

there were considered the points of contact between the levels and the safety to obtain in them, without getting the whole context to vulnerate the internal control principals.

In this context, the targets were fixed with the following distribution:

* Strategic:

- Having computerized, the functional structure of the ownership of the energetic resources (Hydrocarbons).
- To have available the actual and statistics information, that give support to the functions.
- That the whole context of functions and ownership enable to produce information for the decision taking at Government level, and permanently up-dated.

* Tactical:

- That the outlines of fuels policies allow, besides regulating investments in relation to costs and utilities, the obtention of the following elements:
 - Obtain operating cost directly proportional to the increase of the hand labor cost, either informatic as well as of production.
 - Counting with a software that allow to relate the different plans of the complex circuit of: search, drilling or production, transport and/or storage and distribution of fuels.
 - Obtain efficiency and effectiveness at constant levels in the aforementioned areas.

- Technical:

Because the two highest levels use the same source of information, due its piramidal definition, the project must be supported by the following technical structure:

- A centralized data bank.
- A interactive system and with priority of real time, aimed at the use of remote terminals, that enable to the Administrators of resources the necessary means to fulfill its job with better efficiency.
- A feeding system to the data bank, per interaction with the data basis of the company (Y.P.F., G.D.E., Y.C.F.)
- A feeding system of the global models available, per interaction of the data bank.
- An associated system of computerized telemeasure/mimics that enable the following functions:
 - a) automatic control of drilling, transport and/or storage segment of fuels.
 - b) Capture of data on line for the associated computer proceses.
 - c) Control of the supply networks through analog/digital protocols.

The consolidation of these targets will enable to count with a fast and effective tool, technologically advanced and that will bring to the State underlying elements of vital importance for an automated policy of information and decission taking processes.

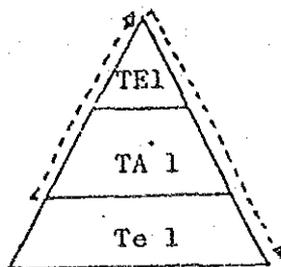
GLOBAL PROJECT

I. Strategic prospects:

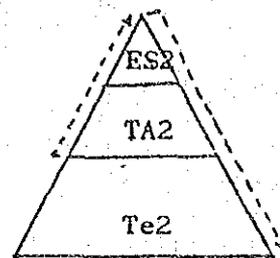
Within the general scheme outlined, the global project that it is outlined hereafter, centers its operative control in the National Bureau of fuels Policies and Programming within the area of the Undersecretariat of Fuels.

The hierarchy scheme and information flow is the one that is schematized hereafter, considering the security and integrity of the data in the interphases and keeping the principle of independency of the internal controls:

FUELS POLICIES



DATA BASIS



TE 1: Energy Secretariat. Undersecretariat of Fuels (Strategics)
 TA 1; National Bureau of Fuels Policies and Programming (Tactical)
 Te 1: Government companies (Y.P.F., G.D.E., Y.C.F.)(Technical)

ES 2: TA 1

TA 2: Technical leaders.

Te 2: Computer support.

II. Tactical prospects:

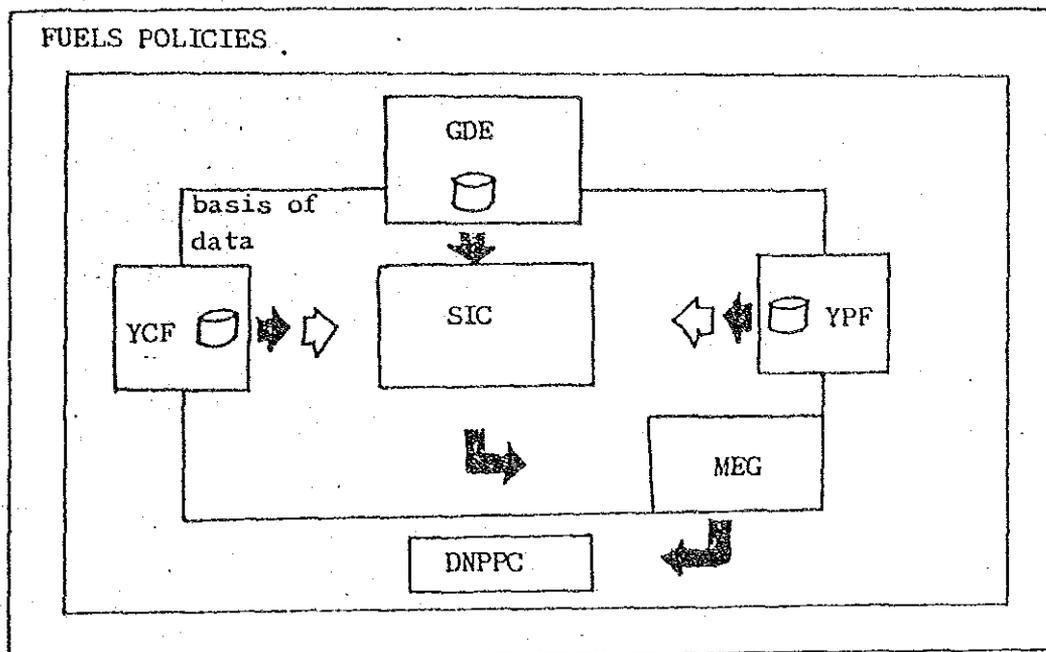
In view of the targets fixed, the agency that will handle the flow, in both ways, of the information within the piramidal scheme, shall count with four indispensable tools:

1. The handling of the data to be presented in decission handling language, through the highest levels.
2. Quick access to storage of the aforementioned data, up-dated

through the lower levels.

