No 4

A SURVEY REPORT ON THE ENERGY SUPPLY-DEMAND DATA BANK SYSTEM IN THE REPUBLIC OF INDONESIA

MARCH 1980

JAPAN INTERNATIONAL
COOPERATION AGENCY

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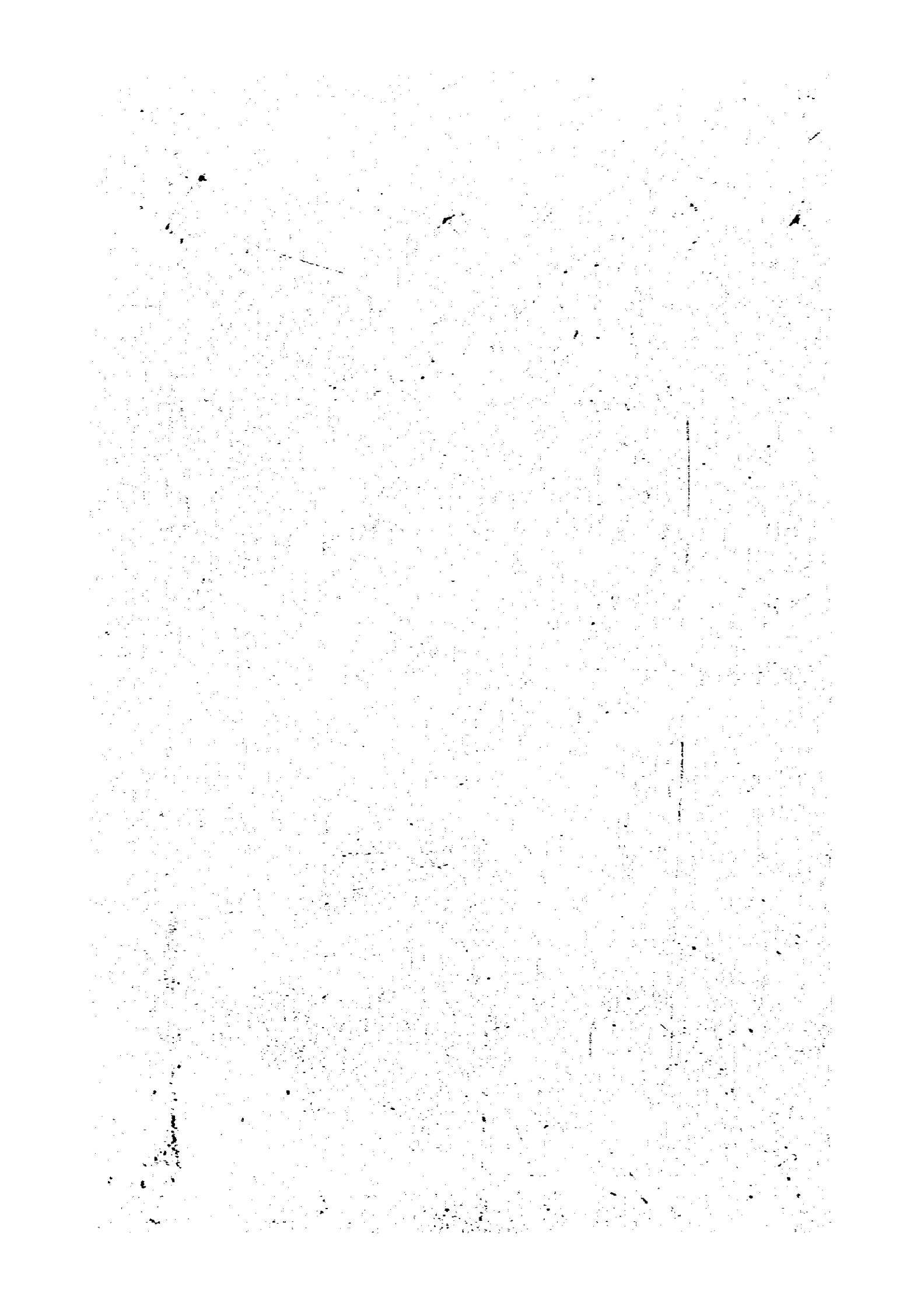

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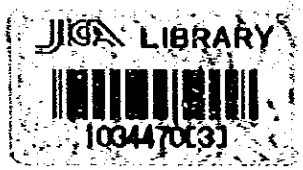

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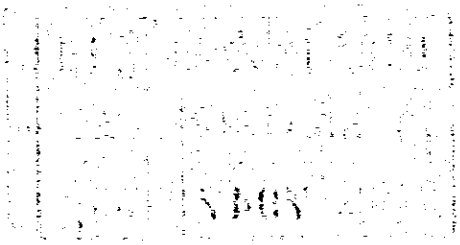

JAPAN INTERNATIONAL
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国際協力事業団
受入月日 '84.1.9
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PREFACE

The Government of Japan, in response to the request of the Government of the Republic of Indonesia, has decided to conduct a survey on the project to establish an Energy Supply-Demand Data Bank System and entrusted the Japan International Cooperation Agency (JICA) to carry out the survey.

JICA, recognizing the importance of this project for the economic and social development of Indonesia, dispatched to Indonesia a nine-man survey team headed by Mr. Takao Tomitate of The Institute of Energy Economics for the period from July 28, 1979 to March 22, 1980.

The team conducted a survey for the establishment of the Energy Supply-Demand Data Bank System.

I hope this report, compiled by the survey team, will prove to be useful for the establishment of the said bank system and for the economic and social development of Indonesia, as well as for the promotion of friendly relations between our two countries.

I wish to express my sincere thanks to the officials concerned of the government of the Republic of Indonesia for their close cooperation extended to the survey team.

