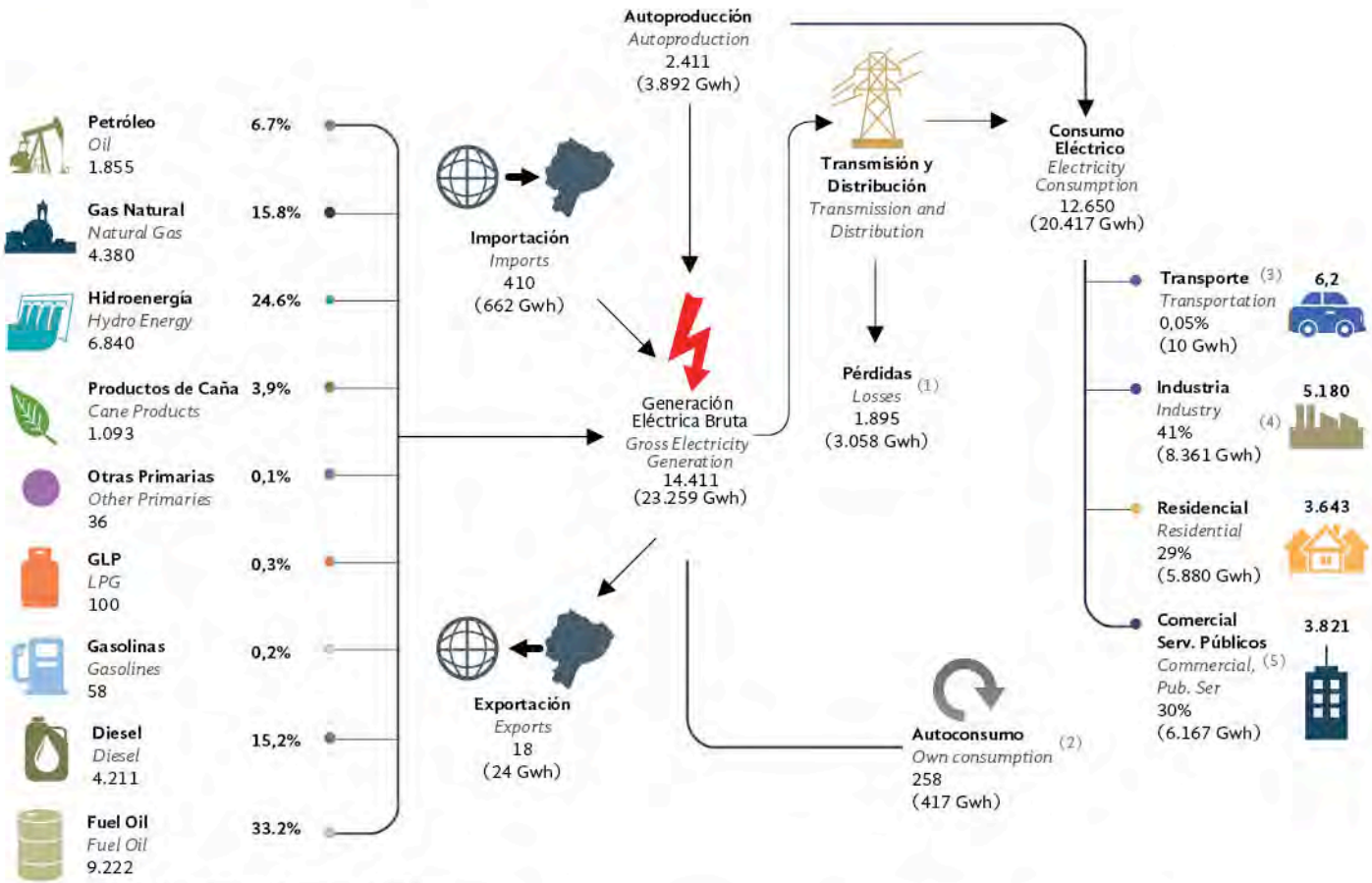
*Energy chain of hydrocarbons derivatives 2013 (kBOE)*




(1) Incluye plantas topping.
(2) Considera gasolinas y naftas
(3) Incluye AVGAS
(4) Cutter stock
(5) Comprende el consumo propio en refinerías y en plantas topping

## Cadena Energética Eléctrica 2013 (kBEP)

*Electricity Energy chain 2013 (kBOE)*

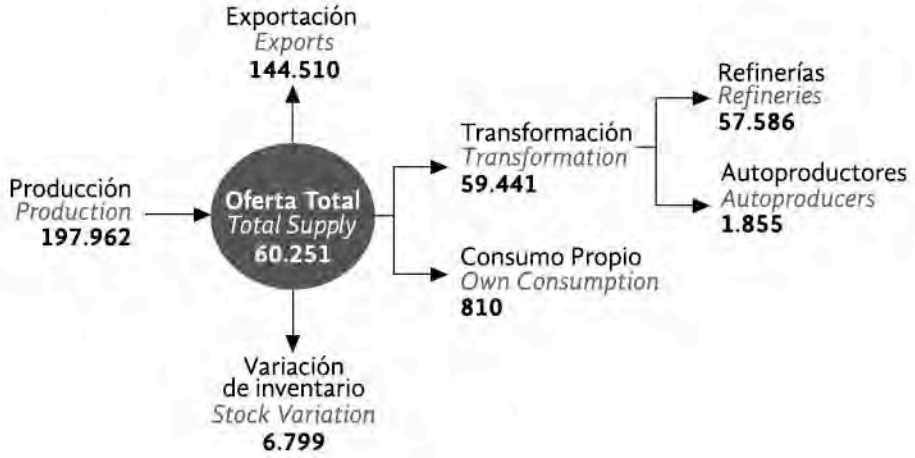



(1) Incluye perdidas técnicas y no técnicas
(2) Autoconsumos en generación para servicio público
(3) Considera un valor constante para el consumo eléctrico del Trolebús. El consumo eléctrico fue proporcionado por la Empresa Eléctrica Quito para el año 2012. Se descuenta el consumo del Trolebús del segmento otros publicado por CONELEC.
(4) Incluye la energía generada no disponible para servicio público y la energía entregada a grandes consumidores en subtransmisión.
(5) Incluye alumbrado público, segmento comercial y otros (descontado el consumo del sector transporte)