3. The computer tools of interfase for the handling of the resulting flow.
4. The handling of the operative supervision of the automatic and/or humans/controls of data capture.

These four elements are related according to the following tactical/operative scheme:



DNPPC: National Bureau of Fuels Policies and programming.

SIC: Computarized informatic system.

MEG: Global energetic models.

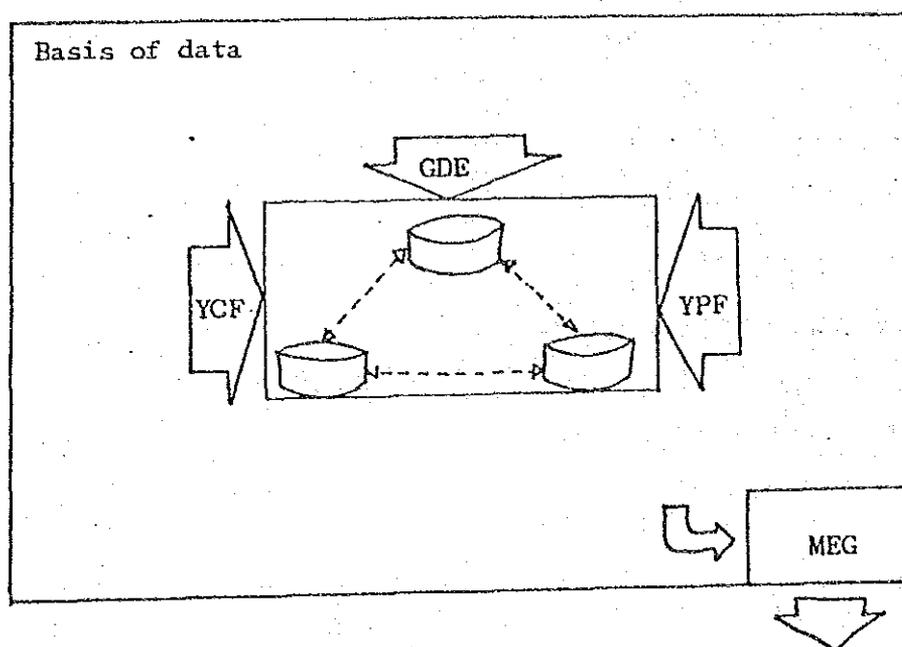
III. Technical prospects:

These prospects have been faced following the outlined exposed in the

tactical prospects.

Of the whole of technological supports necessary, at present it is counted with the global project to be developed and with some computerized elements potentially apt, but without productive implementation yet.

The scheme is as follows:



The existing computational supports are the ones hereafter detailed:

- Mainframe equipments in the three companies depending from the Undersecretariat of fuels, with the necessary software and sufficient to create and keep data basis.
- Two global models presently working:
 - a) Operative model of energetic resources assignments (MOARE)
 - b) Gas supply model (GSM)

- An initial network of three minicomputers with a working capacity in a dual form: intelligents or stimulating remote terminals of the existing mainframes in the National Bureau.

CONCLUSIONS:

It results clear the need to attack the critical point that presently provoke a marked dephasing between the estimated times to reach the targets and the real times consumed.

These critical points conform a priorities plan of:

a Conform a macro/mini network with the companies (Y.P.F., G.D.E., Y.C.F.) sufficient enough to feed the existing energetic models.

b Perform a study for the stablishment of an energy data bank, over the hypothesis of the work to obtain external aid for the implementation and start-up of said bank,

c Technical cooperation request:

The intention of this document is to give a global idea of the energy area in the Argentine Republic and particularly and to a greater extent to the fuels area.

As it has been pointed out, the Argentine Government through the Energy Secretariat is working on an implement of a program that assures the rational use of the vast-energetic resources of the country.

In this order the Under-Secretariat of Fuels, through its national Direction of Fuel's Area Programs and Policies promotes the implementing of a computerized information system, that allow through an orderly and coordinated job with the companies within its jurisdiction, to fulfill precisely

the large targets outlined.

It is therefore, that in a wholly agreeable manner with the outlined targets set by the highest Government authorities, in the sense of acceding throughout new technologies to the State's modernization, the Energy Secretariat considers of highest interest of vital importance to be able to obtain the technical cooperation of the Japanese Government through the Japanese Cooperation International Agency (J.I.C.A.) for the establishment in the Argentine Republic of an energy data bank.

In order to obtain the fulfillment of the aforementioned project and according to the needs that the same generates, following it is detailed the subjects to be covered in this present cooperation requests:

- 1.- Technology transfer and technical consulting on the part of J.I.C.A. agency staff that allow the establishment in the Argentine Republic of a data bank within the global project described.
 - 2.- Training of Argentine staff in the use and future designs complementary to the data banks.
 - 3.- Training of Argentine staff in the design of energetic models as from the data banks.
 - 4.- Due to the lack in the Argentine Republic of high complexity centers with use of such high level technology it is considered convenient that the aforementioned training in points 2 and 3 can be completed with study trips to the centers that to such effects J.I.C.A. have.
- The Argentine staff responsible for the "global project" that in the future assume the role of technical leaders in developing the same will be the destinataries of such training.

