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E C L A

Economic Commission for Latin America
Central American Economic Co-operation Committee

ALTERNATIVES FOR THE SUPPLY OF PETROLEUM DERIVATES
IN THE CENTRAL AMERICAN ISTHMUS

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INTRODUCTION

This is a revised and updated version of the document entitled "Study on the expansion of the petroleum refinery capacity in the Central American Isthmus" (Estudio sobre la ampliación de la capacidad de refinación de petróleo en el Istmo Centroamericano), which was prepared as a result of a resolution taken during the Fourth Meeting of the Subcommittee on Electrification and Water Resources, held in Panama City, from the 27th to the 29th of May 1981.

The formulation of this document was endorsed by the high-ranking executives from the regional electrification agencies who attended this meeting.

This new version includes the alternative for expanding the supply of hydrocarbons by the direct importation of petroleum derivatives as opposed to refinery increments.

1. Background and justification

The economies of the countries of the Central American Isthmus are experiencing an adverse effect as a result of the energy crisis caused by the high prices of the petroleum derivatives.^{1/} In order to lessen these effects, the governments are taking immediate measures toward diminishing the consumption of petroleum derivatives, and identifying actions to reduce the cost of energy resources by substituting for their own indigenous resources.

Preliminary reports indicate that during the year 1981, the countries of the subregion imported petroleum derivatives for approximately US 1 500 million,^{2/} which represented 22% of total exports. With the exception of Guatemala, who has a limited oil production, the rest of the countries are forced to import all their hydrocarbon requirements to run their badly affected economies. In this respect, it should be mentioned that due to the structure of the demand and the characteristics of the existing refineries, the countries are also obliged to import petroleum derivatives, which are usually higher priced than petroleum.

ECLA/Mexico is at present completing a preliminary study on the existing situation and short-term perspectives of the various alternatives to supply hydrocarbons to the countries of the region.

Recently, a new project called "Central American Energy Programme" (Programa de desarrollo energético centroamericano, PRODECA) has been initiated. OLADE is the organization responsible for this programme which is comprised of the four following modules: I - Energy planning; II - Electrical integration; III - Hydrocarbon integration, and IV - New and renewable sources of energy. This project could advance in

1/ See, El impacto del incremento del precio de los hidrocarburos sobre las economías del Istmo Centroamericano (CEPAL/MEX/1036), January 1981.

2/ See, Istmo Centroamericano y República Dominicana. Estadísticas de hidrocarburos, 1981 (CEPAL/MEX/CCE/SC.5/L.152), April 1983.

its findings so as to provide initial support to module II mentioned above. It is worth mentioning that in this vitally important field of hydrocarbons supply and demand, there are no known studies of regional scope.

The annual demand for hydrocarbons in 1981, for the Central American Isthmus, was of approximately 34 million barrels and its basic structure has suffered no significant change in the following years. In four out of six countries, the national demand is between 4.0 and 5.0 million and in the remaining two, between 7.0 and 10.0. The demand structure is concentrated in the medium destillates, as follows: 28% in light products; 44% medium destillates, and 28% heavy products.

The refinery capacity in the region (one refinery per country) ranges between 14 000 to 16 000 barrels per day. The sole exception is the medium-size refinery in Panama, with a capacity of 80 000 barrels per day, since it was originally designed for the export market. These refineries are of the hydroskimming type, with a structure of little flexibility, to adapt to the specific market requirements and thus heavily conditioned to the crude available.

In relation to the flow of hydrocarbons in the region and according to 1981 statistics, the imports of crude and reconstituted oil were around 32 million barrels. In the case of derivatives (also in million of barrels), the imports were of 9.4 and the exports of 6.3. At present, the countries of the region obtain their hydrocarbons from Mexico and Venezuela, through the San José Agreement (Convenio de San José). However, in accordance with the market conditions, they could consider buying crude oil from other

countries, when economically convenient. These options should be seriously considered.

Some of the small refineries of the five countries of the region work at practically full capacity, while others only cover part of their demand. The only exception being Panama, where the refinery is at present working at a very reduced capacity.

Due to the high investments involved, the need to carefully study the different possibilities for expanding the supply of hydrocarbons in the region is undeniable. These studies should contain several alternatives for the supply and handling of hydrocarbons, in order to promote the regional expansion of the oil industry and efficiently meet the demand requirements in a more economical manner.

2. Project objectives

a) Long-term objectives

Upon completion of this project, the following long-term objectives should be accomplished:

i) Contribute to the economic and social development of the countries of the region, by improving the standards of living of the population and fostering technological and industrial development in the Central American Isthmus.

ii) Improve the balances of payments through the rational supply of petroleum derivatives.

iii) Promote a more rational utilization of hydrocarbons through adequate measures and actions in the refinery, transportation and distribution stages.

b) Short-term objectives

i) To determine, at a preliminary level, the technical and economic feasibility of different alternatives for the supply and handling of petroleum derivatives to meet the projected regional requirements up to the year 1995.

ii) To estimate the financial requirements for the scheme selected in i) above, as the most profitable for the Central American countries. To formulate in detail the terms of reference for the feasibility study of the alternative selected.

3. Lines of action

The lines of action proposed for the duration of this 12-months study are as follows.

a) Diagnosis of present situation

First to be analyzed would be a history of the consumption of commercial and non-commercial fuels in the Central American Isthmus, to be followed by an analysis of the patterns of consumption at both, national and regional levels, using single products and utilization by sector. The geographic location of the main consumption centre will also be determined.

The present and foreseeable sources for the supply of crude oil, reconstituted petroleum and its derivatives, will be duly identified. The existing infrastructure of the oil industry will be determined, and will include the location and production pattern of the refineries, the systems of transportation for crude petroleum and its derivatives, as well as the supply terminals.

b) Demand projection

A revision will be made of the studies available dealing with demand. Subsequently, a new projection will be made for the period 1984-1995, using different methodologies and covering the national and regional energy requirements.

