アルゼンティン共和国
工場省エネルギー計画
事前調査報告書

1987年9月

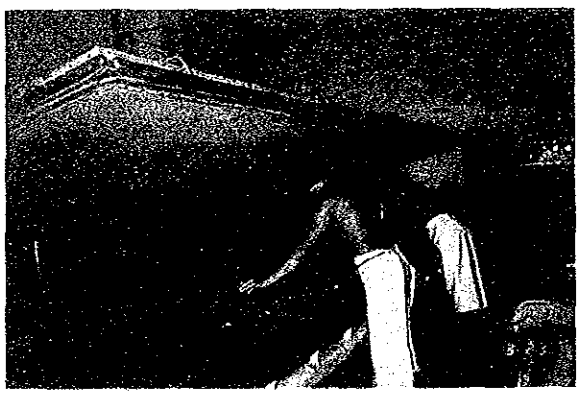
国際協力事業団

紙パルプ工場（Zucamor S. A.）

紙パルプ工場（Zucamor S. A.）
コルゲーター

皮革工場（Carlos Gibaut S. A.）
プレス

鋳物工場（Aceros Potrone）電気炉



鋳物工場（Aceros Potrone）熱処理炉

目　　次

Ⅰ. 要請の背景及び事前調査団派遣の経緯 …… 1

Ⅱ. 調査団の構成と日程 …… 2

1. 調査団の構成 …… 2

2. 日　　程 …… 2

3. 面　会　者 …… 3

Ⅲ. 調査、協議の内容 …… 4

1. アルゼンティン側の要請内容の確認 …… 4

2. INTIとの協議内容及び結果 …… 4

3. S/W及びMinutes of Discussionの協議 …… 5

Ⅳ. アルゼンティン共和国の省エネルギー政策と活動実績 …… 7

1. エネルギー事情と省エネルギー推進の必要性 …… 7

2. 大統領規則の公布 …… 10

3. これまでの省エネルギー活動実績 …… 11

Ⅴ. INTIの組織と活動 …… 14

Ⅵ. 視察工場の概要 …… 15

1. ACEROS POTRONE SAIC（鋳物工場） …… 15

2. ZUCAMOR S.A.（紙・パルプ工場） …… 15

3. CARLOS GIBAUT（皮革工場） …… 16

Ⅶ. 本格調査実施上の留意事項 …… 17

添付資料

1. Scope of Work …… 19

2. The Minutes of Discussions …… 27

3. Questionnaire …… 31

4. 大統領規則 …… 39

5. INTI関係者、カウンターパート名簿 …… 57

6. 経済情勢資料（GNP、インフレ、貿易収支、工業生産） …… 59

7. アルゼンティン省エネルギー会議資料 …… 69

8. アルゼンティン共和国エネルギー需給統計 …… 77

I　要請の背景及び事前調査団派遣の経緯

(1)　アルゼンティン共和国の一次エネルギーは石油54％、天然ガス35％とこの両者にほぼ90％依存しているが、その殆ど100％近くを自給できている。このようにエネルギー源に恵まれているため、最近まで省エネルギーに対する関心は政府部内および企業の何れにおいても必ずしも高くはなかったと云える。一方、工業部門のエネルギー使用効率は経済の停滞により稼動率が低かったことに加えて、設備は旧式のものが多いため、低い水準にある。

(2)　アルゼンティン政府は多額の対外債務を抱えており、エネルギー価格の高騰にともない、石油の国内消費を抑えて輸出に回し、外貨収支の改善を図ることを目的として省エネルギー、天然ガス転換、新エネルギー研究開発を進めるべく、1979年および1985年に大統領規則を公布し、1981年には省エネルギー・新エネルギー局を発足させた。

工業分野の省エネルギー推進については国立工業技術院（ＩＮＴＩ）による省エネルギー技術開発と工場指導や国立技術大学（ＵＴＮ）の教授による工場診断に着手している。他の分野についても後述のように種々のプログラムをスタートさせており、これに伴って省エネルギーに対する国民の関心も高まってきている。

(3)　アルゼンティン政府は1982年8月日本政府に対し、省エネルギーの具体的技術の適用の可能性（工業分野でのエネルギーの合理的使用計画及び改善策の提案）に関する調査の実施を要請越した。

(4)　その後、本要請については調査の実施方法、取り組み方等日本国内で継続協議されていたが、1985年12月にＪＩＣＡが行ったプロジェクト選定確認調査においてアルゼンティン側は依然として我が国の協力を要望していることが確認され、また、1986年7月に来日したアルフォンシン大統領からも本件調査の実施方を再度要請された経緯がある。

(5)　本事前調査団はＦ／Ｓの実施に必要なＳ／Ｗの協議・署名および各種情報収集のため派遣されたものである。

Ⅱ 調査団の構成と日程

1. 調査団の構成

武田慶一	：	団長・総括	ＪＩＣＡ工業調査課長
榊原磨理子	：	省エネルギー政策	資源エネルギー庁省エネルギー対策室
井口光雄	：	省エネルギー普及	(財)省エネルギーセンター
中川雄	：	省エネルギー診断技術	(財)省エネルギーセンター
十郎正義	：	業務調整	ＪＩＣＡ工業調査課

2. 日程

月日	訪問先および内容	
3/17	東京発 (RG-831)	
18	Buenos Aires着	ＪＩＣＡにて日程打合せ、大使館表敬
19		エネルギー庁、ＩＮＴＩ表敬
		鋳物工場視察、外務・宗教省表敬
20		ＩＮＴＩにてＳ/Ｗ協議
23		紙・パルプ工場、皮革工場視察
24		ＩＮＴＩ研究所視察、Ｍ/Ｄ協議
25		外務・宗教省にてＳ/Ｗ、Ｍ/Ｄ署名
		ＪＩＣＡ、大使館報告
	帰国 (AR-384)	

3. 面会者

(1) ＪＩＣＡ

福田所長、石塚課長、古屋職員

(2) 日本大使館

蝦田参事官、高木参事官、三輪書記官

(3) エネルギー庁

Dr. Jaime A. Moragues (Director)

Ing. Eduardo Sotelino

Ing. Claudio Carpio

(4) ＩＮＴＩ

Ing. Enrique M. Martinez (President)

Ing. Horacio E. Perera (Vice President)

Dr. Enrique Grunhut (Secretario Ejectivo)

Ing. Ismael Horton (Jefe del Departamento de Energia)

Ing. Marcelo Silvosa (Departamento de Energia)

Lic. Guillermo Paladino (Ditto)

Lic. Alberto Berset (Ditto)

Lic. Jorge Fiora (Ditto)

(5) 外務・宗教省

Embajador Oscar Yujnovsky (Subsecretario de Cooperacion Internacional)

Dr. Francisco de Grossi (Ditto)

(6) 鋳物工場（ACEROS POTRONE）

Sr. Oscar Portrone (President)

Ing. Jose Taboada (Gerente Produccion)

(7) 紙・パルプ工場（ZUCAMOR S.A.）

Ing. Goffredo Tonino (Jefe, Depart. Mantenimento)

Ing. Panizza Oscar (Jefe, Depart. Procesos)

Lic. Carlos R. Espindola (Jefe, Depart. Laboratorio)

Sr. Mazzetti Romulo (Jefe, Depart. Tecnico)

(8) 皮革工場（CARLOS GIBAUT）

Sr. Carlos Gibaut (President)

Ing. Maria Ines Iribarne

Ⅲ 調査、協議の内容

本件調査団はアルゼンティン共和国外務宗教省国際協力局、エネルギー庁省エネルギー・新エネルギー局、国立工業技術院（ＩＮＴＩ）を訪問し、本件要請にかかる内容の確認、日本側対処案の説明、Ｓ／Ｗおよび本格調査の実施手法等につき協議を行い、あわせてブエノスアイレス近郊の鋳物工場、紙・パルプ工場、皮革工場を視察し、エネルギーの使用状況を調査した。調査結果及び協議内容の概要を以下の通り報告する。

1. アルゼンティン側の要請内容の確認

ＩＮＴＩの要請内容は1985年12月に派遣したコンタクトミッションに対して表明された内容と相違がなく、ＩＮＴＩが実施を予定している製造業分野10業種の省エネルギー診断調査のための

(a) 日本側専門家による省エネルギー診断方法の技術移転

(b) 診断用機材および機材運搬車の供与

(c) アルゼンティンカウンターパート３名の日本における研修

の３項目の協力要請であることを確認した。

2. ＩＮＴＩとの協議内容および結果

(1) 日本側の協力基本方針の説明とアルゼンティン側の反応

アルゼンティン側の要請内容の確認後、我が国の技術協力の事業形態別（専門家派遣、開発調査、機材供与等）の協力方法につき説明したところ、アルゼンティン側は基本的に我が方の用意した調査方法について了解した。しかし、現地工場診断で入手したデータ・資料の分析については日本における国内作業で行う計画としているのに対し、アルゼンティン側からデータ分析手法の技術移転は本件要請の重要な要素であるため、工場調査の結果分析もアルゼンティン国内で実施して欲しい旨要望が出された。調査団としてはアルゼンティン側の要望も理解できるが、本件開発調査のスキームにおいては調査団をアルゼンティン国に長期に滞在させることは予算的にも不可能である旨説明するとともに、診断工場の規模によっては３日間を工場診断、残り２日間をデータ分析に充てる方法も可能であるので、現地調査の実施方法を工夫することにより診断技術、機材の操作技術の移転の効果を上げることは可能である旨説明し、アルゼンティン側も了解した。

(2) 工場診断対象業種および工場数

本格調査の工場診断の対象業種は金属加工、ガラス、製鉄、化学、紙パルプ、食品、繊維、皮革、プラスチックの9業種とし、各業種の調査対象工場数は1業種1～2工場の合計10工場程度とし、対象工場はブエノスアイレン近郊の中小規模の工場とすることで双方合意に達した。

診断工場の選定はINTIが行い、対象工場に対するアンケート調査は9月の予備調査団派遣までにINTI側で実施しておくことで了解に達した。

(3) 調査機材の協議においては我が方の用意したリストの他にガス・蒸気流量測定器の追加要請があったところ、調査の実施に必要と判断されたので追加することで同意した。調査機材の通関を円滑に行うため、上記調査機材に対するA4フォームの提出を求めたところ、INTI側は了解した。

3. S/WおよびMinutes of Discussionの協議

本件調査の目的、調査範囲、調査手法、調査時期等について本件要請機関であるINTIと合意に達した後、S/W全体についての協議を行ったところ、外務宗教省およびエネルギー庁より以下の問題提起がなされた。

(1) S/Wの6－(2)－⑥調査団の私有地立ち入り許可の取付、および⑦調査団の資料およびデータ持ち出しの許可の取付について、外務宗教省は許可の取付の保証はできないので、いずれの条項も「To assist to secure …」に変更することを求めてきた。しかし、本件調査においてはINTIが手配する工場以外への立ち入りを求めることはないし、INTIが許可しない資料・データを持ち出すこともない。また本条項は日本とアルゼンティン共和国外務宗教省との間で署名された過去のS/Wに準拠して用意されたものであるので変更を認め難いとし、アルゼンティン事務所を通じて外務宗教省の国際協力次官補と協議とたところ、アルゼンティン側は変更しないことで了解した。

(2) S/WおよびMinutes of Discussionの協議を終え、署名当日になってエネルギー庁も本件カウンターパートとして署名に参加すること、それに伴いS/WのIntroductionおよびScope of the Studyの箇所の変更を求めてきた。アルゼンティン共和国におけるエネルギー関連の主務官庁はエネルギー庁であることから、本件調査への協力体制を取り付けるためにもエネルギー庁の署名への参加は認められるが、S/Wの内容の変更は時間がないので応じられないと断ったところ、外務宗教省の国際協力次官補がエネルギー庁の幹部およびINTIの総裁を招集し調整した結果、エネルギー庁は署名には参加しないが本件調査には出来るだけ協力することで調整が付いた。

(3) 3月25日、上記の協議及びアルゼンティン国側内部の調整を経て、特に外務宗教育

国際協力次官補から「エネルギー庁は省エネルギーのプログラムを推進する任務を持っており、このプロジェクトの進展にも強い関心を持っているが、このプロジェクトについてはINTIをカウンターパートとする」とのコメントがあった後、エネルギー庁も立ち会ってINTI総裁E. M. Martinez，外務宗教省国際協力次官補O. Yujnovsky と調査団長の間で、日本側原案通りのS/W及びINTIとの協議内容のMinutes of Discussion に署名を行った。

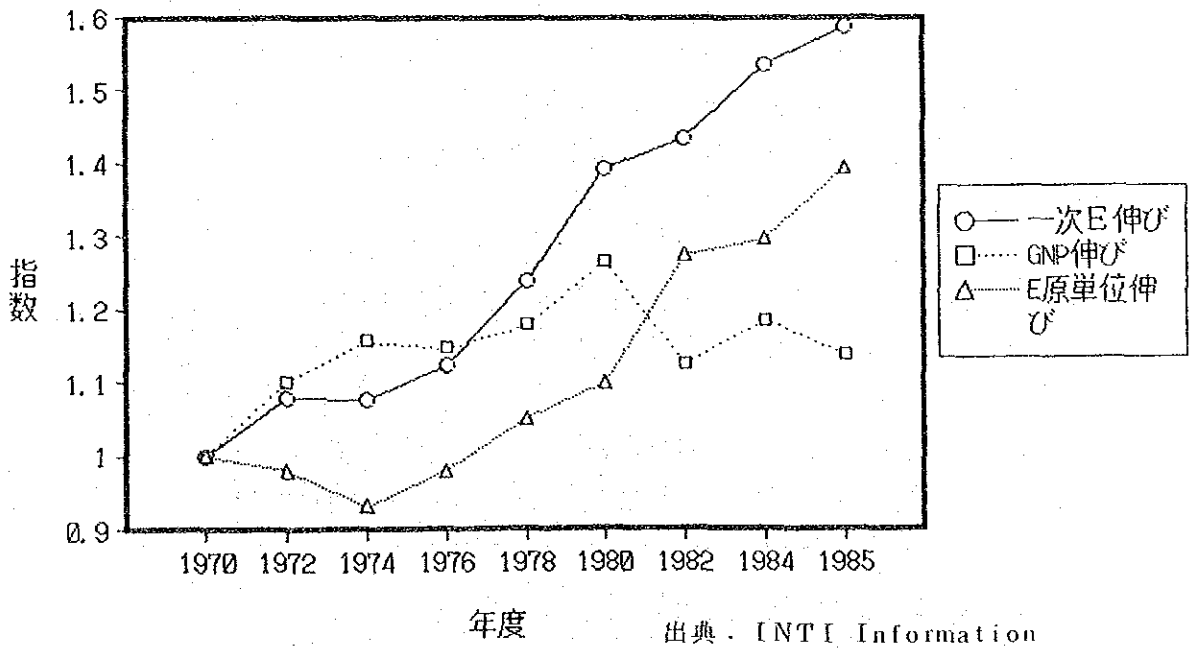
Ⅳ　アルゼンティン共和国の省エネルギー政策と実績

1.　エネルギー事情と省エネルギー推進の必要性

アルゼンティン共和国は肥沃な土地と石油・天然ガス、水力、漁業資源等に恵まれ、基本的には豊かな国である。しかし、第二次大戦後政情が安定せず、軍政、民政の繰り返しが続き、一貫した経済政策が取られなかったことや国際紛争のため、順調な経済発展が妨げられ、500億$にも上る多額の対外債務と、一時は対前年比1,000％にも達した激しいインフレにより経済は停滞した。経済成長率もプラスとマイナスの繰り返しで、1976年から1986年までの10年の平均成長率は0.47％、ここ5年でも0.24％と低い数字に留まっている。1983年に経済運営に行きづまった軍事政権から政権を引き継いだ現政権は、1985年にアウストラルプランとして、1／1000のデノミ、賃金・価格の凍結等を実施し、インフレの収束には一応の成功を収めた。しかし、その後1986年に景気浮揚策がとられた後再びインフレが再燃し、1987年に入ってアウストラルの切り下げ、賃金・物価の一定期間凍結を含む新緊縮策が発表された。このように経済は必ずしも安定しているといえない現状である。

