BOLETIN ENERGETICO

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Organización Latinoamericana de Energía

JULIO/AGOSTO, 1981

EL BALANCE ENERGETICO COMO INSTRUMENTO DE PLANIFICACION olade ANALISIS DEL BALANCE ENERGETICO DE AMERICA LATINA olade ANALISIS DEL BALANCE ENERGETICO DE AMERICA CENTRAL olade ANALISIS DEL BALANCE ENERGETICO DEL AREA ANDINA olade ESTRUCTURA DEL CONSUMO DE ENERGIA EN AMERICA LATINA olade ANALISIS CUANTITATIVO DE LA PARTICIPACION DE LA BIOMASA EN EL CONSUMO ENERGETICO DE AMERICA LATINA olade ESTIMACIONES DE LA DEMANDA FUTURA DE ENERGIA PARA AMERICA LATINA.

ESTRUCTURA DEL CONSUMO DE ENERGIA EN AMERICA LATINA

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1. INTRODUCCION

En el presente artículo se analiza la estructura del consumo de energía en América Latina. El análisis se basa en:

a. El balance regional consolidado para 1978 que se obtiene a partir de los balances de veintidos países de la región (América del Sur, América Central, México y el Caribe);

b. Los balances de seis subregiones, producto de la zonificación de los países, y

c. Los balances individuales de los países para varios años de la década del setenta. Estos han sido elaborados en forma homogénea siguiendo la metodología OLADE y con una unidad de medida común, la tonelada de petróleo equivalente - TEP.

Dentro del consumo total de energía, los balances contemplan los siguientes destinos: consumo de los sectores residencial, comercial y público, industrial, transporte, agropecuario, consumo propio del sector energético, pérdidas de los centros de transformación, pérdidas de transporte, distribución, almacenamiento, consumo no identificado y ajustes. Bajo este esquema se presenta inicialmente el análisis para América Latina y posteriormente se analiza la estructura del consumo subregionalmente. Para los principales sectores; el industrial, transporte y residencial, comercial y público y se analizan los consumos por producto.

2. **Análisis**

2.1. Destino de la Oferta Interna Bruta 1/ - América Latina - 1978.

CUADRO Nº 1

DESTINO	OIB (TEP x 10^3)	(%)
Sector Industrial	83.656	24.8
Sector Transporte	75.133	22.3
Sector Residencial, Comercial y Público	68.033	20.2
Pérdidas de Transformación	47.340	14.0
Consumo propio Sector Energético	26.182	7.8
Sector Agropecuario	9.704	2.9
Pérdidas de transporte, distribución y almacenamiento	11.869	3.5
Otros 2/	15.559	4.6
TOTAL	337.486	100.0