March, 1980

Keisuke Arita

Keisuke ARITA
President
Japan International Cooperation Agency

A Survey Report on Energy Supply-Demand Data System
in the Republic of Indonesia

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1. Outline of Technical Cooperation

The commencement of technical cooperation concerning the establishment of the energy supply-demand data bank in the Republic of Indonesia dates back to May 1977. A request for the said technical cooperation was submitted to the Japanese government by Mr. Piet Haryono, the President Director of the Indonesian State Oil and Gas Mining Enterprise (PERTAMINA).

The contents of the cooperation were confirmed between the Republic of Indonesia and Japan after submission of the request. However, there were various unclear points in connection with the Indonesian attitude and preparedness to receive the Japanese, as well as the scope of collection and filing of various data. Thus, the Japanese government dispatched a preliminary survey team to Indonesia from February 28 to March 12, 1978 in order to carry out investigations on technical cooperation concerning the project.

After their return to Japan, the team prepared the "Feasibility Study Report for Technical Cooperation on the Energy Data Bank System of the Republic of Indonedia." Meanwhile, the Indonesian side included the project in the List of Requests for Foreign Assistance (IGGI LIST) of the BAPPENAS, and at the same time submitted a formal request calling for technical cooperation to the Japanese government through the Technical Coordination Committee in the President's Office.

Upon receiving the formal request from the Indonesian government, the Japanese government examined the results obtained from the preliminary survey and studied the request. As a result, in late August 1978, the Japan International Cooperation Agency requested that the Institute of Energy Economics in Japan conduct formal investigations on the area of cooperation concerning the establishment of the energy supply-demand data bank. The Institute of Energy Economics performed its field survey from October 15 to November 13.

The objective of the field survey was to determine actual conditions in Indonesia regarding the fields which required Japanese cooperation in establishing the data bank. Thus, it was aimed at obtaining information which would help the Japanese side decide on the forms of cooperation which could be offered to the Indonesian side.

Consequently, the team was to study the situation in Indonesia by conducting the survey primarily on the following items.

1) Data related to petroleum and gas
2) Energy supply-demand forecast, and balance table
3) Utilization of computers at oil refineries
4) Overall computer utilization system

5) Data on energy sources other than petroleum and gas, such as electtic power, coal, etc.

After these five survey items had been further broken down into 33 sub items, the survey was undertaken. The results from the extensive survey, lasting three weeks, were presented in its "Survey Report on the Energy Supply-Demand Data Bank System in the Republic of Indonesia." The basic conditions for the establishment of the Energy Supply-Demand Data Bank (EDB) system as delineated in the report may be summarized as follows.

(1) The EDB system shall fall under the control of the MIGAS of the Indonesian Ministry of Mines and Energy, and be utilized by MIGAS and PERTAMINA with the consent of the said Ministry and the Japanese government. The data to be processed at present shall be mainly related to oil and gas, and electronic computers and software at PERTAMINA shall also be employed.

(2) The results of the field survey show that MIGAS and PERTAMINA have sufficient data related to perttoleum and gas, and in addition, the hardware, software, manpower, etc. to formulate a project to establish and EDB system and to execute it.

(3) Important factors in establishing the EDB system include: the type of system to be considered, established, maintained, and operated; and ideas and preparations for future improvement.

According to this basic concept, the types of technical cooperation had been classified into two steps: step 1 which was aimed at establishing a comparatively simple EDB system; and step 2, a more complicated large-scale EDB system. It was noted that technical cooperation should be restricted to step 1 for the present time.

A simple EDB system designed at the first step has the following basic functions: 1) preparation of a basic energy statistical table; 2) preparation of an energy balance table; and 3) midium- and long-term energy supply-demand forecast.

Based on the basic policy described in the survey report, the Japanese govetnment decided to offer and execute technical cooperation required for the establishment of an EDB system in Indonesia in fiscal year 1979, and entrusted the Institute of Energy Economics to undertake the actual activities.

2. Execution of Technical Cooperation

2-1 Objective and Items of Cooperation

Actual cooperative works rendered to Indonesia for the establishment of the EDB system was put into effect from the end of July 1979. The objective was to assist in the establishment of an EDB system which had been necessary for the repletion of an Energy Supply and Demand Scheme, a part of the 4th 5-Year Economic Development Plan (REPERITA IV, FY 1984–1989) set forth by the Indonesian government. Therefore, the scope of the work related to the EDB System Project was agreed upon between the two countries prior to execution of the cooperation. In the resulting Scope of Work, the objective of cooperation is stated as follows:

> "The objective of the project is to enforce Japanese technical cooperation, through her experience and expertise, for the establishment of the data bank for supply and demand of energy, and its utilization system which would enable the formulation of appropriate plans on the supply and demand of energy."

After the results of the field survey of the previous year was studied and necessary adjustment of opinions made, concrete items which required cooperation were narrowed to three:

1) establishment of an energy data base;
2) preparation of energy balance tables; and
3) development of a medium-and long-term energy supply-demand forecast model