省エネルギーの面でも適切な政策が取られなかったため、GNP当たりのエネルギー消費原単位は第1図のように増加を続けている。

第1図　エネルギー原単位推移

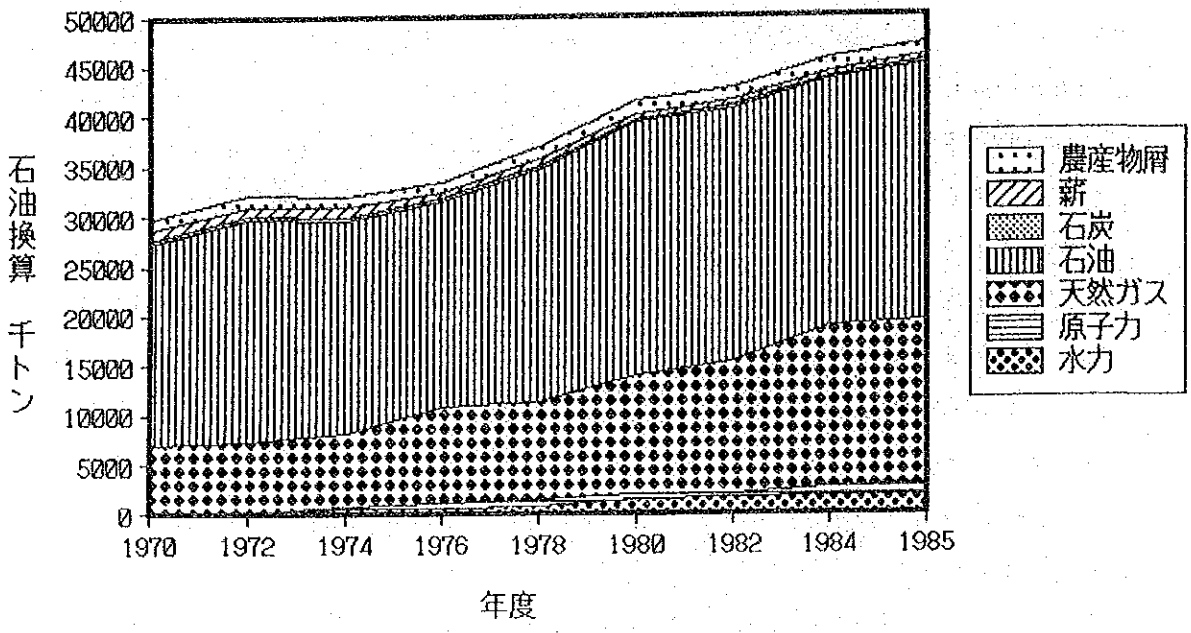


出典．INTI Information

アルゼンティン共和国のエネルギー事情を見ると、一次エネルギー構成では54％が石

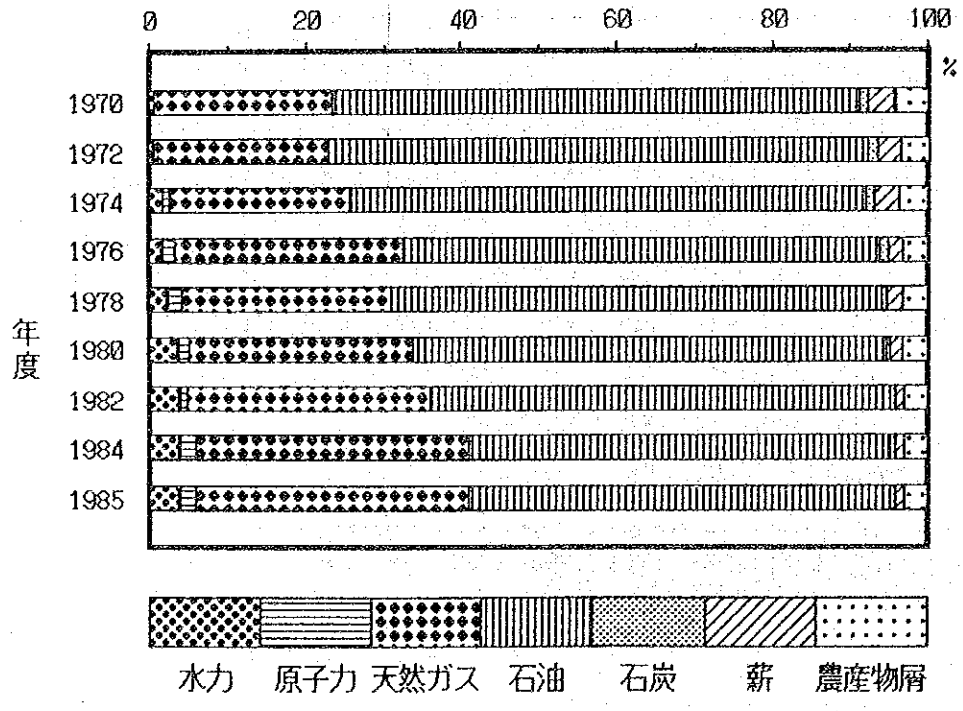
油、35％が天然ガスであり、この両者で90％弱を占めている。この両者で90％という数字はここ10年以上変わっていないが、第2図でみると生産増は天然ガスの方が大きく、第3図でみるように徐々に天然ガスの比率が増加してきている。

第2図　一次エネルギー生産



出典　INTI Information

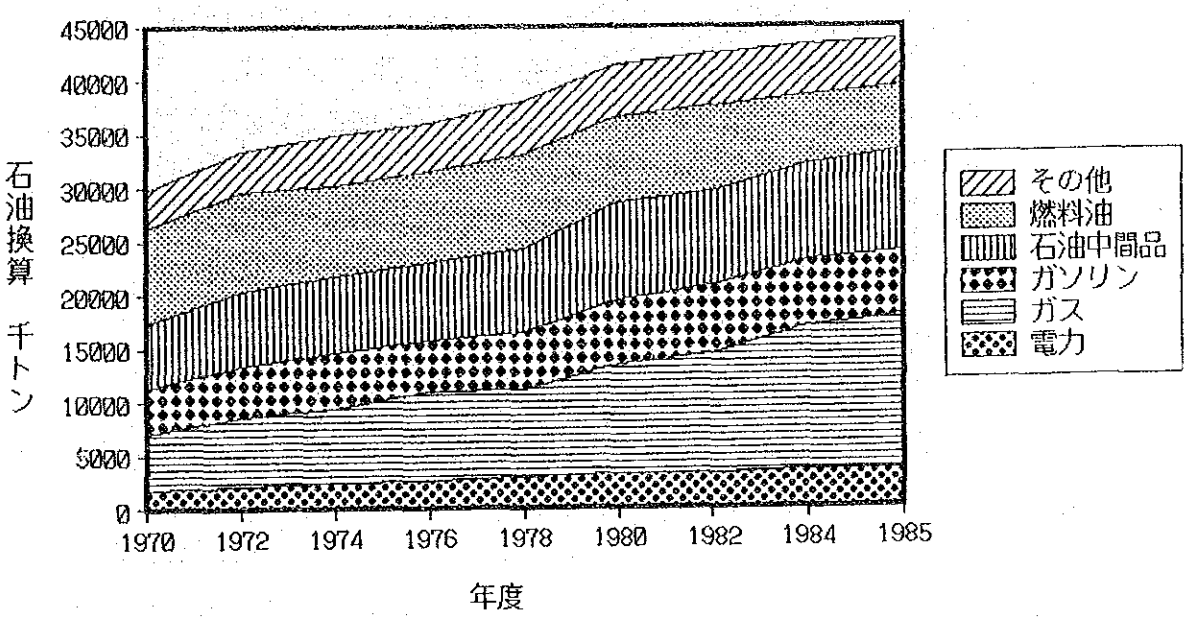
第3図　一次エネルギー生産比率％



出典　INTI Information

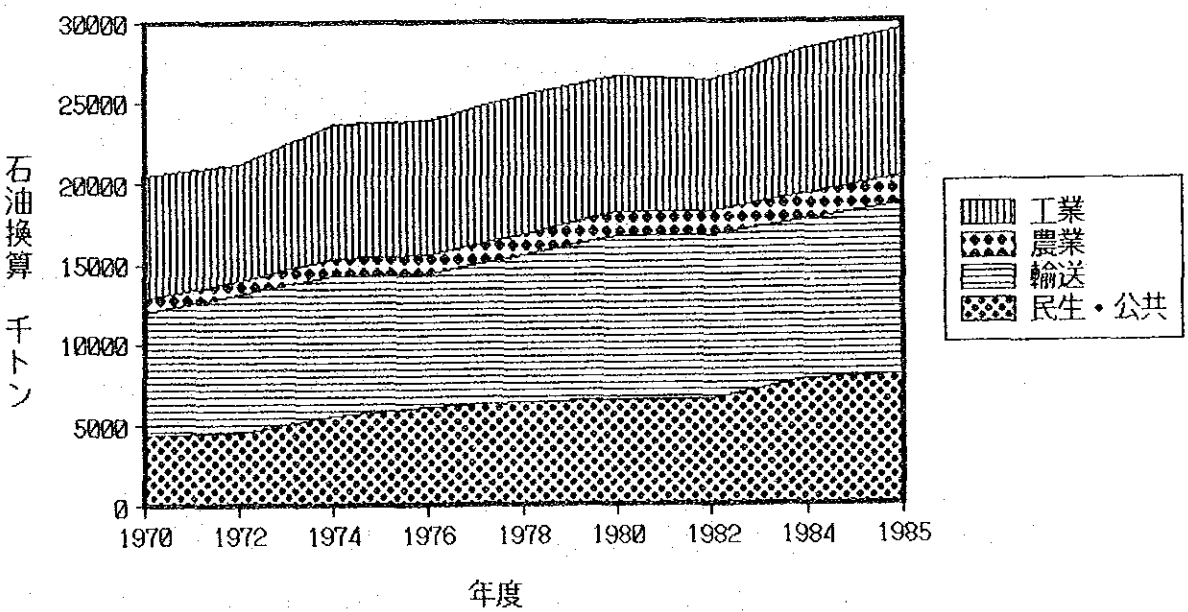
これは、一つには資源量がガスは石油の 1.6 倍存在し可採年数が 35 年あるのに対し、石油の可採年数は 14 年程度しかないこと、二つにはこのガスが石油と併産して産出するので、ガス消費量が少なくて石油消費が多い場合はガスを放散しなければならなくなることから、長距離パイプラインを敷設して天然ガスへの転換を進めているためである。二次エネルギーでみても、第 4 図のようにガスの伸びが目立つ。

第 4 図　二次エネルギー生産



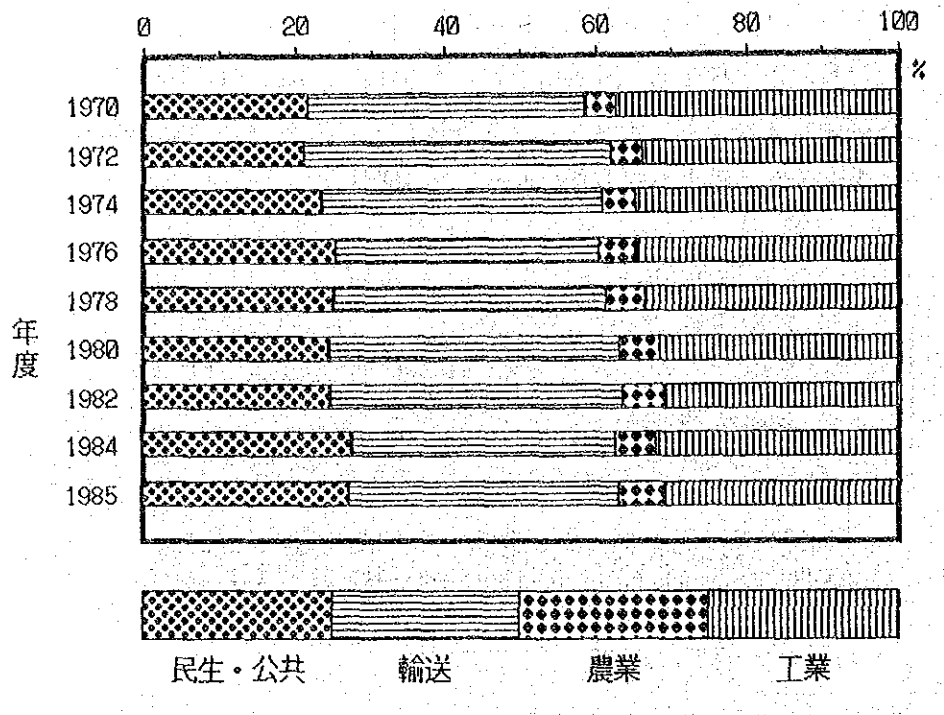
部門別の最終消費は第 5 図、第 6 図でみられるように、産業の停滞を反映して民生・公共部門のウエイトが高くなってきている。

第 5 図　部門別最終消費



出典　INTI Infprmation

第6図　最終消費部門別比率％



出典　INTI Infprmation

以上のような国内経済やエネルギー資源の状況から、アルゼンティン政府は世界市場でのエネルギー価格の高騰にともない、石油の国内消費を抑えて輸出に回し外貨収支の改善を図ること、および省エネルギーを通じて工業の競争力を強化し、経済発展、国民生活向上を図ることを目的として省エネルギーを推進しており、この基本姿勢は現在でも変わっていない。

2.　大統領規則の公布

1979 年に大統領規則No．3408 が公布された。この規則は地熱開発計画 (Neuquen) の承認のため定められたものであるが、他の新エネルギー、省エネルギーの計画も含まれている。予算は 1200 万US＄で、資金源としては電気・石油等の税金を充てている。使途はそれまで道路用（40％），発電所建設用（60％）であったものを省エネルギーに対しても使えるようにした。この規則に基づき 1981 年に省エネルギー・新エネルギー局が発足している。

大統領規則No．3408 は 5 年間の時限立法であり、1984 年 12 月に失効した。これに代わるものとして、大統領規則No．2247 がやはり 5 年間の時限立法で 1985 年 11 にに公布された。予算は 5,817 万A（アウストラル）〔1US ＄＝1.535A，1987．3 現在〕で、資金源はこれまで同様エネルギー税である。

大統領規則No．2247 は以下の 3 つのプログラムにより構成されており、州政府も参加

できるようになっている。

① 省エネルギー（予算は5年間で1,248万A）

② 天然ガス転換

③ 新エネルギー研究開発（太陽エネルギー、風力、地熱、バイオマス、水力、石油二次回収）

目標として次のように1985年から1989年の間で累計12百万トンのエネルギー節減を掲げている。

エネルギー消費推定量　（石油換算　千トン）

年	省エネルギー前	省エネルギー後	節減量
1985	40,885	40,272	613
1986	42,520	41,171	1,349
1987	44,221	42,004	2,217
1988	45,990	42,417	3,573
1989	47,830	43,099	4,731
累計			12,483