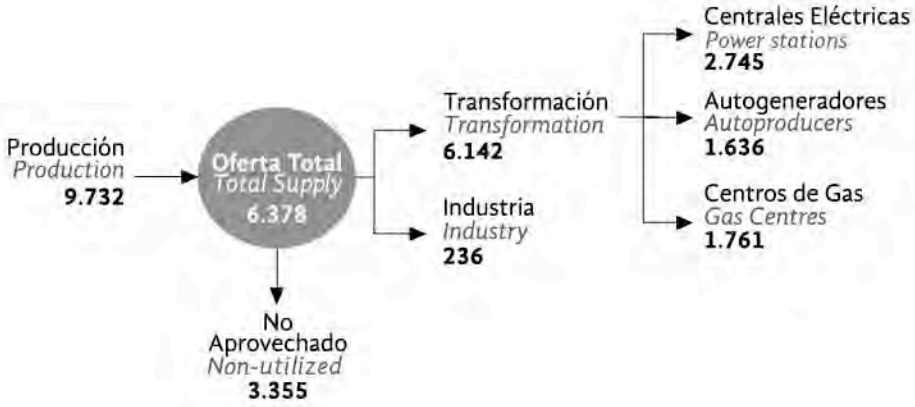
## Flujos de Energía primaria (kBEP)

*Primary energy flows (kBOE)*

### Petróleo
*Oil*



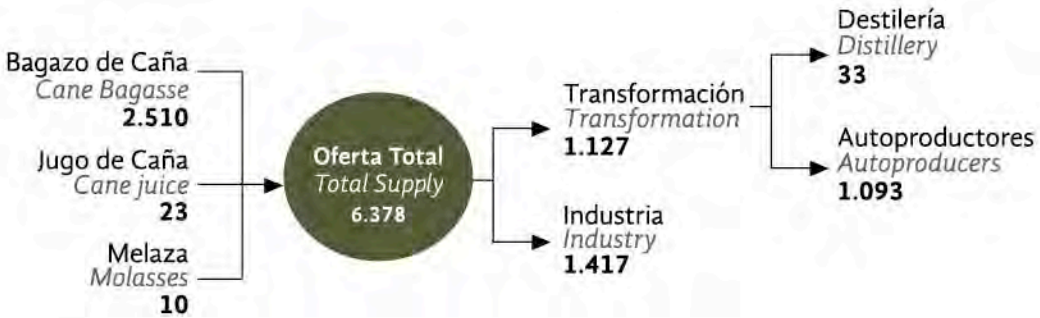

### Gas Natural
*Natural Gas*



## Hidroenergía
*Hydro Energy*

## Leña
*Firewood*

## Productos de caña
*Cane products*




## Otras Primarias
*Other primaries*

# ANEXO A

## Glosario
*Glosary*

### Fuentes de energía

**Energía primaria:** Son las fuentes de energía en estado propio que se extraen de los recursos naturales, de manera directa, como en el caso de las energías hidráulica, geotérmica, eólica, solar, o mediante un proceso de prospección, exploración y explotación, como es el caso del petróleo y el gas natural, o mediante recolección como en el caso de la leña. En algunos casos, como el de la leña y energías no comerciales, la energía primaria puede ser consumida directamente sin mediar un proceso de transformación.

**Energía secundaria:** Son las diferentes fuentes de energía producidas a partir de energías primarias o secundarias en los distintos centros de transformación, para poder ser consumidas de acuerdo a las tecnologías empleadas en los sectores de consumo. Las formas de energía secundaria pueden resumirse en electricidad (producida de fuentes primarias o secundarias), gas licuado de petróleo (GLP), gasolinas, diesel, kerosene y combustible jet, fuel oil y productos no energéticos (por ejemplos asfaltos y lubricantes derivados del petróleo).

### Centros de Transformación[40]

Son las plantas donde la energía que entra se modifica en procesos especiales de industrialización o conversión energética mediante proceso físicos y/o químicos, entregando una o más fuentes de energía diferentes a la o las de entrada.

**Centrales Eléctricas de Servicio Público y de Autoproducción:** Son plantas de generación hidroeléctrica, turbinas a vapor, turbinas de gas, ciclo combinado (CC) y motores de combustión interna (MCI), granjas eólicas y centrales solares de potencia de concentración (CSP) y paneles fotovoltaicos. Las centrales de autoproducción son equipos generadores de electricidad de propiedad de los consumidores para atender sus propias necesidades energéticas y eventual venta de excedentes a la red pública.

### *Energy sources*

***Primary Energy.*** *Is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels, and other forms of energy received as input to a system. Primary energy can be non-renewable or renewable. In some cases, such as for firewood and non-commercial energies, energy can be consumed directly without any transformation process.*

***Secondary energy.*** *Are energy sources produced from primary (or secondary) energy source in transformation centres to be consumed according to the technologies used in consumption sectors. Secondary energy sources can be summarized in electricity (generated from primary or secondary sources), liquefied petroleum gas (LPG), gasoline, diesel, kerosene, jet fuel, fuel oil and non-energy products e.g. asphalt and oil lubricants).*

### *Transformation centres*[40]

*Are plants where input energy is modified with special processes of industrialization or energy conversion through physical/chemical processes, delivering at the end one or more energy sources that are different from the input.*

***Power stations for public service and Autoproducers.*** *Are power stations with technologies such as hydropower, geothermal, steam turbines, gas turbines, combined cycle and internal combustion engines, wind farms, concentrated solar power (CSP) and solar panels. Autoproducers is electricity generation equipment which is owned by consumers to attend their own energy needs and eventual sale of surplus to the public grid.*

***Gas treatment centres.*** *Are natural gas (free of associated) treatment plants where the gas is processed for drying, impurities removal and to recover ethane (raw material for petro chemistry), and light liquids such as propane, butane (both components of LPG) and gasoline. All these processes are with physical separation.*

40. Se debe acotar que para el sector eléctrico, mencionar un centro de transformación implica el proceso en el cual la energía eléctrica cambia de potencia. No obstante, y de acuerdo a la metodología, hablar de centros de transformación dentro de un Balance Energético Nacional implica la energía primaria o secundaria que ingresa y se convierte en energía secundaria; este proceso puede ser descrito como producción de los centros de transformación.
*It must be mentioned, that a transformation center (for the electrical sector), is the process where the electrical energy changes its capacity. Although, for the National Energy Balance, a transformation center is the place, where the input energy (primary or secondary) is transformed in secondary energy. This process can be described as the production of the transformation center.*

**Refinerías de petróleo:** Una refinería o destilería de petróleo es una plataforma industrial destinada a la refinación del petróleo, por medio de la cual, mediante un proceso adecuado, se obtienen diversos combustibles fósiles capaces de ser utilizados de una manera más fácil e.g. diesel, gasolina y fuel oil. Además, y como parte del proceso, se obtienen diversos productos tales como aceites minerales y asfaltos.