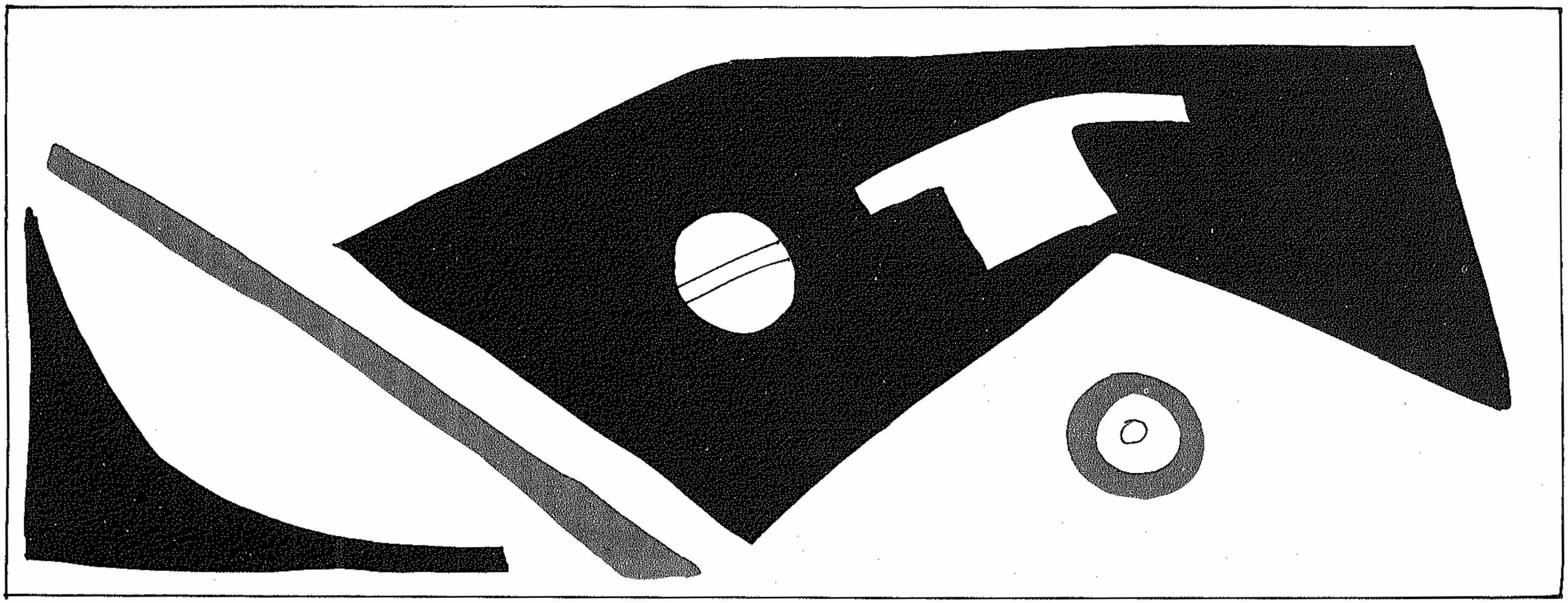
1/ OIB = Es la cantidad energía primaria y secundaria que se pone a disposición de un país o región para ser sometida a los procesos de transformación, distribución y consumo.

2/ Incluye: Consumos no identificados, no energéticos y ajustes.

2.4 CONSUMO FINAL ENERGETICO POR SECTORES - SUBREGIONES - 1978.

SECTOR	MEXICO TEP x 10³	MEXICO %	AMERICA CENTRAL TEP x 10³	AMERICA CENTRAL %	CARIBE TEP x 10³	CARIBE %	ANDINA TEP x 10³	ANDINA %
Residencial, comercial, público	17065	25.1	5886	8.7	2532	3.7	14747	21.7
Transporte	18610	24.4	2166	2.8	2813	3.7	18396	24.2
Agropecuario	2221	22.9	235	2.4	54	0.6	903	9.3
Industrial	18848	22.5	2614	3.1	4584	5.5	17468	20.9
Consumo no identificado	342		28				149	
TOTAL	57086		10929		8956		51663	

SECTOR	SUR ORIENTAL TEP x 10³	SUR ORIENTAL %	ARGENTINA TEP x 10³	ARGENTINA %	URUGUAY TEP x 10³	URUGUAY %	BRASIL TEP x 10³	BRASIL %	AMERICA LATINA TEP x 10³	AMERICA LATINA %
Residencial, comercial, público	6976	10.3	6173	9.1	803	1.2	20827	30.6	68033	100.0
Transporte	10057	13.2	9500	12.5	557	0.7	24111	31.7	76153	100.0
Agropecuario	1078	11.1	1078	11.1			5223	53.8	9714	100.0
Industrial	8818	10.5	8133	9.7	685	0.8	31324	37.4	83656	100.0
Consumo no identificado	393		379						815	
TOTAL	27322		25263				81395		237351	



2.2. Destino de la Oferta Interna Bruta - Subregiones - 1978.

CUADRO Nº 2

	OIB TEP x 10³	%
América Latina	337.486	100
México	88.232	26.1
América Central	12.613	3.7
Caribe	14.650	4.3
Andina	76.827	22.8
Sur-Oriental:		
* Argentina		11.4
* Uruguay		0.8
Brasil	104.008	30.8