3. これまでの省エネルギー活動実績

(1) 工業部門

① 中小企業省エネルギー診断計画

目的：1）工場の省エネルギーの推進

2）省エネルギーの実行可能性の調査

3）診断要員の訓練

体制：1982年からエネルギー庁とUTN（国立技術大学）とで無料の工場エネルギー診断を実施している。

実施機関は全国17ケ所に設置されているエネルギーセンターである。うち5ケ所は最近設立されたばかりであるが、12ケ所が活動中である。また6ケ所のセンターでは移動研究所のシステムを持っている。

各センターは2～3名の大学教授と5～6名の大学高学年生徒で構成されており、全体で約80名である。

診断用機材は最低限必要なものを世界銀行との協定により購入して配置している。

実績：既に140工場の診断を実施した。各業種毎に10%に相当する数の工場を診断する計画であったが、実際は1～2工場の診断数となっている。

② フランスの専門家による診断指導

SANCO社の省エネルギー診断においてフランスから派遣された専門家がUTNの診断員を指導している。（SANCO社：シェア30％のミルク加工会社）

③ 教育訓練

Rosario大学において電気の管理者を集めて講演会を開催した。

エネルギー庁の資金によりINTI内に教育センター（CIPUE）を設立する予定であり、できれば診断も実施させたいと考えている。

④ 省エネルギー機器普及促進

税制・金融上の優遇措置は設けていない。診断実施後に融資することも考えたが金利が高く実施されていない。

⑤ 企業の関心

コストに占めるエネルギー費の割合は製鉄、ガラス、製紙では約25％と高いが、それ以外では低く省エネルギーに対する関心が薄い。しかし、合弁会社（Johnson & Johnson等）では親会社のプログラムにより独自に省エネルギーを進めており、国有会社でも省エネルギー計画を進めている。

工業部門のエネルギー消費量は石油化学、発電を除く全部門の約30％、1,000万TEPであるが，エネルギー庁がエネルギー供給会社に対して行ったアンケート調査によると上位20工場でその15％、125工場でその45％を消費している。

(2) 民生部門

① 家電製品

業界と省エネルギー振興プログラムを打ち合わせたことがあるが実施には到らなかった。

Phillips社の省エネルギーランプのPRにエネルギー庁も協力したが長続きしなかった。

一般市民に対する啓蒙計画は大統領規則にも入っているが、電気・ガスの料金が安いので関心をひき難い。料金政策の必要性も大統領規則で指摘されているが、エネルギー不足の心配が無い状況下で政策的にエネルギー価格を上げることは政治問題になるので難しい。

② 建築物

建築規定は州・市の管理下にあり、エネルギー庁は州・市と協議して省エネルギー規定を作成した。（Chubut、Tucuman両州）

住宅のエネルギー評価計画についてはエネルギー庁、ブェノスアイレス州、科学委員会の協定により、ラプラタ市、ブェノスアイレス市で400軒の住宅診断を実施し

ており、3月末で終了する予定になっている。

引き続き店舗のエネルギー診断を実施する予定である。

(3) 交　通　部　門

省エネルギー計画はないが、ガソリン価格を政府の収入確保のため引き上げた。（それでも国際価格よりは低い水準である。）

ガソリンに砂糖黍から作ったエチルアルコールを混ぜた混合燃料への転換を北部で進めている。またメンドーサ州では日本およびソ連の技術によりトロリーバスの導入を進めている。

(4) 農　業　部　門

ブェノスアイレス州で小麦、ひまわり、大豆等の乾燥設備15ケ所をUTNにより調査中である。

(5) 世界銀行の援助（1979～1985）

① 世界銀行とYPF（石油公社）との協定による省エネルギー調査を世界銀行とINTIとで実施した。10業種で170万TEPの省エネルギーの可能性があると指摘された（1981年）。

② 世界銀行と国立開発銀行との間で1億US$の信用を供与する協定が成立した。うち1,000万US$を省エネルギーに当て10業種、20工場の省エネルギー診断を実施することとし、エネルギー庁で事前調査を行い国際入札するところまで行ったが政変のため中止となった。

V．ＩＮＴＩの組織と活動

(1) 本プロジェクトのカウンターパートとなるＩＮＴＩは、経済省工業貿易庁に属する自立機関として、工業部門の技術的・経済的発展を支援することを目的として1957年に設立された。職員数は1,550人、年予算は27百万Ａ（約22.5億円）である。

具体的な活動としては、企業への技術サービス、技術開発の促進、企業間あるいは産学共同研究の実施、材料・製品の試験、工場の標準化・品質管理の推進、診断指導、中小企業従業員に対する技術面、管理面の研修実施、国内外の技術情報提供等を行う。

工場訪問の実績は次の通りである。

年次別　　1981～1982(5)、1983～1984(1)、1985(1)　計（７工場）

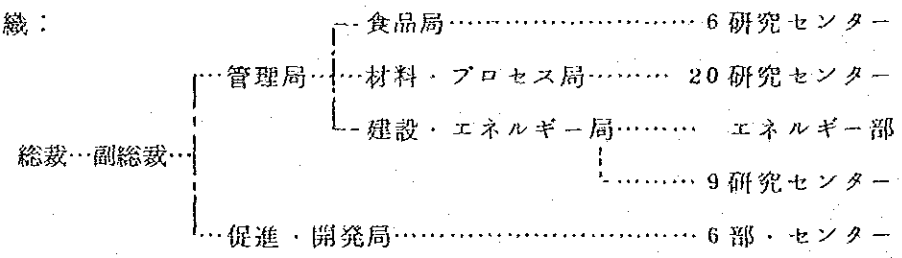
業種別　　繊維（2）　金属機械（1）　化学（1）　紙・パルプ（1）　靴（1）　皮革（1）

エネルギー部では、定期的にエネルギー関係のセミナー、出版その他の活動を実施している。

(2) 組織は２つの系列に分かれている。１つは中央研究所で、物理、化学、食品、機械、建設・エネルギー、コンピューター、マイクロエレクトロニックス、プロジェクト／プロトタイプ、バイオ、応用電気化学の10の局を持っており、ブエノスアイレス郊外のミゲレッテ技術公園に置かれている。

もう一つは、23の研究センターで、それぞれ特定のテーマの研究を実施する。そのうち、紙・セルロース、工業設計、文書、ゴム、染色、食肉、鉱物、プラスチックス、繊維、環境、住宅エネルギー性能の11センターは、中央研究所と同じ場所にあるが、他の12研究所は地方に置かれている。

組織：



(3) 省エネルギー施策上の位置付け

エネルギー庁省エネルギー・新エネルギー局Moragues局長の談によると，省エネルギー政策についての推進調整の責任は省エネルギー・新エネルギー局にあるが、ＩＮＴＩは国立技術大学等関係機関とともに具体的な施策の実行機関として位置付けられている。

VI. 視察工場の概要

INTIが工場選定を行う際の目安とするため、ならびにアルゼンティンの工場における省エネルギーの実態を把握するため3ケ所の工場視察を行った。

これらの工場は中小企業に属し、規模的にも省エネルギーの余地の多い点からも本調査の対象として適当な工場であった。

(1) ACEROS POTRONE SAIC工場（鋳物工場）

スクラップを単相アーク炉で溶解し、ボギーや車輪等の車輌部品を鋳造している工場である。

年産600～800t、従業員60人であり、同業約20社の中で5～8%のマーケットシェアを占めている。生産工程は次の通りである。

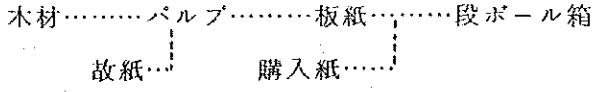
アーク炉溶解……鋳造……手入れ……熱処理

設備は30年以上を経過した古いものであるが，比較的良く整備されていた。溶解用電力原単位は900kWH／tと高い。訪問時は既に終業後であったので作業の状況は見られなかったが、アーク炉としては小容量（1t以下）のものを使っているのも原単位が高い原因の一つであろう。

熱処理は2基のバッチ炉で行っている。燃料ガス原単位は約60万kcal／tであり、処理条件にもよるが高めの数字となっている。炉の1基にはレキュペレータが備えられていた。社長はコスト切り下げの観点から省エネルギーに関心があると云っていたが、これまでは特に何も対策を実施していない。

(2) ZUCAMOR S. A.（紙・パルプ、段ボール工場）

木材からのパルプと購入故紙から紙を作る工程と、それを原料として段ボール箱を作る工程を持っている。生産工程は次の通りである。



段ボール箱月産500万m^2、マーケットシェア25～30%、従業員300人の中規模工場であるが、比較的よく管理されているように見受けられた。

エネルギー消費原単位は電力0.7kWH／kg－紙、蒸気3kg／kg－紙となっている。

これまでに実施した省エネルギー対策としては保温の強化のみであるが、下図のようにボイラに背圧タービンを設置し発電することを計画しているとのことであった。

36 kg／cm蒸気……背圧タービン…… 15 kg／cm蒸気（段ボール用）
⋮
発電機

当工場の工場長も省エネルギーには関心をもっており、以前にそのための戦制を設けたことがあるとのことであった。ただし、大統領布告については出されたことは知っていたが、内容は知らないと云っていた。省エネルギーに関する業界活動もなされていないようであった。

(3) CARLOS GIBAUT S. A.（皮革工場）

牛革の鞣し工場である。生産量1,100 枚／日、マーケットシェア 2.5％、従業員 180 名であるが、当業種の中では中規模に相当する。生産工程は次の通りである。

原皮……肉・毛除去……薬品処理（固定槽・回転槽）……絞り……乾燥……染付

加熱は蒸気並びに熱媒油によって行っている。コストに占めるエネルギー費の割合は10～12％程度であるが、経営者はむしろ原皮の価格高を問題にしていた。

省エネルギーには関心があると云うことで、乾燥工程で出る温水の循環を最近実施した。業界としての省エネルギー活動は行われていない。

Ⅶ. 本格調査実施上の留意事項

1. ＩＮＴＩは中小規模製造業におけるエネルギー使用の概況及び省エネルギーの可能性の調査を10業種、各10工場づつにつき、3年間にわたって実施する計画を持っている。この調査はアルゼンティン側が主体となって実施するものであるが、それに対して本件調査は、日本側が業種毎のモデル工場の省エネルギー診断を通じて調査方法を演示するとともに、調査の過程で把握した工場のエネルギー使用・管理の実態を基に省エネルギー対策のためのガイドブック作成に必要な提言を行うものである。従って、調査に当たっては業種毎の他の工場にも応用できるよう、なるべく普遍的な形で報告するよう留意する必要がある。
2. アルゼンティン側カウンターパートは研究業務に従事しており、一般的な技術知識は備えているが、工場における実際的なプロセスの知識に乏しいということである。工場における省エネルギー対策は生産性や製品品質と密接に関係しており、この面の指導もできるよう調査員にはプロセスの知識を有する技術者を含める必要がある。
3. 言語はスペイン語であり、工場従業員はもとより、カウンターパートでも英語を話せる人が少ない。また、現地における日・西通訳は技術面の通訳の出来る人の数が少ないので、技術者の英・西通訳を確保する必要がある。
4. 現地におけるデータ解析に必要と思われる関係資料を、できるだけ本格調査の前に収集するとともに、現地調査項目のチェックリストを準備し、調査の効率化を図るようにする。
5. ＩＮＴＩには今回持参するような診断機器が殆ど無いので、調査実施前にカウンターパートに対する機器取扱の訓練を実施する必要がある。

添　付　資　料

添 付 資 料 1. Scope of Work

添付資料 1. Scope of Work

SCOPE OF WORK
FOR
THE STUDY
ON
THE RATIONAL USE OF ENERGY IN INDUSTRY
IN
THE ARGENTINE REPUBLIC
AGREED UPON BETWEEN
INSTITUTO NACIONAL DE TECHNOLOGIA INDUSTRIAL
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

March 24,1987

Ing. Enrique Mario Martínez
Presidente de INTI

Embajador Oscar Yujnovsky
Subsecretario de Cooperación Internacional
Ministerio de Relaciones Exteriores y Culto

Mr.Keiichi Takeda
Leader of the Preliminary Survey Team
The Japan International Cooperation Agency

1. Introduction

In response to the request of the Government of the Argentine Republic (hereinafter referred to as "Argentina"), the Government of Japan has decided to conduct a study on the rational use of energy in industry in Argentina (hereinafter referred to as "the Study") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Argentina.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with authorities concerned of the Government of Argentina.

The present document sets forth the scope of work with regard to the Study.

2. Objective of the Study

The objective of the Study is to contribute to the promotion and strengthening of rational use of energy in the field of manufacturing industry in Argentina by (a) studying the technical and managemental applicability of rational use of energy in selected manufacturing industry (b) and formulating the report for the promotion of rational use of energy in industry.

3. Scope of the Study

In order to achieve the above objective, the Study will cover the following items:

(1) Literature survey on the energy situation in Argentina

①To survey the energy situation in Argentina

②To survey the situation of energy use in the field of whole manufacturing industry in Argentina

(2) Study on the promotion of rational use of energy in the manufacturing industry

①To investigate current program for rational use of energy

②To study and evaluate the INTI's activities

ⓐthe current activities for promotion of rational use of energy

ⓑthe achievements of past activities

ⓒthe future plan/program for promotion of rational use of energy

(3) Study on the situation of energy use in the selected factories of each industry

①To survey the situation of energy use in each factory

ⓐthe outline of the factory

ⓑthe situation of energy management

ⓒenergy flow chart

ⓓthe situation of major energy consuming equipment

ⓔthe problems found in each factory and countermeasures without changing the existing production process

ⓕthe estimated effects of the countermeasures

②To prepare the reference to formulate the technical guideline for the promotion of rational use of energy in industry

(4) Recommendation for the promotion of the rational energy use in Argentina

①To recommend with measures to promote rational use of energy in the

field of small and medium sized manufacturing industry

②To recommend with activities of INTI for rational use of energy

4. Steps and Schedule of the Study

(1) Steps

Step 1:Preparatory field work in Argentina

Step 2:Preparatory work in Japan

Step 3:First field work in Argentina

Step 4:Home office work in Japan

Step 5 ①:Second field work in Argentina

②:Presentation of and discussion on the interim report

Step 6:Home office work in Japan

Step 7:Presentation of and discussion on the Draft Final Report

(2) Schedule

Schedule of the Study is shown in Annex.

⑸ Reports

JICA shall prepare and submit the following reports written in English to the Government of Argentina within the time periods indicated below:

(1) Inception Report at the commencement of the Step 3: 10 copies

(2) Progress Report at the end of the Step 3 and 5①: 10 copies

(3) Draft Final Report and its summary within 15 (fifteen) months after the commencement of the Step 3: 15 copies

(4) Final Report and its summary within 3 (three) months after the receipt of comments on the Draft Final Report from the Government of Argentina: 30 copies

6. Undertaking of the Government of Argentina

(1) The Government of Argentina shall accord privileges, immunities and other benefits to the Japanese study team (hereinafter referred to as "the Team") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Argentina.

