

ENERGY DOSSIER

02 **HONDURAS**



Prologue

This publication forms part of a series of monographs produced by the [Energy Division of the Infrastructure and Environment Department](#) of the Vice President of the Research Department at the [Inter-American Development Bank \(IDB\)](#) for regional public good. It is designed to increase the base of knowledge about the characteristics and functions of the Energy Sector in Latin American and Caribbean countries (LAC).

This is the first step in a project that will culminate in books that organize the countries according to the subregions in which the [IDB](#) groups the countries of LAC. The purpose of publishing each country separately is to obtain feedback from the descriptive analysis provided by local authorities, academics and the general reading public.

Comments and observations can be sent to the authors via email at: ramones@iadb.org

The sources of information are made explicit and the responsibility for their use and interpretation is exclusive to the authors of this monograph.

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We hope that this contribution to regional knowledge will be useful,

Ramón Espinasa

Lenin Balza

Carlos Hinestrosa

Carlos Sucre

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Banco Interamericano de Desarrollo
1300 New York Avenue, N.W.
Washington, DC 20577 USA

Introduction

This Energy Report is part of a series that includes all Latin American and Caribbean countries (LAC) that are members of the [Inter-American Development Bank \(IDB\)](#). The publications will be made in sequential order and grouped according to the geographic regions organized by the [IDB](#) in the following order: countries of the Central American Isthmus and the Dominican Republic (CID); countries of the Andes (CAN), countries of the Southern Cone (CSC); countries of the Caribbean (CCB).

The Report on each country has two components: the Energy Flows and the Description of Industrial Organization and Institutional Framework of the energy sector. For both components, the most recent description will be presented first and then the historic development will be discussed.

In the case of Energy flows, the information is gathered from the energy balances that the [International Energy Agency \(IEA\)](#) produces for almost all of the countries in the world. The use of a single source allows comparisons between countries and also a long-term analysis without methodological distortions. Schematic flows derived from this information and are used to describe the energy sector in each country during a specific period.

The most recent “photo” with information from the [IEA](#) is from 2009. Even though it is from a few years ago, we used this matrix in order to ensure consistency among countries. It reflects the current situation because energy matrixes change slowly. What follows is an analysis of the historic evolution of the matrix from 1971 to 2008. It is divided into four periods: 1971-74; 1984-87; 1999-02; and 2005-08.

The reason for using an average of four years as the break between periods is to neutralize the distorting impact that sudden natural, economic and political events could have in a given year. The unit of measurement for the energy flows is thousands of barrels of oil per day (kboe/day), a simple transformation of the unit of measurement used by the [IEA](#), equivalent to tons of oil per year.

For the description of the Industrial Organization and the Regulatory Framework, the work is more complex because they don't have a single source of common information. Even when all the countries are presented under a single descriptive framework, the work of gathering basic information was ad-hoc by country.

In addition to the public information from various agencies and organizations, legal texts, academic publications and press reports are referenced. Beyond a strict description of the sector, this report seeks to link information with the political evolution of a country, which makes the reading more enjoyable and provides a clear picture of institutional changes.

INDEX

1. Guide to acronyms	05
2. Brief description of the country	07
3. Current Energy Sector	08
a. 2009 Energy Matrix	09
b. Institutional organization of the energy sector.....	18
i. Description of the energy sector.....	19
ii. Policy formulation of the energy sector.....	21
iii. Regulator	23
iv. Electricity subsector	25
v. Hydrocarbon subsector.....	33
4. Historic development of the energy sector	34
a. Evolution of the energy matrix.....	35
i. 1971-1974	36
ii. 1984-1987	40
iii. 1999-2002	44
iv. 2005-2008.....	48
b. Institutional developments in the energy sector.....	52
i. Origin	54
ii. The state takes control of the energy sector	54
iii. Facing the crisis: important reforms	56
iv. 1998: Institutional changes.....	60
v. Oil price crisis: renewable fuels and energy.....	62

GUIDE TO ACRONYMS

CAP	Petroleum Management Commission
CEPAL	Economic Commission for Latin America and the Caribbean
CNE	National Energy Commission
CNSSP	National Public Services Supervisory Commission
EIA	United States Energy Information Administration
ENEE	National Electricity Company
GWh	Gigawatt Hour
IEA	International Energy Agency
Kboe/day	Thousand barrels of oil equivalent per day
kV	Kilovolt
kWh	Kilowatt Hour
LMSE	Framework Law for the Electricity Subsector
MW	Megawatt
OLADE	Latin American Energy Organization
PDVSA	Petroleum of Venezuela
PEO	Primary Energy Offering
PEP	Primary Energy Production
PLP	Oil Release Plan
SECOPT	Secretary of Communications, Public Works and Transportation
SERNA	Secretary of Environment and Natural Resources
SIC	Secretary of Industry and Commerce
SIN	National Interconnected System
SINAPH	Honduran National System of Protected Areas
SIPPI	Import Price Equality System
SOPTRAVI	Secretary of Public Works, Transportation and Housing
TEC	Total Energy Consumption
UEPER	Special Unit for Renewable Energy Projects
UNDP	United Nations Development Programme
UTP	Oil Technical Unit



Honduras

Honduras has the second largest land area of any country in Central America aside from Mexico. It has an area of 112,492 thousand kilometers squared. In 2009, its Gross Domestic Product (PIB) reached 14.2 billion current dollars, and its population was 7.88 million inhabitants according to the National Statistics Institute. These indicators situate the country as one of the smallest economies and the most inhabited in the region, which is why its DGD in per capita terms is US\$1,918, the second lowest in Central America and about half of the regional average in 2009.

Honduras is the Central American country with the highest proportion of households living in rural areas with a national average of 52%. According to the national poverty line, about 60% of Hondurans live in poverty (WB 2011) and the country ranks 106 out of the 169 countries that participated in measuring the Human Development Index. This rank is considered average¹ According to the [OLADE](#), coverage of households with access to electricity is 76% (2009). However, national measurements place it at 80%.

The energy sector in Honduras has been visibly affected by the current situation and finds itself in a transitional stage. Available information from official sources is limited. However, press releases and statements by the President of the country have demonstrated that the Executive is interested in creating a ministry of energy to manage Sector policies exclusively. Currently, the [Secretariat of Environment and Natural Resources \(SERNA\)](#) exercises these functions.

In terms of the electricity subsector, Honduras has an installed generation capacity of 1,610.3 MW that supplies the demand with maximum values of 1,245MW. Existing generation infrastructure consists of thermal generation plants mainly from diesel and hydroelectric sources, representing 66.3% and 32.7% of installed capacity in 2010 respectively. In this same year, the national energy supply came from 45.5% hydraulic sources, and the rest was from thermal sources.

As for the hydrocarbon subsector, Honduras is a net importer of fossil fuels. The importing is done directly by national and transnational distribution companies that operate in the country. For example, the multinationals [Esso](#), [Shell](#) and [Chevron Texaco](#) control 46% of the gasoline and diesel import market, while the remaining 54% is operated by national companies like [Dippsa](#) and [Terra Group](#).

¹ Medium Human Development

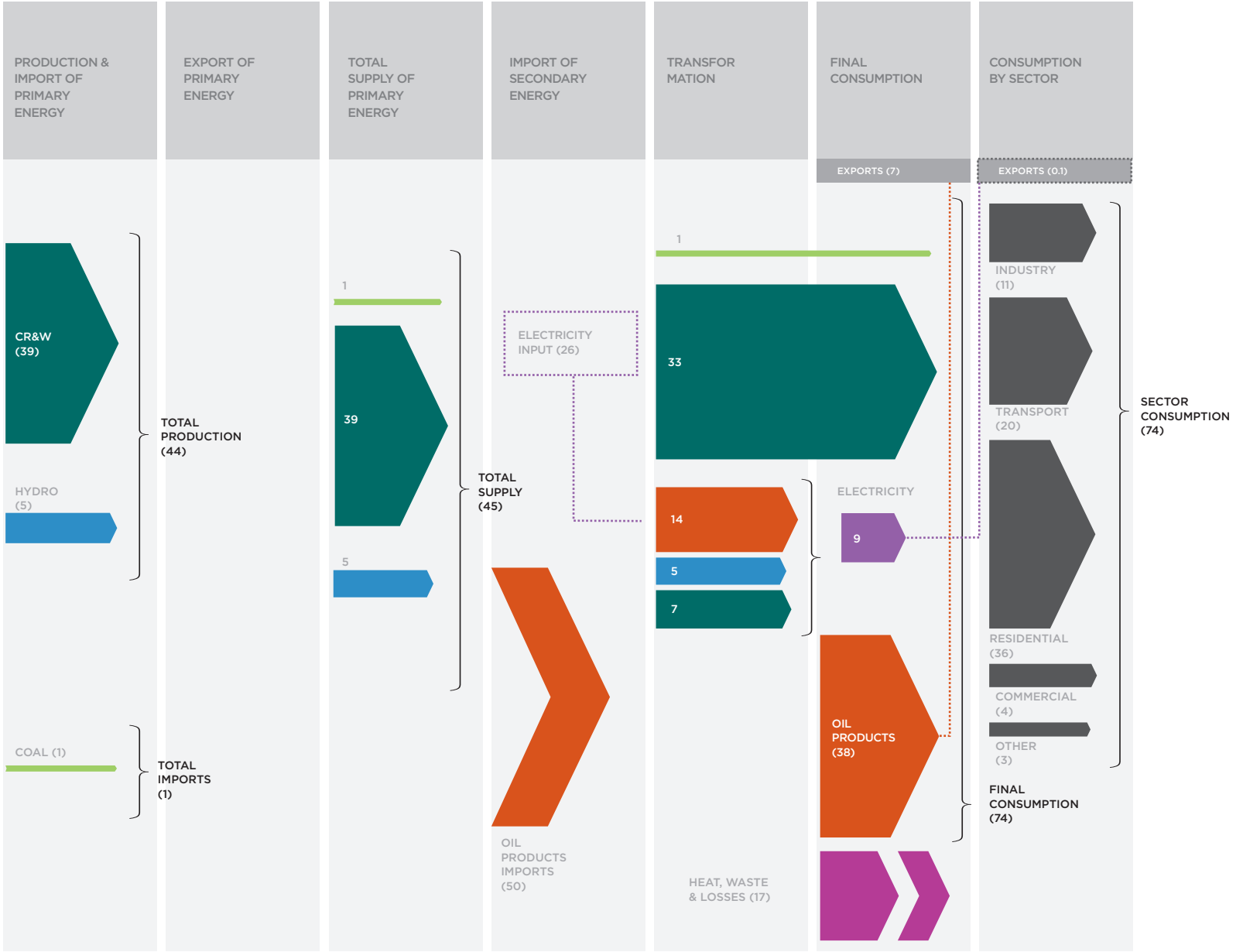
Current Energy Sector



Total Energy Consumption (TEC) in Honduras during 2009 reached 95 thousand barrels of petroleum equivalent per day (kboe/day) thus representing an increase of 4% over the simple average of the 2005-2008 period. This TEC is divided almost equally between domestically produced renewable energy sources and imported liquid fuels.

Energy Flow CURRENT

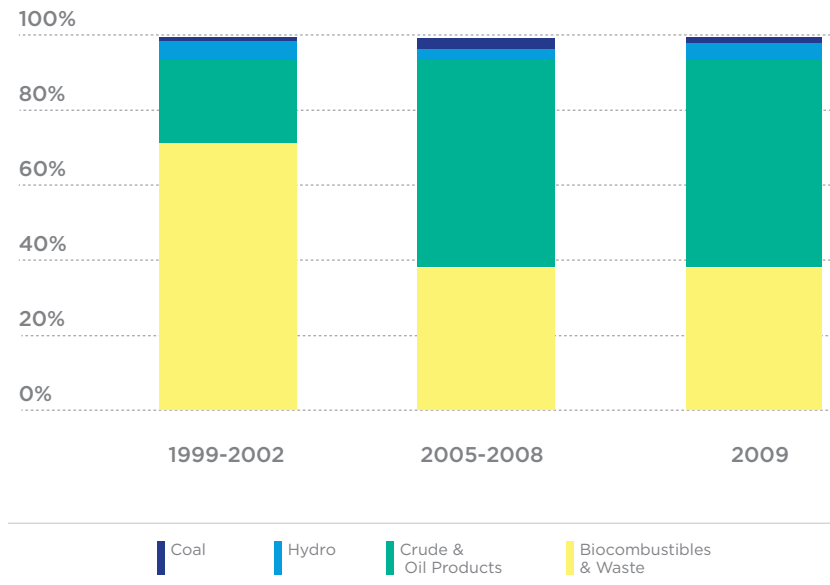
(kboe/day)



Source: Own Calculations based on IEA Energy World Balances

Of the 95 kboe/day supplied during 2009, 44,000 were renewable energy, nearly 46%. Of these renewable sources, 38,000 came from biomass (particularly firewood) and waste. This source of energy is the most important in the renewable energy sector, contributing 40% to TEC. Using data from [OLADE](#), we know that around 85% of this renewable supply comes from firewood, used mainly in rural zones, and the remaining 15% from sugar cane products. The renewable fuel and waste supply grew in 2009, and it was 8% over the average for the 2005-2008 period.

TOTAL ENERGY CONSUMPTION



Source: Own Calculations based on IEA Energy World Balances

Lagging behind other renewable energy sources is hydraulic energy, which contributed 5 kboe/day, around 3% of TEC in 2009. Around 88% of hydraulic production is controlled by the Honduran state and is divided into seven plants. The most important plant is Francisco Morazán, called El Cajón, with 300MW of installed capacity. It opened in 1985 and is located in the center of Honduras.