2-2 Content of Items which were Effected

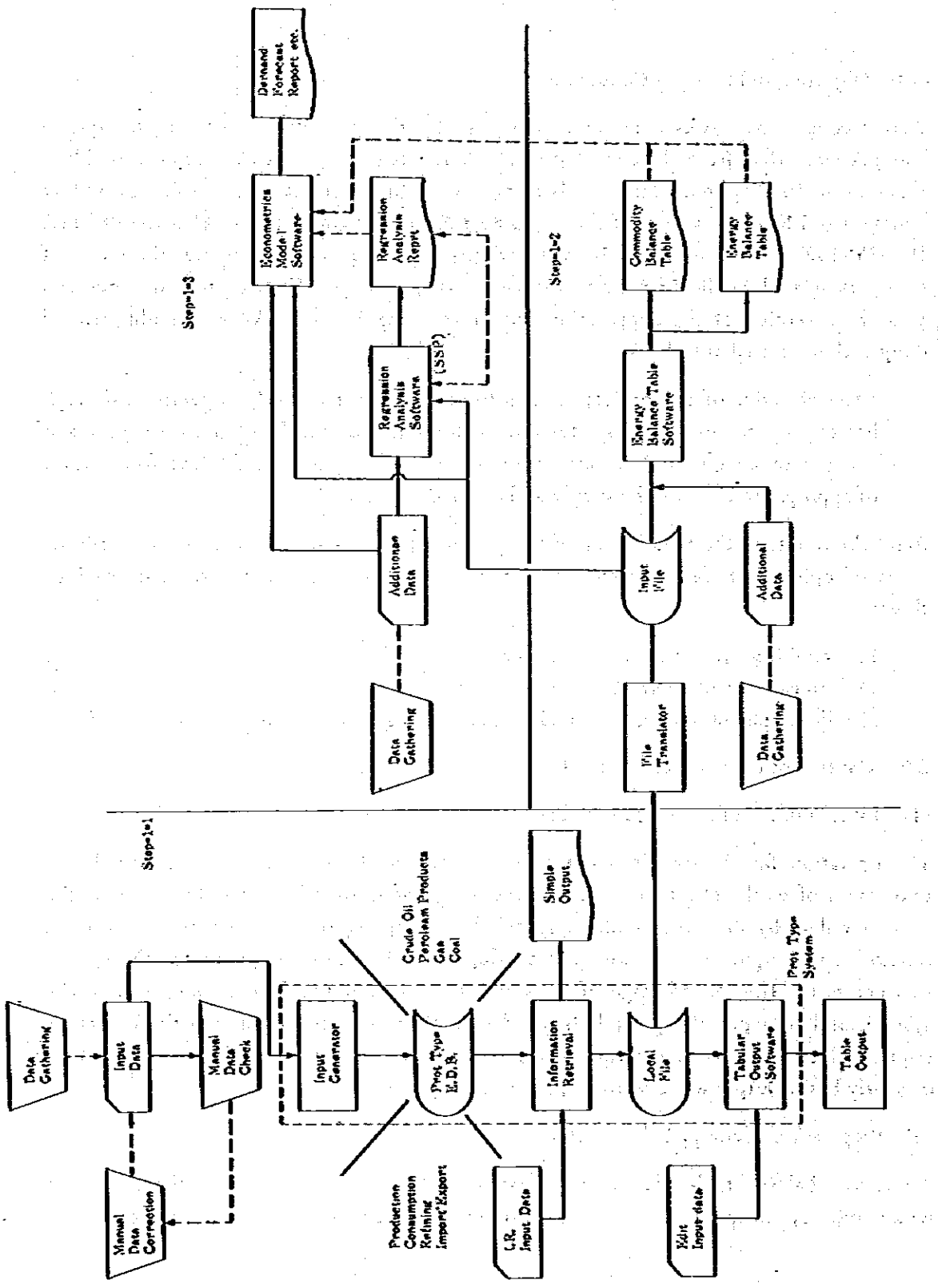
(1) Establishment of an energy data base

The operation for the establishment of an energy data base was roughly separated into two stages of work. The first comprised the design of an overall system which inputs the necessary data by categories under a specified form to create files, perform information retrieval and output. In addition, the development of software required for the system was necessary. The second stage of work was to determine the data to be input into the system, and to input the great bulk of data with a specified form into the computer sequentially, as well as to determine output forms for the necessary data on a monthly or yearly basis. Output was also to be performed sequentially.

(2) Preparation of energy balance tables

An energy balance table illustrates in matrix form, using calorific units, the process in which primary energy is transformed into secondary energy in the energy sector, and

Fig. 2-2-1 Content and Mutual Relationship of the Cooperative Operation and Division of Labor



then consumed by the industry, transportation, and residential and commercial sectors. As a result, in carrying out cooperative activities, the design of a balance table suitable for the conditions in Indonesia was a primary requirement. Next, data which are indispensable for the preparation of the designed balance table had to be collected; and the construction of an equation system for energy balances necessary for the compilation of the designed balance table was required. Finally, software capable of preparing the balance tables by inputing actual data into the equation system had to be developed. As a result, the energy balance tables for Indonesia covering the years from 1969 to 1978 were compiled in this manner.

(3) Development of a medium- and long-term energy supply-demand forecast model

Since medium- and long-term, here, refers to a period of five to ten years, process of the works will be: first, to design medium- and long-term forecast model; second, and most important, to collect time-series macroeconomic data from the past decade, and collect data related to energy which would not be input to the data bank -- indispensable elements for establishing the structural equations of the forecast model, and in deciding the values of exogenous variables; and third, to develop the medium- and long-term model and associated software. With regard to the cooperative operation in this fiscal year, various restrictions were imposed on the development of the model, primarily due to the lack of necessary time-series data. However, sufficient forecast results up to 1990 could be obtained.

The cooperative items were effected in accordance with the above described contents and procedures in Indonesia and Japan respectively, taking the form of a cooperative operation.

Figure 2-2-1 illustrates the content and mutual relationship of the cooperative operation and division of labor.

2-3 Composition of Members Involved in the Cooperative Operation

(1) Composition of the JICA Expert Team

The JICA Expert Team consists of nine members including energy economists, system engineers, and system analysts. A total of eleven members participated in the field survey taken three times. These experts plus one additional took part in the cooperative operation in Japan with the Indonesian members.

(2) Composition of Indonesian Counterpart

In undertaking the project, the Indonesian side formed a team consisting of experts in the related fields at MIGAS, LEMIGAS, and PERTAMINA in order to participate in the cooperative operation. The number of members in the team reached nearly 30, while the number of members who were dispatched to Japan as trainees exceeded 20, 4 of whom were received by the JICA.