2.3 Consumo Final Energético por Sectores - América Latina, 1978.

CUADRO Nº 3

	TEP x 10³	(%)
Consumo final energético	237.351	100.0
Residencial, Comercial y Público	68.033	28.7
Transporte	75.133	31.7
Agropecuario	9.714	4.1
Industrial	83.656	35.2
Consumo no identificado	815	0.3

2.5 Consumo Final de Energía por Productos - América Latina, 1978.

CUADRO Nº 5

PRODUCTOS	TEP x 10³	%
Leña y Carbón Vegetal	52.069	21.9
Gasolina	42.131	17.8
Diesel	37.049	15.6
Combustibles Pesados	32.099	13.5
Electricidad	20.455	8.6
Gas	13.571	5.7
Kerosene y Turbocombustibles	10.568	4.5
Gas Licuado	7.881	3.3
Carbón Mineral y Coque	7.329	3.1
Otros combustibles vegetales y animales	7.049	3.0
Gas natural (asociado y libre)	5.627	2.4
Otros combustibles energéticos	1.523	0.6
TOTAL	**237.351**	**100.0**

2.6 Consumo Energético de Leña y Carbón Vegetal - Subregiones, 1978.

CUADRO Nº 6

	tep x 10³	(%)
América Latina	52.069	100.0
México	11.954	23.0
América Central	5.637	10.8
Caribe	2.245	4.3
Andina	8.057	15.5
Sur-Oriental	941	1.8
Brasil	23.235	44.6

2.7 Consumo de Gasolina por Subregiones - 1978

CUADRO Nº 7

	TEP x 10^3	(%)
América Latina	42.131	
México	11.192	26.6
América Central	1.200	2.8
Caribe	1.099	2.6
Andina	13.352	31.7
*Venezuela	6.249	14.8
*Resto de Países	7.103	16.9
Sur-Oriental	4.871	11.6
*Argentina	4.656	11.1
*Uruguay	215	0.5
Brasil	10.417	24.7

2.8 Consumo de Electricidad por Subregiones - 1978

CUADRO Nº 8

	TEP x 10^3	(%)
América Latina	20.455	100.0
México	3.876	18.9
América Central	618	3.0
Caribe	375	1.8
Andina	4.509	22.0
Sur-Oriental	2.618	12.8
*Argentina	2.402	11.7
*Uruguay	216	1.1
Brasil	8.459	41.4

2.9 Consumo de Combustibles Pesados por Subregiones - 1978.

CUADRO Nº 9

	TEP x 10^3	(%)
América Latina	32.099	
México	6.109	19.0
América Central	682	2.1
Caribe	2.374	7.4
Andina	4.738	14.8
Sur-Oriental	4.002	12.5
*Argentina	3.573	11.1
*Uruguay	429	1.4
Brasil	14.194	44.2

2.10 Consumo de Diesel por Subregiones - 1978

CUADRO Nº 10

	TEP x 10^3	(%)
América Latina	37.049	
México	8.985	24.3
América Central	1.521	4.1
Caribe	830	2.2
Andina	65.521	17.7
Sur-Oriental	6.099	16.6
*Argentina	5.668	15.4
*Uruguay	431	1.2
Brasil	13.062	35.3

2.11 Estructura del Consumo Final Energético por Sectores y por Productos en América Latina en 1978.

CUADRO Nº 11

SECTOR		
Industrial	83.656	100.0
* Combustibles pesados	27.896	33.3
* Gas	16.031	19.2
* Biomasa	13.607	16.3
* Electricidad	10.833	12.9
* Coque y carbón mineral	7.064	8.4
* Otros hidrocarburos	8.225	9.8
Transporte	75.133	100.0
* Gasolina	41.531	55.3
* Diesel	24.353	32.4
* Kerosene y combustibles pesados	5.005	6.7
* Otros	4.246	5.7
Residencial, Comercial y Público	68.033	100.0
* Leña y carbón vegetal	41.411	60.9
* Gas	10.848	15.9
* Electricidad	9.006	13.2
* Hidrocarburos	6.342	9.3
* Otros	426	0.7

3. CONCLUSIONES

A continuación se plantean las conclusiones más importantes del análisis realizado.