Through the technical cooperation that it is requested and thanks to the counselling of specialized technicians in the subject, the country will have not only of a modern processing system and data bank, but also a group of highly trained staff that guarantees through the transfer of technology, the success and continuity of the project developed.-

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Questionnaire
on
The Technical Cooperation for The Energy Data Bank
in
The Argentine Republic

Project Finding Team of JICA

Survey Items for Energy Data Bank

1. Survey of Existing Energy Related Statistics

Including Data Bases in Y. P. F., G. D. E., Y. C. F.

- (1) In what scope the energy related data will be utilized?
- (2) Systems for collection, actual accumulation and classification of energy related data.
 - (a) supply-demand statistics by energy sources and products.
 - (b) supply-demand statistics by sectors.
 - (c) import-export statistics by energy sources and products.
 - (d) price statistics by energy sources and products.

2. Computerization of Energy Statistics

including Conforming a Network with Companies(Y. P. F., G. D. E., Y. C. F.)

Computer utilization is necessary in order to systematically collect, store, retrieve and use the considerable amount of energy statistics.

Present status concerning

- (1) method of data input (including preparation of input format).
- (2) programming for storage and retrieval of data.
- (3) preparation of output format for computer processing of data.
- (4) utilization of computers---types of hardwares, capacity, kind of softwares, etc.
- (5) level of programmers---members and capacity.

3. Possibilities for Preparing Comprehensive Energy Statistics Tables (Energy Balance Tables)

Energy Balance Tables are necessary in order to systematically prepare suitable energy supply-demand plans.

Present status concerning

- (1) designing energy balance tables.
- (2) statistical method of transfer from primary energy to secondary energy and calorific conversion.
- (3) survey of specific consumption by sectors (industry, agriculture, transportation, commerce, household etc.).

4. Energy Models

- (1) Survey and evaluation of existing energy models--- structure of models, parameters, input data, output, etc.
- (2) Needs for introduction of techniques for energy modeling (particularly energy supply-demand forecasting).

5. Training of Argentine Staffs

- (1) Numbers and levels of staffs who could be involved in the use and future designs complementary to the data bank.
- (2) Numbers and levels of staffs who could be involved in the design of energy models with the energy data bank as data bases.