Table 2-3-1 Members of the JICA Expert Team

Name	Distribution of Work
Takao Tomitate	Coordinator
Hitoshi Shozawa	Energy balance table
Kenichi Matsui	Energy supply-demand forecast model
Yoshio Hara	Assistant coordinator, energy statistics
Yoshiki Ogawa	Energy balance table, software for the balance table
Akio Sonobe	Data base, field coordinator
Koichi Osada	Software for the data bank
Shoji Yoshikoshi	Software for the data bank, software for the forecast model
Setsuo Takemoto	JICA
Toru Nishizutsumi (Domestic operation)	Energy supply-demand forecast model

Table 2-3-2 Members of the Indonesian Counterpart

Name	Bureau	Distribution of Work
A. Qoyum	MIGAS	Coordinator
R. S. Robot	PERTAMINA	Assistant Coordinator
Erwin Kasim	"	Designing of the data bank
Maman Widjaja	"	Software for data bank
Agung Witono	"	Software for data bank
Djoko Widagdo	"	Programming
Santoso Koerdi	"	Programming
Paido H.	"	Programming
Anton H.	"	Programming
Sumardi C. D.	"	Programming
Pramono	"	Supply-demand forecast model
Tanujaya	"	Supply-demand forecast model
Rohari Sani	MIGAS	Energy balance table
Mrs. Soeparti Soediro	"	Energy balance table
Mulyanto	"	Supply-demand forecast model
Widartomo	"	Supply-demand forecast model
Razif Razak	"	Energy balance table
C. Djufri	"	Energy balance table
Mrs. Ratna	"	Supply-demand forecast model
Hendro Prawoto	LIMIGAS	Energy balance table
Mrs. Endang Lestari	"	Energy balance table
Bunyani	PERTAMINA	Software for the data bank

2-4 Operational Schedule and its Content

(1) Operational schedule and its content in Indonesia

The Japanese expert team was dispatched to Indonesia three times, and one professional was stationed in Indonesia throughout the operation of the project.

The first expert team was dispatched from July 28 to September 8, 1979. Immediately after determining the scope of the project for this fiscal year, they moved onto the execution of the operation. The first cooperative works included: 1) deciding on the types of data to be input, and the input form; 2) deciding on the forms of data output which could be obtained as statistical tables, and formulating a rough outline of the form; 3) determining the number of raws and columns in the balance tables, and confirming the availability of data; and 4) establishing software for data input into the data bank, etc.

The second team was sent on December 4 and stayed in Indonesia until December 30, 1979. Their work included: 1) preparation of software related to the energy balance table; and 2) installation of software for data retrieval and output.

The third team was dispatched from March 5 to March 11, 1980, taking over the half-completed operation. During their short stay, the work covered: 1) clarification of the problems which had arisen during the course of the cooperative operation up to that stage; and 2) discussions on the direction which the expansion of the data bank should be led in the future, and methods of cooperation required for the expansion.

(2) Operational schedule in Japan and its content

The first domestic operation was undertaken from September 17 to November 20, 1979, succeeding the work carried out by the first dispatched team. The operation took the form of a joint operation between the Japanese and Indonesian members. The number of countermembers who had visited Japan during this period totalled 14, including 2 trainees received by the JICA.

The work of the first domestic operation consisted of: 1) construction of the equation system for energy balances; 2) input of actual data and experimental compilation of the 1978 balance table; and 3) preparation of software for data retrieval from the data bank and data output.

The major objective of the second domestic operation, undertaken from December 13, 1979 to February 17, 1980, was to develop a medium- and long-term energy supply-demand forecast model. As a result, the first half of the operational period was concentrated on the conceptual design of the forecast model. Based on the conceptual design, equation of the model and exogenous variables were set up. In the latter half, real data were input to obtain results, and software required for the operation of the model was also developed.

In order to determine the real situation of energy supply and demand in the Japanese

major industries, four field trips were made during the course of the first and second domestic operations.

Table 2-4-1 Field Trips to Major Domestic Industries

Date		Name of Factory
First trip	Oct. 4-5, 1979	Kashima Plant of Mitsubishi Petrochemical Co., Ltd. Kashima Oil Refinery Kashima Ironworks of Sumitomo Metal Industries, Ltd.
Second trip	Oct. 18-19, 1979	Hamaoka nuclear power plant of Chubu Electric Power Co. Ltd. Toyota factory of Toyota Motor Co., Ltd.
Third trip	Nov. 7, 1979	Isogo steam power plant of Electric Power Development Co. (Coal) Minami-Yokohama steam power plant of Tokyo Electric Power Co., Inc. (LNG) Negishi factory of Tokyo Gas Co., Ltd.
Fourth trip	Feb. 4, 1980	Nagoya Ironworks of Nippon Steel Corporation LNG receiving station of Chubu Electric Power Co., Ltd.

WORK SCHEDULE BY ITEMS AND ASSIGNED PERSONS

WORK ITEM	NAME	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
COORDINATER	Takao TOMITATE	(28)	(10)						(5)	(9)
DESIGN OF ENERGY BALANCE TABLE	Hitoshi SHOZAWA	(28)	(17)							
	Yoshio HARA	(28)	(17)			(4)	(13)			
ESTABLISHMENT OF EQUATIONS AND SOFTWARES FOR E.B.T.	Yoshiki OGAWA					(4)	(30)			
ESTABLISHMENT OF SOFTWARES FOR E.D.B. AND ENERGY SUPPLY-DEMAND FORECAST	Shoji YOSHIKOSHI	(28)		(8)		(4)	(16)			
	Koichi OSADA								(5)	(11)
ESTABLISHMENT OF ENERGY DATA BASE	Akio SONOBE	(28)								(22)
ESTABLISHMENT OF ENERGY FORECAST MODEL	Kenichi MATSUI (Toru NISHIZUTSUMI)								(5)	(11)
COORDINATER	Qoyum				(5)					
	R. S. Robot									
ESTABLISHMENT OF ENERGY BALANCE TABLE (DESIGN, EQUATIONS, AND SOFTWARES)	*Soeparti Soediro		(12)			(20)				
	*Hendro Prawoto		(12)			(20)				
	Razif Razak		(14)							
	C. Djufri			(10)						
	Endang Lestari			(10)						