3.1 Oferta Interna Bruta

(Cuadros N0º 1 - Nº 2)

— De un total disponible para la región de 337.486 TEP x 10^3 PARA 1978, la industria latinoamericana absorbió el 24.8%, el sector transporte el 22.3% y el sector residencial, comercial y público el 20.2.%.

— La conclusión anterior está fuertemente afectada por la altísima participación de tres países (Brasil 30.8%, México 26.1% y Argentina 11.4%) en la utilización de la oferta interna bruta, lo cual hace que solamente quede un 31.7% de la oferta para el resto de los países de la región.

— La región andina considerada en forma integrada, tiene una participación (22.8%) semejante a México y cercana a Brasil.

3.2 Consumo Final Energético

(Cuadros Nº 3 - Nº 4)

— El consumo final energético de la región 237.351 TEP x 10^3 se distribuye en forma parecida a la oferta interna bruta; esto es en forma más o menos equilibrada entre los sectores industrial 35.2% transporte 31.7% y residencial, comercial y público 28.7%.

— Nuevamente tres países concentran el consumo final energético en América Latina (Brasil, México y Argentina).

— En el sector industrial estos países absorben el 69.6%, en el sector transporte concentran el 68.6% y en el sector residencial, comercial y público el 64.8%.

— La región andina considerada en forma integrada, se mueve en forma muy semejante a México y Brasil y tiene una participación del 20.9% en el sector industrial, 24.2% en el sector transporte y 21.7% en el sector residencial, comercial y público.

3.3 Consumo Final de Energía por Productos.

(Cuadros Nº 5 - Nº 6 - Nº 7 - Nº 8 - Nº 9 - Nº 10)

— Del consumo final de energía en América Latina, sorprendentemente para algunos, la leña y el carbón vegetal tiene la mayor participación en el consumo 21.9%, seguido por la gasolina 17.8%, el diesel 15.6%, los combustibles pesados 13,5% y la electricidad el 8.6%.

— Los derivados del petróleo considerados en conjunto suministran el 54.7% de los combustibles utilizados.

— Brasil es el primer consumidor de leña en América Latina 44.6% (23.235 TEP x 10^3).

— México es el segundo consumidor de leña en América Latina 23% (11.954 TEP x 10^3).

— En Haití la leña y el carbón vegetal aportan el 69.3% de la energía utilizada en el consumo final total.

— Existen seis países más en donde la biomasa excede el 50% del consumo final energético: Grenada, Honduras, El Salvador, Guatemala, Nicaragua y República Dominicana.

— México es el primer consumidor de gasolina en América Latina 26.6%, seguido por Brasil 24.7% y Venezuela 14.8%.

— Venezuela es el primer consumidor per cápita de gasolina en América Latina 0.475 TEP/hab-año.

— Bràsil consume el 41.4% de la electricidad, seguido por México 18.9% y Argentina 11.7%.

— Brasil consume el 44.2% de los combustibles pesados, México el 19% y Argentina el 11.1%.

— Brasil consume el 35.3% del diesel, México el 24.3% y Argentina el 15.4%.

3.4 **Consumo Sectorial por Productos.**

(Cuadro N° 11)

— El sector industrial latinoamericano depende básicamente de los combustibles pesados 33.3%, el gas participa en un 19.2% **la biomasa** en un 16.3% y la electricidad en un 12.9%.

— El sector transporte depende en un 94.3% de los **derivados del petróleo** (gasolina 55.3%, diesel 32.4%, kerosene y combustibles pesados 6.7%).

— El sector residencial depende en un 60.9% de la **leña y el carbón vegetal**, el gas participa en un 15.9%, la electricidad en un 13.2% y los hidrocarburos en un 9.3%.

— En Brasil la leña aporta el 35% de la energía utilizada en el sector residencial.

3.5 **Generales**

— El transporte en América Latina es totalmente dependiente del petróleo.

— El sector residencial depende fundamentalmente de la **leña y el carbón vegetal.**

— El sector industrial es el más heterogéneo en cuanto a los combustibles utilizados.