回答資料 1

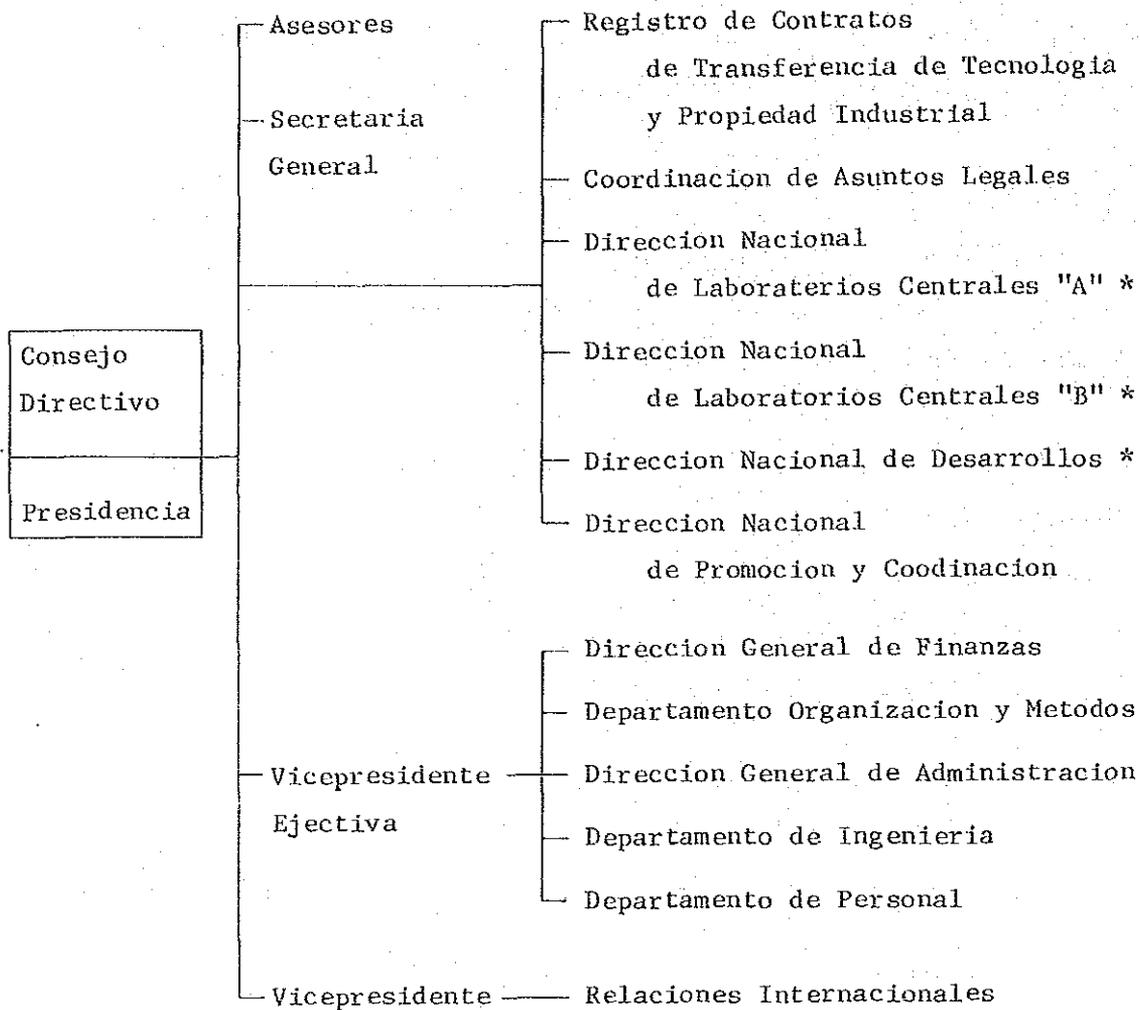
国立工業技術院 (INTI) エネルギー局の保有する主な診断用機材

ミゲレット技術公園にあるエネルギー局の研究室を訪問した際に次の機材の紹介があり確認をした。これらはエネルギー局の保有するうちの主な機材であるとのことである。

- | | |
|--------------------|-----------------|
| ① 炭酸ガス、一酸化炭素濃度計 | ⑩ 照度計 |
| ② 酸素濃度計 | ⑪ 電力計 |
| ③ オルザット式ガス分析計 | ⑫ テスタ |
| ④ 熱伝対式温度計 (1200℃用) | ⑬ ガス組成分析計 (据置型) |
| ⑤ デジタル温度指示計 | ⑭ カロリメータ (据置型) |
| ⑥ 超音波式流量計 | ⑮ 燃焼試験機 (据置型) |
| ⑦ うず流式流量計 | ⑯ 電導度計 |
| ⑧ 熱線風速計 | ⑰ PH計 |
| ⑨ 電流計 | |