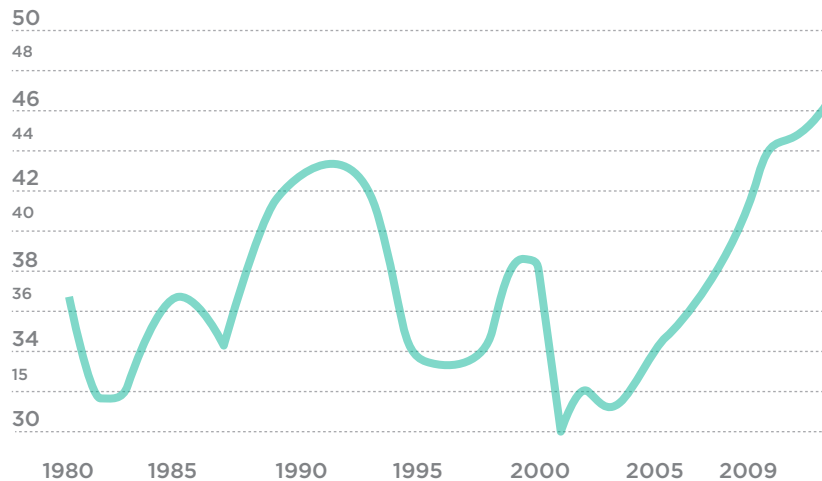
Liquid fuels, imported in their entirety, make up the other half of TEC for 2009 with 50 kboe/day. These products had around 53% participation in the energy supply in Honduras during that year. The import of liquid fuels increased in 2009 4% over the average levels between 2005 and 2008.

Domestic Production

In 2009 Honduras produced 44,000 barrels of petroleum equivalent per day in primary energy. By far the most important source in the Production of Primary Energy (PEP) was renewable fuels and wastes, with 89%. The dominance of this energy source is similar to other Central American countries with a similar per capita income to Honduras. In second, and far behind in importance in primary production, is hydraulic energy with the remaining 11%. The 2009 PEP registered an increase of 11% over the simple average between the 2005-2008 period.

PRIMARY ENERGY CONSUMPTION

Thousand barrels of oil equivalent per day (kboe/day)



Source: Own Calculations based on IEA Energy World Balances

Commercial balance of primary energy

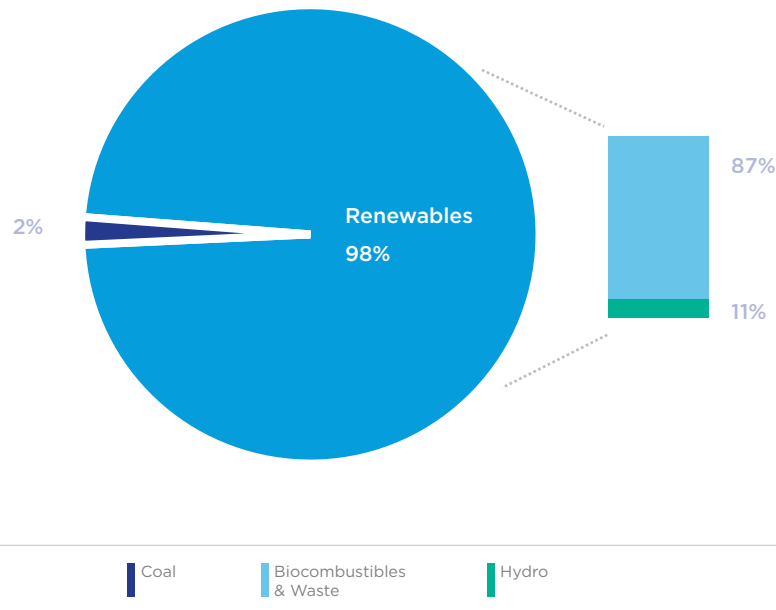
To meet its primary energy needs, Honduras made small coal imports, mainly from the United States and Canada. These totaled only 1,000 barrels of petroleum equivalent per day. During the 2005-2008 period, these imports averaged 2 kboe/day, which represented a notable drop in 2009. Honduras, following its historic pattern, did not export primary energy in 2009.

Internal primary energy supply

Primary Energy Supply (OEP) in Honduras during 2009 destined to the transformation of secondary energy, to final consumption of economic sectors and to energy sector consumption reached 45 kboe/day at the end of 2009.

Renewable energy had an absolutely dominant position in the primary energy offering in Honduras, accounting for about 98% in 2009. Among these, the importance of renewable fuels and waste is clear given that these sources make up 87% of the OEP. Knowing that these fuels are 85% firewood, it is clear that the use of wood as an energy source in Honduras is of the highest importance.

PRIMARY ENERGY SUPPLY



Source: Own Calculations based on IEA Energy World Balances

Electricity

Installed capacity

At the end of 2009, Honduras had an installed electricity generation capacity of 1,697 MW, of which 52.4% were thermoelectric plants operated with liquid fuels. The installed capacity for electricity generation from renewable fuels reached 47.6% (hydroelectric 47.5% and other renewables 0.1%).

Installed Capacity	2000	2005	2009
Total Renewables	48	34	36
Hydroelectric	48	30	31
Non-hydroelectric	0	4	5
Thermoelectric	52	66	64
Total	100	100	100

Source: U.S. EIA

Installed capacity built over the last decade increased 62%, mainly due to the increase in generation capacity from liquid fuels. This capacity has more than doubled since 2000, while the expansion of installed hydropower was 20%.

Electricity generation input

Honduras allocated 26 kboe/day to electricity generation, using primary sources and imported liquid fuels. Compared to the average electricity generation input between 2005 and 2008, this refers to an increase of 8.3%. Liquid fuels represented 53.8% of the input for electricity production with 14 kboe/day, maintaining average levels for this energy source between 2005 and 2008.

Honduras	2005-2008		2009	
Total inputs for generation (kboe/day)	24	100%	26	100%
Oil Products	14	58%	14	55%
Renewables	10	42%	12	46%

Source: Own Calculations based on IEA Energy World Balances
Renewables include hydro and combustibles renewables & waste.

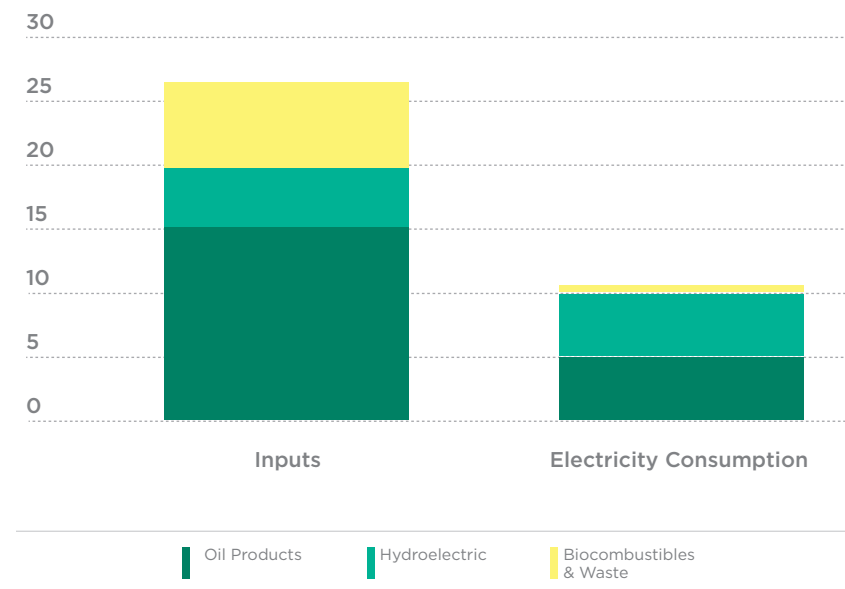
The rest of the input comes from renewable energy, with hydraulic energy contributing almost 5 kboe/day and liquid renewables the other 7 kboe/day. Hydropower participation increased around 30% over the 2005-2008 period, while renewable fuels expanded their contribution to this purpose nearly 16%. Thus, in 2009, renewable resources played a more important role in electricity generation, growing 20% over the average between 2005-2008.

Electricity matrix

Electricity consumption, which in 2009 reached 6,579 GWh, is fueled mostly by thermoelectric generation, which contributed 3,614 GWh (55% of the total). Hydraulic sources followed with 2,797 GWh (43%) and renewable fuels come in last place with 3% of the total, or 168 GWh of generated electricity.

Electricity distribution went mainly to the industrial sector, which consumed 53.7% of generated electricity in 2009. The residential sector came in second place, consuming 24.5% of available electricity. Commercial activity used 10.6% of electricity, the same as other sectors of the Honduran economy.

ELECTRICITY MATRIX (KBOE/DAY)



Source: Own Calculations based on IEA Energy World Balances

Secondary balance and consumption

Secondary energy balance

As described above, liquid fuels represent 53% of total energy consumption in Honduras during 2009 with 50 kboe/day. All of the liquid combustibles consumed in Honduras are imported. According to the National Honduran Statistics Institute, these fuels are made up of a third fuel oil, for the thermogenerators, with diesel in second, followed closely by gasoline. It should be noted that the fuel imports increased 4% in 2009 over the 2005-2008 period.

During 2009 Honduras saw significant growth in liquid fuel exports. These averaged 3 kboe/day during 2005-2008, while in 2009 they were 8,000 barrels per day. Electricity imports also surged, moving from 10 kboe/day between 2005-2008 to 100 bep/d in 2009.

Final consumption by sector

The residential sector was by far the most important energy consumer with 36,000 of the 74 kboe/day used by the Honduran economy. This maintains the historically dominant pattern of the residential sector in energy consumption and represents a growth of 12.5% over the average between 2005-2008. Residential use was based on 86.3% biomass (essentially firewood) and waste, 10.4% from electricity and 3.3% from liquid fuels.

With a little more than half of residential energy consumption is the transportation sector that totaled 20 kboe/day and only consumed liquid fuels. This means that transportation has stayed in second place since 2005 and refers to the 11% growth over the 2005-2008 period.

Industry consumed 11 kboe/day - a drop of 15.4%- from diverse sources: 50.3% from liquid fuels, 19.7% from electricity, 18.3% from renewable sources and 11.7% from coal.

Finally, the commercial sector and other sectors consumed 4 kboe/day (81% electricity and 19% liquid fuels) and 3 kboe/day (100% liquid fuels), respectively. This represents the maintenance of the level of consumption in the commercial sector and a fall of 25% for other sectors from the average between 2005 and 2008.



Institutional Organization of the Energy Sector

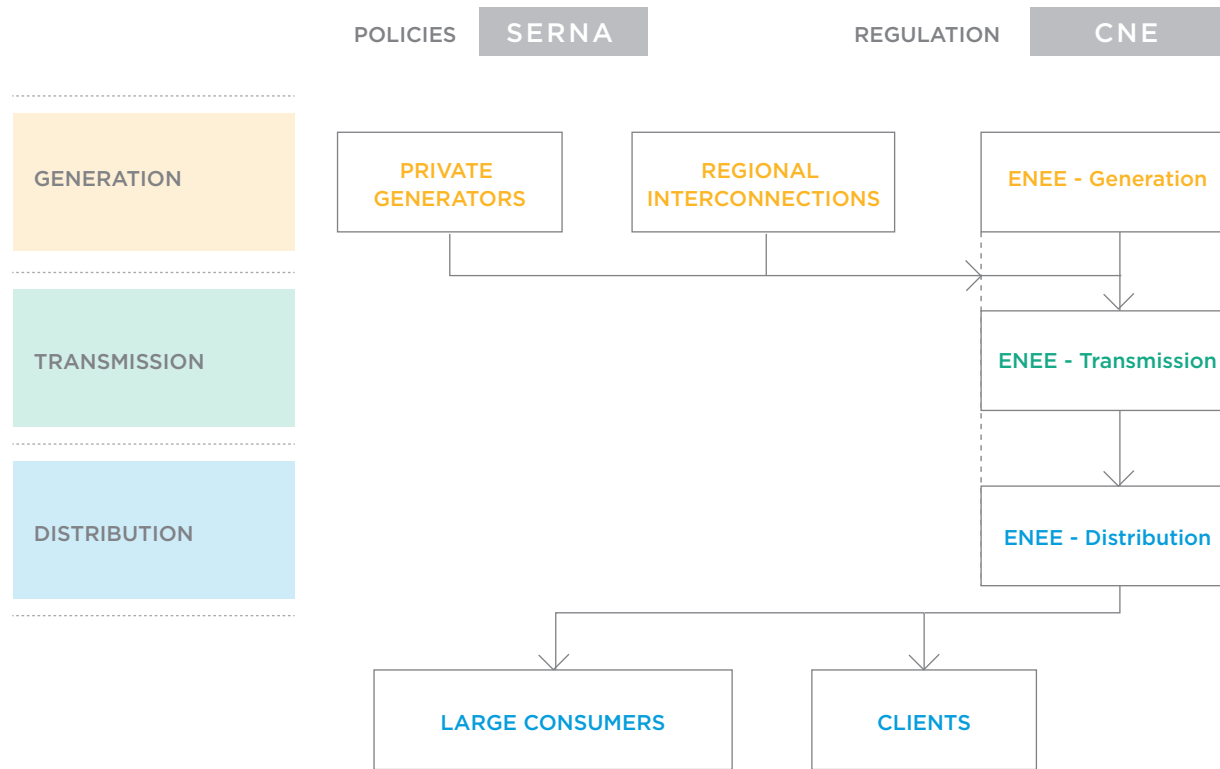
Energy Sector Description

The current structure of the energy sector in Honduras is the result of reforms and policies that date back to the 90s. The state has an important interference role in the sector, especially its regulatory role of electricity rates and prices of oil derivative products.