ENERGY BULLETIN

21

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Latin American Energy Organization

JULY - AUGUST/1981

ENERGY BALANCES AS AN INSTRUMENT OF PLANNING olade ANALYSIS OF THE LATIN AMERICAN ENERGY BALANCE olade ANALYSIS OF CENTRAL AMERICAN ENERGY BALANCES olade ANALYSIS OF THE ANDEAN REGION ENERGY BALANCE olade STRUCTURE OF ENERGY CONSUMPTION IN LATIN AMERICA olade QUANTITATIVE ANALYSIS OF THE ROLE OF BIOMASS WITHIN ENERGY CONSUMPTION IN LATIN AMERICAN olade ESTIMATES OF FUTURE ENERGY DEMAND FOR LATIN AMERICA

STRUCTURE OF ENERGY CONSUMPTION IN LATIN AMERICA

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1. INTRODUCCION

In the present article, the energy consumption structure for Latin America is analyzed based on:

a. The 1978 consolidated regional balance, which was obtained from the balances of twenty-two countries from the region;

b. The balances of six subregions, the product of the zoning of the countries; and,

c. The individual balances of the countries for various years from the 1970's.

These were elaborated in a uniform manner following the OLADE methodology and with a common unit of measure, tons of oil equivalent-TOE.

Within the total energy consumption the balances consider the following uses: consumption by the residential, commercial and public; industrial; transportation; and agricultura livestock sectors; as well as transformation centers; transportation, distribution, and storage losses; unidentified consumption, and adjustments.

Using this scheme, a consumption analysis is presented for Latin America and its sub-regions. Within the principal sectors, (industrial, transportation, and residential, commercial and public), the consumption is broken down by products.

2. Analysis

2.1 Destination of the Gross Internal Supply 1/ Latin America - 1978.

TABLE 1

DESTINATION	GIS TOE x 10^3	(%)
Industrial Sector	83.656	24.8
Transportation Sector	75.133	22.3
Residential Commercial and Public	68.033	20.2
Transformation Losses	47.340	14.0
Energy Sector's Own Consumption	26.182	7.8
Agricultural/Livestock Sector	9.704	2.9
Transportation, Distribution and Storage Losses	11.869	3.5
Others 2/	15.559	4.6
TOTAL	**337.486**	**100.0**

1/ GIS = This is the quantity of primary and secondary energy that the country has available for the processes of transformation, distribution and consumption.

2/ INCLUDES: Unidentified and non-energy consumption and adjustments.

2.2 1978 Destination of the Gross Internal Supply by Sub-Regions.

TABLE 2

	GIS OIB TOE x 10^3	(%)
Latin America	337.486	100
Mexico	88.232	26.1
Central America	12.613	3.7
The Caribbean	14.650	4.3
The Andean Sub-region	76.827	22.8
The Southeastern Region		
*Argentina		11.4
		12.2
*Uruguay		0.8
Brazil	**104.008**	**30.8**

2.3 1978 Final Consumption by Sector for Latin America

TABLE 3

	TOE x 10^3	(%)
Final Energy Consumption	237.351	100.0
Residential, Commercial and Public	68.033	28.7
Transportation	75.133	31.7
Agricultura/Livestock	9.714	4.1
Industrial	83.656	35.2
Unidentified Consumption	815	0.3

2.5 1978 Final Energy Consumption by Products for Latin America

TABLE 5

PRODUCT	TOE x 10^3	(%)
Firewood and Charcoal	52.069	21.9
Gasoline	42.131	17.8
Heavy Fuels	37.049	15.6
Diesel	32.099	13.5
Electricity	20.455	8.6
Gas	13.571	5.7
Kerosene and Turbofuels	10.568	4.5
Liquid Gas	7.881	3.3
Coal and Coke	7.329	3.1
Other Plant and Animal Fuels	7.049	3.0
Natural Gas (associated and free)	5.627	2.4
Other Energy Fuels	1.523	0,6
TOTAL	**237.351**	**100.0**