**Destilerías de bioetanol:** En estas destilerías se procesan productos de la caña de azúcar (jugos, melazas, mieles) mediante procesos de fermentación con la adición de levaduras se convierten los azúcares en alcoholes que se separan por destilación.

## No Aprovechado, Pérdidas y Ajuste

**No aprovechado:** Es la cantidad de energía que, por razones técnicas y/o económicas o falta de valorización del recurso (por ejemplo en el caso del gas asociado), no está siendo utilizada.

**Pérdidas de transporte, almacenamiento y distribución:** Es la energía perdida en las actividades de transporte, almacenamiento y distribución de los distintos productos energéticos, tanto primarios como secundarios.

**Ajuste o diferencia estadística:** Es la diferencia entre el destino y el origen de la oferta interna de una fuente energética como consecuencia de errores estadísticos. Su valor debe ser naturalmente muy bajo, si es mayor a un 5% indica que debe efectuarse una cuidadosa revisión de los datos básicos a partir de los cuales se calcularon las variables que componen la oferta interna de dicha fuente.

## Consumo de Energía

Es la energía utilizada ya sea como uso propio del sector energético y en los distintos sectores consumidores, tanto para uso energético como no energético.

***Oil refinery.*** *An oil refinery or petroleum refinery is an industrial process plant where crude oil is processed and refined into more useful products such as petroleum naphtha, gasoline, diesel fuel, asphalt base, heating oil, kerosene and liquefied petroleum gas.*

***Bioethanol distilleries.*** *In these distilleries, sugar cane products are processed (sugar cane juice, molasses, honey). Through fermentation processes and the addition of yeast, sugar is transformed into alcohol.*

## *Not-used, losses and adjustments*

***Not used.*** *Is the amount of energy that due to technical or economic reasons is not being used. For example: associated gas in oil production.*

***Losses in transport, storage and distribution.*** *Is the energy lost in the activities of transport, storage and distribution of energy products, both primary and secondary sources.*

***Adjustemets or statistical differences.*** *Is the difference between destination and origin of the internal supply of an energy sources, due to statistical errors. This value must naturally be very small, if it is greater than 5%, a careful revision of the data used to calculate the internal supply of an energy source must be carried out.*

## *Energy consumption*

*Is the energy used by the different economic sectors as well as energy used by the energy sector itself for energy and non-energy uses.*

***Own consumption.*** *Is the energy used for the inner workings of the energy sector for stages of production, transformation, transport, distribution and storage of energy sources.*

***Final consumption.*** *Includes all energy flows grouped according to socioeconomic sector which are consumed for energy and non-energy uses.*

## Glosario
*Glosary*

**Consumo final:** Se incluyen todos los flujos energéticos agrupados según los sectores socioeconómicos en que son consumidos, tanto para uso energético como no energético.

**Sector residencial:** El consumo final de este sector es el correspondiente a los hogares urbanos y rurales del país.

**Sector comercial, servicios y administración pública:** Incluye el consumo de todas las actividades comerciales y de servicio de carácter privado, los consumos energéticos del gobierno a todo nivel (nacional, provincial, municipal), instituciones y empresas de servicio público como educación, salud, etc.

**Sector transporte:** Incluye los consumos de energía de todos los servicios de transporte dentro del territorio nacional, sean públicos o privados, para los distintos medios y modos de transporte de pasajeros y carga (carretero, ferrocarril, aéreo y fluvial-marítimo).

**Sector agricultura, pesca y minería:** Comprende los consumos de energía relacionados con toda la actividad agropecuaria, silvicultura y la pesquería. Incluye además todos los consumos de energía de las actividades extractivas e industriales vinculadas a la minería.

**Sector industrial:** Comprende los consumos energéticos de toda la actividad manufacturera (pequeña, mediana y gran industria), excepto el transporte de mercaderías que queda incluido en el sector transporte.

**Construcción y otros:** Incluye el consumo energético de las actividades de la construcción y eventualmente otros sectores menores no incluidos en los anteriores.

### Derivados de petróleo

Entre los principales productos derivados del petróleo que se consideran son los siguientes:

Gas Licuado de Petróleo (GLP): Es la mezcla de propano-butano utilizada como combustible principalmente doméstico, en el sector de transporte y también comercial e industrial.

***Residential sector.*** *The energy consumption comprised by urban and rural households of the country.*

***Commercial sector, services and public administration.*** *Includes energy consumption of all commercial and services activities of the private sector, and energy consumption of government institutions and public services companies such as education and health.*

***Transport sector.*** *Includes energy consumption of all transport services in the country (public and private), including different types of transportation (land, railway, air and sea-river transport).*

***Agriculture, fishing and mining sector.*** *Comprises the use of energy in agricultural, forestry and fishing activities. It also considers energy consumption in activities related to the exploitation and industrialization of minerals.*

***Industry sector.*** *Comprises energy consumption in manufacturing activities (small, medium and large), except transportation of goods which is included in the transport sector.*

***Construction and others.*** *Includes energy consumption in construction activities and other minor sectors that have not been included in the previous mentioned sectors.*

### *Oil Products*

*Among the most representative oil product, the following are considered in this publication:*

***Liquefied Petroleum Gas (LPG).*** *Is a mixture of propane and butane use mainly as a residential fuel, but also in the transport, industrial and commercial sectors.*

***Gasoline (GM).*** *Is "extra" gasoline (87 octane) and "super" gasoline (92 octane) available in Ecuador for vehicle uses.*

***Kerosene and jet fuel (KJ).*** *Are intermediate distillates that are lighter than diesel. The most important in Ecuador is Jet Fuel, which is used in jet aircrafts.*

**Gasolina (GM):** Son las gasolinas extra (87 octanos) y super (92 octanos) comercializadas en el mercado para uso automotor.