回答資料 2

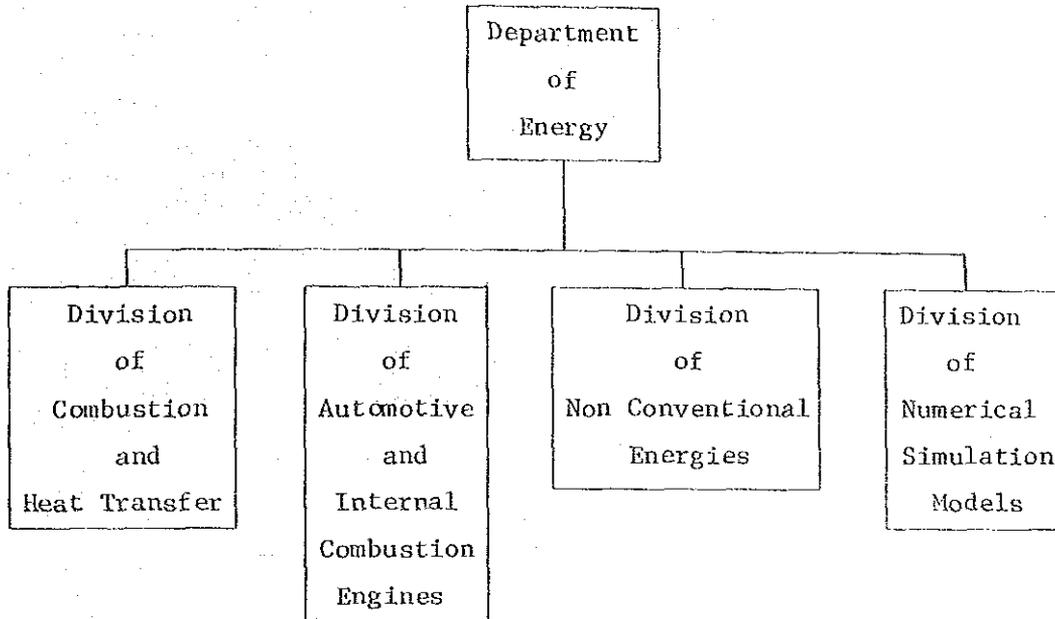
INTI 組織図



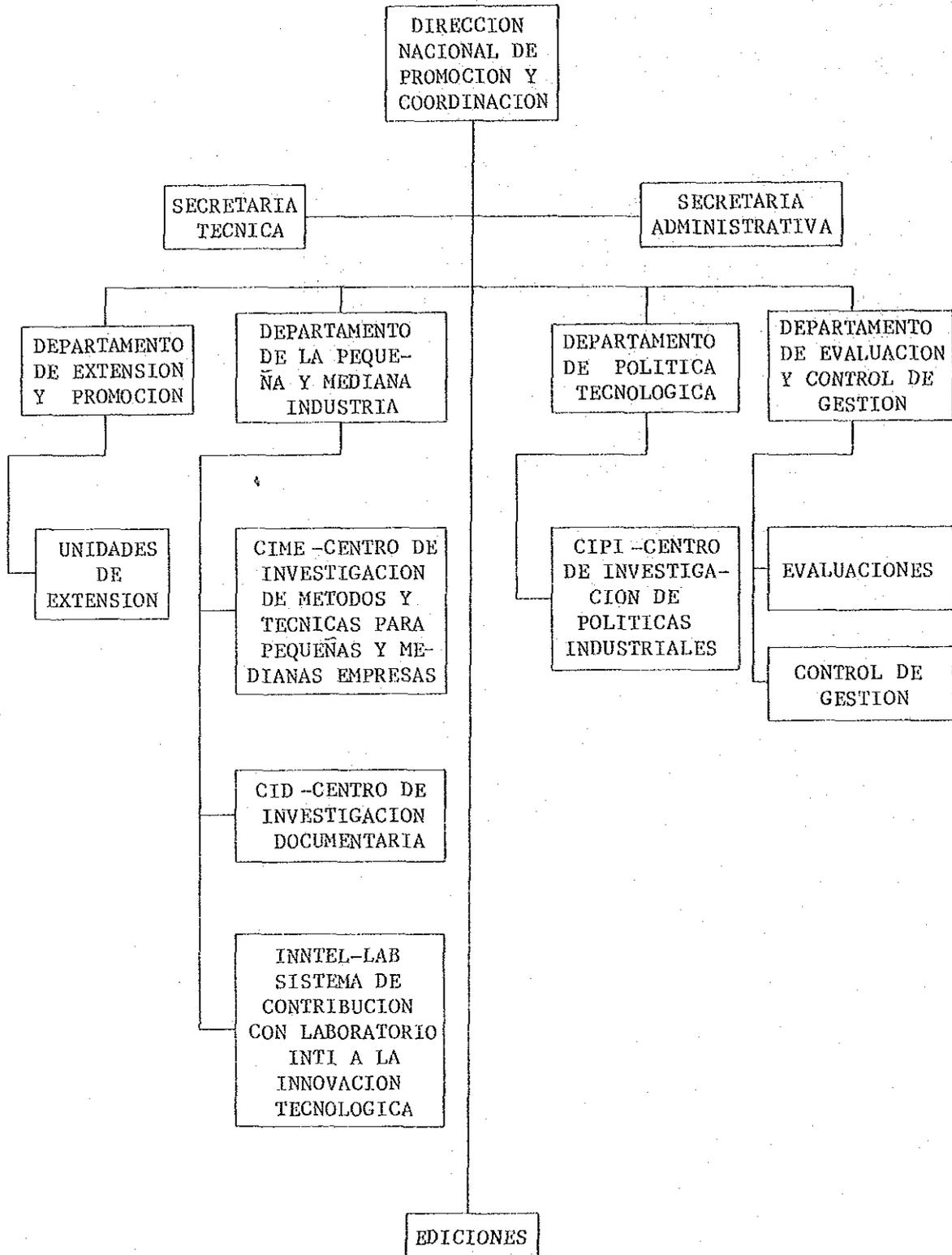
注) 中央研究所, 研究センターは * 印の組織に所属している。

回答資料 3

エネルギー局組織機構図



振興部組織機構圖



回答資料 5

研究センターリスト

Centros de
investigación
del sistema INTI

ASISTENCIA TECNICA
A LA INDUSTRIA

Luis Beltrán y San Martín C.C.271
8336-Villa Regina - Río Negro

CELULOSA Y PAPEL

Parque Tecnológico Miguelete

CONSTRUCCION

INDUSTRIALIZADA

Parque Tecnológico Miguelete

DISEÑO INDUSTRIA Y GRAFICO

Parque Tecnológico Miguelete

DOCUMENTARIA

Parque Tecnológico Miguelete

INDUSTRIA DEL CAUCHO

Parque Tecnológico Miguelete

INDUSTRIA LACTEA

Parque Tecnológico Miguelete

INDUSTRIAS MINERALES

Parque Tecnológico Miguelete

INDUSTRIA DEL PLASTICO

Parque Tecnológico Miguelete

INGENIERIA AMBIENTAL

Paseo Colón 850 -4° piso
1063 - Capital

MATERIALES

Casilla de Correo 884
5000 Córdoba

MAQUINAS HERRAMIENTA

Parque Tecnológico Miguelete

MEDICIONES Y

TELECOMUNICACIONES

Av. R.S. Castillo y Calle 12
Edif. Movimiento - 4° piso
1104 - Capital

METODOS Y TECNICAS

PARA PEQUEÑAS Y

MEDIANAS EMPRESAS

Leandro N. Alem 1067
1001 - Capital

REGLAMENTOS NACIONALES
DE SEGURIDAD

PARA OBRAS CIVILES

9 de Julio 1925 - 22° piso
1332 - Capital

TECNOLOGIA DE CARNES

Parque Tecnológico Miguelete

TECNOLOGIA DEL CUERO

Camino Centenario entre 505 y 508
C.C.6 - 1897 - Manuel Gonnert
La Plata, Pcia. de Buenos Aires

TECNOLOGIA DE FRUTAS

Y HORTALIZAS

Acceso Sur y Arãoz 1511
Casilla de Correo 15
5505 - Chacras de Coria - Mendoza

TECNOLOGIA DE LA MADERA

Casilla de Correo 42
1708 - Morón - Buenos Aires

TECNOLOGIA PESQUERA

Marcelo T. de Alvear 1168
7600 - Mar del Plata
Pcia. de Buenos Aires

TECNOLOGIA DE LA

PROVINCIA DE SANTA FE

Buenos Aires 2405
2000 - Rosario - Santa Fe

TEXTILES

Parque Tecnológico Miguelete

COMPORTAMIENTO AMBIENTAL

Y ENERGETICO DE VIVIENDA

Parque Tecnológico Miguelete

表1 一次エネルギー生産の推移

単位：10⁸ 石油換算トン

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
水	174	173	165	322	541	559	539	620	833	1,146	1,504	1,423	1,632	1,599
原子力	-	-	-	-	291	562	580	419	691	617	536	664	430	768
天然ガス	6,778	7,237	7,177	7,657	7,406	8,806	9,784	9,897	9,895	11,164	11,966	12,063	13,388	14,579
石油	20,177	21,740	22,296	21,630	21,260	20,327	20,486	22,167	23,236	24,279	25,281	25,534	25,196	25,200
石炭	363	373	399	266	369	296	363	315	256	429	230	294	304	287
薪	1,023	963	907	693	999	592	571	609	762	555	628	531	502	533
植物くず	1,213	1,185	1,112	1,183	1,162	1,103	1,046	1,162	1,138	1,174	1,273	1,333	1,219	1,317
合計	29,728	31,671	32,056	31,751	32,028	32,245	33,369	35,189	36,811	39,364	41,418	41,842	42,671	44,283