WORK ITEM	NAME	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
DEVELOPMENT OF E.D.B. SYSTEM AND SOFTWARES	Erwin Kasim			(14) ⊢ - - - - →						
	Maman Widjaja									
	Agung Witono									
	Sumardi C.D.			(11) ⊢ - - - - - - - - - - - - → (9)						
	Santoso			(11) ⊢ - - - - - - - - →						
	Paido			(11) ⊢ - - - - - - - - →						
	Anton				(11) ⊢ - - - - - - - →					
	Bunyani				(10) ⊢ - - - →					
ESTABLISHMENT OF ENERGY SUPPLY-DEMAND FORECAST MODEL	Mulyanto						(25) ⊢ - - - - - - - - - - - - → (17)			
	Widartomo							(3) ⊢ - - - → (17)		
	Ratna				(28) ⊢ - - - - - - →			(6) ⊢ - - - - - - →		
ESTABLISHMENT OF SOFTWARE FOR ENERGY SUPPLY-DEMAND FORECAST MODEL	☆Pramono						(25) ⊢ - - - - - - - - - - - - → (17)			
	Tanujaya							(3) ⊢ - - - → (17)		
ESTABLISHMENT OF SOFTWARES FOR E.D.B. AND FORECAST MODEL	☆Djoko Widagdo						(13) ⊢ - - - - - - - - - - - - → (17)			

Note: ⊢——→ Work in JAKARTA
⊢- - - -→ Work in TOKYO
( ) Date
( ) Expert for the domestic work
☆ Trainees accepted by JICA

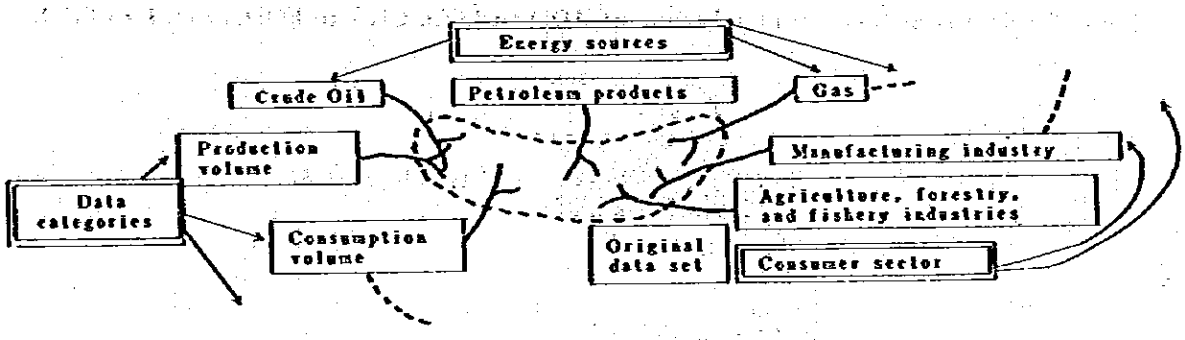
3. Energy Supply-Demand Data Bank

3-1 Outline of the Data Bank System and Its Usage

The data bank system (hereinafter referred to as EDBS) provides for the creation and updating of energy-related information files, as well as extraction, editing, and printout of necessary information.

Since the EDBS handles diversified and massive data related to energy, it requires an efficient data access method. Therefore, the EDBS employes the concept of "list structure" which manages data in terms of energy types, or data categories such as production volume and consumption volume.

Fig. 3-1-1 Data Categories



Original data which is processed in an EDBS-type system is input in an encoded form. Since data is prepared based on a table which the actual names and codes, errors may possible occur in copying or punching. Thus, the EDBS provides a "Data Check System" (hereinafter referred to as DCS), a sub-system to prevent transmission of mistakes into the information file.

The DCS determines whether there is a code which is not registered in the corresponding table with the actual names, and whether the sum of values of the header data (Refer to 3-1-1) matches the sum of values of the original data (balance check).

3-1-1 Creation and Update of the Information File

The EDBS provides three functions for creation and update of the information file.

- Addition of new data

- o Correction of existing data
- o Deletion of existing data

Two types of data are required in order to utilize these functions. The first is the so-called directive data, specifying which of the functions will be used, and the second is a set for updating the information file depending on the selected function.

Directive data

There are three types of directive data indicating addition, correction, or deletion, and each type is paired with an end of data directive indicating the conclusion of the updating data set.

ADD	Addition of new data
CNG	Correction of existing data
DEL	Deletion of existing data
EOD	End of data

Thus, the data configuration may be one of ADD to EOD, CNG to EOD, or DEL to EOD.

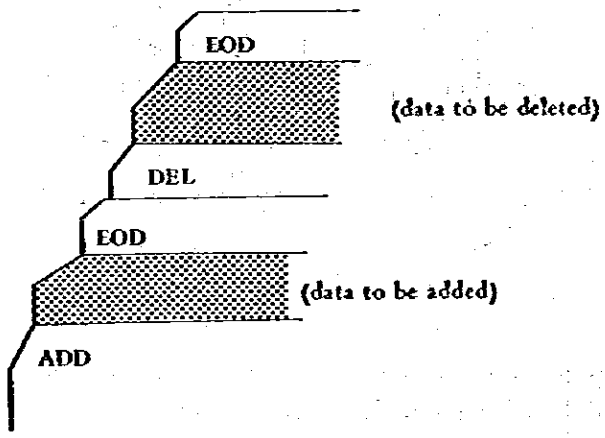


Fig. 3-1-2 An Example of Data Configuration

Data updating the information file

Since the format for updating data differs according to the function, preparation of updating data for each case will be discussed below.

Addition of new data (ADD)

Data for addition is divided into several groups, each consisting of a group header, data to be added to the information file, and a group end (END).

The group header defines the period for which data following the header will remain in the file, along with other information. The value in the header is maintained until the group end is encountered (Refer to Page 15).