**Kerosene y jet fuel (KJ):** Son cortes de destilados medios más livianos que el diésel, el más importante en el país es el combustible jet utilizado en aeronaves propulsadas por turbinas.

**Diésel oil (DO):** Son los cortes de destilados medios utilizados en transporte para uso en motores de ciclo Diésel y en la industria y otros sectores, incluyendo la generación termoeléctrica.

**Fuel oil (FO):** Cortes de hidrocarburos pesados, bunker y otros utilizados principalmente para ciertos usos industriales y generación eléctrica en turbinas de vapor y motores de media velocidad.

**No energéticos (NE):** Productos que resultan del procesamiento de residuos pesados, como los asfaltos, el azufre, entre otros.

***Diesel oil (DO).*** *Are intermediate distillates used in the transport sector, industry and electricity generation in diesel engines and diesel operated equipment.*

***Fuel oil (FO).*** *Heavy hydrocarbon distillates, such as bunker fuel used primarily for industrial processes and electricity generation (steam turbines and medium speed engines).*

***Non-energy (NE).*** *Are products that result in the processing of heavy oil residues such as asphalt, tar, sulphur, etc.*

# ANEXO B

## Factores de Conversión y emisión
*Conversion and emission factors*

| Unidad física<br>*Physical Unit* | Unidad Energética<br>*Energy Unit* |
|---|---|
| 1 Barril de Petróleo<br>*Barrel of Oil* | = 1,0304 BEP/ *BOE* |
| 1 Barril de Gasolina<br>*Barrel of Gasoline* | = 0,8934 BEP/*BOE* |
| 1 Barril de Diesel<br>*Barrel of Diesel* | = 1,0015 BEP/*BOE* |
| 1 Barril de GLP<br>*Barrel of LPG* | = 0,6701 BEP/*BOE* |
| 1 Barril de Kerosene<br>*Barrel of Kerosene* | = 0,9583 BEP/*BOE* |
| $10^3$ $m^3$ de Gas Natural<br>*Natural Gas* | = 5,9806 BEP/*BOE* |
| $10^3$ KWh de hidro/geoenergía<br>*Hidro/geoenergy* | = 0,6196 BEP/*BOE* |
| 1 Tonelada de Leña<br>*Ton of Firewood* | = 2,5940 BEP/*BOE* |
| 1 Barril de Alcohol<br>*Alcohol* | = 0,5980 BEP/*BOE* |
| 1 Tonelada de Bagazo<br>*Ton of sugar cane bagasse* | = 1,3114 BEP/*BOE* |
| 1 Tonelada de jugo de caña<br>*Ton of cane juice* | = 0,4453 BEP/*BOE* |
| 1 Tonelada de Melaza<br>*Ton of Molasses* | = 1,2970 BEP/*BOE* |

**En la tabla siguiente se muestra los factores de emisión utilizados (kg/TJ):**

***The following table lists the emission factors used (kg/TJ):***

| Tipo combustion | Tipo industria | Combustibles | CO2 | CH4 | N2O |
|---|---|---|---|---|---|
| **Estacionaria** *Stationary* | Energética, manufacturera, comercial, residencial, agrícola, transporte. *Energy, manufacturing, commercial, residential, agricultural, transportation.* | Petróleo Crudo *Oil* | **73.300** | **3** | **0,6** |
| | | Gas Natural *Natural gas* | **56.100** | **1** | **0,1** |
| | | Leña *Firewood* | **112.000** | **30** | **4** |
| | | Productos de caña *Sugar cane products* | **100.000** | **30** | **4** |
| | | GLP *LPG* | **63.100** | **1** | **0,1** |
| | | Gasolinas *Gasoline* | **69.300** | **3** | **0,6** |
| | | Kerosene | **71.500** | **3** | **0,6** |
| | | Diesel | **74.100** | **3** | **0,6** |
| | | Fuel Oil | **77.400** | **3** | **0,6** |
| | | Gases | **57.600** | **1** | **0,1** |
| | | No Energético *non-energy* | **73.300** | **3** | **0,6** |
| **Móvil** | Transporte *Transportation* | Kerosene | **71.900** | **0,5** | **1,2** |
| | | GLP *LPG* | | **62** | **0,2** |
| | | Fuel Oil | | **7** | **0,6** |
| | | Gasolinas *Gasoline* | | **33** | **0,96** |
| | | Diesel | | **3,9** | **0,96** |
| **Estacionaria** *Stationary* | Residencial *Residential* | Leña *Firewood* | | **300** | |
| | Residencial, comercial, agrícola, otros. *Residential, commercial, agricultural, others.* | GLP *LPG* | | **5** | |
| | | Gasolinas *Gasoline* | | **10** | **0,6** |
| | | Diesel | | **10** | **0,6** |
| | | Fuel Oil | | **3** | |

La metodología utilizada para el cálculos de emisiones de Gases de Efecto Invernadero se basa en el Método de Nivel 1 de las directrices del IPCC de 2006. / *The methodology used to calculate emissions of greenhouse gases is based on Level 1 method of the 2006 IPCC Guidelines.*

## Referencias
*References*

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*Recuperado a partir de http://www.Bce.Fin.Ec/frame.php?Cnt=arb000841*

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**OLADE. (2004):** SIEN Sistema de información Económico Nacional- guía m-1. Metodología para la elaboración de los balances de energía. Ecuador.