In the electricity subsector the process of liberalization undertaken in the mid-90s, which was successful in incorporating private capital in generation, failed to do the same in distribution, where the State had a monopoly. Therefore, currently the electricity subsector has a single public buyer who buys more than 50% of its energy needs from private generation companies. In turn, the private generation market is highly concentrated in two companies of Honduran capital that, in 2010 supplied, via long-term PPA contracts, 82.3% of the energy bought by the [ENEE](#).

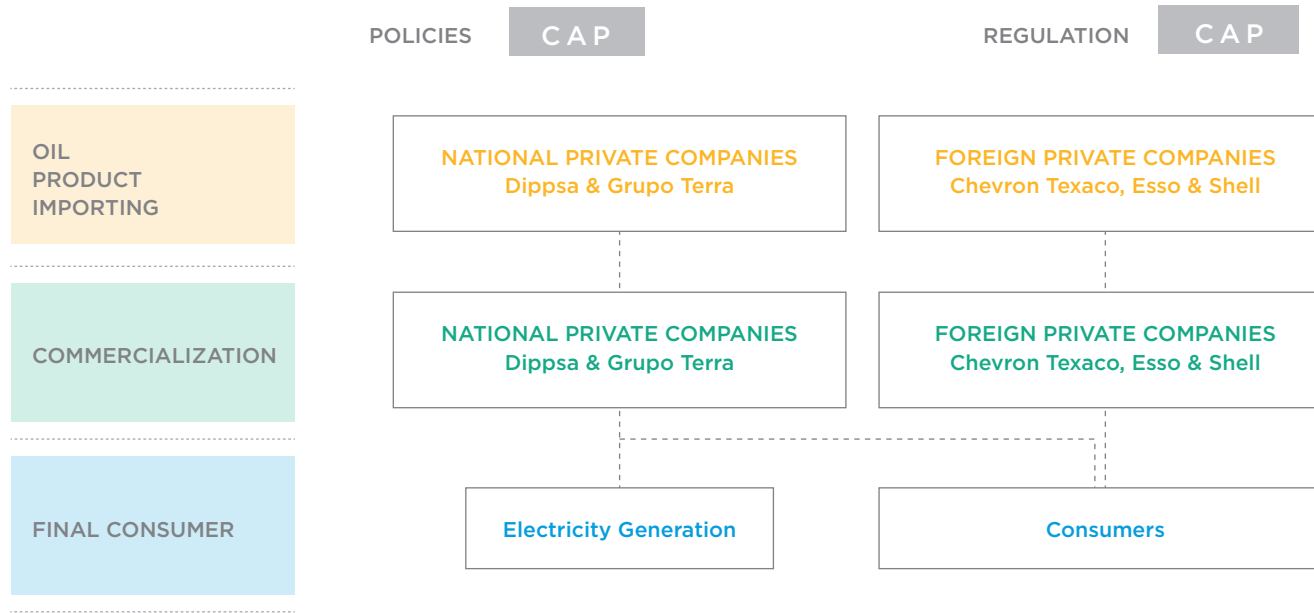
The hydrocarbon sector depends mainly on the petroleum derivative product imports that are used for private electricity generation and transportation. In this subsector, like in the private electricity generation subsector, there is a strong presence of private Honduran capital that controls up to 60% of derivative petroleum product imports and manages 40% of the service stations.

Institutional Structure of the Electricity Sub-Sector, 2011



Source: Author's work based on SERNA, CNE and regulatory framework

Institutional Structure of the Hydrocarbon Sub-Sector, 2011



Source: Author's work based on CAP and regulatory framework

Formulation of energy sector policies

According to current legislation, the formulation of energy sector policies in Honduras is divided into three agencies: the Energy Cabinet for electricity subsector policies, the [Secretariat of Environment and Natural Resources \(SERNA\)](#) that can also interfere in the electricity subsector and in the hydrocarbon subsector, and the Petroleum Management Commission (CAP) for the internal petroleum derivatives market.

The Energy Cabinet, which was created in the 1994 Framework Law of the Electricity Subsector, constitutes the top management authority responsible for electricity subsector policies. This authority, chaired by the President of the Republic, consists of six members who are secretaries of state from different offices.¹ The Cabinet will meet when convened by the president. Among its functions are:

- To order the preparation of comparative studies of the relative prices of different energies with the purpose of promoting the rational use of energy and preventing or correcting distortions.
- To establish evaluation criteria and procedures for management and development of multipurpose projects.
- To decide at the request of the CNE when to move forward with greater market liberalization.
- To approve expansion programs for the sector.
- To make rules for efficient electricity use.

¹ According to the Framework Law, the secretaries of state that form part of the Energy Cabinet are: Secretary of State in the Office of Communications, Public Works and Transportation; Secretary of State in the Ministry of Economy and Trade; Secretary of State in the Office of Housing and Public Credit; Secretary of State in the Office of Planning, Coordination and Budget; Secretary of State in the Office of Natural Resources and the Environment.

Probably due to the fact that the Energy Cabinet consists of very high-level authorities with tight schedules, this public body has not made substantive or permanent interference in the formulation of sector policies. Thus, its functions have been taken over by the [SERNA](#) and by the [National Electric Energy Company \(ENEE\)](#).

The [ENEE](#) and the [SERNA](#) take on the functions of policy planning in the sector through production, every two years, via the [ENEE](#) of expansion plans for the National Interconnected System (SIN) and the subsequent approval of this document by the [SERNA](#).²

The [Secretariat of Environment and Natural Resources \(SERNA\)](#) is the agency responsible for the formulation, coordination and evaluation of policies related to the protection of and taking advantage of water resources, renewable energy and everything related to hydroelectric and geothermal energy generation and transmission, such as mining activity and the exploration and exploitation of hydrocarbons in Honduras. It was created by Executive Decree 218 in 1996.

[SERNA](#) is responsible for formulation, coordination, implementation and evaluation policies related to:

- The protection and use of water resources.
- Matters relating to new and renewable energy sources.
- Transformation of hydropower and geothermal energy.

² Article 9 of the Framework Law of the Electricity Subsector and article 14 of its regulations establish provisions concerning the preparation, submission and approval of the Expansion Programs of the SIN.

- All matters related to mining.
- All matters related to hydrocarbon exploration and exploitation.

In the case of hydrocarbon subsector policies, specifically in relation to fuel supply chain activities, the agency in charge is the Administrative Commission of the Purchase, Sale and Marketing of Oil and its Derivatives (CAP). Among the political powers granted to this agency in the regulations are “carrying out studies and making recommendations, such as proposals to the Executive Power related to oil derivatives.”.

Regulator

The [National Energy Commission \(CNE\)](#) is the national institution in charge of regulating the Electricity Sector. The [CNE](#) is a decentralized agency of the Secretariat of Environment and Natural Resources ([SERNA](#)). The agency’s board is composed of five members who can hold office for a term of four years. They are named by the President of the Republic at the recommendation of the Secretary of the [SERNA](#).³

The [CNE](#) has operational independence and is financed by resources assigned by the General Budget of Revenues and Expenditures of the Republic of Honduras.

According to current legislation, among the responsibilities of the CNE include the following:

- To monitor compliance with the current rules and regulations of the electricity subsector.
- To propose regulations to the Executive that it considers appropriate for the operation of the sector.
- To establish bar prices and those for the final consumer.
- To set rates for calculating tariffs (based on the opportunity cost of capital).
- To present Expansion programs to the National Interconnected System to the Executive.
- To oversee energy purchase contracts by the [ENEE](#) (calculations based on the short-term marginal cost).
- To rule on sales contracts to energy distribution companies.
- To review applications to classify users as large consumers.
- To approve standards of quality, reliability and safety.
- To approve planning standards for distribution systems.
- To propose concessions for the use of renewable natural resources for electricity generation.
- To prevent anti-competitive actions among participants in each of the stages in the industry.
- To determine the terms and conditions of selection for awarding electricity distribution and generation concessions.

Additionally, the Secretariat of Public Works, Transportation and Housing (SOPTRAVI)⁴ has regulatory responsibilities in the electricity subsector given that it is in charge of regulating the activities related to the process of bidding for concessions.

³ They can be reelected for more than one consecutive period.

⁴ The Framework Law refers to the Secretariat of Communications, Public Works and Transportation (Secopt). However, this Secretariat is replaced by the Secretariat of Public Works, Transportation and Housing (Soptravi).

In the hydrocarbon subsector, the agency in charge of regulation is the Administrative Commission of the Purchase, Sale and Marketing of Oil and its Derivatives (CAP). CAP was created in 1983, and its regulations were published in September 2006. They establish that CAP will be coordinated by the Secretariat of the State in the Office of Industry and Marketing (SIC), which will represent the agency legally. Additionally, the secretariats of the State offices of Natural Resources and the Environment and Finances participate in the commission. The commission will be attached to the Sub-secretariat of Business Development and Domestic Trade of the SIC. The CAP will have an Executive Secretariat headed by the Executive Secretary who is named directly by the president of the Republic.

The primary objective of CAP according to its regulations is “to ensure the national supply of petroleum derivatives in conditions of quality, efficiency, economy and competitive practices.” Among the main contributions of the CAP are:

- To establish procedures, measures, provisions, criteria and mechanisms to follow hydrocarbon market activities.
- To decide on projects and issues related to the importation, transportation, refining, storage and distribution of petroleum and its derivatives.
- To authorize the necessary mechanisms to compensate consumers for the impact of changes in international fuel prices.
- To negotiate and settle agreements and contracts.
- To adopt contingency measures in case of emergencies (natural disasters, accidents, fuel shortages, social and economic conflicts).

The functions of the Executive Secretariat of CAP are:

- To coordinate the supply of oil and its derivatives.
- To conduct periodic site supervision of the facilities of agencies that participate in the oil derivatives supply chain, including reviewing the volume imported, sold, re-exported and the prices and quality of the products.
- To keep track of the agents in the marketing chain.
- To prepare statistics about oil and its derivatives and present periodic reports.
- To prepare reports that validate price changes according to the structure of costs and prices of oil and its derivatives.
- To coordinate the verification of the quality of petroleum products sold in the country.
- To propose projects to the CAP concerning legal instruments on the regulation of the oil industry.

Electricity Sector Institutional Matrix

Generation		Transmission		Distribution	
	Installed Capacity¹	Company	ENEE		
Hydroelectric	32.2%	Ownership	State	Companies	ENEE
Solar & Wind	n/a	Market	State monopoly		
Thermoelectric	65.8%		Operate the integrated national system	National coverage	81.27%
Geotérmica	n/a	Functions	Integrated operation		
Main State-Owned Company	ENEE (38%)		Only energy purchaser	Market	State monopoly
Private Participation	Allowed	Pricing policy	Regulated toll		
Requirements	Minimal			Private participation?	Allowed
Registrations	35 plants (62%)	Private participation?	Not allowed		
Vertical integration	In isolated systems			Municipalities and/or cooperatives	Allowed
		Retailers	n/a		
Fiscal Incentives		Large consumers	22	Concessions	Between 10-50 years
(a) Equipment	Without tariffs (renewables)			Subsidized users	Between 0 - 100 kWh Max subsidy 55%
(b) Fuels	No import tax				Between 101 - 300 kWh Max subsidy 20%
(c) Income & Other taxes waived for biofuels projects	Exoneración ISLR y otros impuestos para proyectos de biocombustibles.	Max demand	100 kV		
Pricing politics	Contracts last at least 5 years. Regulated price. P≤Short term MC	Max demand	Every 2 years, ENEE must present an expansion plan	Pricing policy	Regulated
Regulator		Comisión Nacional de Energía (CNE)			
Members of the board		5			
Appointment		Appointed by the Secretary of State based on threesomes proposed by 5 organisms			
Financing		From the General Budget of the Republic			

Source: CEPAL, Aresep, ICE, CNFL, Law 7200 modifications and regulations, Law 8345

Electricity subsector

The Framework Law of the Electricity Subsector and its regulations, enacted in 1994, are the main legal instruments in the electricity subsector in Honduras. The most relevant provisions of the two legal instruments can be summarized as:

Electricity generation:

- It allows the participation of the private sector via two modalities:
 - Direct sales to a large consumer or a distribution company. In these cases, the necessary lines must be built in order to do so; and
 - Sale of the product to the [ENEE](#). This case has two modes: i) if the sale is made on the initiative of the private company or mixed company, the [ENEE](#) will guarantee the purchase of production if it is sold at a price equal or less than the short-term marginal cost; and ii) if the purchase and sale is promoted by the [ENEE](#), the tariff and other issues will depend on the terms of the bidding contract.
- The short-term marginal cost is calculated annually or can be adjusted by formulas that include calculation parameters that reflect the formation of these costs.
- Power and energy sales are exempt from sales taxes.

Transmission:

- The State reserves management of the operation of the transmission system and the [Dispatch Center](#).
- Companies with transmission lines may allow the paid use of these by other electricity companies, including self-generators, co-generators and consumers.

.Distribution:

- To establish that electricity distribution should primarily be performed by private legal entities.
- Contracts signed by distribution companies along with generation companies cannot last for less than five years.
- Only allows distribution companies connected to the interconnected system to have generation activities when it is the most economic way to do it according to the [CNE](#).
- Vertical integration in isolated systems that are not interconnected is permitted.

Operating contracts:

- Operation contracts with Soptravi should be signed by the [SERNA](#) and should be approved by Congress. These contracts are required in order to operate.
- Operation contracts should last between 10 an 50 years.