– Frequency	M: Month Q: Quarter Y: Calender year F: Fiscal year
– Year	Year
– Quarterly	If quarterly data, indicate one of 1 through 4.
– Monthly	If monthly data, indicate one of January(1) through December(12).
– Scale	A scaling factor for the value of additional data (the column of Amount) is indicated in terms of an exponent of 10. If Scale = 2 and the value of data is 100.0, the data will be processed as $100.0 * 10^2 = 10000$.
– Unit	A unit of the value of updating data (the column of Amount); the following table shows available seven units.

No.	Code	
1	BBL	Barrel
2	KL	Kirolitres
3	M3	Cubic metre (m^3)
4	MCF	
5	MT	10^3 tons
6	BTU	British thermal units
7	KWH	Kirowatt hours

Table 3-1-1 Available Units

– Sub-Total	Used for balance check of data

Data to be added to the information file, (Refer to Page 16), as mentioned earlier, are in encoded form. Although the example shown below is a configuration for oil-related data, the one for gas-related data is the same.

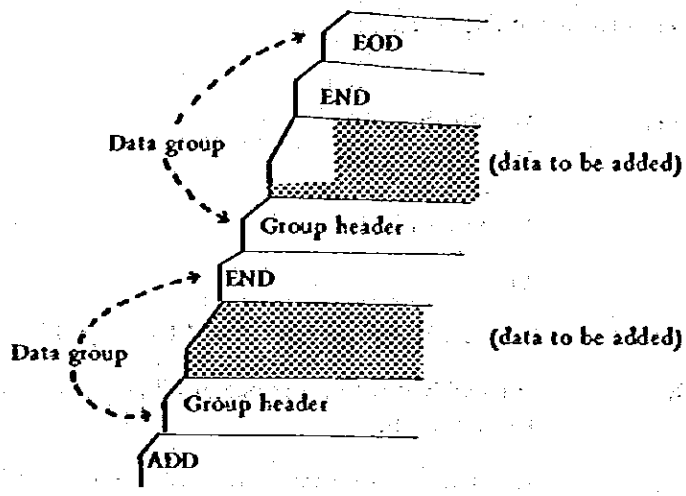


Fig. 3-1-3 An Example of an Additional Data Configuration

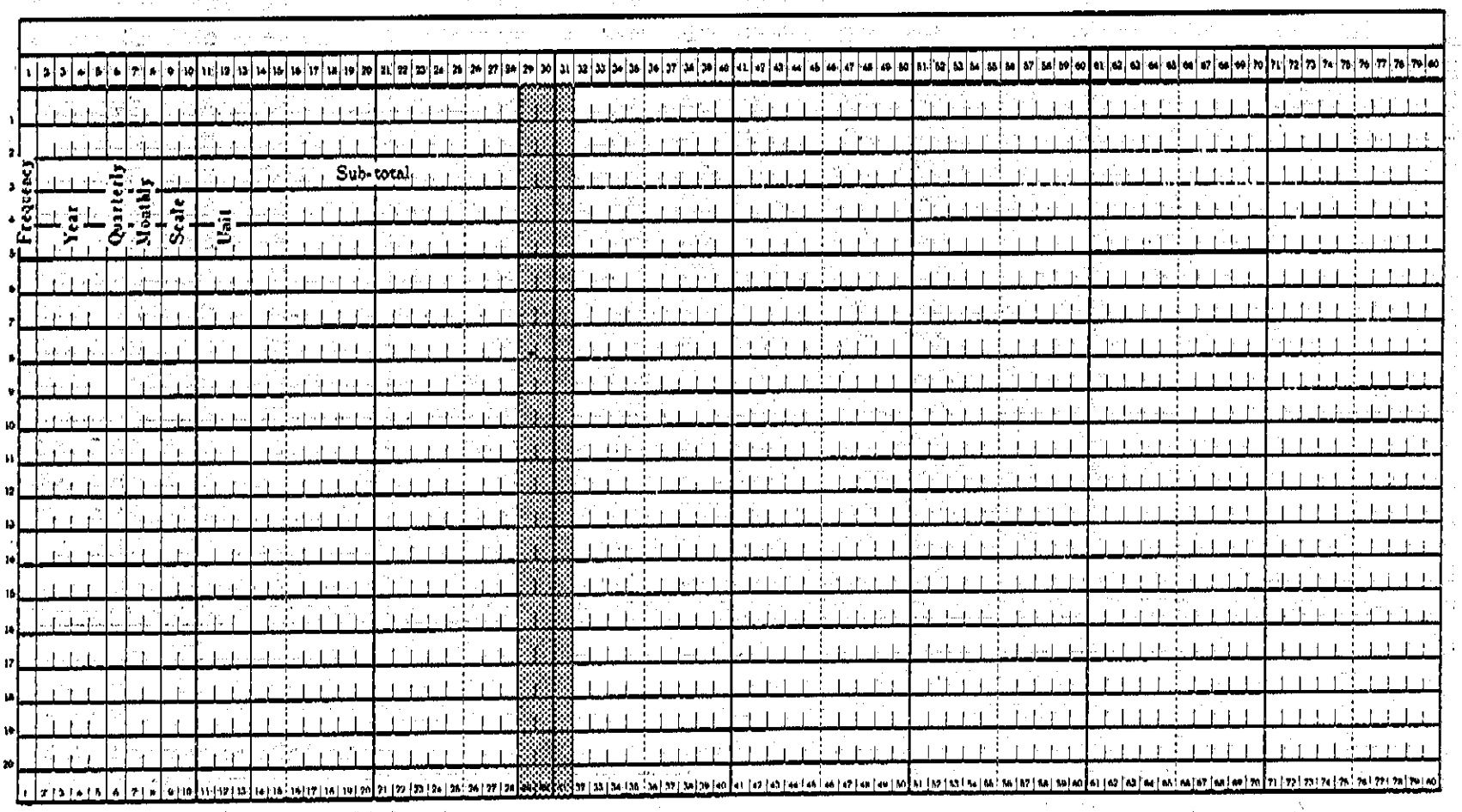
日付 / / ページ /

客先名

作業名 Group Header (ADD)