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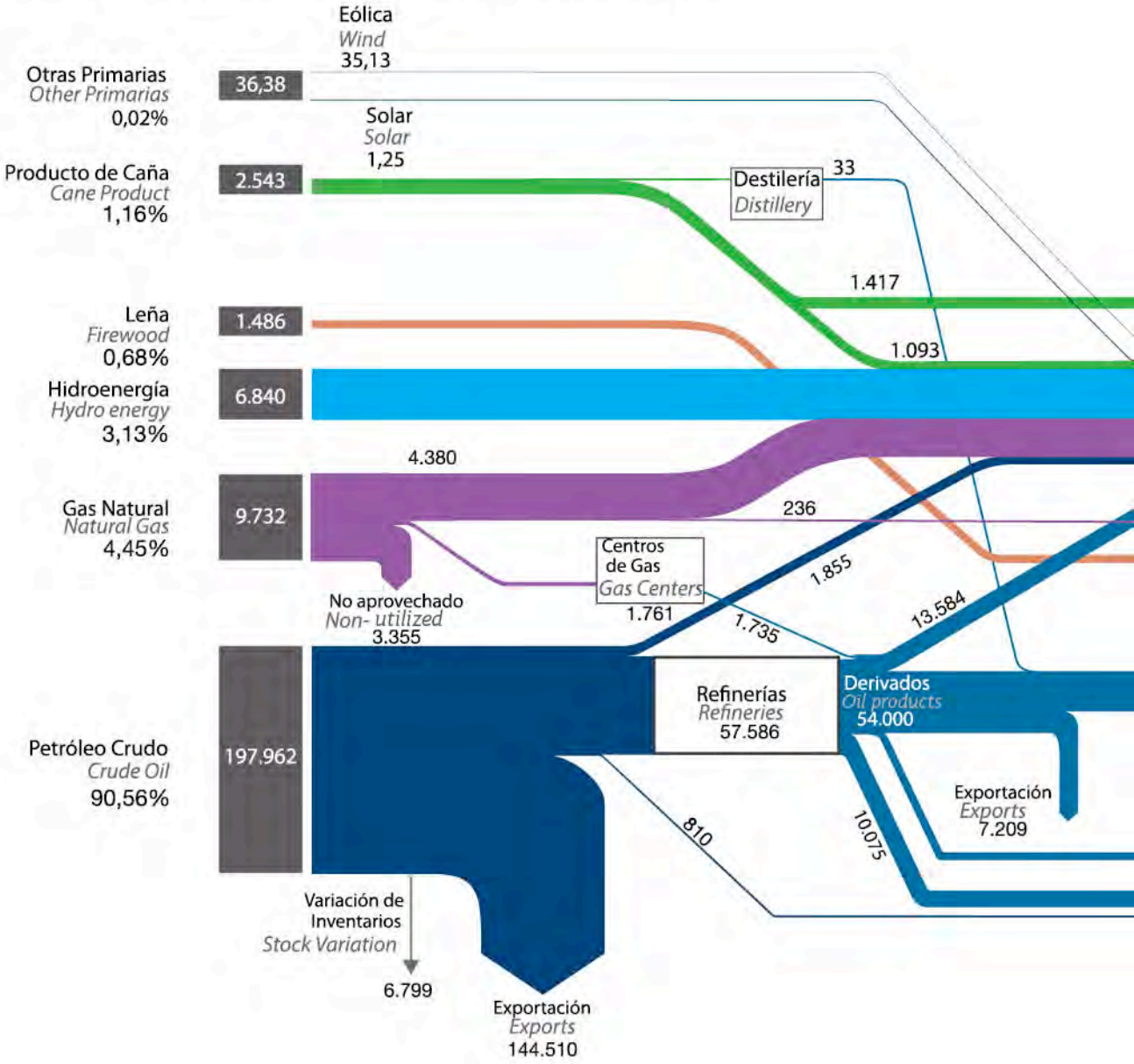
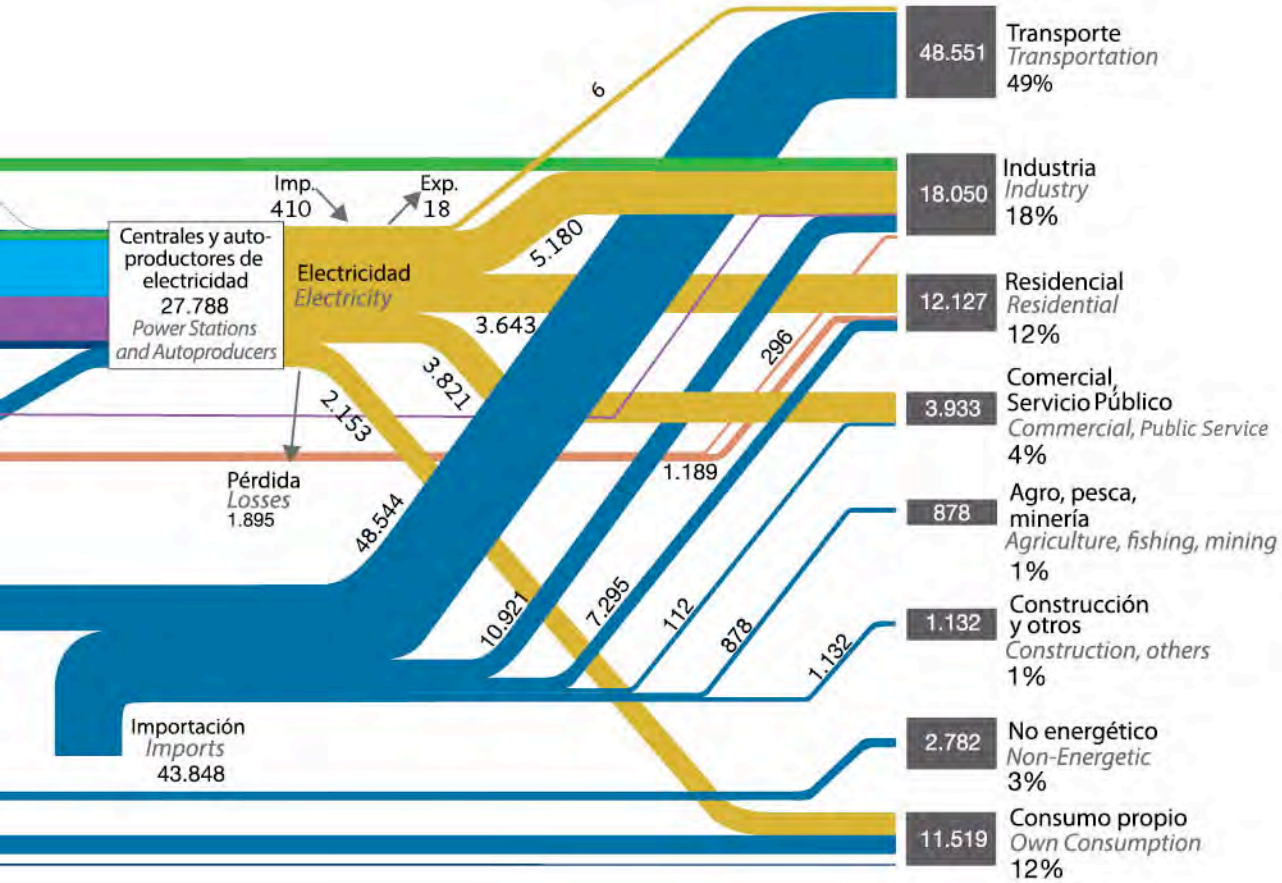
**ONUDI (2013):** Energía y Cambio Climático. Programa de capacitación en energías renovables.