Tariff system:

- The rates should reflect the marginal cost of supply and the Added Value of Distribution and should promote the efficient and economically equitable use of electric energy.
- All consumers, with the exception of residential consumers, should be charged between 100% and 120% percent of the total supply cost.
- Rates for residential consumers should be structured in the following manner according to the level of monthly accumulated consumption:
 - If exceeding 500 KWh charge 110% of the total cost
 - Between 301 and 500 KWh charge no less than 100% of the total cost.
 - Between 101 and 300 KWh charge no less than 80% of the total cost.
 - Less than 100 KWh charge 45% of the total cost.

Generation

Three main agencies participate in the Honduran power Generation sector:

The National Electric Energy Company (ENEE): state controlled and vertically integrated,⁵ manages around 37% of installed capacity, controls the majority of hydraulic potential and a marginal portion of thermal generation sources. The hydroelectric plant General Francisco Morazán (known also as El Cajón) is the main generation plant under the

⁵ Art. 51 Agreement No. 934-97. "(...) When distribution companies have exceptional distribution facilities they must keep separate accounts for each of the activities."

control of the ENEE. In 2010 it produced 26.8%⁶ (1.812,2 GWh) of the total energy used in the National Interconnected System.

Private sector: Manages around 35 generation plants and with these 63% of the national installed capacity (including 6% from biomass). Private generation in Honduras is concentrated in generation plants owned by national shareholders from the Terra Group (shareholders Enersa and EMCE) and the company Lufussa. The energy sold to the ENEE by these two companies in 2010 represented 82.3% (3.291,03 GWh) of the total and covered 48.7% of the energy used in the system.⁷

The main generation plant of the Terra Group/Enersa is called Choloma III, and it has an installed capacity of 281,7 MW and has been in operation since 2004 (100% since 2006). In the case of Lufussa, its main generation plant is called Pavana III, and it has an installed capacity of 267.4 MW. It began to operate in 2004. Both companies, which produce energy using bunker oil, signed contracts with the ENEE for the purchase and sale of energy for 12 years (expiring in 2016), starting with their entry into oil operation and with the potential for extension.

Regional interconnections: The Honduran electricity transmission network is connected with its neighbors – Nicaragua, Guatemala and El Salvador. In 2010 Honduras imported a total of 22.1 GWh of energy, of which 93% came from El Salvador.

Private sector participants have limited barriers for entry for participation in this market sector. New generation projects from thermal sources that use biofuels are exempt from the ISLR, among other taxes.⁸

⁶ Source ENEE.

⁷ Source ENEE.

⁸ In accordance with decree 144 of 2007.

Table 1. Distribution of Electricity Generation Capacity in Honduras, 2010

Sources	Public	Private	Total
Primary			
Hydro	28.8%	3.9%	32.7%
Geothermal	n/a	n/a	n/a
Wind	n/a	n/a	n/a
Secondary			
Thermal	7.7%	59.6%	67.3%
Total	36.6%	63.4%	100%

Source: CEPAL and own calculations

Generation companies can sell energy directly to large consumers, distributors or the [ENEE](#). In the case that large registered consumers don't exist and the state company is the only distributor in the country, the [ENEE](#) is the only purchase company in the energy system.

If the sale of energy is at the initiative of generation companies, then the purchase price by the [ENEE](#) cannot be greater than the short-term marginal cost, which is defined as the economic cost of supplying one kilowatt and an additional kilowatt-hour in a period of five years. If the sale is promoted by the [ENEE](#), the fixed rate is what results from the corresponding bidding process.⁹ Power sales contracts have a minimum duration of five years.

⁹ Art. 12 Decree 158-94.

Transmission

Electricity transmission and distribution operations in Honduras are below the regulations of the state company the [ENEE](#). Current legislation establishes that the operation of the transmission system and the dispatch center is the exclusive responsibility of the State. Participants in the electricity market that use the SIN should pay a toll.

The dispatch center is located in the flowchart of the [ENEE](#) four levels below the general manager. The dispatch center or dispatch unit is under the responsibility of the department of energy control that is also directed by the operations division that is under the technical sub-manager, who depends on the general manager.

Distribution

The [ENEE](#) is in charge of the electricity distribution monopoly. Its operation is divided into three geographic zones known as: the central region, which in 2010 had 45.8% of the clients who consumed 39.5% of distributed energy; the northern region with 42.5% of clients demanded 50.85% of the energy; and the coastal region had 11.7% of subscribed clients and consumed 9.7% of distributed electricity. In the northern region there are mainly high consumption, industrial and commercial subscribers while in the central region there are mainly residential clients. In 2010 [ENEE](#) calculated that the coverage of the interconnected system reached 81.27% of homes.

Table 8 shows the distribution of electricity sales, revenue from those sales and the number of subscribers according to the consumer sector.

Sector	Average energy per client						
	Sales (GWh)	Revenue (Thousand US\$)	Number of clients	Sales (kWh/client)	Revenue (US\$/client)	Average revenue (US\$/kWh)	Tariffs (US\$/kWh)*
Residential	2,171.89	260,251.86	1,158,446	1,874.80	224.66	0.120	0.119
Commercial	1,277.35	252,072.55	101,655	12,565.50	2,479.69	0.197	0.179
Industrial	557.95	95,198.97	1,652	337,657.80	57,611.96	0.170	0.169
High consumption	709.16	101,293.19	22	31,653,468.90	4,518,655.33	0.143	
Public lighting	124.72	18,891.08	312	399,755.30	60,548.33	0.151	0.179
Government	103.76	21,850.81	6,936	14,960.10	3,150.58	0.211	0.179
Autonomous entities	105.88	22,477.16	2,006	52,777.20	11,204.50	0.212	0.179
Municipal	13	9,641.16	1,988	24,533.00	4,850.71	0.198	0.179
International	29	2,181.66	3	4,429,010.00	727,219.52	0.164	0.179
Total	5,112.76	783,858.47	1,273,020	7274,016.24	615.75	0.174	

Source: ENEE and own calculations

*Data from OLADE. The same value is used for the commercial sector, public organisms, autonomous entities, government and public lighting
The average Exchange rate in 2010 was 18.8949 lempiras/US\$. IADB database.

Additionally, you can see the sales and the average revenue per subscriber, the revenue per KWH sold and the 2010 rates. Given that the rate structure establishes the legal framework and that cross subsidies favor residential consumers with a consumption of less than 300 KWH per month at the expense of other consumers, the state company took in an average of 0.12 US\$/KWh for energy sold to residential subscribers, whereas for business subscribers the average was 64% higher, reaching 0.197 US\$/KWh. According to data reported by [OLADE](#), the electricity rates before taxes in 2010 were 0.119 US\$/KWh for residential consu-

mers, 0.179 US\$/KWh for commercial clients and public authorities and 1.169 US\$/KWh for the industrial sector.

In 2010 Honduran electricity exports reached 13.29 GWh, of which it reported a net revenue of 2.18 US\$ million. 88.7% of the revenue from electricity exports was a product of sales to El Salvador, followed by Costa Rica with 9.8% and Panama with the remaining 1.4%. According to [CEPAL](#)¹⁰ statistics, Honduras was a net importer of electricity in 2010, presenting a negative commercial balance of 8.26 GWh.

10 CEPAL. Central America: Electricity Subsector Statistics 2010.

Price formation

Price formation in the Honduran electricity subsector depends mainly on the [National Electric Energy Company \(ENEE\)](#), which is the only market buyer and the only distributor. The Framework Law establishes the conditions that directly affect price formation because it avoids the direct transfer of the costs of generation, transmission and distribution to electricity rates.

The prices paid by the [ENEE](#) to private generators, which make up 60% of the total energy of the system, were established by long-term contracts that were signed by both parties. These contracts establish a fixed payment that allows them to compensate for available capacity and in which are included the investment costs, fixed costs and the usefulness for the operator, as well as a variable payment depending on the generation costs (mainly fuel inflation). In this case, it is important to note that the [ENEE](#) maintains contracts with [Enersa](#) and [Lufussa](#), which provided 48.7% of the total electricity used in the system and would provide 27.43% of the energy used in the following five years according to estimates by the [ENEE](#).¹¹

Like the rest of thermal generation contracts, the contracts with [Enersa](#) and [Lufussa](#) establish the Payment for Capacity (adjusted for demonstrated capacity and real availability factor) and a variable payment for energy produced called the Monthly Energy Payment.

For example, in the case of [Lufussa](#), the fixed component of the Pay by Capacity¹² called Fixed Charge by Capacity¹³ for the first month of operation was established at 11.27 US\$/KW per month.

This amount is a result of the sum of the Fixed Finance Charge of 7,894 US\$/KW per month (the value does not vary during the life of the contract) and the Fixed Operation and Maintenance charge of 3.38 US\$/KW per month (the value is indexed monthly for United States inflation). In the case of [Enersa](#), the fixed amount differs in some of its components but is essentially similar.

Their variable payment depends on the price offered by the National Dispatch Center company. This price, however, cannot be higher than the Maximum Energy Price established in the contract, which is indexed by United States inflation and by the fuel prices. In the calculation of marginal short-term costs in 2012, the Government estimated the price of generation for [Enersa](#) and [Lufussa](#) III at 138,09 and 140,26 US\$/MWh, respectively.

In the case of electricity generation using renewable sources, a fixed payment is established during the duration of the contract that is equal to the marginal short-term cost that was calculated for the year the contract was signed. In the words of the consultants who prepared the

¹¹ ENEE. Calculation for the Short-Term Marginal Cost in 2012. Published in November 2011.

¹² Pay by Capacity is composed of the Fixed Cost by Capacity adjusted by the Demonstrated Capacity and the Availability Factor.

¹³ Fixed Charge by Capacity is added to the Fixed Finance Charge and the Fixed Operation and Maintenance Charge.

report on Honduras related to the project [ARECA](#),¹⁴ “in the price structure introduced by the Framework Law, the short-term marginal cost is basically an economic signal to generators to promote supply.” The report indicated that “however, the current practice is that each year the [ENEE](#) calculates only the short-term marginal energy cost, which becomes a price signal for generators.”¹⁵

To determine the rate for end users, the [ENEE](#) should follow the rate document published on January 31, 2009 by the [CNE](#). These rates are in effect until 2013 and should be modified by automatic adjustment formulas that take into account fuel prices, inflation and existing generation infrastructure in 2008. [The National Electric Energy Company \(ENEE\)](#) revises monthly (on the 22nd of each month) possible fluctuations in variables of the formula to adjust rates and decides if they are applicable or not. The law establishes that these automatic adjustments should be applied if the calculated variation adjusts the rate by more than 5%. However, the rates are not automatically adjusted each time the value of adjustment exceeds this level.

14 The Accelerated Project for Investment in Renewable Energy in Central America and Panama (ARECA) is a collaboration between the PNUD, the GEF and the BCIE.

15 Central American Bank for Economic Integration. Comparative Analysis of the Regulatory Framework, Incentives and the Tariff Price System of Existing Prices for the purchase/generation of Electricity from Renewable Energy plants in Central America and Panama. 2011.

Electricity Sub-Sector Institutional Matrix, 2011

Import		Wholesale Market		Retail	
Private participation	Allowed	Private participation	Allowed	Pricing policy	Regulated
Market share	100%	Market share	100%	Subsidies	
Imports by products		Pricing policy	Regulated		
Gasoline, diesel and other products		Wholesale market purchasers		Gasolines, diesel and other products	
Percentage of total imports (2010)	47,1%	Service station	91% of gasolines 74% of diesel	Service stations total	420
Companies in market (share 2010)	Puma (52,8%) Chevron-Texaco (24%) Unopetrol / Grupo Terra (23%)	Commercial, industrial, agricultural clients	9% of gasolines 26% of diesel	Companies (# of stations - market share)	Chevron Texaco (83 - 19,8%) Puma (184 - 46,2%) Unopetrol / Grupo Terra (108 - 25,7%) Otras (35 - 8,33%)
Fuel Oil		Wholesales		Fuel Oil	
Percentage of total imports (2010)	29,6%	Gasolines, diesel and other products		Electricity generation	Lufussa Grupo Terra Otras
Companies in market (share 2010)	Unopetrol / Grupo Terra (82,3%) Lufussa (10,0%) Puma (7,7%)	Companies in market (share 2010)	Puma (40,9%) Chevron-Texaco (30,7%) Unopetrol / Grupo Terra (26,3%) Otros (2,1%)	LPG	
LPG		LPG		Sales	Homes
Percentage of total imports (2010)	23,30%	Companies in market	Gas del Caribe / Tomza Chevron-Texaco Zeta Gas		
Companies in market (share 2010)	Gas del Caribe / Tomza (95,3%) Chevron-Texaco (2,5%) Zeta Gas (2,2%)				
		Transport			
		Private participation	Allowed only for national companies		
		Pricing policy	Regulated		
		Honduras lacks a pipeline network for the transport of fuels transport, which therefore has to be carried out with trucks. Due to the legal restriction, multinational companies are not vertically integrated into this market segment.			
Regulator		Comisión Administradora del Petróleo (CAP)			
Appointed by the President of the Republic		Free appointment by the President of the Republic			
Financing		Ordinary Budget			

Budget: CDCP, SIC, ENE, CEPAL and current legislation

Hydrocarbon subsector

Honduras does not produce hydrocarbons; all consumption of oil derivatives is imported, stored and marketed by the private sector. The main government actor in this subsector is the Administrative Commission of the Purchase, Sales and Marketing of Oil and its Derivatives (CAP), that is the regulatory body for all the phases in the chain of oil derivatives distribution.

According to [CEPAL](#),¹⁶ 76.8% of liquid derivative imports are controlled by national companies (Dippsa¹⁷ and the [Terra Group](#)) and the remaining 23.2% by foreign companies (Esso and [Chevron Texaco](#)). The country has a storage capacity for 111.2 days of consumption of GLP, 41.7 days of gasoline and 61 days of diesel.