表2 一次エネルギー生産の推移 — 構成比

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
水力	0.6	0.6	0.5	1	1.7	1.7	1.6	1.8	2.3	2.9	3.6	3.4	3.8	3.6
原子力	-	-	-	-	0.9	1.8	1.8	1.2	1.9	1.6	1.3	1.6	1.0	1.7
天然ガス	22.8	22.9	22.4	24.1	23.1	27.3	29.3	28.1	26.9	28.4	28.9	28.8	31.4	32.9
石油	67.9	68.6	69.6	68.1	66.4	63.0	61.4	63.0	63.1	61.6	61.0	61.0	59.0	57.0
石炭	1.2	1.2	1.2	0.9	1.2	0.9	1.1	0.9	0.7	1.1	0.6	0.7	0.7	0.6
薪	3.4	3.0	2.8	2.2	3.1	1.9	1.7	1.7	2.1	1.4	1.5	1.3	1.2	1.2
植物くず	4.1	3.7	3.5	3.7	3.6	3.4	3.1	3.3	3.0	3.0	3.1	3.2	2.9	3.0
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表3 二次エネルギー生産の推移

単位：10⁸ 石油換算トン

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	1,869	2,032	2,182	2,293	2,404	2,524	2,599	2,786	2,876	3,237	3,315	3,216	3,223	3,393
ガス	5,241	5,640	6,458	7,188	7,081	7,866	8,343	8,593	8,368	9,102	10,156	10,525	11,336	12,610
ガソリン	4,276	4,656	4,776	5,273	5,211	4,693	4,817	5,056	5,253	5,438	6,127	6,366	6,237	6,213
中間留分	6,038	6,885	6,885	7,102	7,085	6,740	7,295	7,731	7,797	8,074	8,983	8,970	8,828	8,909
燃料油	8,747	9,279	9,224	8,761	8,461	8,100	8,407	9,061	8,769	8,860	8,056	8,569	7,832	6,722
その他	3,585	3,817	3,785	4,103	4,541	4,293	4,478	4,664	4,888	4,658	4,800	4,379	4,929	4,894
合計	29,756	32,309	33,310	34,720	34,783	34,216	35,939	37,891	37,951	39,369	41,437	42,025	42,385	42,741

表4 二次エネルギー生産の推移 — 構成比

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	6.3	6.3	6.5	6.6	6.9	7.4	7.2	7.3	7.6	8.2	8.0	7.6	7.6	7.9
ガス	17.6	17.4	19.4	20.7	20.4	23.0	23.2	22.7	22.0	23.1	24.5	25.0	26.7	29.5
ガソリン	14.4	14.4	14.3	15.2	15.0	13.7	13.4	13.3	13.8	13.8	14.8	15.1	14.7	14.5
中間留分	20.3	21.3	20.7	20.4	20.4	19.7	20.3	20.5	20.6	20.5	21.7	21.3	20.8	20.8
燃料油	29.4	28.7	27.8	25.3	24.3	23.7	23.4	23.9	23.1	22.5	19.4	20.4	18.5	15.7
その他	12.0	11.9	11.3	11.8	13.0	12.5	12.5	12.3	12.9	11.9	11.6	10.6	11.7	11.6
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表5 最終エネルギー消費の推移

単位：10³ 石油換算トン

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	1,537	1,660	1,815	1,935	2,016	2,127	2,203	2,340	2,398	2,718	2,828	2,747	2,808	2,989
ガス	2,823	2,890	3,342	3,677	4,007	4,245	4,692	4,680	4,764	5,116	5,406	5,459	5,599	6,965
石油製品	15,547	16,296	15,822	16,945	17,667	16,926	17,434	17,895	18,348	19,327	19,400	19,632	18,787	18,571
植物くず	1,174	1,144	1,061	1,144	1,122	1,065	1,006	1,119	1,095	1,109	1,205	1,274	1,149	1,209
その他	973	825	773	802	991	762	753	646	897	634	580	477	586	464
合計	22,054	22,815	22,813	24,503	25,803	25,125	26,088	26,680	27,502	28,904	29,419	29,589	28,929	30,198

表6 最終エネルギー消費の推移 — 構成比

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	7.0	7.3	7.9	7.9	7.8	8.5	8.4	8.8	8.7	9.4	9.6	9.3	9.7	9.9
ガス	12.8	12.7	14.6	15.0	15.5	16.9	18.1	17.5	17.3	17.7	18.4	18.5	19.3	23.1
石油製品	70.5	71.4	69.5	69.1	68.5	67.4	66.8	67.1	66.7	66.9	65.9	66.3	64.9	61.5
植物くず	5.3	5.0	4.6	4.7	4.4	4.2	3.8	4.2	4.0	3.8	4.1	4.3	4.0	4.0
その他	4.4	3.6	3.4	3.3	3.8	3.0	2.9	2.4	3.3	2.2	2.0	1.6	2.1	1.5
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表7 最終エネルギー—消費部門別構成比の推移