These requirements will, in any case, indicate the needs of the different sectors such as transport, industry, residential, etc., and the needs of each single product.

c) Supply alternatives

A review will be made of the studies, which may be available, dealing with the supply of hydrocarbons at both, national and subregional levels. It will be assumed that, with the exception of Guatemala (that at present produces limited quantities), the countries of the region obtain their hydrocarbons from abroad and they resort to exchange among themselves whatever excess they may have, when proven convenient.

The different possibilities for expanding the existing oil supply installations will be studied. The idea being to compare the high degree of national refining autonomy versus an optimal scheme for importing petroleum derivatives. Consideration will also be given to an intermediate solution; whereby the local refineries and the external supply of derivatives resort to a certain degree of expansion.

In the formulation of these studies, especial considerations will be given to the availability of crude oil and its derivatives, including such basic characteristics, as are density, sulfur content, etc., and their corresponding technical and economical implications.

d) Transport and distribution

The transportation and distribution schemes required will be duly analyzed, taking into consideration the supply alternatives already analyzed in the previous paragraph which includes refinery installations.

In the first place, maritime transport from exporting countries, such as Mexico, Venezuela, Ecuador, Curacao, etc., will be properly analyzed, taking into account the more convenient routes in terms of country of origin and country of destination. Subsequently, a study of the distribution scheme feasible within the region will be made, bearing in mind the different transportation needs, such as trucks, pipelines and cabotage.

e) Economic evaluation

For each of alternative considered (combined schemes of supply, refining and distribution), estimates will be made of the capital investments required and of the annual operating and maintenance costs, for the period covered by the study.

The investments would be related to refineries, pipelines, mobile equipment and terminal installations. The annual costs would be based on the normal operation of the installations, assuming a normal degree of efficiency and an adequate maintenance. The costs for the administration and future development planning should also be covered. Based on the investments required and the costs of operation, the alternatives will be compared in terms of benefit-cost ratio and rate of return of the invested capital.

f) Other considerations

An analysis will be made of the advantages, disadvantages and other considerations for the proposed scheme. These considerations will include a general criteria on the distribution of benefits in the case of subregional refining, its impact on the balance of payments and on the industrial development of the countries and its effect on the environment.

g) Terms of reference for the feasibility study

For the selected scheme, the corresponding terms of reference will be formulated for the subsequent pre-investment study. These should cover in detail the general condition for a well balanced performance, the scope of the studies, the technical and economical research necessary to ensure a complete evaluation of the subject, a listing of the man-months of experts, and an estimate of the direct and indirect costs involved.

4. Project costs

a) Extra-budgetary contribution

It is estimated that the execution of the project requires an extra-budgetary contribution of US\$ 119 000, of which 75 000 would correspond to manpower and the rest to other costs. (See Table 1.)

These contributions would enable the financing of 11 man-months of experts and consultants, in addition to the costs of several field missions, one seminar, and the administrative and miscellaneous expenses involved.

b) Contribution by ECLA

ECLA would contribute an estimated amount of US\$ 50 000 of which 35 000 correspond to its permanent staff. (See Table 2.)

Table 1

EXTRA-BUDGETARY FINANCING

Item	Man/months	US dollars
<u>Total</u>	<u>11</u>	<u>119 000</u>
<u>Project personnel</u>	<u>11</u>	<u>75 000</u>
General consultant ^{a/}	1	15 000
Principal expert	6	36 000
Consultant	4	24 000
<u>Other expenses</u>		<u>44 000</u>
Mission cost		10 000
Seminar		15 000
Unforeseen or miscellaneous		14 000
Administrative expenses		5 000

a/ High-level consultant to be employed for very short periods.

Table 2
CONTRIBUTION BY ECLA

Item	Man/months	US dollars
<u>Total</u>	<u>8</u>	<u>50 000</u>
Direction and co-ordination	1	5 000
Energy planning	2	10 000
Transport economy	2	10 000
Research assistants	3	15 000
Office space and facilities		6 000
Secretarial and reproduction services		2 000
Communications		2 000

Specifically, ECLA would contribute one man-month for the general direction and co-ordination; two man-months for energy planning; two man-months for transport economy and three man-months for a research assistant. In addition, ECLA would provide office space and equipment, communication, secretarial and reproduction facilities.

JOB DESCRIPTION

Title: Petroleum expert (supply and demand)

Category: P-4/5

Organization: Economic Commission for Latin America

Country: Mexico City

Functions: Under the general supervision of the Head of Natural Resources Energy and Transport Section, the expert will undertake studies regarding the development of complete schemes for the supply of the projected oil requirements of the six countries of the region. Based on previous appraisal he will:

- 1) Elaborate a full diagnosis of the conditions prevailing in the petroleum industry in each of the countries involved, including the present installations and equipment, the sources for importing oil and the modes of transportation utilized.
- 2) Make an analysis of the existing demand projection with a view to defining a revised projection through to 1995 which cover the sector's requirements as well as the single products.
- 3) Propose alternative schemes to supply the estimated future requirements. These schemes should include as required, port installations, pipelines, refinery and distribution facilities including the necessary equipment.
- 4) Make a comparative economic evaluation of the main supply alternatives proposed. Capital investment, and operation and maintenance should be considered so as to establish a benefit/cost relation and rate of return on investments. For the selected alternative, prepare the corresponding terms of reference for the corresponding feasibility study.

Requirements: University degree on petroleum engineering or economics. A minimum of ten-years experience on the subjects specified on this job description.

Languages: Spanish or English. Spanish desirable.