There are 422 service stations in Honduran territory, 111 of them from the Dippsa company, which is the main marketer of derivatives, and the [Terra Group](#) manages 107, followed by [Chevron-Texaco](#) with 92 service stations.

Price formation

The government, through the CAP, regulates the marketing prices of oil derivatives in Honduras. The price structure of oil derivatives is called the “System of Import Parity Prices,” and it was established based on Executive Decree PCM-02-2007 and the following modifi-

cations, the latest made on May 20, 2011.¹⁸ The price system is a table in which fixed values are established for all activities and stages of the derivatives marketing chain, once the product has arrived in Honduras, including the margin for the importer, the wholesaler and the retailer. Therefore, even though fuel prices are regulated, domestic imports vary according to the international market.

¹⁶ Economic Commission for Latin America and the Caribbean (CEPAL) • Sub-regional Headquarters in Mexico. Central America. Hydrocarbon Statistics, 2009.

¹⁷ Dippsa: Distributor of Petroleum Products S.A.

¹⁸ Agreement 482-2011 on May 20, 2011. Gaceta No 32.577. Secretariat of Industry and Commerce.

Historic Development of the Energy Sector



Evolution of the Energy Matrix 1971 - 2008

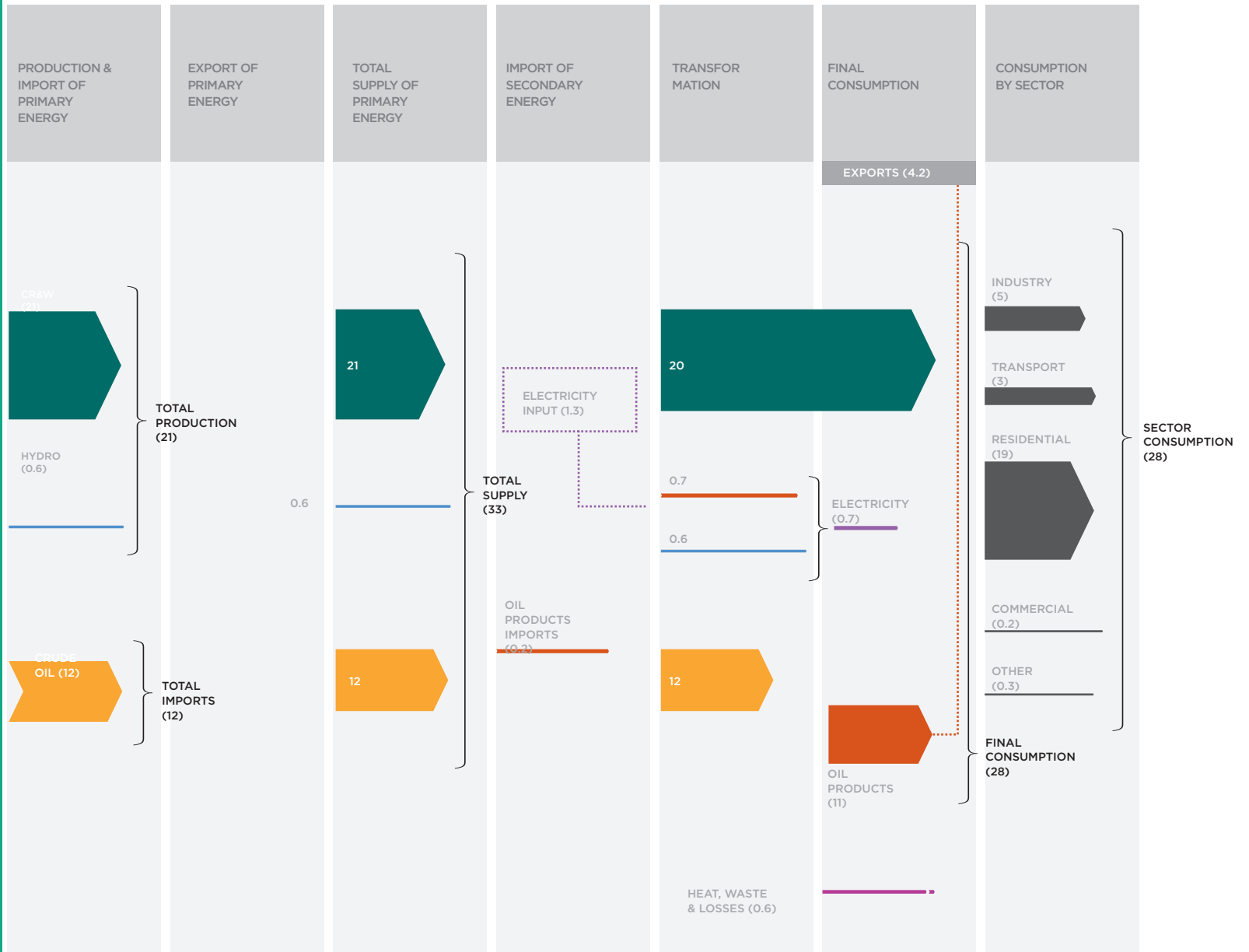


1971-1974

At the beginning of our analysis, Honduras was a country completely dependent on biofuels, mainly firewood for residential electricity consumption, as well as imported crude refined in Puerto Cortés for transportation demands.

Energy Flow 1971-1974

(kboe/day)



Total Energy Consumption

Biofuels were by far the most important energy source in Honduras at the beginning of our historic analysis, representing 62% of total energy consumption with 20.5 barrels of petroleum equivalent per day. This high proportion of consumption from renewable fuels and wastes can be explained by the low level of development that the Honduran economy had during this period and by the high proportion of rural population in the country. Rural consumption of Honduran energy has depended up until now on biofuels, mainly firewood. Crude oil imports, with 12 thousand barrels per day and 36% of total consumption, are processed in the Puerto Cortes refinery in the north of the country. In addition to the 12 thousand barrels, 200 barrels of derivative product equivalent per day were imported. Finally, between 1971 and 1974, 600 barrels of oil equivalent per day from hydraulic energy were offered. These were produced by the hydroelectric plants Cañaverel/Río Lindo, opened partially in 1964, and El Coyolar, which has been in service since 1965.

Electricity

Honduras divided its consumption for electricity generation between 57% liquid fuels and 43% hydropower. These sources totaled 1.29 kboe/day for this purpose, of which 0.69 kboe/day was produced that were consumed on average per year in electricity during this period. It is important to note that hydropower represented 72% of generation thanks to its high efficiency. Products went from 57% of input to 28% of generation.

Source	Inputs (kboe/day)	%	Electricity consumption (GWh)	Electricity consumption (kboe/day)	%
Oil products	0.72	57%	128.50	0.19	28%
Hydro	0.56	43%	326.25	0.50	72%
Total	1.29	100%	454.75	0.69	100%

Source: Own Calculations based on IEA Energy World Balances

Final consumption by sector

Reflecting the composition of Honduran energy offerings between 1971 and 1974, residential consumption stands out by far compared to other sectors. Residential energy use explains 68% of the total and was based 94.3% on biofuels – due to high levels of rural population during this period. Oil derivatives and electricity totaled 4.3% and 1.4% of residential consumption. Industry used 18% of total energy, 52% as renewable fuels (in particular due to the consumption of sugar plants) and 40.8% came from derivative products and 7% from electricity. Finally, transportation, 12% of final consumption, used only liquid fuels.

Consumption by sectors	Industry	Transport	Residential	Commercial	Others
Oil products	40.8	100	4.3	100.0	80.5
Biocombustibles	52.1	0	94.3	0.0	0
Electricity	7.0	0	1.4	0.0	19.5
Total	100%	100%	100%	100%	100%

Source: Own Calculations based on IEA Energy World Balances



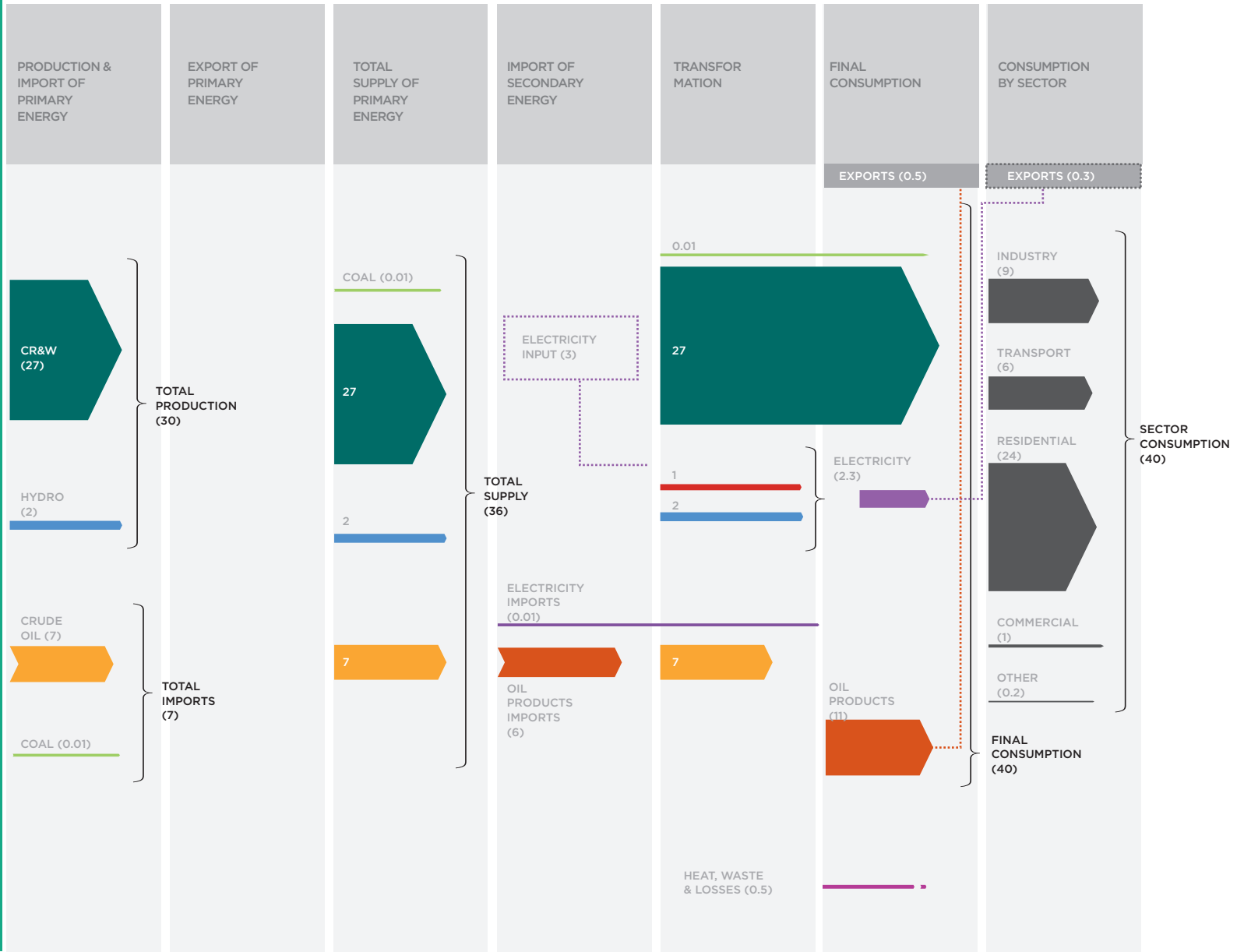
1984-1987

In the decade between our first analytical period and this one, the Honduran economy maintained its reliance on biofuels, while noting an increase in hydropower production. The refining capacity of Puerto Cortes was reduced and thus the country started to import many more derivative products than before. Consumption patterns changed slightly with a growth in industrial energy use.

1984-1987

Energy Flow

(kboe/day)



Total Energy Consumption

After 28% growth, total Honduran energy consumption remained highly focused on biofuels, which with 27,000 of the 43 kboe/day consumed, represented almost 65% of the total. Crude oil imports fell from 12 to 7 thousand barrels per day, thus losing dominance in total primary energy consumption, falling from 36 to 16% during this decade. The decrease in imported crude was compensated for by an increase in imported derivative products. These grew from 0.2 kboe/day during the previous period to 6 kboe/day in this historic moment - 14% of final consumption.

Of note is the remarkable growth of hydropower. This source moved from 0.6 to 2,000 barrels of equivalent per day. The growth was mainly due to the completion of the Cañaveral/Río Lindo plant, the opening of El Nispero in 1982 and El Cajón in 1985. El Cajón is still the largest plant in the country with 300 MW of installed capacity. The incorporation of hydropower plants explains the 313% growth that this source registered over the previous period. Honduras also began to import small quantities of coal, averaging 10 barrels of equivalent per day between 1984 and 1987.

Electricity

Thanks to hydropower growth, this became the main source of input and the main electricity generator in Honduras. Hydropower met 83% of electricity consumption and 91% of generation. The rest of electricity came from liquid fuels and thermoelectric processes.

Source	Inputs (kboe/day)	%	Electricity consumption (GWh)	Electricity consumption (kboe/day)	%
Oil products	0.46	17%	126.25	0.18	9%
Hydro	2.31	83%	1,338.50	1.92	91%
Total	2.77	100%	1,464.75	2.10	100%

Source: Own Calculations based on IEA Energy World Balances

Final consumption by sector

During this period the residential sector had, by far, the highest consumption of the sectors of the Honduran economy with 60% of final consumption. Residential energy use was mainly composed of biofuels and wastes, which maintained their historic pattern and contributed 94% of the total. The remaining 6% was divided between liquid fuels and electricity. Industry and transportation were the sectors that followed, with a final consumption of 23% and 14% respectively. The first diversified its energy consumption, with renewable fuels contributing 51.6%, derivative products 37.4% and electricity the remaining 11%. Transportation consumed only liquid fuels.