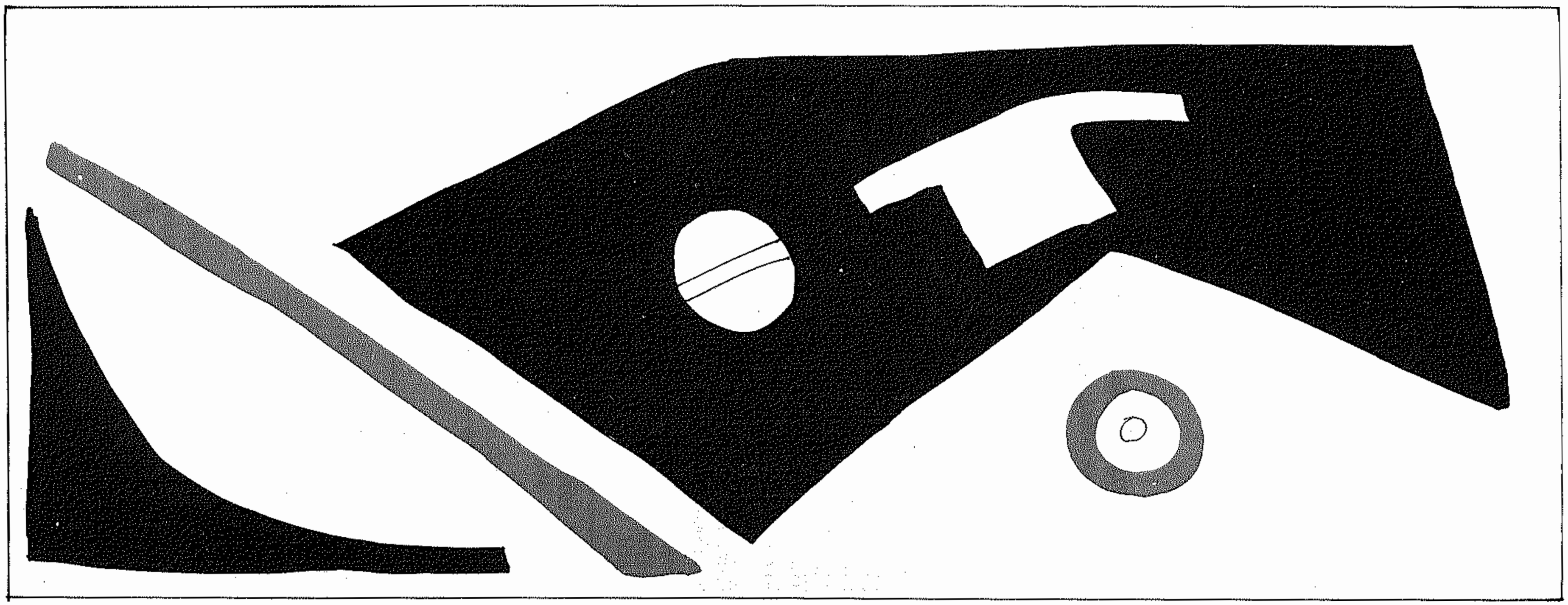
2.6 1978 Firewood and Charcoal Consumption by Sub-regions

TABLE 6

	TOE x 10^3	(%)
Latin America	52.069	100.0
Mexico	11.954	23.0
Central America	5.637	10.8
The Caribbean	2.245	4.3
The Andean Sub-region	8.057	15.5
The Southeastern Region	941	1.8
Brazil	23.235	44.6

FINAL CONSUMPTION BY SECTORS 1978
TOE x 10^3

SECTOR	MEXICO		CENTRAL AMERICA		CARIBBEAN		The Andean Subregion		The Southeastern Subregion		ARGENTINA		URUGUAY		BRAZIL		AMERICA LATINA	
	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%	TEP x 10^3	%
Residential	17065	25.1	5886	8.7	2532	3.7	14747	21.7	6976	10.3	6173	9.1	803	1.2	20827	30.6	68033	100.0
Transportation	18610	24.4	2166	2.8	2813	3.7	18396	24.2	10057	13.2	9500	12.5	557	0.7	24111	31.7	76153	100.0
Agricultural	2221	22.9	235	2.4	54	0.6	903	9.3	1078	11.1	1078	11.1			5223	53.8	9714	100.0
Industrial	18848	22.5	2614	3.1	4584	5.5	17468	20.9	8818	10.5	8133	9.7	685	0.8	31324	37.4	83656	100.0
Unidentified	342		28				149		393		379						815	
TOTAL	57086		10929		8956		51663		27322		25263				81395		237351	