## Balance Energético Nacional 2014 (Año base 2013) (kBEP)

*National Energy Balance 2014 (Base year 2013) (kBOE)*



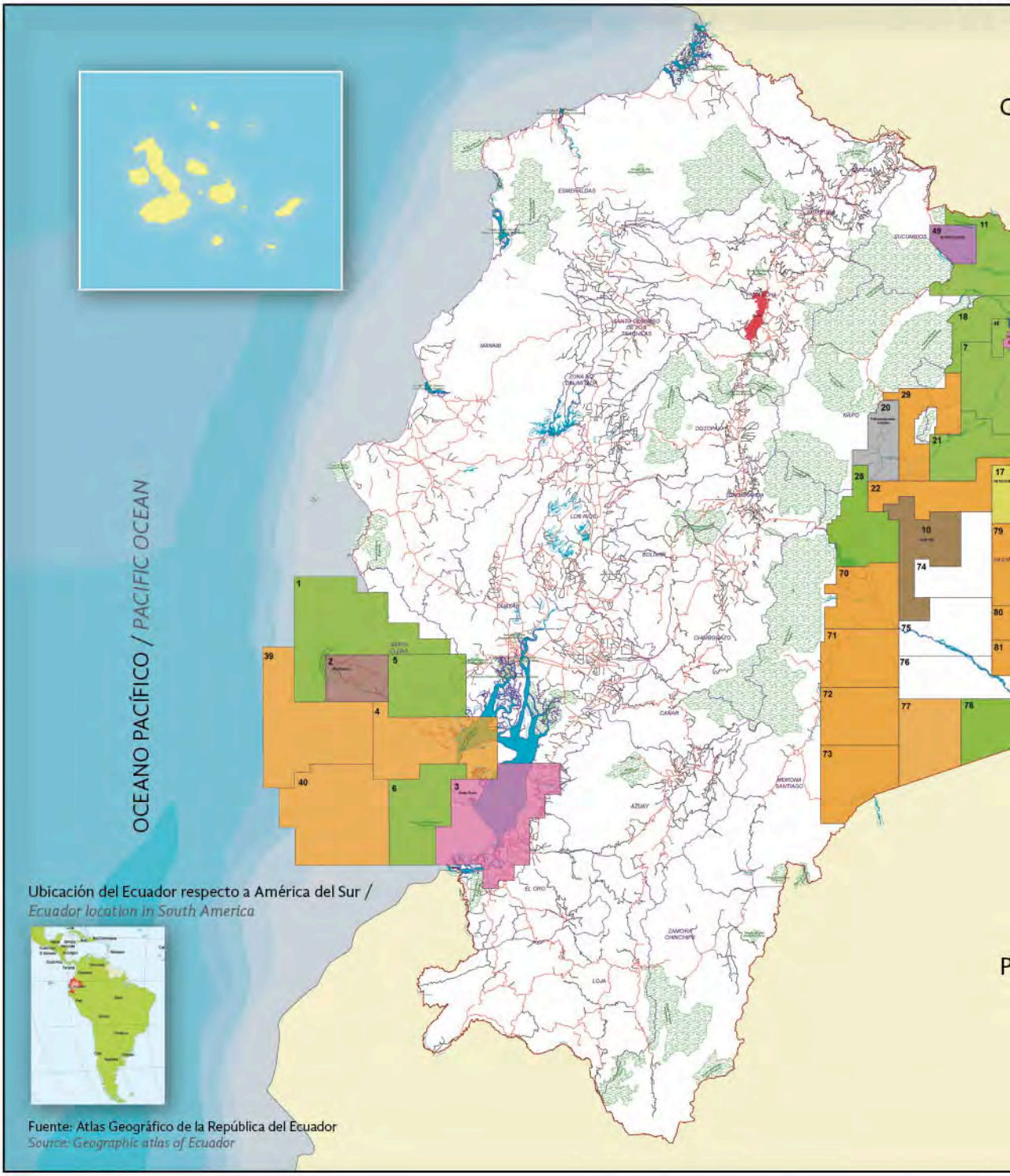

| Producción *Production* | + | Importación *Imports* | - | Exportación *Exports* | + | Variación Inventario *Stock Variation* | - | No Aprovechado *Non-utilized* | = | Oferta Total *Total Supply* |
|---|---|---|---|---|---|---|---|---|---|---|
| 218.599 | | 44.258 | | 151.736 | | 10.072 | | 3.355 | | 117.838 |




| = Centros Transformación *Transformation Centers* | + Consumo Propio *Own Consumption* | + Pérdidas y Ajustes *Losses and Adjustment* | + Consumo Final *Final Consumption* | = Demanda Total *Total Demand* |
|---|---|---|---|---|
| 16.989 | 11.519 | 1.895 | 87.451 | 117.838 |