Consumption by sectors	Industry	Transport	Residential	Commercial	Others
Oil products	37.4	100	3.6	59.0	100
Biocombustibles	51.6	0	94.0	0.0	0
Electricity	11.0	0	2.4	41.0	0
Total	100%	100%	100%	100%	100%

Source: Own Calculations based on IEA Energy World Balances

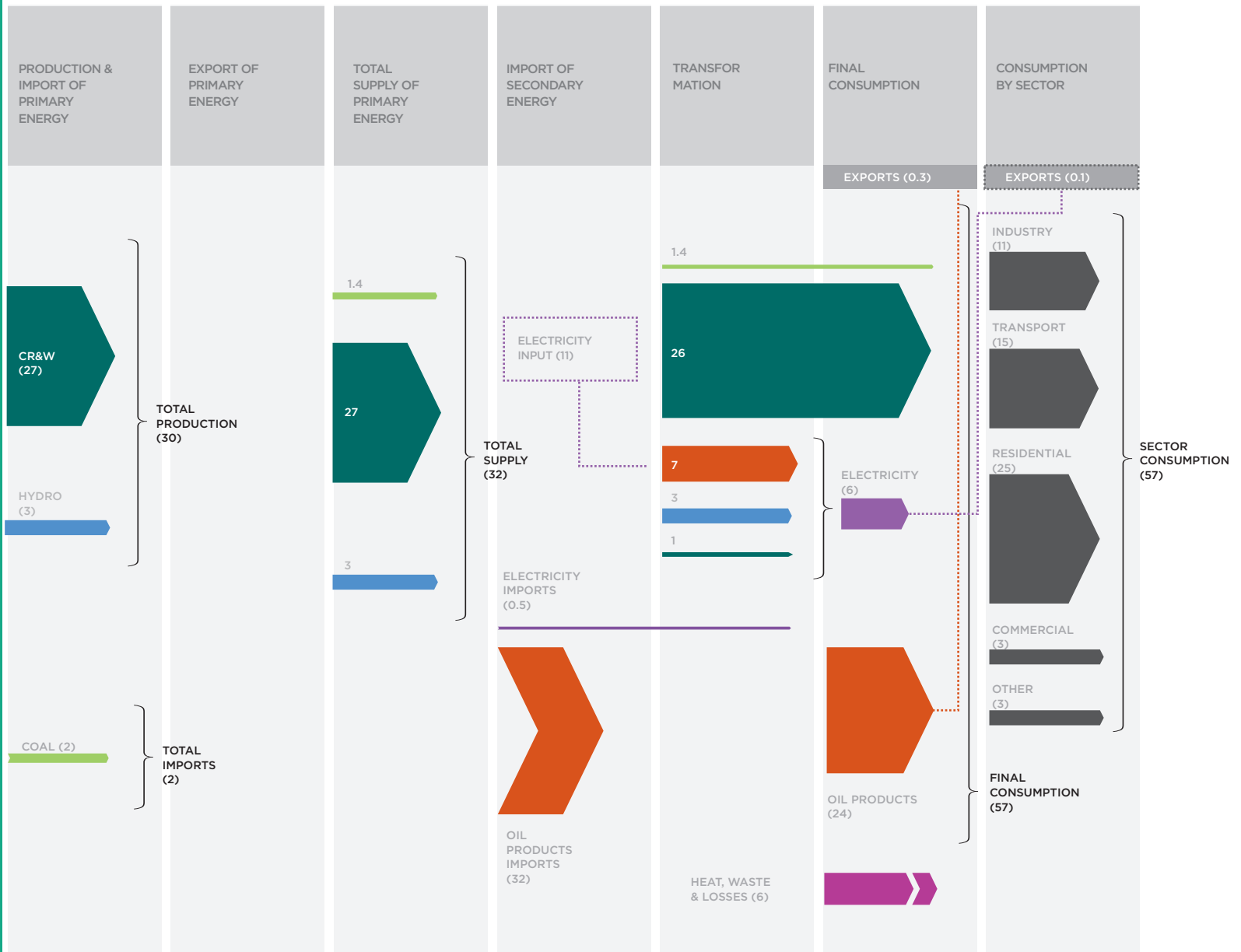


1999-2002

For the first time in our analysis, Honduras does not depend on biofuels as the main energy source. Imports of derivative products moved into first place, and thus energy consumption was divided almost evenly between these two sources. In the 12 years since the previous period, Honduras stopped importing crude oil, and residential consumption stayed constant while the industrial and transportation sectors grew in high proportions.

Energy Flow 1999-2002

(kboe/day)



Total Energy Consumption

In the 12 years since the end of the previous analytical period, Honduran energy consumption grew nearly 50%, driven mainly by a significant increase in hydrocarbon consumption. In 1993 Puerto Cortes refinery ceased operations and the country stopped importing crude oil. It then began to import derivative products to meet the hydrocarbon demand. These imports averaged 31.6 kboe/day, 50% of total energy consumption between 1999 and 2002 and five times more than the product imported between 1984 and 1987.

As detailed above, biofuels moved to second place with 26.9 kboe/day of consumption and 42% of the total. This consumption is, in fact, 2% less than the annual consumption between 1984 and 1987, thanks in part to the rural electrification and urbanization process in the country in the 90s. The hydraulic supply grew nearly 50% to 3.4 kboe/day,

thanks in part to the restoration of El Coyolar plant during the decade between the two analytical periods. Finally, it should be noted that coal imports during this period rose from 10 barrels of equivalent per day to 1,400 barrels of equivalent per day, a substantial growth that makes coal 2% of total energy consumption during this period.

Electricity

Input for electricity generation during this period averaged nearly 11 kboe/day. Of the 32 kboe/day of imported liquid fuels, 6.8 kboe/day were consumed to generate electricity, 63% of the total. Consumption of hydropower for electricity generation reached 3.42 kboe/day and the remaining 0.58 kboe/day came from biofuel consumption. From this consumption 5.63 kboe/day (3.766 GWh) were generated, of which 53% were from hydropower and 47% were from derivatives.

Source	Inputs (kboe/day)	%	Electricity consumption (GWh)	Electricity consumption (kboe/day)	%
Oil products	6.79	63%	1,782.00	2.66	47%
Hydro	3.42	32%	1,977.50	2.96	53%
Biocombustibles	0.58	5%	6.50	0.01	0%
Electricity	10.79	100%	3766.00	5.63	100%

Source: Own Calculations based on IEA Energy World Balances

Final Consumption by Sector

The residential sector remained the main consumer of energy with 45% of final consumption, made up of 86% biofuels, 9% electricity and 5% derivatives. Transportation came in second place, reaching 26% of the total, and was composed entirely of derivatives. It was followed by industrial consumption with 19% of the total. Industrial consumption was divided in 40% renewable fuels, 33% liquid fuels, 15% electricity and 13% imported coal.

Consumption by sectors	Industry	Transport	Residential	Commercial	Others
Coal	12.6	0	0	0	0
Oil products	33.1	100	4.8	44.4	100
Biocombustibles	39.9	0	86.0	0.0	0
Electricity	14.5	0	9.2	55.6	0
Total	100%	100%	100%	100%	100%

Source: Own Calculations based on IEA Energy World Balances

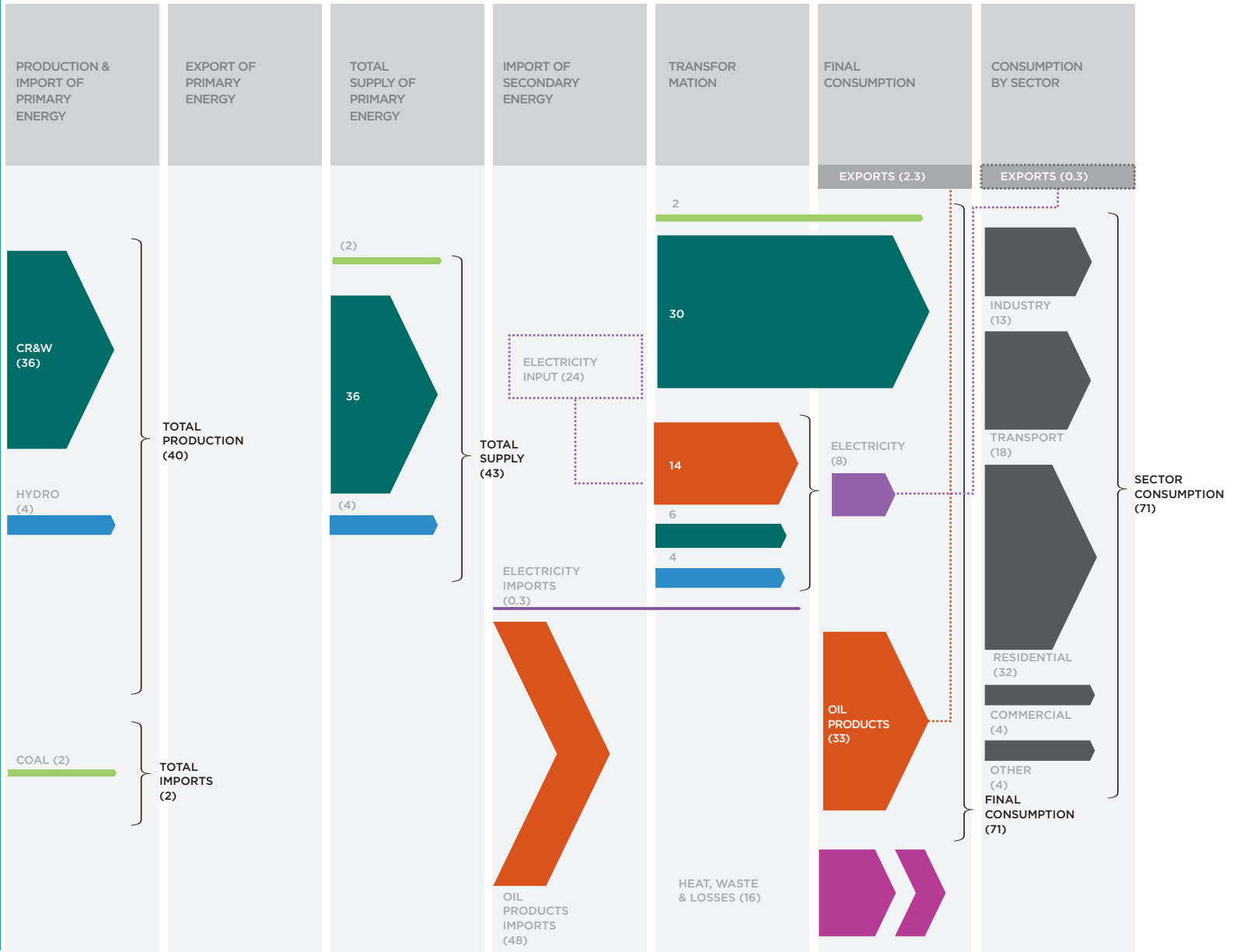


2005-2008

It is important to highlight that although general patterns in energy use remain stable at the end of the last decade in Honduras, the growth of consumption and a change in its composition by economic sector are remarkable. Between 2005 and 2008, 90 thousand barrels of equivalent per day were consumed, while this figure totaled 63 kboe/day between 1999 and 2002.

Energy Flow 2005-2008

(kboe/day)



Total Energy Consumption

Driven by a significant increase in imports, total consumption grew 42% in the three years between this analytical period and the last. Derivatives held its position as the most important energy source for Honduran consumption with 47.8 kboe/day and 53% of the total. Growth of this source since the previous period was 51%. Consumption of biofuels increased 35% to reach 36.3 kboe/day. However, renewable fuels fell 42% in consumption between 1999 and 2002 to 40% for this period. Moreover, hydraulic production grew 4% between periods with the incorporation of the Cuyamapa, Río Blanco, Cececapa, Yojoa, San Pedro Zacapa and La Nieve generators, all of which opened during this period or shortly before. Finally, all coal imports stayed at the same level, offering 2,000 barrels of equivalent per day, thus reaching 3% of total consumption.

Electricity

Consumption for electricity generation during this period totaled 24.24 kboe/day, more than double the total of the previous period. Of this consumption, liquid fuels totaled 60%. Changing the historic pattern, the second source for electricity generation was biofuels, with 6.19 kboe/day and 25%. Hydropower lagged behind in third place with 3.58 kboe/day and 15% of generation consumption. However, the hydraulic source demonstrated high efficiency, since it represented 34% of the 6,104.75 GWh that were consumed per year annually during this period. Liquid fuels represented 63%, while biofuels only reached 3%.

Source	Inputs (kboe/day)	%	Electricity consumption (GWh)	Electricity consumption (kboe/day)	%
Oil products	14.47	60%	3,868.75	5.13	63%
Hydro	3.58	15%	2,073.25	2.75	34%
Biocombustibles	6.19	25%	162.75	0.22	3%
Total	24.24	100%	6,104.75	8.10	100%

Source: Own Calculations based on IEA Energy World Balances

Final Consumption by Sector

Consumption by sector has also increased considerably during this period, reaching 71 kboe/day, a growth of 25%. Of this consumption, the residential sector had the highest percentage, reaching 45% and maintaining historic patterns: a high dependence on biomass consumption, with 87% of the total and consuming nearly 10% of its total as electricity. The transportation sector, using only derivatives, came in second place with 18 kboe/day and 25% of the total.

Industrial consumption, with 13 kboe/day, was made up of 48% oil derivatives, 18% coal, 18% biomass and 16% electricity, and represented 19% of the total. The commercial sector, 65% electricity and 35% derivatives, totaled 4 kboe/day – 5% of the total – while other sectors, using only derivatives, were the remaining 5% with 4 kboe/day.