(2) In order to facilitate the smooth implementation of the Study, the Government of Argentina shalll take necessary measures:

①To secure the safety of the Team,

②To permit the members of the Team to enter, leave and sojourn in Argentina for the duration of their assignment therein , and exempt them from alien registration requirements and consular fees,

③To exempt the members of the Team from taxes, duties and other charges on equipment, machinery and other materials brought into Argentina for the implementation of the Study,

④To exempt the members of the Team from income tax and other charges of any kind imposed on or in connection with any emolument or allowance paid to them for their services in relation to the implementation of the Study,

⑤To provide the members of the Team with necessary facilities for remittance as well as utilization of the funds introduced into Argentina from Japan in the course of the implementation of the Study,

⑥To secure the permission for the members of the Team to enter into private properties and restricted areas for the implementation of the Study,

⑦To secure the permission for the members of the Team to take all data and documents (including photographs and maps) related to the Study

out of Argentina to Japan,

⑧To provide medical services as needed and its expenses will be chargeable on the members of the Team.

(3) The Government of Argentina shall bear claims, if any arises against the members of the Team resulting from, occuring in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

(4) INTI shall act as counterpart agency to the Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

(5) INTI shall, at its own expense provide the Team with the following, in cooperation with other relevant organization:

①Available data and information related to the Study

②Counterpart personnel

③Suitable office space with necessary equipment

④Identification cards

7. Undertaking of JICA

For the implementation of the Study, JICA shall take the following measures:

(1) To dispatch, at its own expense, the Team to Argentina

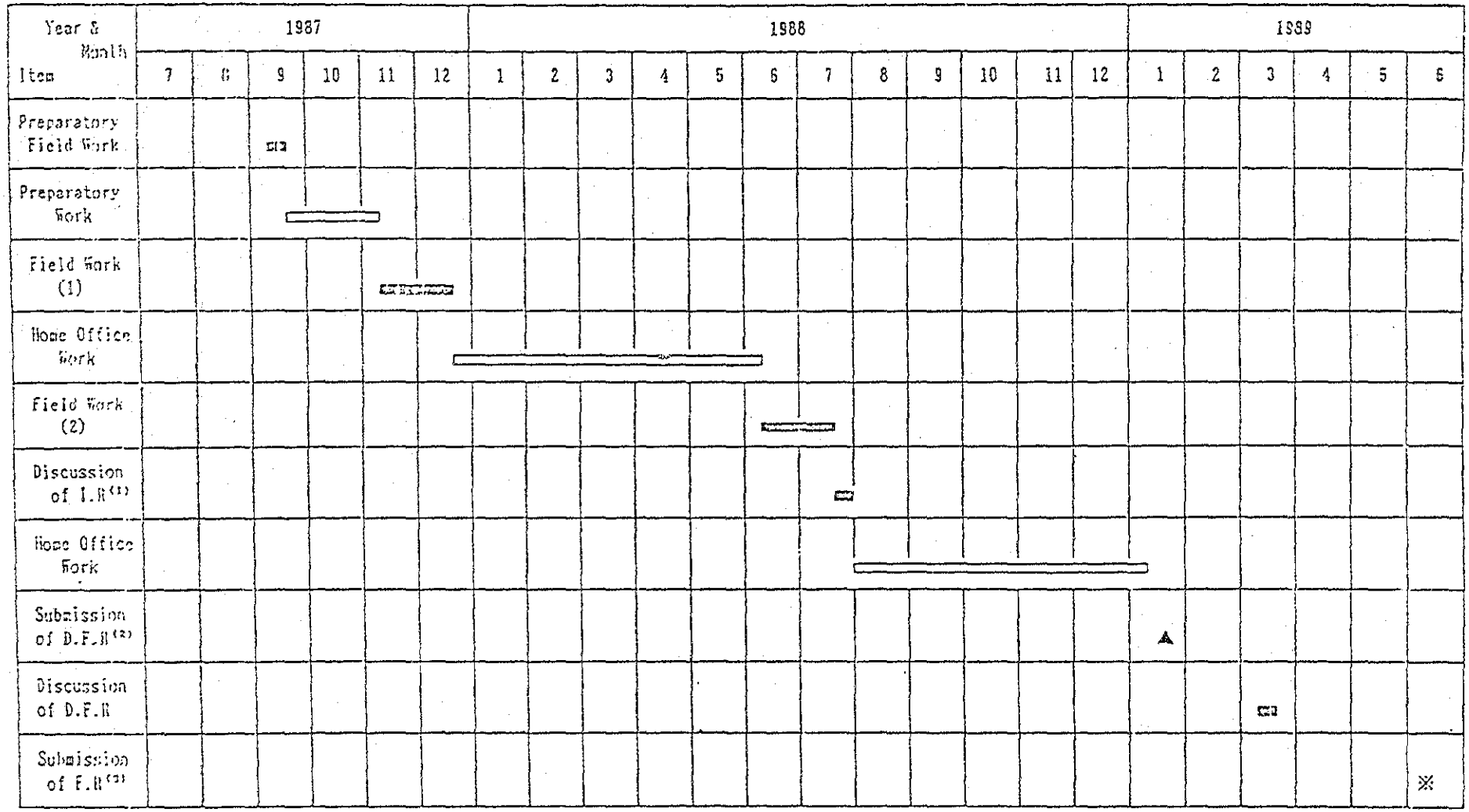
(2) To pursue technology transfer to Argentine counterpart personnel in the course of the Study

8. Consultation

JICA and INTI shall consult with each other in respect of any matter that may arise from or in connection with the Study.

Tentative Schedule of the Study

<Annex>



In Japan ▭ In the Argentine Republic ▭

(1) I.R :Interim Report (2) D.F.R :Draft Final Report (3) F.R :Final Report

添付資料 2. The Minntes of Discussions

添付資料2. The Minutes of Discussions

The Minutes of Discussions

The preliminary survey team of the Japan International Cooperation Agency, headed by Mr. Keiichi Takeda, visited the Argentine Republic from March 17 to 25, 1987 and had discussions with the Instituto Nacional de Tecnología Industrial and the Secretaría de Energía and other agencies concerned on the scopes of work and the methods of implementation of the Study on the Rational Use of Energy in Industry in the Argentine Republic.
Through the discussions and consultations, both parties agreed upon the matters as follows:

I - The sub-sectors and the number of factories to be surveyed in the Study are:

a) Sub-sectors:
(1) Metal; (2) Glass; (3) Iron & Steel; (4) Chemical; (5) Paper & Pulp; (6) Food; (7) Textile; (8) Leather and (9) Plastic.

b) Number of factories: Aproximately ten (10)

II - The selection of small and medium sized factories in each sub-sector of industry shall be done by INTI based upon the criteria agreed upon between both parties.

III - The Japanese side suggested INTI to finish the questionnaire survey toward the selected factories before the arrival of the preparatory field survey team in September 1987, and INTI agreed to it.

IV - INTI requested the Japanese side to provide the equipment listed in the attached paper upon the completion of the said study, and the Japanese side agreed to it.

V - The Japanese side asked INTI to forward the A-4 form for the above mentioned equipment through the proper channel of the Argentine side, and INTI agreed to it.

VI - The Argentine side emphasized the importance of technology transfer to the Argentinian counterparts in the field of factory energy audit and data analysis through either the implementation of the field survey in Argentina or counterpart training in Japan, and the Japanese side took a good note of it.

March 25, 1987

Ing. Enrique Mario Martínez
Presidente de INTI

Mr. Keiichi Takeda
Leader of the Preliminary
Survey Team
The Japan International
Cooperation Agency

ATTACHED PAPER

Equipment List
for
Factory Energy Audit

No	Item	Numbers
1	Equipment Carrying Veheicle with Rack and Lifter	1
2	Portable Type Equipment for Heat Audit	
	1) Ultrasonic Flow Meter for Fuel Oil	1
	2) Ultrasonic Flow Meter for Water	1
	3) High Temperature Anemometer	1
	4) Heat Flow Meter	1
	5) Pocketable Oxygen Meter	1
	6) Zirconia Type O2 Analyzer	1
	7) CO2 and CO Gas Tester	1
	8) Gas Sampling Tube	1
	9) Surface Thermometer	1
	10) Sheath Thermo Couple (CA)	10
	11) Compensated Cable for Thermo Couple	10
	12) Digital Thermometer for Thermo Couple	2
	13) Water Conductivity Meter	1
	14) pH Meter	1
	15) Digital Low Pressure Meter for Gas	1
	16) 12-Channels Hybrid Recorder	2
	17) 3-Channels Pen Recorder	1
	18) Infrared Radiation Thermometer (-50 to 1000 C)	1
	19) Infrared Radiation Thermometer (600 to 3000 C)	1
	20) Infrared Radiation Thermal Video System with Personal Computer	1
	21) Voltage Stabilizer of Supply Power	2
	22) Steam Trap Checker	1
	23) Desk Size Wagon	2
	24) Power Supply Cord and Reel	1
	25) Pocket Computer	1
	26) Stop-Watch	1
	27) Glass Thermometer	1
	28) Cobalt Glass for Eye Protect	1
	29) Heat Resisting Gloves	1
	30) Camera	1
	31) Flow Mater for Gas and Steam	II

No	Item	Numbers
3	Portable Type Equipment for Electricity Audit	
	1) Clamp-on Type Watt-Power Factor Meter (6-Channels)	1
	2) Clip-on AC Power Meter	1
	3) DC Volt-Ammeter	1
	4) Watt-Hour Meter	1
	5) 12-Channels Hybrid Recorder	1
	6) 3-Channels Pen Recorder	2
	7) Power Line Transducer (A,V,kW,kVar,PF)	2
	8) Circuit Tester	1
	9) Tachometer	1
	10) Lux Meter	1
	11) Voltage Stabilizer of Supply Power	1
	12) Desk Size Wagon	1
	13) Power Supply Cord and Reel	1
	14) Pocket Computer	1
	15) Frequency Meter	1
	16) Voltage Detector	1
	17) Insulation Gloves	1

添 付 資 料 3. Questionnaire

添付資料3. Questionnaire

QUESTIONNAIRE

1.Background

(1) Energy Situation	Please fill in Q-1,2
(2) Economic Situation	GNP Growth Inflation Trade Balance Payments Balance
(3) The Needs and Urgency to promote Rational Use of Energy	
2.Policy,Concrete Countermeasures	Achievement based on "Decreto 2247/85" Gravity within the National Economic Plan Assignment of each Agency Energy Saved until now
3.INTI's Outline	Please fill in or correct Q-3
4.Situation of Industry	Please fill in or correct Q-4 Consciousness of the management General Situation of Energy Management System & major Facilities concerning Energy
5.Counterpart Member	Please fill in Q-5

Q – 1

ENERGY SITUATION

Source Under Secretariat of Fuels
Data Bank on Energy : Dec.1985

Primary Energy Production (1,000 TEP)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
Hydraulic	174	165	541	539	833	1,504	1,632	1,599		
Nuclear	-	-	291	580	691	536	430	768		
Nat.Gas	6,788	7,177	7,406	9,784	9,895	11,966	13,388	14,579		
Oil	20,177	22,296	21,260	20,486	23,236	25,281	25,196	25,200		
Coal	363	399	369	363	256	230	304	287		
FireWood	1,023	907	999	571	762	628	502	533		
Veg.Res	1,213	1,112	1,162	1,046	1,138	1,273	1,219	1,317		
Total	29,728	32,056	32,028	33,369	36,811	41,418	42,671	44,283		

Secondary Energy Production (1,000 TEP)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
Electric	1,869	2,182	2,404	2,599	2,876	3,315	3,223	3,395		
Gas	5,241	6,453	7,081	8,343	8,368	10,156	11,336	12,610		
Gasoline	4,276	4,776	5,211	4,817	5,253	6,127	6,237	6,213		
Intermed	6,038	6,885	7,085	7,295	7,797	8,953	8,828	8,909		
Fuel Oil	8,747	9,224	8,461	8,407	8,769	8,056	7,832	6,722		
Others	3,585	3,785	4,541	4,478	4,888	4,800	4,929	4,894		
Total	29,756	33,310	34,783	35,939	37,951	41,437	42,385	42,741		

Final Consumption (1,000 TEP)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
Res.Com.Pub.										
Transport.										
Agriculture										
Industry										

Selfsufficiency (1000TEP, %)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
Local Market	32,476	35,199	37,539	39,395	41,829	44,334	43,729	44,578		
Production	29,723	32,056	32,028	33,369	36,811	41,418	42,671	44,283		
Prod/Market	91.54	91.07	85.32	84.70	88.00	93.42	97.58	99.34		

Energy Consumption by Sector (%) 1983

	Res.Com.Pub.	Transport	Agricult	Industry	Total(1,000 TEP)
Electricity	18.5	0.2	2.1	18.4	2,989
Line Gas	45.6	-	-	40.7	6,965
Refinery Gas	-	-	-	-	
Liquified Gas	13.2	-	-	-	
Gasoline	0.6	52.3	-	-	
Intermediate	12.9	46.1	97.9	2.2	18,571
Fuel Oil				15.3	
Residual Carbon	5.2	1.4	-	4.4	
Non Energy	-	-	-	2.9	
Coke Oven Gas	-	-	-	0.9	
Blast Furnace Gas	-	-	-	0.5	
Coal Coke	-	-	-	0.5	
Charcoal	1.0	-	-	-	
Firewood,Others	3.0	-	-	14.2	1,673
Total	100.0	100.0	100.0	100.0	30,198
	26.4	36.9	5.4	31.3	100.0

Energy Balance

	1,000TEP	%
Production	46,838	93.9
Import	2,805	5.6
Stock Variation	245	0.5
Supply	49,891	100.0
Final Consumption	30,198	60.6
Own Consumption	4,475	9.0
Export,Bunker Oil	2,758	5.5
Loss	12,460	24.9
Transportation	979	2.0
Waste	2,752	5.5
Conversion	8,404	16.8
Adjustment	325	0.6
Consumption	49,891	100.0

Energy Price

Electricity _____

Gas _____

Gasoline _____

Intermediate _____

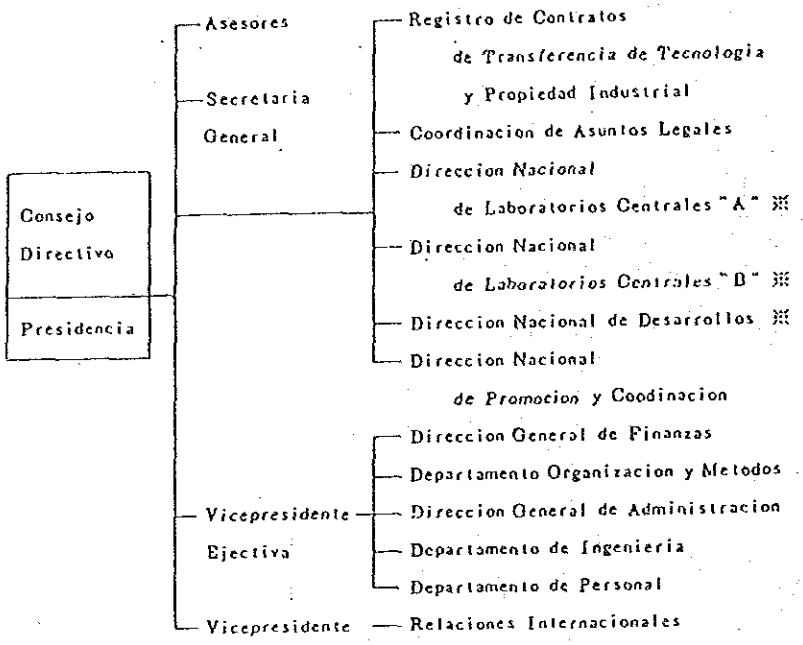
Fuel Oil _____

Coal _____

Fire Wood,Others _____

Q－3　　I N T I (Instituto Nacional de Technologia Industial)