# Mapa catastral de petróleo

*Cadastral map of oil*

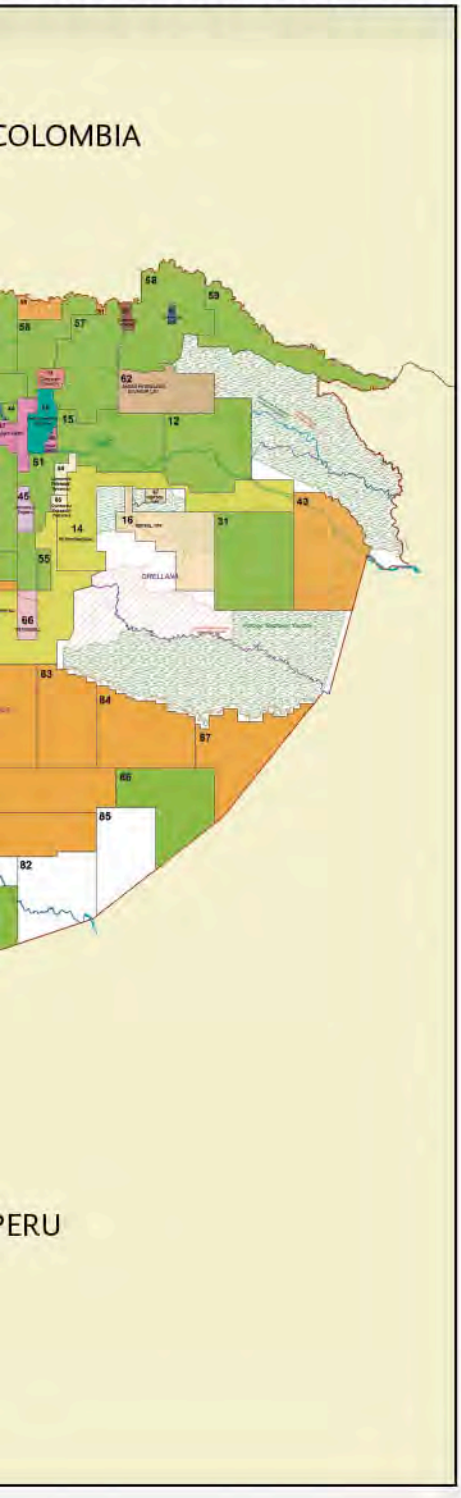



Ubicación del Ecuador respecto a América del Sur /
*Ecuador location in South America*



Fuente: Atlas Geográfico de la República del Ecuador
*Source: Geographic atlas of Ecuador*

# ÚBLICA DEL ECUADOR




## Leyenda / *Legend*

**Bloques para Licitación** / ***Blocks for bidding***

22, 29, 70, 71, 72, 73, 79, 80, 81, 83, 84, 87

En negociaciones con Petroamazonas EP (28, 78, 86) / *Under negotiation with Petroamazonas EP*

**Bloques Asignados** / ***Assigned blocks***

- Agip (Bloque 10)
- Andes Petroleum Ecuador Ltd (Bloque 62)
- Consorcio DGC (Bloque 53)
- Consorcio Interpec (Bloque 52)
- Consorcio Marañon (Bloque 54)
- Consorcio Palanda-Yuca Sur (Bloque 64)
- Consorcio Pegaso ( Bloque 45)
- Consorcio Petrosud-Petroriva (Bloque 65)
- Enap Sipec (Bloques 46, 47)
- Pacifpetrol (Bloque 2)
- Petroamazonas EP (Bloques 1, 5, 6, 7, 11, 12, 15, 18, 21, 31, 44, 48, 56, 57, 58, 59, 61)
- Petroamazonas EP - Ivanhoe (Bloque 20)
- Petroamazonas EP - Río Napo (Bloque 60)
- Petrobell (Bloque 66)
- Petroriental (Bloques 14, 17)
- Repsol YPF (Bloques 16, 67)
- Secretaría de Hidrocarburos (Bloques 39, 40, 77)
- Tecpecuador (Bloque 49)
- Sin asignación (Bloques 74, 75, 76, 82, 85) *Unassigned*

## Símbolos Convencionales / *Conventional signs*

- Límite internacional / *International limits*
- Límite Provincial / *Provincial Limit*
- Capital del Ecuador (Quito) / *Capital city of Ecuador*
- Sistema Nacional de Áreas Protegidas / *National system of protect*
- Zonas Intangibles / *Intangible zones*
- Red Hidrográfica / *Hidrographic network*