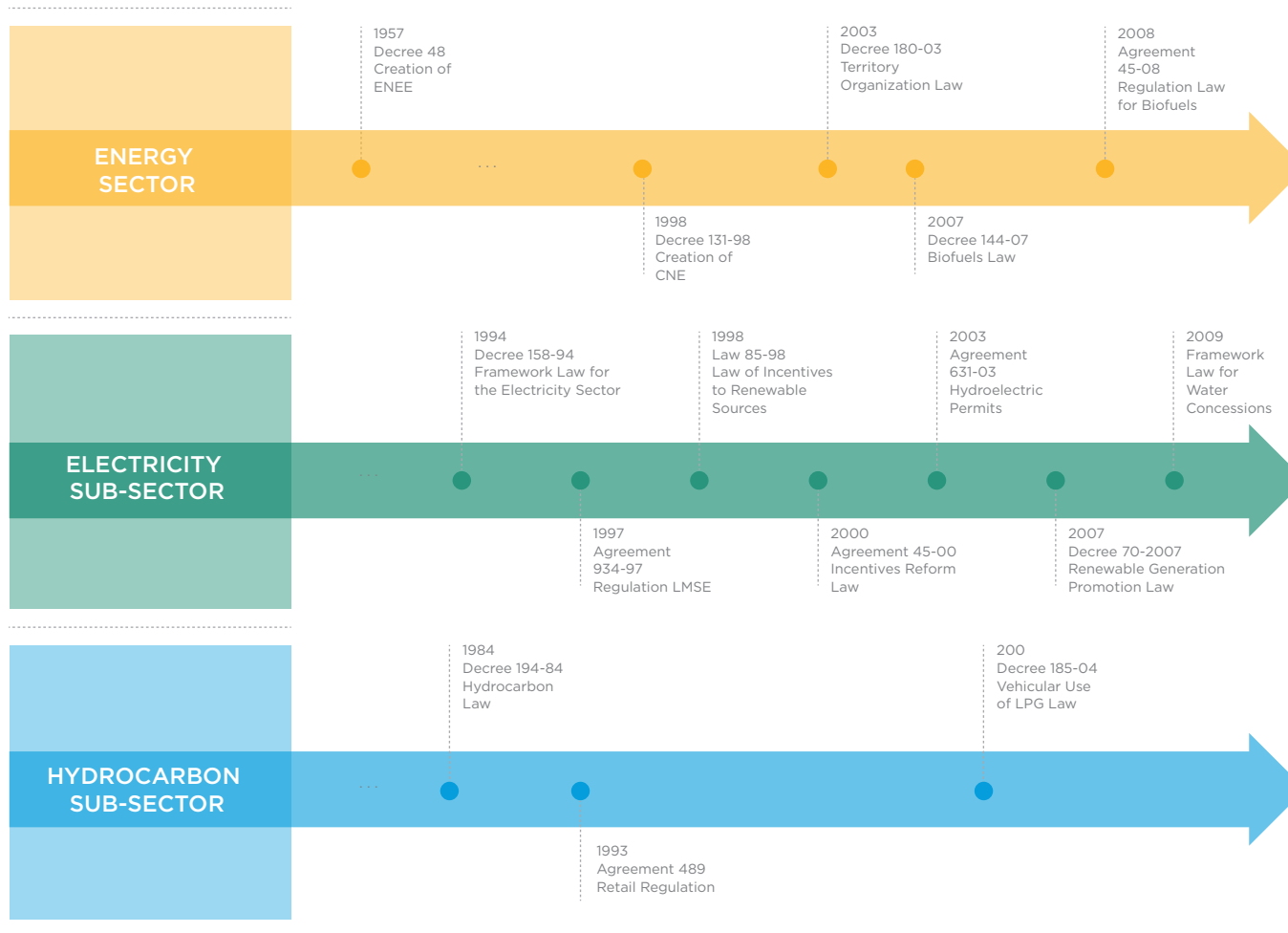
Consumption by sectors	Industry	Transport	Residential	Commercial	Others
Coal	18.1	0	0	0	0
Oil products	47.9	100	3.1	34.9	100
Biocombustibles	17.5	0	86.5	0.0	0
Electricity	16.4	0	10.4	65.1	0
Total	100%	100%	100%	100%	100%

Source: Own Calculations based on IEA Energy World Balances



Institutional Organization of the Energy Sector

Evolution of the Regulatory Framework for the Energy Sector, Electricity Sub-Sector and Hydrocarbon Sub-sector in Honduras



Source: Author's work

Origin

In 1957 the military junta that had governed Honduras for 14 months since the end of 1956 created the [National Electric Energy Company \(ENEE\)](#) as an autonomous body responsible for the production, marketing, transmission and distribution of electric energy in the country. The Constitutional Law of the [National Electric Energy Company \(ENEE Law\)](#), which was included in decree No. 48 of the military junta, stipulated that from that time forward there was the potential for private participation in some electricity sector activities, and it permitted the vertical integration of the [ENEE](#).

The new state company was in charge of developing construction of the hydroelectric complex Cañaveral/Río Lindo that was constructed in three stages. Construction started in 1960 and finished in 1978. Additionally, 138 KV transmission lines were constructed to San Pedro Sula and Tegucigalpa.

The State takes control of the energy sector

Under president Roberto Suazo, the first civil president after a decade of military regimes, the Honduran State promoted some key reforms in the hydrocarbon subsector. In 1983 the National Honduran Congress created the Administrative Commission for the Purchase, Sales and Marketing of Oil and its Derivatives (Petroleum Management Commission or CAP) was, for a time, in charge of importing directly or establishing contracts with third parties to import crude

oil and its derivatives for local consumption and to set sales prices for the whole chain. The commission would function without specific legislation until 2007.

The CAP was very important given that during more than 10 years the agency was in charge of buying crude from Venezuela and Mexico based on the San José Agreement and selling it to the refinery in Puerto Cortés. This refinery, constructed in 1968, was property of Texaco and was the only one in the country. It had a refining capacity of 14,000 bbl/day.¹

Texaco decided to suspend refining activities in this plant at the beginning of the 80s given that the prices of oil derivative products on the international market did not justify its operation. However, in 1982 the Honduran government reached an agreement with [Texaco](#) to reactivate the refinery operation in Puerto Cortés. The agreement stipulated that the government would sell crude to Texaco and that Texaco would sell the refined products to domestic marketing companies (Esso, [Shell](#), [Texaco](#) and [Chevron](#) and two small Honduran companies) with a guaranteed earnings of 1.48 cents on the dollar per gallon.² In 1991 [Texaco](#) supplied all the fuel in Honduras through the operation of its plant (supplied 60% of the market)³ and imports (the remaining 40%) authorized by the CAP.

1 Petroleum Supply Management. Honduras. 1991.

2 In 1991 the World Bank calculated that this margin would guarantee Texaco annual earning of \$5 million. Reform Program of the World Bank. 1991.

Fuel prices established by the CAP in the internal market did not permit the transfer of international prices to imports paid by final consumers. In consequence, in order to ensure the function of the marketing chain, the Government had to maintain a system of subsidies that each day became increasingly burdensome for national finances. At the beginning of the 90s this situation would become extremely serious.

In 1984 the new Hydrocarbon Law is published and it deals mainly with regulating the upstream activities of the oil industry. This legislation authorizes the State to enter into contracts with private entities for all the activities of exploration and exploitation, retaining the property with those natural resources.

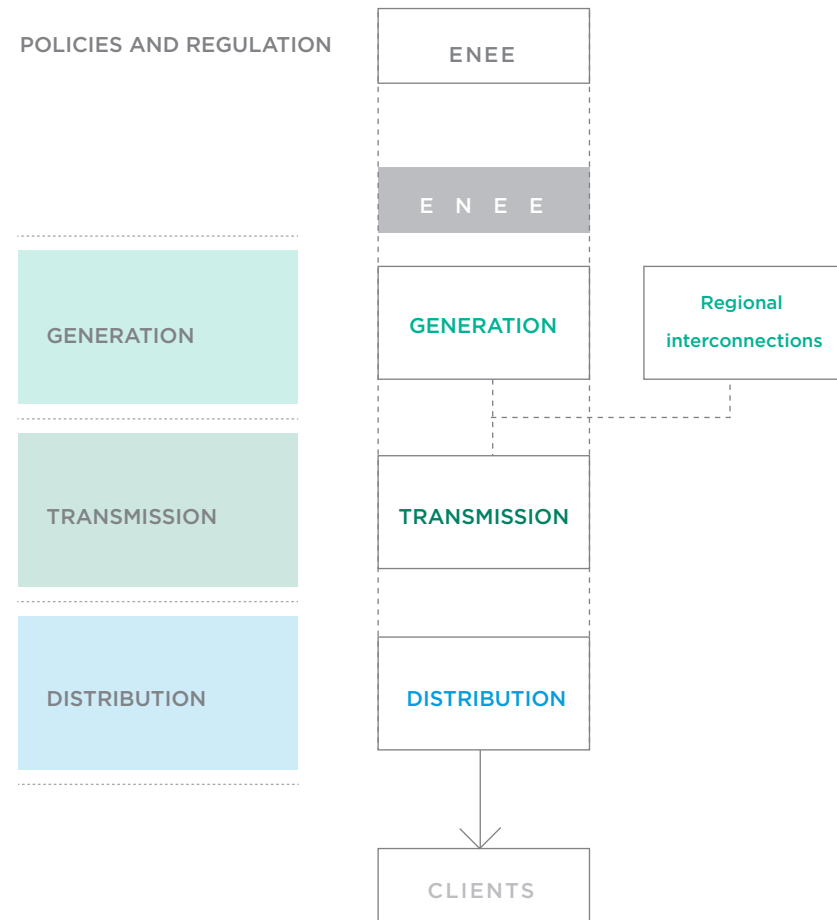
The electricity subsector, for its part, will be equally impacted by a group of reforms during this period. In November 1986, the legislature published the General Law of Public Administration, which took away operative autonomy from public companies, among them the ENEE. It mandated that they ask for approval from the National Congress for their annual operation plans,⁴ budget and rate modifications.⁵

These provisions would mean that the public electricity company did not have the financial flexibility necessary for efficient administration. Additionally, it created the Secretariat of Communications, Public Works and Transportation (Secopt) with power to influence the electricity subsector in its responsibility to manage the bidding process and appoint some authorities.

⁴ Article 68 stipulated that the plans of action had to be approved by congress. This article would be repealed in 1996.

⁵ Article 79 mandated that all price changes had to be approved by Congress. This article would be repealed in 1991.

Figure 1: Electricity sub-sector structure in Honduras, 1990



Source: Author's work

Facing the crisis: important reforms

At the beginning of the 90s, under the governments of Rafael Callejas (1990-1994) and Carlos Roberto Reina (1994-1998), a series of reforms are initiated in the energy sector. This process was part of the “Energy Sector Adjustment Program” led by the World Bank that included the “Oil Liberalization Program” (PLP) in the oil area, and institutional changes in the electricity subsector that were necessary given the significant financial and management crises that had plagued the [ENEE](#) since the 80s. Public finances were suffering equally, with considerable impact as a result of the subsidies in the oil derivative products market. With the signing of contracts with the World Bank, the Government agreed to carry out a restructuring of the energy sector that would increase efficiency through private sector participation.

1991 marks the beginning of the reform process with the creation of the National Supervisory Commission of Public Services (CNSSP) that assumed the task of supervising the operation and financial stability of public companies. Among the most important powers granted to the CNSSP is the one to establish the rates charged by these companies, thereby eliminating the participation of the National Congress in setting rates.

Meanwhile, the Oil Liberalization Program sought to promote deregulation in the entire chain of activities of marketing of petroleum products. The intention was to promote a competitive market in the sector where prices to the final consumer would finally reflect international prices and generate private investment. Among the first steps of this reform was the elimination, in November 1992, of the margin guaranteed by refining and the authorization to private companies to participate in the import of fuels. Under this circumstance, [Texaco](#) closed its refinery in January 1993, adapting its facilities to operate only for the import and storage of refined products. New import and marketing companies of oil derivative products are also incorporated. Table 1 summarizes the major events involving the PLP.

Table 2. Highlights from the petroleum liberalization chronogram, 1991-1996

Year	Event
January 1991	Liberalization of prices for asphalt and aviation fuel
November 1992	Liberalization of prices for aviation fuel and Shell premium gasoline Opening of all fuel imports to private companies (agreement 378-92) Price parity formula to imports introduced
January 1993	Texaco closes down all refining operations at Puerto Cortés Puerto Cortés converted to an import terminal
September 1993	Fuel oil price liberalized
March 1994	Price parity formula for imports adopted for all products Environmental code for oil and gas exploration published
November 1994	Gasoline tax raised All subsidies eliminated
May 1995	Central American countries agree on quality standards for oil products
November 1995	Unleaded gasoline introduced
January 1996	Aviation fuel prices liberalized Price parity formula for imports revised

Source: World Bank. Implementation Completion Report. Energy Sector Adjustment Program (Credit 2306-Ho). June 17, 1997

At the same time, reforms were advanced in the electricity subsector. The centerpiece of this effort is incorporated in 1994 under the newly elected government of Carlos Reina with the enactment of decree 158-94 of the Framework Law of the Electricity Subsector (LMSE or Framework Law). This law, which is still in force, has a large number of articles with direct interference in electricity subsector activities. Among the main objectives of the law are the following:

- To establish the conditions to meet the country's electricity demand at a minimum economic cost.
- To promote economic operation, a safe and reliable electricity system and the efficient use of electricity by users.
- To guarantee equal and fair treatment for consumers in the same category, but allowing for the preferential treatment of small residential consumers.
- To facilitate the participation of private enterprise in generation and to promote its participation in distribution. .