1. Character　　Decentralized, Autonomous Agency within the Secretariat for Industry
2. Establisfment　　1957
3. Function　　Fostering & Carrying out Applied Research to improve the Technical and Economic Development of Industry
   - -Applied Research
   - -Technical Counseling
   - -Laboratory Service
   - -Technical Publication
   - -Documentary Information
   - -Elabolate Standard & Regulation
   - -Introduction of Foreign Technology
4. Organization　　Board of Directors (Chairman 1, Members 8)



5. No.of Staffs　　1500
6. Annual Budget　　Amount _____
7. Counter Part　　Members of The Department of Energy

Coordinator,Physicist	1
Mechanical Engineer	3
Chemical Engineer	1
Mechanical Technicians	3
Chemist	1
Mathematician	1
Physicist	1
Administrative Secretary	1
Total	12
Electric Engineer	___

8. Factories visited

1981～1982	5 factories	Textile	2
1983～1984	1	Metal Mechanics	1
1985	1	Chemical	1
	7	Pulp & Paper	1
		Shoe	1
		Leather Tannery	1

9. Other Activities　　Seminar _____
   Publicity _____

Q－4

SITUATION OF INDUSTRY (1986)

Subsector	Amount of Plants		Amount of Production (millo A)	Energy Consumption (1000 TEP)
	Small & Medium	Big		
Food	8,080	225		
Textile	893	57		
Cement	87	17		
Leather Tannery	252	11		
Chemical	1,435	58		
Metal-Mechanics	9,812	1,021		
Steel	300	26		
Glass,Ceramics	541	36		
Pulp,Paper	74	14		
Petrochemical	59	12		

Q－5

COUNTERPART OF FACTORY SURVEY

Charge	Name	Agency	Position	Speciality & Back Ground
Chief				
Engineer				
Instrument Operater				
Administrative Secretary				

Q－6　　PERSONS CONCERNED

Agency,Position	Name
Presidencia	Ing. Miguel de Santiago
Vicepresidente	Ing. Alfredo Isidro Zilberstein
Direccion Nacional de Desarrollos	Ing. Oscar Delma Herrera
Jefe A/C Departmento de Energia	Lic.Ismeal Ignacio Horton
Departmento de Energia	Dr. Enrique Gruenhunt
	Ing.Ernest M. Leikis
	Ing. Jorge Fiora

Q – 7

ENERGY CONSERVATION POLICY

Decreto 2247/85

1.Objective

Energy consumption (1000 TEP)

	Without Conservation	With Conservation	Saving
1985	40,885	40,272	613
1986	42,520	41,171	1,349
1987	44,221	42,004	2,217
1988	45,990	42,417	3,573
1989	47,830	43,095	4,735
Total			12,487

2.Action for Development

1) Campaign by Massive Education
2) To define the Energy Price Policy
3) To establish Economic Incentive
4) To establish Energy Management Sectors inside the National Enterprises
5) To promote Recycling of High Energy Content Products

6) INDUSTRY SECTOR

6.1 To motivate Energy Intensive Enterprises
6.2 To organize a Trained Group For Energy Audit in the National Technology University
6.3 To promote Electric Generation in Industry

7) TRANSPORTATION SECTOR

7.1 To promote the Development & Manufacture of Efficient Vehicles
7.2 Taxation on the Inefficient Model
7.3 To promote the Improvement of Traffic Rules

8) RESIDENTIAL & COMMERCIAL SECTOR

8.1 To promote the Energy Conservation in Building incorporating with Building Code
8.2 To promote the Development & Manufacture of Efficient Devices for House
8.3 Taxation on the Inefficient Devices
8.4 To promote the Use of Efficient Illumination System

9) AGRICULTURE SECTOR

9.1 Coordination with other Institutions
9.2 To promote the Development & Manufacture of Efficient Devices
9.3 To promote the Use of Railway & Ship to transport the Harvest
9.4 To study the Energy Consumption of the Grain Dryer

添付資料 4.　大統領規則

添付資料4. 大統領規則

DECRETO Nro. 2247/85

The National Executive Power Decree Nro 2247/85

Buenos Aires ,Dec. 1985

Once seen the expedient Nro. 23,284/85 from the Register of the Energy Department, and

Considering:

That the energy supply to the population in adequated quantity and form in order to assure a dignified life level is one of the functions that the Modern State must carry out,

That for guaranteeing that supply is necessary a heavy actionover the energy suplys and demand, for a rational use of it.

That since the energetic world crisis begun with the oil embargo of 1973 and the duplication of the oil price in 1979, The experience of the most developped countries has demostrated the great effectivity of the ways in the rational use of energy, that have allowed a better in the life level with the decreasing in the relative consumption of energy.

That because of the lack of adequated politics and programmes in this country for the last ten (10) years an increase in the energy consumption by unity of the internal gross product, That is to say, a totally inversed result from the one expected in a modern and actualized country. That a rational programme of energy conservation will insure the economic increasement and the better of the life quality with a relative decreasement of the energetic consumption, at lesser cost than the one that would be necessary for producing the energy that is saved.

That an agressive programme of substitution, that privilege the use of renewable resources and also those that are non-reneuable but more abundant, will allow to insure the adequated supply for the future generations and generate exportable remainders without putting in danger those resources.

That the continuous development of new technologies for the exploitation of non-conventional energetic resources, must be adopted and absorved to the local conditions, developing the human resources that can make it possible and promoting the local manufacture of the necessary equipment.

That the ENERGY DEPARTMENT propitiates the approval of a programe for the rational use of energy, to be carried out between the years 1985 to 1989, formed by subprogrammes: a)Conservation of the Energy, b)Substitution of fuels, c) Evaluation, Development and Application of New Energy Sources.

That is reasonable that the resources with which fulfillment of that programme will be faced, come from the taxes to the consumption of the non- renewable fuels, every time that programme will be aimed to obtain an improve in the efficiency of its use as well as a partial replacement by ways of renewable energy.

That for making possible the use of those of use resources it is necessary to modify the Resime of the Functionins of the Special Account Nro. 529 - National Fund of the Energy established by Decree Nro. 1327 of date 30th April 1974.

That is convenient to invite the provincial Goverments and their enterprises and Institutes to participate in the execution of this programme and to celebrate the specific agreements that instrument this partipation.

That is convenient that the National Universities Through their Faculties and Institutes and their Professors and students, add theirselves to the execution of this programme, what will make their access to the treatment of this important problem of the state easier, allowing their capacitation for the eventual entrance of their graduated people in the Public Function. That for that purpose corresponds to exercise the the given atributes by the article 86, clause 1st of the National Constitution.

For that,

THE PRESIDENT OF THE ARGENTINE NATION

Decrees:

1st Article: The programe of rational use of energy, formed by the subprogrammes whose texts form constituent part of the present Decree as Annexes I, II, III and IV is passed.

2nd Article: It is fixed in five (5) years (1985 to 1989) the duration of the programme, assigning the following annual budgets taht will be attended with funds coming from the National Fund of the Energy (Decree Nro. 22,389/45, Law 13,892), The amount being in australes:

YEAR	TOTAL
1985	5,000,000
1986	13,120,000
1987	13,197,000
1988	13,352,000
1989	13,506,000
TOTAL	58,175,000

3rd Article: The Regime of Functionins of the Special Account Nro. 529 is modified - National Fund of the energy established by Decree Nro. 1327 of date 30th April 1974 that remains fixed in accordance with what was detailed in the Annex IV That forms constituent part of the present decree.

4th Article: The Energy Department is Authorized to sign agreements that instrument the actions to be performed and provide the necessary funds for the development of the passed programmes with: - ENERGETIC-ENTERPRISES OF THE STATE, UNIVERSITIES, AND NATIONAL ORGANISMS, PROVINCIAL GOVERNMENTS and/or their enterprises or institutes devoted to the energy production.

5th Article: The Energy Department is Authorized to make the transferencies of funds in accordance with what was establish in the passed agreements according to 4th Article.

6th Article: The annual amounts pointed, could be increased with funds from another orisins. The Energy Department is authorized to collect donations destined to finance the executionof the plans, reason of this decree.

7th Article: The public and private institutions are invited to add their efforts to the efforts of the Energy Department, so, with the rational integration of them, the results to be obtained will be maximized.

5th Article: Communicate, publish, give to the National Direction of the oficial Register and file.

ANNEXE I : SUBPROGRAMME OF ENERGY CONSERVATION

a) OBJETIVES

To obtain the followins improvment in the enersetic efficiency.

Estimed consumption in tons equivalent of oil X 1000

YEAR	WITHOUT CONSERVATION	WITH CONSERVATION	SAVE
1985	40,885	40,272	613
1986	42,520	41,171	1,349
1987	44,221	42,004	2,217
1988	45,990	42,417	3,573
1989	47,830	43,099	4,731
	Total of the estimed energy save		12,483

b) ACTIONS TO BE DEVELOPMENT

1. Educational campaign of the population in general, in it charact of enersetic consumer in residential, pertainins to farmins, transport or industrial uses, in order to inform about the nature of the energy, its influence in daily life and the necessity of adoptins rules for the conservation in the enersetic consumption.This campaisn will be permanent during the extention of the programme.

2. To define the bases of the price politics of the energy (fuel and electricity) that pays attention not only its present cost, but also the cost of the reinstatement in the long period, in order to make it one of the principal signals that guide the consumer to undertake the necessary actions for its efficient use and allow to guarantee the income-yield capacity of the inversion to be performed for obtains energy save.

3. To establish incentives in the economy conducises to the rationalized enersetic use and that promote the necessary invertions for achieving it

4. To create within the statal enterprises, sectors that has the specific mission of obtaining the rational use of energy and promoting that objetive in their clients, giving the necessary advice.

5. To impart directives for the compulsive fulfillment all over the statal area, destined to achieve the rational use of energy in the sector, inviting the Provincial Powers and Municipal Powers to make them extensive in their jurisdiction.

6. To promote the recicle of products with hish energetic content replacing virgin raw matirial, in order to achieve economy of energy, conservation of eshaustable resources, and decreasement of the environmental polution. It will be given priority to the recicled for paper, glass, metals and plastics.

7. INDUSTRY SECTOR

The enterprises whose energetic annual consumption is above the beginning minimum that the Energy Department will fix, will be motivated to organize an specific sector that is in charge of keeping the better degree of energetic transformation.

To organize in the Regional Faculties of the National Technologic University, the creation of groups especialized in the realization of auditorships and projects of energetic rationalization, specially in the small and medium industry.

To organize in the National University the teaching of 'post-degree' courses about 'rational use of energy', in order to count with trained professionals for realizing the necessary actions.

To realize, with the participation of the respective chambers or asociations of industrials, studies in each industrial sector that allow teh settlement of the present situation of the constituent enterprises about the rational use of energy and the identification of the improvements to be realized.

To promote the industrial generation of electricity in the cases that is integrated to the own process of manufacturing, especially when a thermical jumps exist or when the fuel used is not traditional or residue of the operation.

8. TRANSPORT SECTOR

To promote the development and manufacture of vehicles with a great energetic efficiency, establishing compulsive rules that must be reached in a fixed period of time.

To trend, in the fixation of the tax of vehicles settling (patent), to record progresively the energetic ineffiency of the pattern.

To promote rules of transit that make the fuel save possible.

To promote the change of ways in the transport to the most efficiency, energetically.

9. RESIDENTIAL AND COMMERCIAL SECTOR

To promote the incorporation to the codes of creation of compulsive rules in order to conservate the energy in buildings and consider especially the weather reality of the zone in which they are placed.

To promote the development and manufacturing of appliances for the houses with greater energetic output: stoves, thermotanks, freezers, air conditioner systems, etc.,settling down rules of compulsives fulfillment. It will be tried to record taxly the most inefficient equipments, putting their prices at the same level of the most efficient, for avoiding to make their low prices a cause of their buying.

To promote the use of lighting systems with greater energetic efficiency in publicand private ambits. The present situation of the residential and commercial sector will be studied about the rational use of energy, in order to identify the possible improvements and to organize the actions to be performed.

10. FARMING

The actions that diferent organisms and institutions perform, will be coordinated for achieving the rational use of energy in farming.

The development and manufacturing of equipments for farming wiht energetic efficiency will be promote.

The increasing of the railway and the ship as means of transport for the harvest will be promote.

To study the energetic improvement in seed drying.

To study the energetic improvement in farming watering.

To promote the adoption of technics of biological fixation of nitrogen, using the energy accumulated in the stubbles.

ANNEXE II: SUBPROGRAMME OF SUSTITUTION OF FUELS

a) OBJETIVES

Substitute lacking fuels, mainly the liquids, coming from the oil for others more abundants, such as natural gas or renewable the ethanol of biomass.

Substitute imported fuels for national fuels.

b) ACTIONS TO BE DEVELOPED

1. To replace by natural gas (compressed or liquified) the consumption of petrol and gas oil in transport, mainly in the intensive consumer: taxis, buses, transport of burden in the cities, railway, etc..

2. To promote the substitution of the fuel-oil, diesel-oil, and gas-oil, that consume the electric centrals of vapours, dieselor gas turbines for natural gas.

   During the first period, it will be promote the conversion of the centrals that are over gas pipes, and later the ones that have to be fed with natural compressed or liquid gas because of not being possible to feed them with gas pipe.

3. To replace by natural gas the consumption of liquid and solid fuels in oil destileries.

4. To replace by natural gas the consumption of fuel-oil and gas-oil in industries.

5. To substitute the use of petrol in cars by ethanol obtained from biomass (alcopetrol programme) and study its extention to gas-oil and the use of engines that work with hydrated ethanol. To substitute by natural gas the liquid fuels (fuel-oil and gas-oil) used in the heating of public and private buildings in cities provided with networks, especially in Buenos Aires City.

6. To promote the cooling (air conditioner systems) by absortion, in the places provided with natural gas, what will allow to reduce the 'tops' of electric energy consumption in summer and to usethe 'valleis' that the

system of providing natural gas in that same period presents.

7. To provide with natural gas to the places that are far to the networks of gas pipe, through the use of natural compressed or liquid gas.

8. To substitute the mineral coal imported for coke of high oven (SOMISA), by coke produced from residual coal of oil and coal from Rio Turbio.

9. To promote the development of electric batery vehicles, or hybrids: electric - explosion engine - especially for the collective transport in cities.

10. To promote the development of combustion cells with natural gas for generation of electricity.

ANNEXE III: SUBPROGRAMME OF EVALUATION, DEVELOPMENT, AND APPLICATION OF NEW SOURCES OF ENERGY

a) OBJETIVES

To provide the energy to the lacking regions of the country, through teh application of proved technologies.

To replace, when it es possible and convenient, teh use of fossil fuels by non-conventional energetic sources, to improve the recovering of fossil fuels of exhausted fields, according to conventional techniques.

b) ACTIONS TO BE DEVELOPED

1. Solar energy

To form one or more Centers for the application of Solar Energy, that will have fundamental mission, besides the information of human resources, to give to all the country technical advice that is required in the differants technologies, that belons to theuse of this energetic resources and the preparation of projects for the introduction of new technologies.

To so on with the evaluation of resource, already started with the installation of the Solarimetric Network, in order to give the maximun support for installations of different types.

To incentive the use of those techniques that belons to theheating exploitation of the Solar Energy and taht are already available in the national industry like the heating of water and the drying of forming products.

To propitiate the use of passive and active systems for the thermical conditioning of houses, promoting the incorporation to the codes of creation of compulsive rules, that make it possible. Also the industrial enterprises and installation for animal breeding.