## Red Vial / *Road network*

- Vía Primaria / *Primary road*
- Vía Secundaria / *Secondary road*

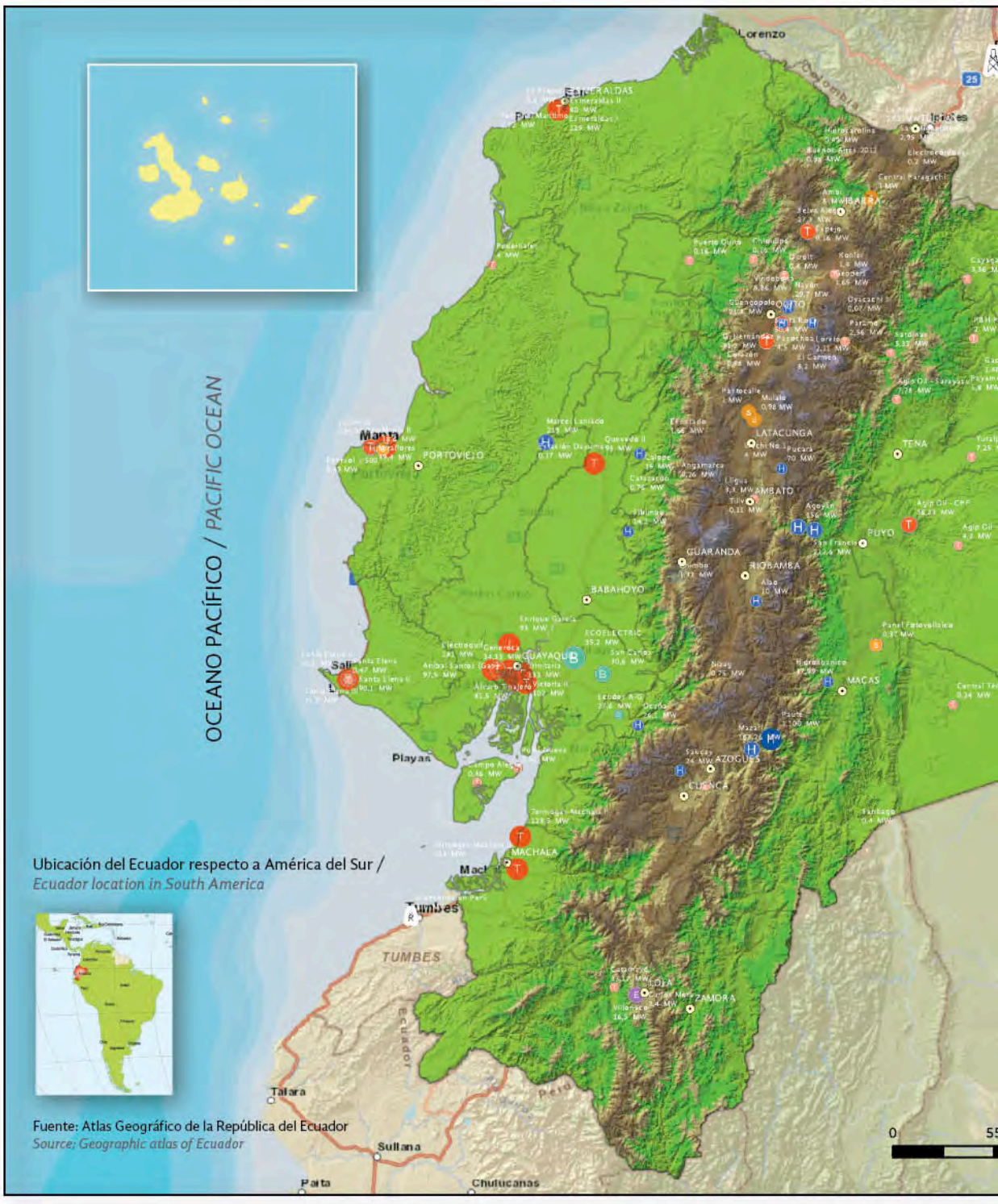
## Fuente / *Source*

Límite Provinvincial: CELIR / Cartografía Básica: Instituto Geográfico Militar, 2008, Base Naci
Escala 1:1'000.000 / Bloques: Secretaría de Hidrocarburos (SHE)
Areas Protegidas, Bosque y Vegetación Protectora: Ministerio de Ambiente Ecuador

0 55 110 220 Kilómetros

# Mapa de Centrales de Generación

## *Map of Generation Plants*

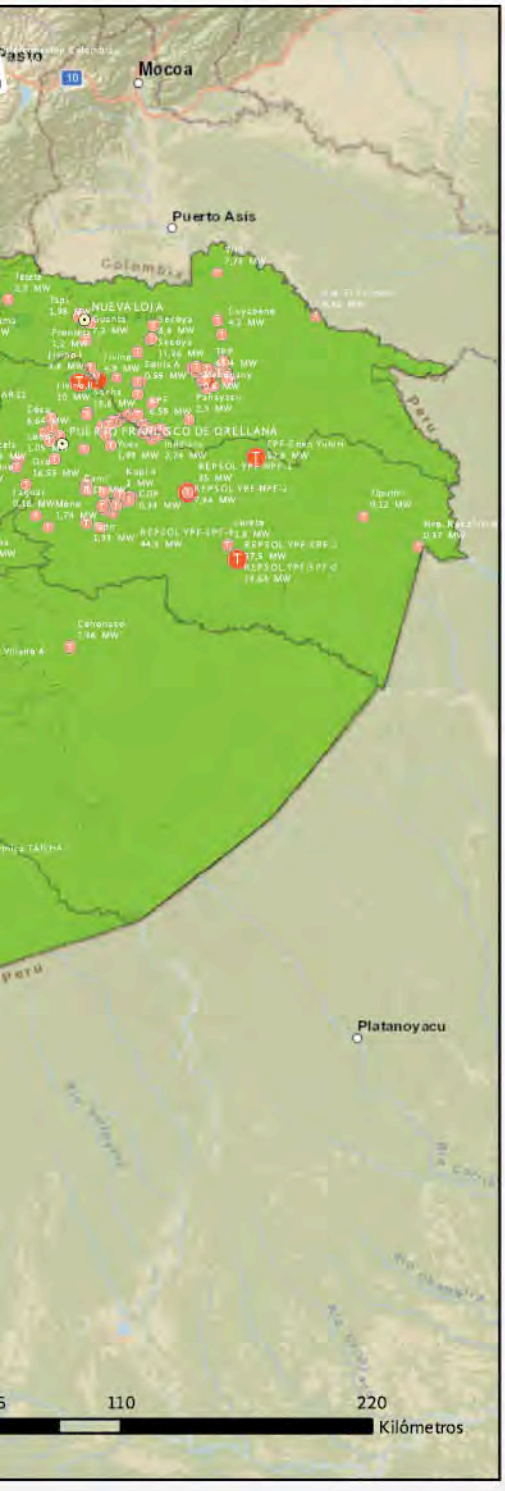



Ubicación del Ecuador respecto a América del Sur /
*Ecuador location in South America*



Fuente: Atlas Geográfico de la República del Ecuador
*Source: Geographic atlas of Ecuador*

# EPÚBLICA DEL ECUADOR




## Leyenda / *Legend*

**Centrales de generación hidráulica**
*Hydro energy generation plants*
**Potencia efectiva (MW)**
*Effective power (MW)*
- 10,00 - 70,00 MW
- 70,01 - 213,00 MW
- 213,01 - 1.100,00 MW

**Centrales de generación térmica**
*Thermal generation plants*
**Potencia efectiva (MW)**
*Effective power*
- 0,05 - 20,24
- 20,25 - 65,40
- 65,41 - 181,00

**Centrales de generación eólica**
*Wind energy generation plants*
**Potencia efectiva (MW)**
*Effective power*
- 2,40
- 2,41 - 17,16

**Centrales de generación solar /**
*Solar generation plants*
**Potencia efectiva (MW) /**
*Effective power (MW)*
- 0,01 - 0,02
- 0,02 - 0,50
- 0,50 - 1,00

**Centrales de generación de biomasa /**
*Biomass generation plants*
**Potencia efectiva (MW) /**
*Effective power*
- 27,60 MW
- 27,61 - 30,60 MW
- 30,61 - 35,20 MW

**Interconexiones**
*Interconnection*
**Potencia efectiva (MW)**
*Effective power*
- 110,00 MW
- 110,01 - 525,00 MW

## Signos convencionales / *Conventional signs*

- Límite provincial / *Province limit*
- Cabecera provincial / *Province capital*

## Fuente / *Source*

CONELEC

COORDINACIÓN NACIONAL DE REGULACIÓN

DIRECCIÓN NACIONAL DE ESTUDIOS ELÉCTRICOS Y ENERGÉTICOS

UNIDAD DE INFORMACIÓN ESTADÍSTICA Y GEOGRÁFICA

MAPA DE LA DIVISIÓN POLÍTICA ADMINISTRATIVA

| Fecha de elaboración: | Fecha de Corte de la Información: |
|---|---|
| Agosto, 2014 | Diciembre, 2013 |

Fuente:
Cartografía Base: Arc Gis. com
Cartografía Temática: INEC, 2012

* Para mayor detalle consulte el Geoportal CONELEC www.conelec.gob.ec

Ministerio Coordinador
de Sectores Estratégicos

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www.sectoresestrategicos.gob.ec