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
家庭+商業+公共用	-	-	-	-	-	-	-	-	-	-	-	-	-	-
輸送用	21.6	22.0	21.2	23.5	23.5	24.3	25.4	25.9	25.3	23.8	24.4	25.0	24.7	26.4
農業用	37.0	38.2	40.6	38.5	37.4	36.3	35.1	36.6	36.4	38.0	38.7	38.3	39.0	36.9
工業用	4.0	4.0	4.3	4.2	4.5	5.0	5.0	5.3	5.2	5.5	5.4	5.4	5.6	5.4
合計	37.4	35.8	33.9	33.8	34.6	34.4	34.5	32.2	33.1	32.7	31.5	31.3	30.7	31.3
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表8 家庭用, 商業用, 公共用最終エネルギー消費 — 構成比の推移

単位: %

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	16.6	16.9	18.6	16.4	16.3	17.3	16.5	16.3	17.2	18.6	19.6	19.4	19.6	18.5
都市ガス	22.8	25.6	26.9	25.9	27.2	29.1	30.6	28.1	31.0	33.1	36.7	37.4	39.6	45.6
L P G	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ガソリン	17.8	18.8	19.2	16.7	16.6	16.5	15.3	14.0	14.4	15.3	15.2	14.5	14.4	13.2
中間留分	1.4	1.4	1.2	1.4	1.4	1.3	1.2	1.2	1.3	0.8	1.0	0.7	0.6	0.6
	23.7	21.2	20.2	21.0	21.0	21.3	20.4	21.1	18.3	16.5	14.7	13.3	14.6	12.9
	6.3	6.9	5.2	11.5	8.2	8.9	10.9	15.3	11.3	11.2	7.8	10.7	7.0	5.2
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
木炭	5.7	5.6	3.2	2.7	5.3	1.6	1.4	0.9	3.7	2.0	2.2	1.2	0.8	1.0
薪	5.7	3.6	5.5	4.4	4.0	4.0	3.7	3.1	2.8	2.5	2.8	2.8	3.4	3.0
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表9 輸送用最終エネルギー消費 — 構成比の推移

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電 力	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
ガソリン	52.5	52.7	52.9	54.6	52.5	46.7	47.2	47.6	49.9	50.8	53.5	53.8	52.6	52.3
中間留分	35.9	38.0	38.6	39.2	41.3	45.4	44.9	46.3	46.2	45.8	45.4	45.3	45.6	46.1
燃料油	9.8	8.2	7.6	5.5	5.6	7.3	7.4	5.7	3.7	3.2	0.9	0.7	1.6	1.4
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
薪/ 鋳物	1.4	0.8	0.6	0.4	0.3	0.3	0.2	0.1	-	-	-	-	-	-
合 計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表10 農業用最終エネルギー消費 — 構成比の推移

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
電力	1.8	2.6	2.7	2.6	2.6	2.8	3.3	3.3	2.8	2.4	1.9	1.9	2.4	2.1
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
中間留分	98.2	97.4	97.3	97.4	97.4	97.2	96.7	96.7	97.2	97.6	98.1	98.1	97.6	97.9
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表11 工業用最終エネルギー消費 — 構成比の推移

単位：%

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1972	1983
電力	9.8	10.9	12.9	13.0	12.8	13.9	13.7	15.8	14.8	17.4	17.7	16.4	18.2	18.4
都市ガス	21.8	20.4	27.3	27.7	28.6	31.0	32.3	34.7	31.2	32.8	33.4	32.1	34.8	40.7
精製ガス	-	-	-	0.2	0.2	0.3	0.2	0.9	1.2	-	-	-	-	-
LPG	-	-	-	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	-	0.1	-
中間留分	11.0	11.9	9.3	5.7	2.9	1.4	1.0	0.4	2.1	2.1	4.2	3.5	2.5	2.2
燃料油	32.8	32.7	26.2	29.3	30.9	28.2	29.4	23.4	25.2	24.8	21.7	25.1	20.2	15.3
タール	2.3	2.6	2.4	1.9	1.9	1.4	1.9	1.8	1.9	2.3	2.1	1.9	1.9	4.4
非エネルギー	2.2	1.9	2.5	2.1	3.3	4.8	3.8	3.6	4.7	3.5	3.3	3.5	4.1	2.9
コークスガス	1.1	1.1	1.1	1.2	1.6	1.9	1.6	1.6	1.5	1.3	1.2	1.0	1.1	0.9
高炉ガス	1.2	1.3	1.3	1.1	1.5	1.5	2.1	1.8	2.0	1.5	1.1	1.1	1.2	0.5
石炭コークス	1.3	1.1	1.1	1.6	1.0	0.9	0.8	0.8	1.9	0.7	0.4	-	0.7	0.5
石炭、薪その他	16.5	16.1	15.9	16.1	15.2	14.6	13.0	15.0	13.4	13.5	14.8	15.4	15.2	14.2
合計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

表12 エネルギー自給率の推移

単位：10³石油換算トン

	内 需	国内生産	生産/内需(%)
1970	32,476	29,728	91.54
71	34,866	31,671	90.83
72	35,199	32,056	91.07
73	36,693	31,751	86.53
74	37,539	32,028	85.32
75	37,577	32,245	85.81
76	39,395	33,369	84.70
77	40,580	35,189	86.71
78	41,829	36,811	88.00
79	44,080	39,364	89.30
1980	44,334	41,418	93.42
81	43,355	41,842	96.51
82	43,729	42,671	97.58
83	44,578	44,283	99.34