2.7 1978 Gasoline Consumption by Sub-regions

TABLE Nº 7

	TOE x 10³	(%)
Latin America	42.131	
Mexico	11.192	26.6
Central America	1.200	2.8
The Caribbean	1.099	2.6
The Andean Region	13.352	31.7
Venezuela	6.249	14.8
Remaining Countries	7.103	16.9
Southeastern Region	4.871	11.6
*Argentina	4.656	11.1
*Uruguay	215	0.5
Brazil	10.417	24.7

2.9 1978 Electricity Consumption by Sub-regions

TABLE 9

	TOE x 10³	(%)
Latin America	20.455	100.0
Mexico	3.876	18.9
Central America	618	3.0
The Caribbean Sub-region	375	1.8
The Andean Sub-region	4.509	22.0
The Southeastern Sub-region	2.618	12.8
*Argentina	2.402	11.7
*Uruguay	216	1.1
Brazil	8.459	41.4

2.8 Per Capita Gasoline Consumption in Latin America

TABLE 8

	TOTAL FINAL GASOLINE CONSUMPTION.	PER CAPITA/TEP/HAB. TOE/INHAB
LATIN AMERICA	42.131	
MEXICO	11.192	0,167
CENTRAL AMERICA	1.200	0,058
COSTA RICA	164	0,076
EL SALVADOR	169	0,038
HONDURAS	107	0,031
GUATEMALA	317	0,048
NICARAGUA	185	0,077
PANAMA	258,3	0,142
THE CARIBBEAN	7,96	0,066
HAITI	51	0,011
JAMAICA	220	0,104
DOMINICAN R.	462	0,090
SURINAME	313	0,277
TRINIDAD & TOBAGO 1/	313	0,277
THE ANDEAN SUB-REGION	13.352	
BOLIVIA	407	0,070
COLOMBIA	3.294	0,132
CHILE	1.146	0,106
ECUADOR	1.036	0,139
PERU	1.220	0,072
VENEZUELA	6.249	0,474
THE SOUTHEASTERN SUB-REGION	4.871	0,167
ARGENTINA	4.656	0,176
URUGUAY	215	0,075
BRAZIL	10.417	0.089

1/ Año 1979.

2.10 1978 Heavy Fuels Consumption by Sub-regions

TABLE 10

	TOE x 10^3	(%)
Latin America	32.099	100
Mexico	6.109	19.0
Central America	682	2.1
Caribbean Sub-region	2.374	7.4
Andean Sub-region	4.738	14.8
Southeastern Sub-region	4.002	12.5
* Argentina	3.573	11.1
* Uruguay	429	1.4
Brazil	14.194	44.2

2.11 1978 Diesel Consumption by Sub-regions

TABLE 11

	TOE x 10^3	(%)
Latin America	37.049	100
Mexico	8.985	24.3
Central America	1.521	4.1
The Caribbean Sub-region	830	2.2
The Andean Sub-region	65.521	17.7
The Southeastern Sub-region	6.099	16.6
* Argentina	5.668	15.4
* Uruguay	431	1.2
Brazil	13.062	35.3

2.12 Structure of the Final Consumption by Sectors and Products in Latin America

TABLE 12

SECTOR	TOE x 10^3	(%)
Industrial	83.656	100.0
* Heavy Fuels	27.896	33.3
* Gas	16.031	19.2
Biomass	13.607	16.3
* Electricity	10.833	12.9
* Coke and Coal	7.064	8.4
* Other Hydrocarbons	8.225	9.8
	75.133	100.0
Transportation	75.133	100.0
* Gasoline	41.531	55.3
* Diesel	24.353	32.4
Kerosene and Heavy Fuels	5.005	6.7
Others	4.246	5.7
Residential, Commercial and Public	68.033	100.0
Firewood and Charcoal	41.411	60.9
* Gas	10.848	15.9
* Electricity	9.006	13.2
* Hydrocarbons	6.342	9.3
* Others	426	0.7

3. CONCLUSIONS

The most important conclusions of the analysis are presented below:

3.1 **Gross Internal Supply**

(Tables 1 and 2)

— In 1978, of the 337,486 TOE x 10^3 AVAILABLE to the region, industry absorbed 24.8%, transportation 22.3% and the residential, commercial and public sector 20.2%.