To determin the technical and economical possibility of the utilization of photovoltaic systems for electric generation in isolated places and also in places connected to the distribution network.

2. Aeolian Energy

To form one or more Regional Centers for the application of Aeolian Energy similar to those of the Solar Energy

To make an evaluation of aeolian resource in the country.

To make determinations of the aeolian potential in those places in which the local characteristics make them advisable.

To Study the possibility of installation of a wind farm of an adequated power for its interconnection to a network.

To study the possibilities of installing systems of electric generation of small and middle power in isolated places.

To propitiate teh active partipation of the national industry in the manufacturing of different components that form part of an aerogenerator system.

To incentive the electric use of the aeolian energy in zones of adequated conditions ansd lacking of other energetic forms or where it could be convenient social and economically.

3. Geothermic Energy

To form one or more Regional Centers for the application of the Geothermic Energy, which will have similar missions of other energies.

To realize the study of technical and economical possibility in the Geothermical field of Copahue, Neuquén, with the objetive of determining its potentiality and prepare the project of development and plant of production.

To study the possibility or pre-possibility in those areas in which previous studies and socioeconomical conditions are advisable.

To make studies of acknoledgment in zones where the geological - structural conditions show a favorable environment and if there exist certain possibilities of development of other factors of progress.

4. Biomass Energy

To form one or more Regional Centers for the study and development of technologies for the exploitation of biomass as energy sources, especially the production of alcohol as fuel.

To make Technical, economical and social studies trending to determine possible zones, productors of ethanol, throush the exploitation of different vegetal species, with the objetive of making possible the extension of their production and use.

To spread, throush adequated mechanisms, teh use of biosas in its different alternatives in those places where the concentration of raw material is abundunt and its use profitable economically.

To study the possibility of using the timber residues for the production of timber gas, pointing, during the first period, to the self-sufficiency in industries of forestal processing.

5. Small Hidroelectric Exploitation

To form one or more Regional Centers for the Exploitation of small undertakings of hidroelectricity, with similar missions to the other energetic sources.

To inventory the main exploitation of little dimension in different regions of the country.

To realize studies trending to make concrete project of hydroelectric exploitation of little dimension, given priority to those isolated places and without energetic supply. In all cases the actions will be performed coordinately with the provincial and communal organisms.

To incentive the national industry for the manufacturing of small turbines, in order to reach an effective decreasement in the use of foreign currency. In order to improve the effect of social development of these exploitations, it will be promote the participation of the country, from the beginning, in the project, construction, operation and maintenance of the equipments and installations.

4. Assisted Recovery of exhausted fields.

It will be promoted the transference, adaptation and the development with autonomous of new technologies that allow to increase the extraction of fuel of fields that have been exhausted accordins to the conventional technologies.

ANNEXE IV: JURISDICTION 64 - DEPARTMENT OF ENERGY - SPECIAL ACCOUNT Nro. 529 - NATIONAL FUND OF ENERGY

REGIME OF FUNTIONING

a) OBJETIVES

To support financially the Enterprices and organims of the National State for the execution of their Plans of Patrimonial Investment, in all What is referred to the construction, equipment and the operation of sources of energy and finance the Programme of Rational Use of Energy and its subprogrammes: Conservation of Energy, Substitution of Fuels and Evolution, Development and Application of New Sources of Energy.

b) IT WILL BE CREDIT

With the obtained resources that will come from:

1. Particiration of the 35 % in the produced of the fuels Fund Decree-law Nro. 17,597 - Article 8th.
2. Earnins for the application of the 8th article of the decree Nro. 3616/76.
3. Earnins for the investisations.

IT WILL BE DEBIT

For the distributions that will be performed in respect of:

1. Transferences to Enterprises and organisms of the National State for the attention of their Plans of Patrimonial Investment, in all that is related to the construction, equipment and operation of sources of energy.
2. Transferences to Energetic Enterprises of the State, Universities and National Organisms, Provincial Governments and/or their Enterprises and Institutes

devoted to the production and study of the energy and spending coming from the fulfillment of theProgramme of Rational Use of Energy and its subprogrammes: Conservation of Energy, Substitution of Fuels.

COUNTERPART OF FACTORY SURVEY

Charge	Name	Agency	Position	Specialty & Back Ground
Chief	Marcelo A. SILVOSA	I N T I		Electromechanical Engineer - Combustion and Heat Transfer
Engineer	Jorge A. FICRA	I N T I	Jefe de División	Mathematician - Heat and Mass Transfer
	Alberto BERGET	I N T I		Chemicorbasicist - Non Conventional Energy
	José L. ARAGANI	I N T I		Electromechanic - Refrigeration and Air Conditioned Systems
	Ignacio F. COZZA	I N T I		Electromechanic - Refrigeration and Air Conditioned Systems
	María L. GOMEZ	I N T I	Jefe de División	Chemist - Refrigeration and Air Conditioned Systems
	Daniel O. H. AFIONE	I N T I		Electromechanic - Vehicles and Internal Combustion Engines
	Roberto DOMECQ	I N T I		Mechanic - Vehicles and Internal Combustion Engines
	María I. DEL CERRO	I N T I		Chemist - Water Treatment
	María C. LONAZZI	I N T I	Jefe de División	Chemist - Water Treatment
	Ernesto M. LEIKIS	I N T I	Jefe de División	Mechanic - Combustion and Heat Transfer
Instrument Operator	Arturo D. VERGNELET	I N T I		Mechanical Technician - Project Designer
	Miguel BERMEJO	I N T I		Electromechanical Technician - Non Conventional Energy
	María P. KOHLER	I N T I		Chemical Technician - Non Conventional Energy
	Blanca N. OYOLA	I N T I		Technical Assistant - Water Treatment
	Juan C. BALMAYOR	I N T I		Automotive Technician - Vehicles and Internal Combustion Engines
	CHOFER (Driver)	I N T I		
Administrative Secretary	Concepción L. GIACOMETTI	I N T I	Secretary	Commercial Secretary
	Josefa A. RUMI	I N T I	Secretary	Administrative Secretary

添付資料5. INTI関係者、カウンターパート名簿

添付資料5. INTI関係者、カウンターパート名簿

Q - 6 PERSONS CONCERNED

Agency,Position	Name
Presidente (President)	Ing. Enrique M. MARTINEZ
Vicepresidente ejecutivo (Executive Vicepresident)	Ing. Horacio PERERA
Dirección Nacional de Coordinación(National Direction of Coordination)	Ing. Guillermo D. DIPACCE
Dirección Nacional de Construcciones y Energía (National Direction of Construction and Energy	Lic. Jorge FUCARACCIO
Jefe A/C Departamento de Energía (Chiefe in charge of Energy Department)	Dr. Carlos MOINA
Departamento de Energía (Energy Department)	Dr. Enrique GRONHUT Lic. Jorge A. FIORA Ing. Ernesto LEIKIS Ing. María C. LOMAZZI Ing. Alfredo L. BASCOU Ing. María L. GOMEZ Lic. Mario R. OGARA Lic. Beatriz R. MARTINEZ Ing. Marcelo A. SILVOSA Lic. Alberto BERSET Ing. María I. DEL CERRO Ing. Daniel O. H. AFIONE Ing. Roberto DOMECQ Ing. Ignacio F. COZZA Ing. José L. ARASANZ Tec. Miguel BERMEJO Tec. Arturo VERGHELET Tec. Hector G. CITADINO Tec. María P. KOHLER Tec. Juan C. BALMAYOR Tec. Elida N. GIANANDREA Asud. Tec. Oscar W. FUENTES Asud. Tec. Blanca N. OYOLA Sec. Concepción L. GIACOMETTI Sec. Josefa A. RUMI Auxil. Graciela B. LOPEZ

添付資料 6.　経済情勢資料

添付資料6. 経済情勢資料

APPENDIX 1

GROSS NATIONAL PRODUCT GROUTH

Period	GNP US$(1970)	GNP US$(Current)
1970	23,524	23524
1971	24,401	25133
1972	25,873	26837
1973	25,731	31392
1974	27,197	39436
1975	27,092	42805
1976	26,966	44710
1977	28,685	50457
1978	27,718	52581
1979	29,577	63147
1980	29,797	72526
1981	27,939	74206
1982	26,484	71825
1983	27,029	74222
1984	27,854	78437
1985	26,771	78077
1986	28,269	84027

APPENDIX 2

B. RECENT MACRO-FINANCIAL DEVELOPMENTS

Overview

1.08 The large imbalances which have afflicted the Argentine economy over the past several years, including a steep and unsustainable growth of fiscal deficit, erratic and misguided exchange rate policies, and uncontrolled external borrowings by public and private sector alike, led Argentina by 1984/85 to the edge of hyper-inflation (with an annual inflation rate touching the 4-digit mark by May 1985) and an unsustainable balance of payments position. Nominal interest rates in the economy also experienced massive increases of a similar magnitude, although real interest rates (especially on loans in the unregulated market) have fluctuated sharply depending on the realized inflation rates, changes in the external accounts and the crawl of the exchange rate. Since late 1984, the real lending interest rates have been at very high levels — of the order of 10 percent per month until the economic reforms of mid-June. Over the years, the degree of financial deepening in the Argentine economy has also been similarly subject to wide fluctuations, depending on variations in inflation rates, exchange rates, the degree of control of the financial markets, and more generally, the degree of public confidence. Since 1981, the economy had been becoming increasingly demonetized, and in the months immediately preceding the June economic reforms, the ratio of M1 to GDP reached an all time low of less than 4%. Charts 1.1 to 1.8 illustrate these main developments which profoundly affected the operation of the financial system and private sector enterprises. As the difficulties and stabilization problems unfolded, firms as well as the public at large tended to adopt increasingly intricate defense mechanisms against the high and varying inflation rates and learned to adjust rapidly to drastic changes in the economy. One consequence of this has been that activities involving financial speculation and hedging in asset liability management commanded much higher priority and offered greater

Deficits and Inflation

1.09 The growing domestic financing requirements of the public sector stemming from an expanding budget deficit and the high cost of the various exchange and credit subsidies granted by the Central Bank of Argentina since 1981 (e.g., foreign exchange guarantees, swaps, reprogramming of corporate debts at very negative interest rates), were the root cause of sharp increases in the rate of growth of the money supply (M1), as well as of an increasing "crowding-out" of private sector expenditures as the economy contracted and interest rates rose. Annex I provides a more detailed discussion of the macro-financial indicators and evidence of the magnitude of crowding out). The intensity of such pressures can be illustrated by the fact that Government expenditures represented 44% of the GDP in 1983. If the quasi-fiscal deficit of BCRA is also taken into account, total expenditures of the consolidated public sector exceeded 50% of Argentina's GDP in each of the years since 1978.

1.10 As M1 grew further after 1981 and successive stabilization efforts became short lived, inflation accelerated. From an average rate of increase in the Consumer Price Index (CPI) of 5% per month during 1980, inflation

CHART 1.1

MARGINAL/OFFICIAL EXCHANGE RATE

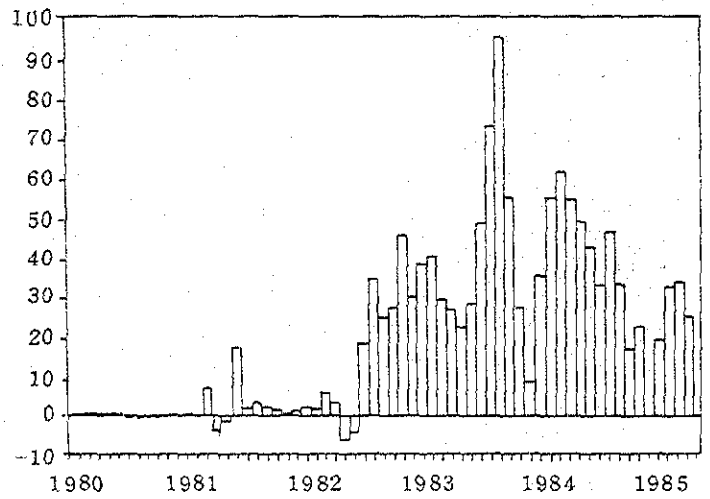


CHART 1.2

ARGENTINA: MONTHLY RATE OF INFLATION

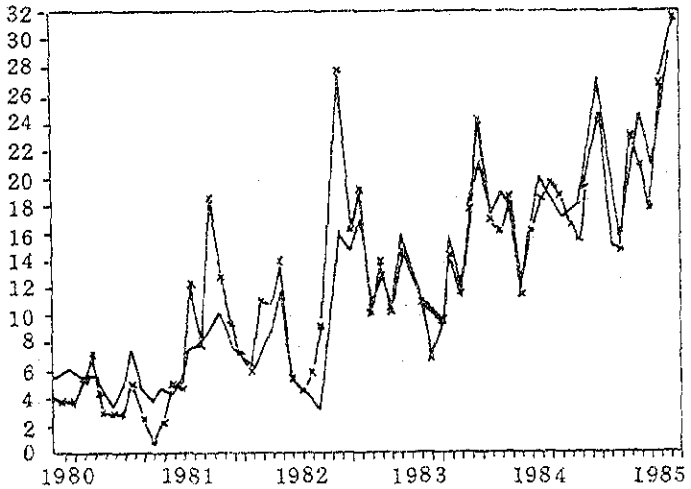


CHART 1.3

ARGENTINA: EFFECTIVE INTEREST RATES

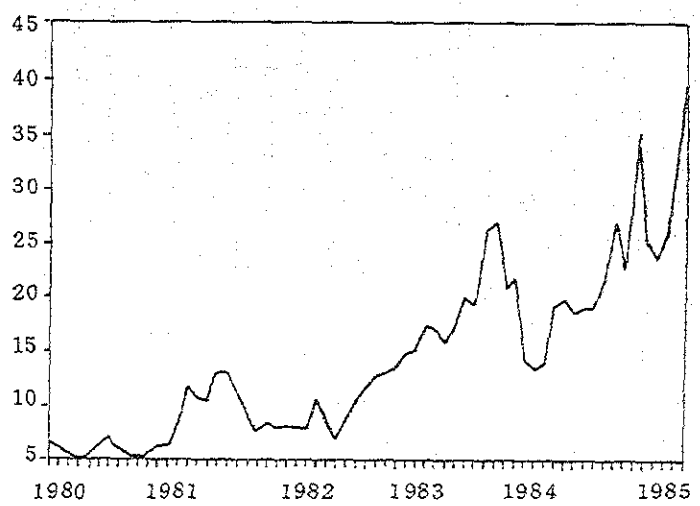
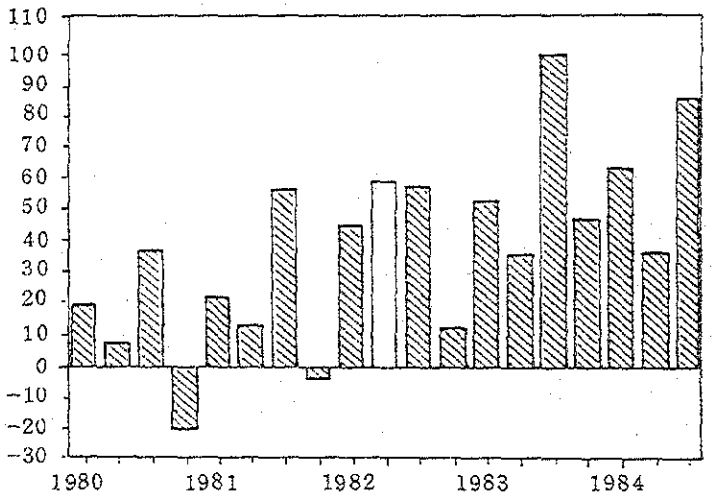


CHART 1.4

MONEY SUPPLY (M1) GROWTH



gradually rose to average monthly rates of 7.3%, 10%, and 18.8% in the next four years, to finally exceed average monthly rates of 25% during the first five months of 1985.