作成者名

Frequency	Year	Quarterly	Monthly	Scale	Unit	Sub-total



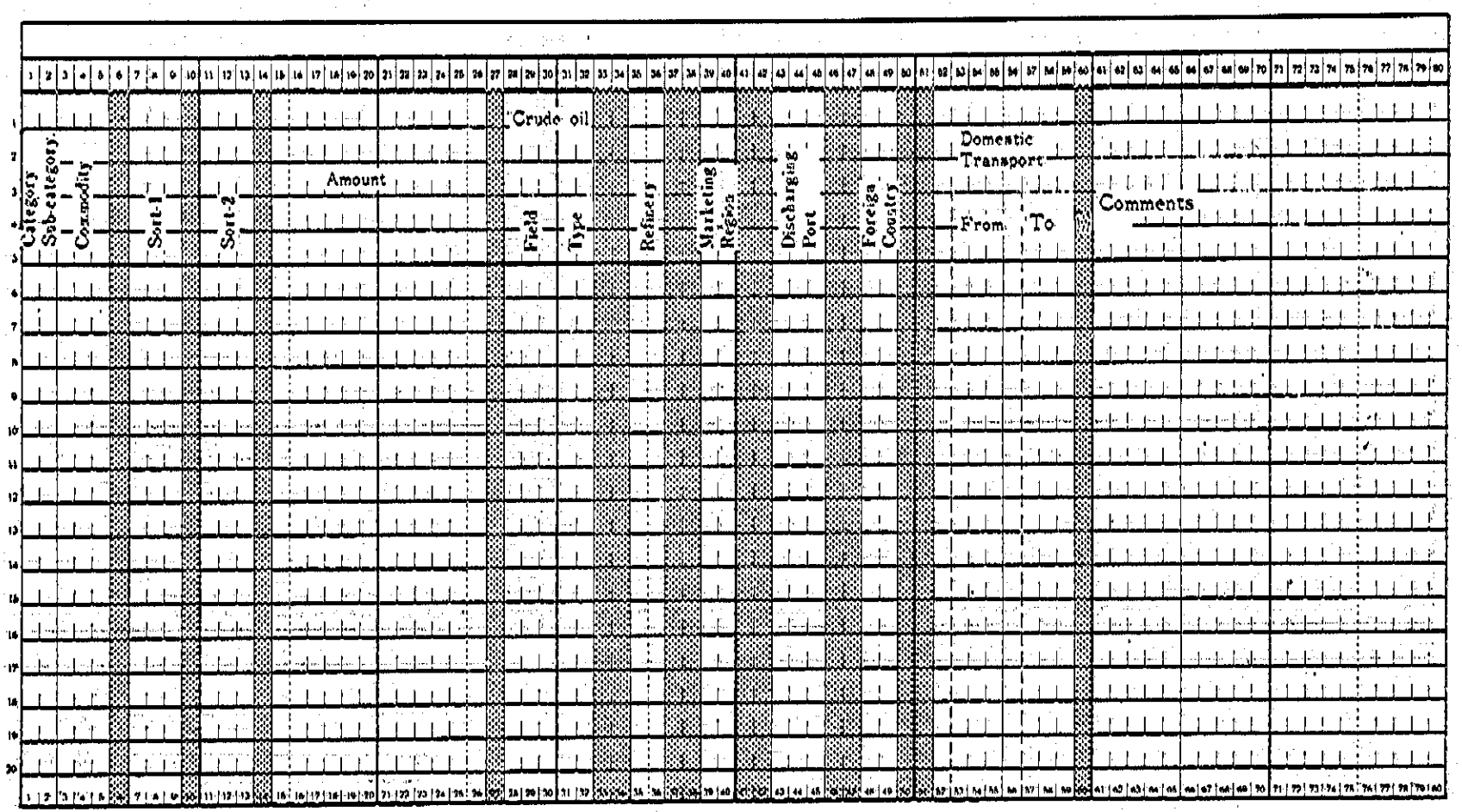
客先名 _____

作業名 _____

作成者名 _____

日付 / / ページ /

Addition Data to the Information File (ADD, CNG)



Category	Sub-category	Commodity	Sort-1	Sort-2	Amount	Crude oil: Field	Crude oil: Type	Refinery	Marketing Region	Discharging Port	Foreign Country	Domestic Transport: From	Domestic Transport: To	Comments

(Reference) A sample list of additional data

```
I N D O N E S I A N   E N E R G Y   D A T A   B A S E   S Y S T E M

                    --- INPUT DATA LIST ---

NO      ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1   INIT  Refer to 3-1-5
  2   ADD                                0          0
  3   M1979 01 CELL
  4   P OCR                10528514.0  001
  5   P OCR                 942807.00  004
  6   P OCR                 122772.00  008
  7   P OCR                 850771.00  005
  8   P OCR                 924867.00  002
  9   P OCR                 165503.00  025
 10   P OCR                 237559.00  003
 11   P OCR                  20944.00  009
 12   P OCR                  48856.00  011
 13   P OCR                  45023.00  007
 14   P OCR                   7703.60  012
 15   P OCR                 571476.00  010
 16   P OCR                 -10772.00  026
 17   P OCR                 335610.00  018
 18   P OCR                 536912.00  015
 19   P OCR                1635482.00  014
 20   P OCR                 245319.00  013
 21   P OCR                 358622.00  016
 22   P OCR                 431612.00  006
 23   P OCR                 266867.00  020
 24   P OCR                 480773.00  023
 25   P OCR                  46784.00  022
 26   P OCR                  29156.00  019
 27   P OCR                   9648.00  021
 28   P OCR                  19767.00  017
 29   P OCR                 345974.00  024
 30   P OCR                 382664.00  027
 31   P OCR                  24545.00  028
 32   P OCR                 201632.00  031
 33   P OCR                 221530.00  029
 34   P OCR                  46570.00  032
 35   P OCR                636905.00  030
 36   P OCR                 31510.00  033
 37   P OCR                     0.0   034
 38   P OCR                 17558.00  038
 39   P OCR                104825.00  036
 40   P OCR                 11318.00  037
 41   P OCR                 22407.00  039
 42   P OCR                161072.00  040
 43   P OCR                 30222.00  042
 44   P OCR                  4141.00  035
 45   P OCR                173653.00  041
 46   P OCR                 18126.00  045
 47   END                       0.0

1726   M1979 01 OBBL
1727   W PGS                 12691.00          11
1728   W NAP                  5535.00          11
1729   W KER                 57528.00          11
1730   W ADO                  3454.00          11
1731   W IDO                 16482.00          11
1732   W MFO                 49078.00          11
1733   W LSR                  3510.00          11
1734   END                       0.0
1735   M1979 01 OBBL
1736   W KER                551794.00          16
1737   W ADO               1102773.00          16
1738   END                       0.0
1739   END          0
1740   LST                                0          0
```