It is important to note that in 1994 the only legislation that had influence over the electricity subsector was the decree creating the [ENEE](#), enacted 37 years before. Therefore, the Framework Law of the Electricity Subsector had to construct an institutional framework from scratch that would adapt to the challenges of a country with a more complex power economy. Based on those, the LMSE created two institutions. For policy design it created the Energy Cabinet, and in the area of regulation it created the [National Electric Energy Commission \(CNEE\)](#). The Executive reserved the power to appoint the seven members of the Energy Cabinet. Five members of the [CNEE](#), for their part, were

selected by the Secretary of State in the Office of Communications, Public Works and Transportation (Secopt) from a panel of experts proposed by different non-governmental organizations. Its most outstanding contributions are:

- Generation: Create new players via contracts between private companies and the [ENEE](#), allowing the state company to buy electricity without bidding to one of the established players in the system.
- Transmission: The State reserves the operation of the transmission systems and the Dispatch Center. These activities will become the responsibility of the [ENEE](#).
- Distribution: The creation of different distribution areas.
- Distribution: It is required that the [ENEE](#) sell all systems of distribution over which it has control. It established that the [ENEE](#) could participate in up to 30% of the capital of the distribution companies sold.
- Operating contracts: It established that the Secretary of Communications, Public Works and
- Transportation should ask for the approval of Congress to sign operation contracts with private participants (distribution and generation).
- Rates: Ratifies the department of the CNSSP to determine the rates for final consumers.
- Taxes: Established that sales of energy and power made by companies of that sector should be exempt from paying sales tax.

- Tax system: Created the Social Fund for Electricity Development managed by the [ENEE](#), which would be financed with, among other sources, 15% of the net profits of all the companies in the subsector. The fund is intended to finance electrification studies and works that are of social interest.

Tax system: Establishes a 5% surcharge on the electricity rate for electricity produced with renewable energy for reforestation in their areas of influence.

The general idea of the reforms and especially the Framework Law was to create a competitive electricity market with high private sector participation in generation and distribution. In the generation sector, the reforms allow the growth of private generation mainly using thermoelectric plants that sold energy to the [ENEE](#). However, on the distribution side, the market was not large enough for private companies interested in participating. Thus, the ENEE continue to operate as the sole purchaser of energy.

The country's generation capacity increased from 547 MW in the early 90s to 919.8 MW at the end of the decade. It showed a growth of 68% based solely on thermal technology plants. At the end of 2010, the sector showed continued growth, 75% based on thermal energy.

In 1996, via decree 218-96, the Secretariat of Environment and Natural Resources ([SERNA](#))⁶ is created which assumed all responsibilities related to the energy sector that were previously divided into several ministries. Similarly, the name Secopt was replaced with the Secre-

⁶ Through agreement No. 1.089/97 the "Internal Rules of the Secretary of State in the Office of Natural Resources and Environment" were approved.

tary of Public Works, Transportation and Housing (Soptravi), and it had the same powers. In the same decree, the 1986 provision of the General Law of Public Administration is repealed, which required the [ENEE](#) to annually ask for the approval of Congress for its operating plan. This gave greater administrative flexibility to the state company.

1998: Institutional changes

In 1998 the ex-president of the Congress, Carlos Roberto Flores, takes office as President. He initiated energy sector reforms, especially in the electricity subsector. In April 1998 he approved decree 85-98, known as the "decree to encourage renewable energy" that declared in article 1 the public utility of "the development and generation of energy from new and renewable sources"⁷ which was the first step to create a regulatory framework for renewable energy. This instrument, together with its subsequent modifications, provided the basis for enacting the 2007 Law of Promotion of Electricity Generation with Renewable Resources.

Decree 85-98 and a previous modification⁸ made at the end of 1998 included provisions that sought to promote renewable energy projects, of which the following stand out:

⁷ Decree 85-98 considers renewable energy resources to be those that come from hydraulic, geothermal, solar, biomass, wind, alcohol, urban solid wastes, vegetable sources and self-generation, from natural origins or from established with the specific rational purpose of long-term sustainable use.

⁸ Decree 267-98, issued at the end 1998, modified several articles of the original text of article 85-98.

- It prohibited the creation of new regulations that could affect the cost of projects that involved the use of biomass. Environmental regulations are exempt
- To prioritize equally electricity produced from renewable sources in electricity purchases by the State.
- To allow the [ENEE](#) to sign contracts for electricity purchases with private generation companies with a duration of 20 years, ensuring the purchase price for that period.
- To provide a payment of an extra 20% over the marginal short-term cost for electricity used that has been produced by renewable sources.
- In state bidding, renewable energy projects will always be prioritized when the present value of the generation sequences does not exceed by more than 10% the value of the optimal generation sequence.
- Is exempt from sales tax during the construction period for all equipment, materials and services required for the project.
- Is exempt from all taxes and import duties on all equipment, spare parts and supplies during the study phase and during construction.
- Is exempt from income tax for the first five years of entry into commercial operation.

Later, also in 1998, the framework law is reformed to align it with the objective of promoting renewable energy. Thus, by decree 89-98, the 5% surcharge to electricity generated from these types of energy is eliminated. This change is made since it was already considered that

this surcharge decreased the competitiveness of these sources compared to fossil fuels. Additionally, the financing method for the Social Fund for Electricity Development is modified to give responsibility exclusively to the [ENEE](#), which must contribute 1% of its gross income, with the exception of the contribution of private companies involved in the subsector.

Also in 1998 by decree 131-98 that reformed the legal framework, the [National Energy Commission \(CNE\)](#) is created as the decentralized body of the [SERNA](#). This new institution replaced the CNEE and the CNSSP in all their functions. The reform decree modified the selection method for the commission, leaving it in the hands of the President to choose the members. The most important responsibility granted to the new organization was to establish bar tariffs and final consumer tariffs, which was previously the responsibility of the CNSSP. The same decree, known as the “Law to Promote Production, Competitiveness and Support for Human Development,” modified the System of Import Parity Prices of oil derivative products, modifying a component of the formula so that prices would reflect the a new contribution to the country’s road system.

In August 1998, by Executive Decree 013-98 the Government created the Technical Unit of Oil and all of its derivatives (UTP), which became responsible for the functions that CAP⁹ had performed since 1983. With this new organization, which was attached to the [SERNA](#), the Government sought greater flexibility in the administration of the System of Import Price Parity. Additionally, in October marketing prices of the GLP and tariffs of land freight rates for fuel were modified.

⁹ Although no legal instrument formally eliminated the Oil Management Commission, the Technical Unit of Oil took on all its responsibilities, thereby annulling it de facto.

In 2000, Congress interprets some of the articles of 1998 renewable energy laws, which imply changes in current legislation. The text of decree 45-2000 relates specifically to clarifying the methodology for calculating the initial purchase price of a kilowatt-hour set in the contracts between generation companies and the [ENEE](#). This interpretation is very important given that the initial price would remain (indexed annually for inflation) over the life of the contract, which could reach up to 20 years. The base price agreed to in the contracts is the main variable that private investors use to assess the feasibility of a renewable energy project.

In 2001, by decree 74-2001, the new Law of State Hiring is issued which repeals the law published in 1985. This new legal instrument requires in Article 13 that all State institutions ask for the approval of Congress to do any kind of hiring in which the effect will extend into the next governing period¹⁰ or have tax benefits. This condition especially affects the approval times for renewable energy projects with tax benefits and its contracts for the purchase of electricity, which can span 20 years.

In January 2002 Ricardo Maduro, the opposition candidate of the National Party of Honduras, became president. The new government had a profile of conservative economic policies directed at meeting the conditions agreed upon with the [IME](#) at the end of the 90s. In this context, the main contribution of the energy sector during this period was the expansion of private sector generation capacity with the incorporation of the two largest thermal plants in the country into the generation park.

¹⁰ Presidencies in Honduras last four years.

The new plants, known as Choloma III and Pavana III, had a joint installed capacity of 546,1 MW. Since they began operating in 2004 and up until 2010, these plants generated an average of 45.1% of the total electricity incorporated into the National Interconnected System.

The companies Enersa¹¹ and Lufussa,¹² owners of the plants previously mentioned, each signed a supply of capacity and energy contract with the [ENEE](#) for a period of 12 years. These contracts were signed under conditions stipulated in Executive Decree PCM-026-2002, better known as the emergency electricity decree, which exempted the [ENEE](#) from having to initiate the bidding process for contracting 410 MW of energy. The government argued that the executive decree was necessary, given that it was the quickest response to the failure of a bidding process that began in 2001 and due to the fall of generation capacity at the General Francisco Morazán (El Cajón) plant. It had shown a drop in its levels since 1999.¹³

The oil prices crisis: fuels and renewable energy

Starting in 2002, oil prices began to rise quickly. The domestic market for fuels and electric energy rapidly reflected these increases. In this context of sustained growth of oil prices, president José Manuel Zelaya takes office. In January 2006, when he is sworn in as president, prices of a barrel of crude have doubled since 2002.

¹¹ The Renewable Energy Company S.A. of C.V. (Enersa).

¹² Power and Light of San Lorenzo.

¹³ During this process a contract with the AES Honduran Generation, Limited Partnership Society for Variable Capital Shares was approved. It had the same characteristics of the contracts with Lufussa and Enersa. However, the contract is canceled later for failing to meet some of the promises made by the private company.

The new Government decided to strengthen the state's presence in the domestic fuel market. It assumed that it could cushion the effects of the surge in the value of oil if the State participated more actively in the import of fuels and the setting of domestic prices. Pursuing this goal, the Technical Unit of Oil¹⁴ was eliminated, which had served a very limited regulatory function. The Oil Management Commission¹⁵ was restored to 1983 terms when the State had monopoly control of derivative imports. Additionally, and not without some controversy, the parameters of the "System of Import Price Parity" (SIPPI) were modified, which was the mechanism that regulated the prices for the whole fuel supply chain.

Executive decree 02-2007¹⁶ cut retail prices by reducing taxes, earnings margins by importers and wholesalers¹⁷ and some transportation costs. Given the vertical integration of the companies in the sector, the Government considered that these could operate efficiently if they kept the earnings margin in the final product.

In 2008 the government signed the entry of Honduras to the Petrocaribe agreement, led by [Venezuelan Oil \(PDVSA\)](#). According to this agreement, the Government could import up to 20,000 barrels of oil derivatives per day from Venezuela. According to the agreement, the bill for purchases could be paid in two parts: the first would be a cash payment that would cover from 5% to 50% of the total bill depending on international oil prices, and the remaining part would be financed for 25 years with a two year grace period and a 1% annual interest

14 Executive Decree PCM-030-2006 on September 1, 2006.

15 Through Executive Agreement 25-2007 on September 6, 2007 the rule of operation of the Oil Management Commission was published.

16 Executive Decree PCM-02-2007 of January 20, 2007.

17 Executive Decree PCM-02-2007 eliminated the earnings margins for diesel imports, liquid gas and all types of gasoline. Additionally, it reduced the required price of regular gasoline, kerosene and liquid gas in what was called the "Contribution to Social Programs and Heritage Road Conservation."

rate.¹⁸With the financed amount a trust was created that would receive 40% of the expansion of hydroelectric generation and 30% of the necessary investments for the [ENEE](#). In June 2008 the first shipment of 82,000 barrels of diesel for power generation was received.

In 2008 the average price of 95-octante gasoline was \$4.03 per gallon in Honduras, the second lowest in the Central American countries. Only Panama had cheaper fuel, averaging \$3.59 per gallon, while the most expensive was in Costa Rica, where it cost \$4.63 per gallon.¹⁹

The increase in hydrocarbon prices in the first decade of the twenty-first century renewed Honduran authorities' concerns about the need to diversify electric energy sources. With this idea, they take up legislative efforts at the end of the 90s, without much success, to promote the use of renewable energy. Thus, in 2007 in Decree 70-2007 the "Law to Promote Electric Energy Generation with Renewable Resources" was published. It gave support to decree law 85-98 and the reforms that were subsequently passed. In 2008 the Regulations to the Biofuels Law are published.

The Government, advancing further legislation to promote the development of renewable energy projects, in 2010 published the Special Regulatory Law for Renewable Energy Public Projects. It sought to accelerate the implementation of the hydroelectric projects Patuca III (Piedras Amarillas), Patuca IIA (La Tarrosa), Patuca II (Valencia), Los Llanitos and Jicatuyo and the Valle del Aguan Energy Complex, among other renewable energy projects.

18 Petrocaribe energy cooperation Agreement between the Government of the Bolivarian Republic of Venezuela and the Government of the Republic of Honduras.

19 Statistics on Fuel in Honduras 2004-2008. Secretary of the Presidential Office. March 2009.

Among the reasons given for the publication of this law are the slow development of the projects listed above and the obligation to meet the target set by the National Plan of the Republic of Honduras. It established that by 2011 70% of generation must come from renewable sources.

The Special Regulatory Law of Renewable Energy Public Projects in its articles:

- Declares of pressing urgency, public interest and national necessity of the highest priority the construction and operation of the projects listed above.
- Asks that all public institutions give priority to these projects in their attention to any administrative procedure within their responsibility.
- Declares the public utility of confiscating, via forced expropriation, all properties located in project implementation areas.
- Establishes that all properties in the project zones belong to the [ENEE](#) via transfer, sale or any other transfer mechanism.
- All activities related to the implementation of projects are exempt from taxes, fees, bonds and other payments.
- Creates the Special Unit for Renewable Energy Projects (UEPER), that will help the [ENEE](#) with all activities related to the projects, and will take over management of administrative, technical, operative and financial affairs.

This law is the last relevant reform of the Honduran energy sector.

02

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