表13 総括エネルギーバランスの推移

単位：10⁸ 石油換算トン

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
一次エネルギー生産	29,993	31,937	32,315	32,264	32,869	33,262	34,356	36,211	38,205	41,178	43,729	44,113	45,159	46,838
輸入	3,287	3,855	3,278	5,980	5,815	5,695	6,442	6,534	5,451	6,011	5,562	4,660	3,736	2,805
一次エネルギー	2,039	2,762	2,779	5,016	5,099	4,550	5,445	5,701	4,794	4,128	4,750	3,797	3,332	2,344
二次エネルギー	1,248	1,093	499	964	716	1,145	997	833	657	1,883	812	863	404	461
在庫変動	204	- 380	303	- 727	- 34	- 24	33	- 352	596	- 360	- 607	388	327	248
一次エネルギー	186	- 250	109	- 135	- 343	98	103	- 364	290	- 23	- 294	116	316	- 114
二次エネルギー	18	- 130	194	- 592	309	- 122	- 70	12	306	- 337	- 313	272	11	362
供給合計	33,484	35,412	35,896	37,517	38,650	38,933	40,831	42,393	44,252	46,829	48,684	49,161	49,222	49,891
最終エネルギー消費	22,054	22,815	22,813	24,503	25,803	25,125	26,988	26,680	27,502	28,904	29,419	29,074	28,929	30,198
一次エネルギー	1,619	1,449	1,435	1,502	1,486	1,401	1,303	1,378	1,304	1,312	1,419	1,491	1,443	1,447
二次エネルギー	20,435	21,366	21,378	23,001	24,317	23,724	24,785	25,302	26,198	27,592	28,000	27,583	27,486	28,751
自家消費	3,245	3,703	3,833	3,834	3,618	3,550	3,384	3,921	3,904	4,160	4,288	4,402	4,504	4,475
一次エネルギー	115	108	86	72	72	106	159	177	198	146	112	126	116	143
二次エネルギー	3,130	3,595	3,747	3,762	3,546	3,444	3,425	3,744	3,706	4,014	4,176	4,276	4,388	4,332
輸出	743	880	438	311	270	339	449	791	1,029	935	2,039	3,535	3,005	2,758
一次エネルギー	32	27	24	26	71	16	-	-	-	-	-	-	-	20
二次エネルギー	711	853	444	285	199	323	449	791	1,029	935	2,039	3,535	3,005	2,738
ロス	7,442	8,014	8,812	8,869	8,959	9,919	10,710	11,001	11,817	12,830	12,938	12,150	12,784	12,460
輸送ロス	478	541	717	776	405	769	719	894	957	1,005	1,223	1,278	1,131	979
転換ロス	1,434	1,449	1,419	1,579	1,413	1,993	2,675	2,765	3,183	3,283	2,944	2,692	2,928	2,752
調整	5,277	5,641	5,899	6,116	6,613	6,561	6,870	7,281	7,293	8,191	8,360	7,903	7,770	8,404
	253	383	777	398	528	596	446	61	384	351	411	277	955	325
合計	33,484	35,412	35,896	37,517	38,650	38,933	40,831	42,393	44,252	46,829	48,684	49,161	49,222	49,891

表14 石油製品,天然ガス輸出入

(1) 輸 入

	数 量 (m ³)		金 額 (US\$)	
	1983	1984	1983	1984
溶 済	859	41	687,985	26,940
灯 油	91,357	130,616	20,899,117	30,512,817
潤 滑 油	12,945	26,229	6,248,413	11,584,857
潤滑グリース	41	22	103,882	64,164
パラフィン(トン)	270	231	329,881	287,304
石油コークス(トン)		2,659		410,109
天然ガス(10 ³ m ³)	2,227,148	2,211,011	378,167,569	375,925,562
合 計			406,436,847	418,811,753

(2) 輸 出

	数 量 (m ³)		金 額 (US\$)	
	1983	1984	1983	1984
レギュラーガソリン	-	21,397		4,335,529
プレミアムガソリン	14,748	21,009	3,492,849	4,464,125
溶 済	137,746	155,949	27,999,625	29,752,382
テ レ ビ ン 油	11,531	7,071	2,501,869	1,593,541
軽 油	203,606	201,182	41,395,795	42,899,135
燃 料 油	1,285,877	1,161,973	186,959,491	192,075,728
潤 滑 油	18,463	8,487	4,339,764	2,310,082
アスファルト(トン)	7,521	10,719	1,122,341	1,863,245
グリース(トン)	39	29	31,673	9,334
パラフィン(トン)	4,928	5,320	2,722,076	2,676,041
コールタール(トン)	616,204	132,911	19,022,159	4,792,921
L P G(トン)	24,088	52,787	7,276,653	10,797,985
合 計	-	-	296,864,295	297,570,048

表15 石炭需給と輸出入

	1983	1984
粗 生 産	(t) 1,112,756	1,109,260
商 業 生 産	(t) 485,860	509,151
販 売 量	(t) 333,972	373,571
輸 入 (トン)	(t) 478,206	538,453
輸 入 (米ドル)	(US\$) 3,491,500	38,126,646
輸 出 (トン)	(t) 33,008	
輸 出 (米ドル)	(US\$) 552,089	