Interest Rates and Financial Subsidies

1.11 A direct consequence of the rampant inflation and economic uncertainties in recent years has been the high and sharply varying nominal interest rates (Chart 1.3) both in the regulated financial markets and, particularly, in the unregulated (but legal) segment of the market. 2/ These changes in the nominal interest rate levels had two major consequences. First, the real interest rates fluctuated sharply during 1981-85, particularly in the unregulated markets from near zero or negative rates in some months to monthly rates of nearly 10% in others (Chart 1.6). The average annual real rate of interest was in excess of 30% during 1983-84, and was more than 100% in the unregulated markets during late 1984 and the first half of 1985. Second, even in cases where the real interest rates were modest or negative (e.g., in the regulated markets during 1982-83), the very high levels of nominal interest rates implied severe cash flow burdens on the firms and drastic shortening of effective maturities: the so-called "medium term" loans bearing 6-12 month maturities eventually disappeared from the market.

1.12 In June 1982, at the same time that the unregulated nominal interest rates were going up, leading to very high real rates of interest, the Government reversed its previous policies, and attempted to alleviate firms' financial problems and reactivate the economy by setting and maintaining regulated interest rates at sharply negative levels in real terms (see Charts 1.6 and 1.7). The prevailing view then was that the high levels of indebtedness, in local as well as in foreign currency, was the main reason for the inability of the private productive sector to reactivate. On this premise, a transfer of resources was engineered in 1982 from savers to debtors in the case of peso-denominated liabilities (through concessional loans bearing highly negative real interest rates), and from BCRA to private sector debtors in the case of foreign currency-denominated liabilities, through granting of foreign exchange guarantees and swaps. A major consequence of these actions was to produce a very significant transfer of wealth from savers and taxpayers to all Argentinian debtors, and to aggravate the tendency towards financial disintermediation.

Financial Disintermediation and Demonetization

1.13 The negative real interest rates prevailing in Argentina's over-regulated financial sector and the high and rising inflation tax on

---

2/ "Unregulated segment" refers to deposits and loans which are subject to BCRA's interest rate ceilings and credit; "Unregulated segment" refers to the intermediation between deposits and loans not subject to interest rate ceilings, which is permitted for banks and certain other types of financial institutions. It is estimated that during 1984-85 the unregulated segment may have accounted for as much as one-third of the credit channeled through the financial system.

CHART 1.5

DEPRECIATION OF THE ARGENTINIAN PESO

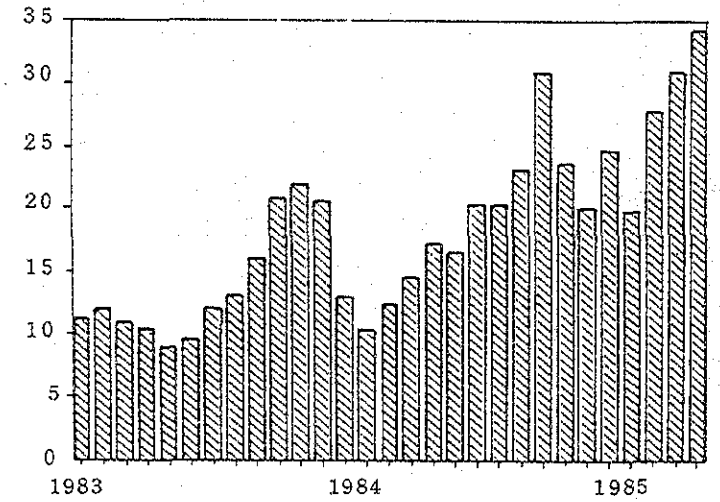


CHART 1.7

REGULATED REAL INTEREST RATES

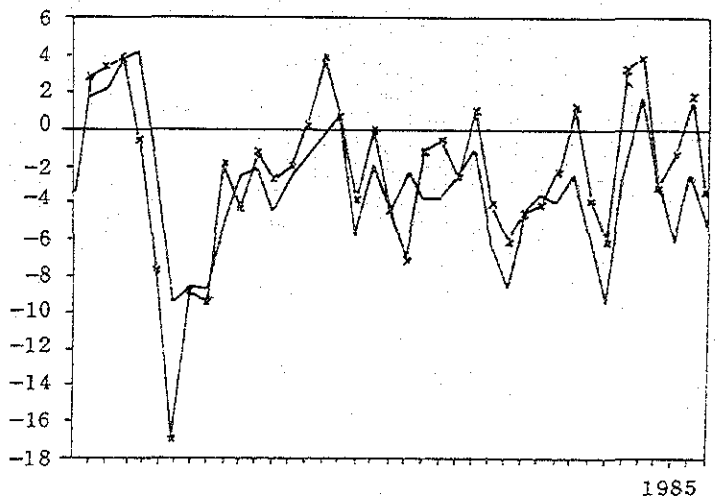


CHART 1.6

REAL INTFREST RATES (LOANS)
1983-Moy. 1985-UNREGULATEI)

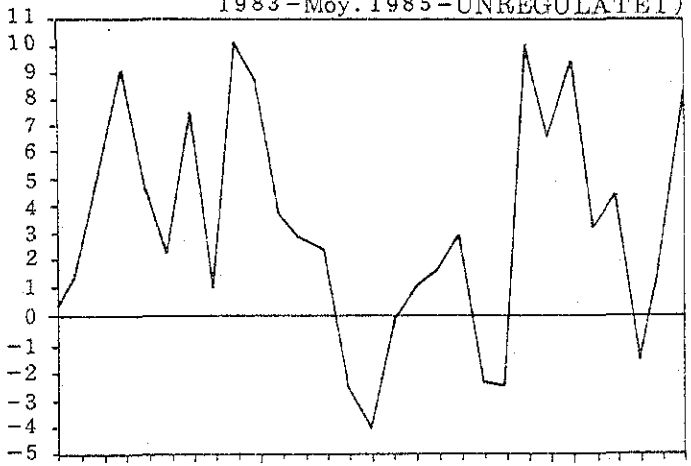
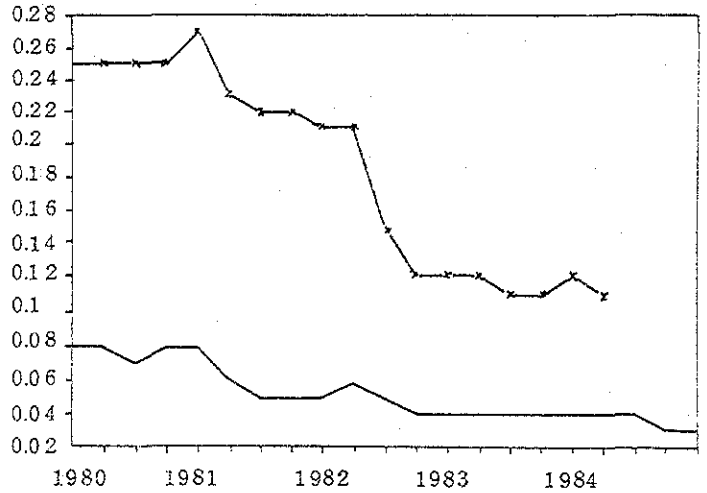


CHART 1.8

ARGENTINA: FINANCIAL DEEPENING



peso-denominated liquid assets, led to a sharp decline in the ratios of M1 to GDP and M3 to GDP, starting in 1982 (Charts 1.4 and 1.8). 3/ These indices reflected the disintermediation of the financial system and demonetization of the economy, which resulted from the strong desires of savers to avoid the high inflation tax and to reduce uncertainties in their real return. In trying to avoid the very high inflation tax, savers developed defensive mechanisms involving, among other things, a drastic reduction in their demand for peso-denominated assets, reallocation of investment portfolios in favor of foreign currency holdings and other financial assets offered outside the institutional market, and a marked reduction in the maturity of financial savings (to about 7 days on average), as well as an increase in consumption levels. The shallowing of Argentina's financial system became dramatic in early- to mid-1985, when the ratio of M1 to GDP fell below 4%. Moreover, the monetary authorities increasingly lost control over the money supply, as the velocity of circulation of money rose to unprecedented levels, exceeding 30 by June 1985 (para. 4.08).

Effect on External Accounts and Exchange Rates

1.14 The combination of an excess of money supply created to finance the growing fiscal deficit, large external debt service, negative interest rates in the controlled domestic financial market, and the increasingly uncertain political and economic environment, put severe pressures on the balance of payments, and led to very large differentials between the exchange rates in the parallel and official markets. These differentials have been particularly large during the second semester of 1983, preceding the transfer of power to the democratically elected government. During 1983-1984, the parity of the Argentinian peso-in-the parallel market exceeded the official rate by an average of 35% to 40%, and the differentials occasionally rose to much higher levels. These developments aggravated the anti-export bias in the economy since export proceeds had to be converted at the official exchange rate, whereas costs of tradeable domestic inputs reflected more closely the movements in the parallel market rate. The differentials were reduced substantially in late 1984, following the initiation of a more austere monetary policy.

Impact on Corporate Finances

1.15 The dilution of the real value of liabilities engineered through the mid-1982 financial reforms (para. 1.12) substantially alleviated the financial burden of many companies. As a result, the level of indebtedness of firms had not been a major problem until mid-1984 for most industrial firms. However, given the very high real rates of interest that generally prevailed since late 1984 (para. 1.11), the problem can be rapidly compounded again. In addition, such interest rates deter any new investment and penalize firms with low market power and tight cash flows. These aspects, and the various determinants of the financial condition of firms, are discussed in greater detail in Section E below.

3/ M1 refers to currency plus demand deposits, and M3 refers to M1 plus deposits, certificates of deposit and bank acceptances.

APPENDIX 3

ARGENTINE EXPORTATIONS (in millions of dollars)

SOURCE: DNIS(SC) BASED ON INDEC

PERIOD	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1 TRIMESTER	1,260	1,331	1,550	2,058	1,991	2,170	1,933	2,159	1,803	1,513
2 TRIMESTER	1,694	1,808	2,384	1,924	2,849	2,347	2,108	2,449	2,569	1,960
3 TRIMESTER	1,465	1,966	2,161	2,036	2,720	1,625	2,002	2,081	2,311	1,800
4 TRIMESTER	1,236	1,294	1,718	2,002	1,583	1,484	1,792	1,418	1,713	1,667
YEAR	5,655	6,399	7,813	8,020	9,143	7,626	7,835	8,107	8,396	6,927

ARGENTINE IMPORTATIONS (in million dollars)

SOURCE: DNIS(SC) BASED ON INDEC

PERIOD	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1 TRIMESTER	881	857	1,199	2,282	2,614	1,484	977	865	977	921
2 TRIMESTER	1,019	870	1,380	2,285	2,602	1,333	1,183	1,099	928	1,127
3 TRIMESTER	1,142	1,045	1,912	2,781	2,112	1,217	1,210	1,326	980	1,260
4 TRIMESTER	1,123	1,062	2,220	3,191	2,102	1,303	1,132	1,293	930	990
YEAR	4,165	3,834	6,711	10,541	9,430	5,337	4,501	4,583	3,815	4,320

CLEARANCE BALANCE OF TRADE (in million dollars)

SOURCE: DNIS(SC) BASED ON INDEC

PERIOD	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1 TRIMESTER	379	474	351	- 224	- 623	686	956	1,294	826	592
2 TRIMESTER	675	938	1,004	- 361	247	1,014	925	1,350	1,641	833
3 TRIMESTER	323	921	249	- 753	608	408	793	755	1,331	540
4 TRIMESTER	113	232	- 502	-1,189	- 519	181	660	125	783	677
YEAR	1,490	2,565	1,102	-2,527	- 287	2,289	3,334	3,524	4,581	2,607

APPENDIX 4

BALANCE OF PAYMENT

	Period	1983	1984	1985
I	Merchandise (Balance)	3,310	3,500	4,582
	Exportations (FOB)	7,835	8,100	8,396
	Importation (CIF)	-4,515	-4,600	-3,814
II	Services (Balance)	-5,773	-5,995	-5,535
	Real Services	- 365	- 283	- 231
	Financial Services	-5,408	5,712	5,304
III	Unilateral Transferences	25	3	0
	Current account (Balance) I + II + III	-2,438	-2,492	- 953
IV	Movements of Capitals (Non-Compensatory) (1)	-1,403	684	1,007
	Private Sector	-1,344	- 825	608
	a) Long Term	162	-2,489	- 604
	b) Short Term	-1,506	1,664	- 4
	Public Sector	30	2,152	965
	a) Local Goverments	- 3	----	- 1
	b) National Goverments	27	2,152	966
	Bank Sector	- 88	----	651
V	Errors and Omissions	- 364	- 87	- 189
VI	International Payments (2)	-4,204	-1,895	- 134
	Monetary Reserves (Variations) (3)	244	196	2,495
	Movements of Capitals (4)	-3,202	-2,111	-2,205
	a) BCRA	-2,710	-1,724	-2,423
	b) National Government	- 492	- 387	218
	Assignations of special rights of turnover by IMF (4)	----	----	- 569
	Adjustment for change of parity	-1,246	20	146

Source: Central Bank of Argentine Republic (BCRA) - in millions dollars

Q - 4 (Cont'd)

Situation of Industry

In respect with the questionnaire Q-4, We do not have new information about the amount of plants, and only We can give you the global production of total industries.

VOLUMES OF PRODUCTION

This data includes small , midium and big industries

SECTOR	1986	VARIATION (%)
Paper and Cardboard (ton)	773.7	5.7
Cellulose and paste (ton)	684.8	23.8
Raw Steel (mil. ton.)	2,630.3	13.0
Primary Iron (mil. ton.)	2,119.2	25.2
Lam. in Heat (mil. ton.)	233.4	17.7
Lam. in cool (mil. ton.)	61.4	69.7
Base Oil	2,044.0	- 14.6
Processed Oil (mil. m3)	-------	-------
Natural Gas	13,489.0	9.9
Electric Energy (mil. kWh)	4,617.0	8.9
Commercial coal (tonnes)	325.0	2.5
Aluminium (tonnes)	125,314.0	8.4
Cement (tonnes)	4,004.3	- 61.9
Wine (hectolitres)	15,323.2	- 0.3
Bier (hectolitres)	3,054,957.0	- 0.2
Non-Spirituals (Hectolitres)	-------	-------
Cigaretes (mills. packs)	1,496.5	2.9
Suser (tonnes)	741.6	4.1
Flours (tonnes)	2,581,045.6	8.6
Edible Oils	1,194,250.0	2.4
Cookies and Biscuits	141,853.0	24.6
Cars (units)	139,462.0	25.7
Tractors (units)	6,660.0	34.7
Tyres (units)	4,132.4	26.8
Sulfuric Acid (tonnes)	206,599.4	1.2
Caustic Soda (tonnes)	127,644.0	7.6
Chlorine (tonnes)	28,767.0	12.3
Ethylene (tonnes)	220,654.0	- 1.2
Aromatics (tonnes)	102,104.0	- 5.7
Pelleted Urea (tonnes)	74,730.0	- 7.3
Ammonium Sulphate (tonnes)	6,453.0	- 42.3
Ammonia (tonnes)	-------	-------
P.V.C. (tonnes)	44,186.0	30.5
Polyethylene (tonnes)	177,643.0	35.7
Polystyrene (tonnes)	36,493.0	103.5
Rubber SBR (tonnes)	41,838.0	1.6
Freezers (units)	291.3	122.4
Washing Machines (units)	195.4	157.7
Nylon (tonnes)	18,231.0	75.4
Cellulosic Films	-------	-------
Other Synthetics Fibres	27,154.0	67.3

添付資料 7.　アルゼンティン省エネルギー会議資料

添付資料7. アルゼンティン省エネルギー会議資料

APPENDIX 5

ACHIEVEMENT BASED ON 'DECRETO 2247/85'

II ARGENTINE CONGRESS OF RATIONAL USE OF ENERGY

Buenos Aires, January, 1987

LECTURES

1. The bund of gas is now of 15 % , previously it was of 20 %. Internationally 5 % is accepted. It is still necessary a small improvement. The rules of substitution within the Energetic Plan are about the replacement of oil by gas and coal. (1)

2. For the period 1986-2000 the total investment for the energetic sector in electric energy and fuels, will be of 1900 millions of dollars. This shows the importance of the investment in the energy within the Internal Gross Product. Any conducent measurement to rational use, through it will be necessary to revise others. The Bolivian gas is four times more expensive than what is payed to gas of the State and 75 % more Expensive than the same cubic metre in U.S.A.. (2)

3. The two-Thirds parts of the rational investment is concentrated in energy. Where is it Invested?: In a greater production or in a saving more... for producing and saving it is necessary a financing. What is done with the oil selling? Part of it must be incorporated to the Rational Use of Energy (R.U.E.). The public Enterprises of the sector have a critical financial situation of contracting debts.