- The foregoing was strongly influenced by the very high participation of three countries (brazil 30.8%, Mexico 26.1%, and Argentina 11.4%) in the use of the gross internal supply, which meant only 31.7% of the supply was consumed by the remaining countries.

- The Andean sub-region as a whole had a participation (22.8%) similar to that of Mexico and Brazil.

3.2 **Final Energy Consumption**

(Tables 3 and 4)

- The distribution of the region's final energy consumption (237,351 TOE x 10^3) was similar to that of the gross internal supply; i.e., uniformly between the industrial (35.2%), transportation (31.7%) and residential, commercial and public sector (28.7%).

- Once again, the final energy consumption was concentrated in three countries (Brazil, Mexico and Argentina.)

- In the industrial sector, these countries absorbed 69.6% in the transportation sector 68.6%, and in the residential, commercial and public sector 64.8%.

- The Andean Sub-region, when considered as a whole, was very similar to Mexico and Brazil, with a participation of 20.9% in the industrial sector, 24.2% in the transportation sector, and 21.7% in the residential, commercial and public sector.

3.3 **Final Energy Consumption by Products**

(Tables 5, 6, 7, 8, 9, and 10)

- As surprising as it seems, within the Latin American final energy consumption, firewood and charcoal had the greatest participation; with 21.9%, followed by Gasoline (17.8%) diesel (15.6%), heavy fuels (13.5%), and electricity (8.6%).

- The oil derivatives, considered as a whole, supplied 54.7% of the fuels consumed.

- Brazil was the largest firewood consumer (23.235 TOE x 10^3 equal to 44.6%).

- Mexico was the second largest consumer of firewood, (11.954 TOE x 10^3 equal to 23%).

- In Haiti, firewood and charcoal account for 69.3% of the energy utilized in the total final consumption.

- There were six more countries where biomass exceeded 50% of the final energy consumption: Grenada, Honduras, El Salvador, Guatemala, Nicaragua and the Dominican Republic.

- Mexico was the largest gasoline consumer in Latin America with 26.6%, followed by Brazil (24.7%) and Venezuela (14.8%).

- Venezuela was the largest per capita consumer of gasoline with 0.475 TOE/inhabitant, followed by Trinidad and Tobago with 0.277 TOE/inhab., Argentina with 0.176 TOE/inhab. and Mexico with 0.167 TOE/inhab.

- Brazil consumed 41.4% of the electricity, followed by Mexico (18.9%) and Argentina (11.7%).

- Brazil consumed 44.2% of the heavy fuels, Mexico 19% and Argentina 11.1%.

- Brazil consumed 35.3% of the diesel, Mexico 24.3% and Argentina 15.4%.

3.4 **Sectorial Consumption by Products**

(Table 11)

— The Latin American industrial sector depended mainly on heavy fuels (33.3%), gasoline (19.2%), **biomass** (16.3%), and electricity (12.9%).

— The transportation sector depended on **oil derivatives** for 94.3% of its consumption (gasoline 55.3%, diesel 32.4%, kerosene and heavy fuels 6.7%).

— The residential sector depended on **firewood and charcoal**, for 60.9% of its consumption, on gas, for 15.9%, on electricity for 13.2% and on hydrocarbons for 9.3%.

— In Brazil, firewood participated with 35% of the residential consumption.

3.5 **General Conclusions**

— Transportation in Latin America was totally dependent on oil.

— The residential sector depended basically on firewood and charcoal.

— The industrial sector was the most heterogeneous with respect to the fuels it utilizes.

— The agricultura/livestock sector had a very low participation in the final energy consumption (4.1), which, among other things indicates the low level of mechanization in Latin American agriculture.