It will be necessary to free them from these charges and to put there structures of enterprises before saving aims and new sources.It is not possible to think of saving more without spending. And it is not possible tothink of new sources without investment... the energetic resource is finite and the implicates to have a large exemption of it. The introduction to the conservationist concept will allow to make a good combination of sources. The proved reserves of oil shortly surpass 30 years.

The two-thirds parts are concentrated in five countries that do not include us. In spite of that, we extract here more than we discover. We should equalize that equation. In the energetic balance our reserves are: 2/3 parts of uranium, gas, coal and 12 % of oil. However, the oil participates in almost 50 % of the

energy that is consumed.

Owing to the great social component of the energy, it is necessary to conciliate the macroeconomic interest with the microeconomic one. In order words, to make compatible the general interest with the particular ones. The tariffs should punish the irrational use of energy. For this, it will be necessary the participation of the user in the decision processes, in the comparison of prices in the arrangement of plans, and in teh control of them. (3)

4. The maximun consumption of energy in our country is in the transport: 35 %. Then the industries, houses, etc. appear. From this 35 % : 50 % petrol - 47 % gas oil - 1.5 % electricity. The CNG (compressed natural gas) does not have significant consumption. (4)

The use of CNG does not mean an important saving of petrols. There are 2,000 vehicles that consume 3,200,000 m3. At the end of the year it is expected to be incorporated 5,100 vehicles that will consume 12,800,000 m3. (4)

For the consumption of alcopetrol there are two phases.

1. To consume all the cane that is not transformed into sugar in the 12 provinces that form part of NEA (Argentine North-East) and NOA (Argentine North-West).

2. Enlargement of the consumption and incorporation of other provinces, for appropiate technical and economic studies. (4)

To use the national coal not only as fuel, but also as siderurgical coke.

The aim is to surply 6 % of the total used 35 %. (4)

The Energy Department has signed coverals agreements: It will be realize agreements in UBA (Buenos Aires University) for the Study and the applications of the secondary recovery. UTN (National Technologic University), through 12 of its Regionals give advice to industries.It was advocated about 100 enterprises, that achieve to reduce in 28 % the

consumption of the consumed energy.

In 24 of them, it was obtained good results with very simple actions.

It is being carried out a plan with the municipalities of the centre zone and south of the country for the rationalization of the public lightings.

With INTI (National Institute of Industrial Technology) it was arrange a measurement of the energetic efficiency of the electrical and thermical house appliances.

For the development of new sources of energy, it will be created, through agreements with S.E.E., the Regional Centres. The activity in short and medium term is to give solutions through the application of new sources. The industrial and technological activity and the prevention of teh environment will concentrated in the following Centres:

Regional Centre of Aeolian Energy, Province of Chubut, University of San Juan Bosco, Regional Centre of Microexploitations, Province of Misiones,University of Misiones, Regional Centre of Solar Energy, Province of Salta, University of Salta, Regional Centre of Geothermic Energy, Province of Neuquen, University of Comahue. (4)

5. Before the formulation of the present Energetic Plan, YCF (Yacimientos Carboniferos Fiscales) had two alternatives for the next 15 years; to remain as it is now or to grow. For the first case, it was needed to invest 200 millonsof dollars; and for the second case 360 millons of dollars.

The present characteristic of the enterprise is of low production (about 400,000 ton/year) and reability. This, in short, is due to an onerous infrastructure of internal and maritime transport and an exesive contraction of debts, caused by the lack of plans and appropiate politics of investment. The market is the generation of electrical energy and the siderurgy. (5)

The Energetic National Plan settles, as main politics, the substitution of hydrocarbons by gas. The most important limitation for the period of greater consumption are their own gas pipes. The aim of this sector is to cover that periods. (5)

If YCF remains with its present forms the energetic plan is not going to be fulfill. Its 400,000 ton by year of production does not reach to cover the demand that the gas cannot satisfy. That should be cover with liquid fuels, as until the present. Quadruplicating the production, in fifteen years, it is possible to do it.

The politics is not to complete with gas but to complement it.

The main limitation of this plan are the tariffs. The present of 39 US$/ton, put in power plant, does not cover the cost of production. A proposal could be the adoption of two tariffs, one 57 US$/ton and the other 65 US$/ton. Comparing these two values with the international prices we have that: for each million of kCal, the fuel oil cost 10 US$ CIF user port and our coal of 57 US$/ton would be of 9.2 US$, but FOB power plant. The polish coal, consumed presently, cost 10.17 in the same conditions of delivery.

We have to consider two aspects:

To carry out this plan will mean to create 4,700 positions for working, about 9.5 % of the total manuallabor in the Province of Santa Cruz and 5 % of its GNP. It also implicates a population settling down of 10,000 inhabitants linked to this plan, helping to increase the density of population that now is 0.5 inh/km2. The second aspect is the saving of foreign currency. In fifteen years it is possible to produce 18 millions tonnes of coal, that will substitute 9 millions tonnes of fuels, that in september, 1986 would be 650 millions dollars, that is much more than the 360 millions necessary to be invested for spreading. With a rythm of investment of 20 to 25 millions by year it is possible to reach the aims proposed and to show that this plan is not a fiction. (5)

PRESENTED WORKS

4. Through a programme, already directed, the Province of Neuquén proposes itself to supply with electrical energy, by means of eolian turbines, to the marginal

zones of low density of charges. This modality of application of non-conventional resources was one of the congress conclusions. (6)

7. The petrols that are consumed in our country have 20 times more lead that their similar of U.S.A. and Europe.

Consequentely, They are highly contaminants, not allowing the use of catalytic converters of the delivery gaves and they will go on being, unless it is invested in installations in order to obtain other processes of destillation. If this changes are not produce, the degradation of our life quality, within the mentioned countries and our, will grow. (7)

8. The increasement in gas reserves, in our country, is very remarkable in front of oil reserves. Especially, after the discovery and cubing of the field of "Loma de la Lata".

By the 2,000 year we will have a satisfied demand of petrols but not of gas oil.

In front of this state of things, itis being started plans of substitutions of hydrocarbons by hydrogenized compounds for the obtaining of petrols. In this way, Crude for petrols, destining it to other uses. (8)

9. In Puerto Piramides, at the west of Peninsula de Valdez, on the northern part of Nuevo Gulf, It has been planned an aero-hydraulic system, in order to supply a population of 150 inhabitants and the summer tourism.

By means of two aerogenerators of 100kW each, a desalt appliance and the consumption is supplied. If there is remain of energy, through two electrobombs of 30 HP each, water is acumulated in a reservoir of 250,000 m3 placed in 79 m on level sea. For the calm moments this flood accumulated in an hydraulic group of 150 kW is turbined. (9)

10. If the aims of seed exportation had been fulfilled, in 1985, it would have been necessary 5000 wagons of hopper, having only 2,000 through studies of existent resources and how to increase them, it was reached by a modification a transport capacity of 40 ton to 56 ton for each wagon, and the tare decrease in 5 ton. This means a smaller investment in the buying of new wagons.

This measures, and other economic measures in the use of electrical Diesel locomotors, allow an annual saving of more than A 10,000,000. (10)

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添付資料 8.　アルゼンティン共和国エネルギー需給統計

添付資料8.　アルゼンティン共和国エネルギー需給統計

アルゼンティン共和国エネルギー需給統計

1．一次エネルギー生産推移（　石油換算　　千ｔ）　　出典　ＩＮＴＩ　information

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
水力	174	165	541	539	833	1,504	1,632	1,599	1,777	1,836
原子力	-	-	291	580	691	536	430	768	965	997.
天然ガス	6,788	7,177	7,406	9,784	9,895	11,966	13,388	14,579	16,123	16,663
油	20,177	22,296	21,260	20,486	23,236	25,281	25,196	25,200	24,637	25,462
石炭	363	399	369	363	256	230	304	287	300	310
薪	1,023	907	999	571	762	628	502	533	537	554
農産物屑	1,213	1,112	1,162	1,046	1,138	1,273	1,219	1,317	1,321	1,355
計	29,728	32,056	32,028	33,369	36,811	41,418	42,671	44,283	45,660	47,177

2．一次エネルギー生産構成推移（%）

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
水力	0.6	0.5	1.7	1.6	2.3	3.6	3.8	3.6	3.9	3.9
原子力	-	-	0.9	1.8	1.9	1.3	1.0	1.7	2.1	2.1
天然ガス	22.8	22.4	23.1	29.3	26.9	28.9	31.4	32.9	35.3	35.3
油	67.9	69.6	66.4	61.4	63.1	61.0	59.0	57.0	54.0	54.0
石炭	1.2	1.2	1.2	1.1	0.7	0.6	0.7	0.6	0.7	0.7
薪	3.4	2.8	3.1	1.7	2.1	1.5	1.2	1.2	1.2	1.2
農産物屑	4.1	3.5	3.6	3.1	3.0	3.1	2.9	3.0	2.9	2.9
計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

3．二次エネルギー生産推移　（石油換算　千t）

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
電力	1,869	2,182	2,404	2,599	2,876	3,315	3,223	3,395	3,575	3,604
ガス	5,241	6,453	7,081	8,343	8,368	10,156	11,336	12,610	13,507	14,302
ガソリン	4,276	4,776	5,211	4,817	5,253	6,127	6,237	6,213	6,068	6,118
石油中間品	6,038	6,885	7,085	7,295	7,797	8,953	8,828	8,909	9,016	9,375
燃料油	8,747	9,224	8,461	8,407	8,769	8,056	7,832	6,722	6,333	5,926
その他	3,585	3,785	4,541	4,478	4,888	4,800	4,929	4,894	4,730	4,294
計	29,756	33,310	34,783	35,939	37,951	41,437	42,385	42,741	43,229	43,618

4．二次エネルギー生産構成推移　（%）

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
電力	6.3	6.5	6.9	7.2	7.6	8.0	7.6	7.9	8.3	8.3
ガス	17.6	19.4	20.4	23.2	22.0	24.5	26.7	29.5	31.2	32.8
ガソリン	14.4	14.3	15.4	13.4	13.8	14.8	14.7	14.5	14.0	14.0
石油中間品	20.3	20.7	20.4	20.3	20.6	21.7	20.8	20.8	20.9	21.5
燃料油	29.4	27.8	24.3	23.4	23.1	19.4	18.5	15.7	14.6	13.6
その他	12.0	11.3	13.0	12.5	12.9	11.6	11.7	11.6	10.9	10.5
計	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5．最終消費推移　(1000 TEP)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
民生・公共	4,414	4,472	5,546	6,036	6,360	6,499	6,486	7,255	7,788	8,014
輸送	7,551	8,629	8,801	8,360	9,194	10,295	10,256	10,174	9,930	10,581
農業	828	913	1,064	1,186	1,319	1,434	1,480	1,497	1,551	1,768
工業	7,631	7,130	8,180	8,211	8,525	8,366	8,081	8,608	9,035	9,109
計	20,424	21,144	23,591	23,793	25,398	26,594	26,303	27,534	28,304	29,472

6．最終消費構成推移　(%)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
民生・公共	21.6	21.2	23.5	25.4	25.0	24.4	24.7	26.3	27.5	27.2
輸送	37.0	40.8	37.3	35.1	36.2	38.7	39.0	37.0	35.1	35.9
農業	4.0	4.3	4.5	5.0	5.2	5.4	5.6	5.4	5.5	6.0
工業	37.4	33.7	34.7	34.5	33.6	31.5	30.7	31.3	31.9	30.9

7．エネルギー自給率推移　(石油換算　千t，%)

	1970	1972	1974	1976	1978	1980	1982	1983	1984	1985
国内市場	32,476	35,199	37,539	39,395	41,829	44,334	43,729	44,578	45,715	—
国産	29,723	32,056	32,028	33,369	36,811	41,418	42,671	44,283	45,660	47,177
自給率	91.54	91.07	85.32	84.70	88.00	93.42	97.58	99.34	99.88	—

8．部門別消費エネルギー種別 (%)　(1983年)

	民生・公共	輸送	農業	工業	計（石油換算　千t）
電力	18.5	0.2	2.1	18.4	2,989
都市ガス	45.6	-	-	40.7	6,965
石油精製ガス	-	-	-	-	26
ＬＰＧ	13.2	-	-	-	1,186
ガソリン	0.6	52.3	-	-	6,050
石油中間品	12.9	46.1	97.9	2.2	7,078
燃料油	-	-	-	15.3	2,015
残留炭素	5.2	1.4	-	4.4	340
非エネルギー	-	-	-	2.9	1,610
コークス炉ガス	-	-	-	0.9	81
高炉ガス	-	-	-	0.5	56
石炭コークス	-	-	-	0.5	56
木炭	1.0	-	-	-	73
薪その他	3.0	-	-	14.2	1,673
計	100.0	100.0	100.0	100.0	30,198
	26.4	36.9	5.4	31.3	100.0

9．エネルギーバランス

	1,000TEP	%
Production	46,838	93.9
Import	2,805	5.6
Stock Variation	245	0.5
Supply	49,891	100.0
Final Consumption	30,198	60.6
Own Consumption	4,475	9.0
Export,Bunker Oil	2,758	5.5
Loss	12,460	24.9
Transportation	979	2.0
Waste	2,752	5.5
Conversion	8,404	16.8
Adjustment	325	0.6
Consumption	49,891	100.0

10．エネルギー価格

		A	US $
Electricity	[KWH]	0.1090	0.063
Gas (Gross 9,300KCAL/M3)	[M3]	0.0830	0.052
Gasoline	[L]	0.6600	0.413
Gas Oil	[L]	0.2990	0.187
Diesel Oil	[L]	0.2200	0.138
Fuel Oil	[L]	0.1542	0.096
Coal(Gross 6,000KCAL/KG)	[TON]	50.5	31.563
Fire Wood (3,500KCAL/KG) (30% Moisture)	[TON]	19.2	12.0