No. 2 Directive data

No. 3–No. 47 Data group

No. 3 Group header

No. 4–46 Additional data

No. 47 Group end

No. 1726–No. 1734 Data group

No. 1735–No. 1738 Data group

No. 1739 End of data

Correction of existing data (CNG)

The EDBS handles correction of existing data as replacement of data. The data to be corrected is deleted from the file by giving its record number, and then the correct data is inserted in its place. The data configuration for CNG is similar to that of ADD.

The group header indicates the record number of data to be replaced (the column of Element No. on Page 19). The updating data follows the header (the same as shown on Page 15). Since the header and updating data are in pair, the group end required for ADD) is not necessary for CNG.

Deletion of existing data (DEL)

Existing data is deleted from the file by giving the record number of the file to be deleted (Refer to Page 20).

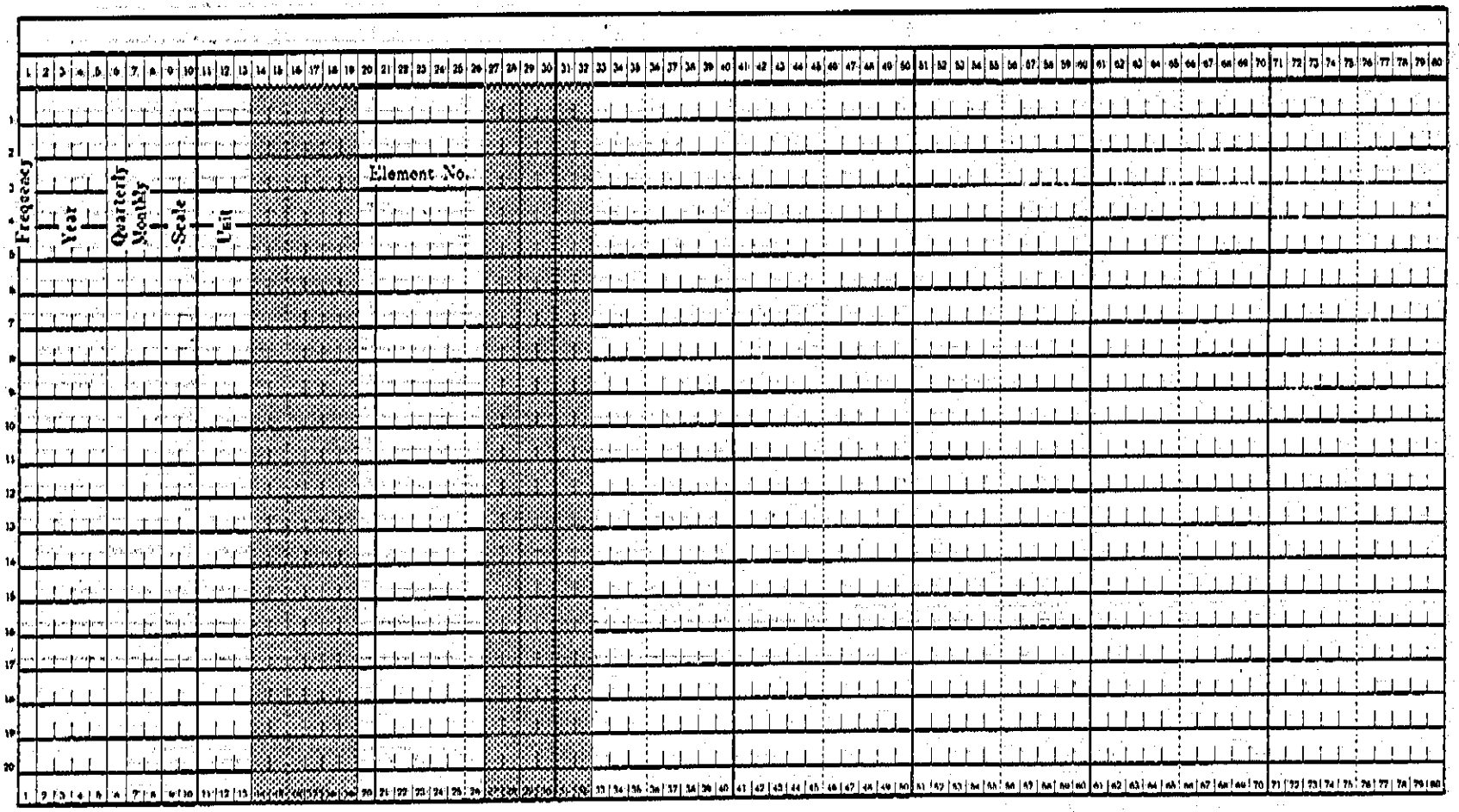
日付 / / ページ /

客先名

作業名 Correction of Existing Data

作成者名 Header (CNG)

	Frequency	Year	Quarterly Monthly	Scale	Unit	Element No.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						



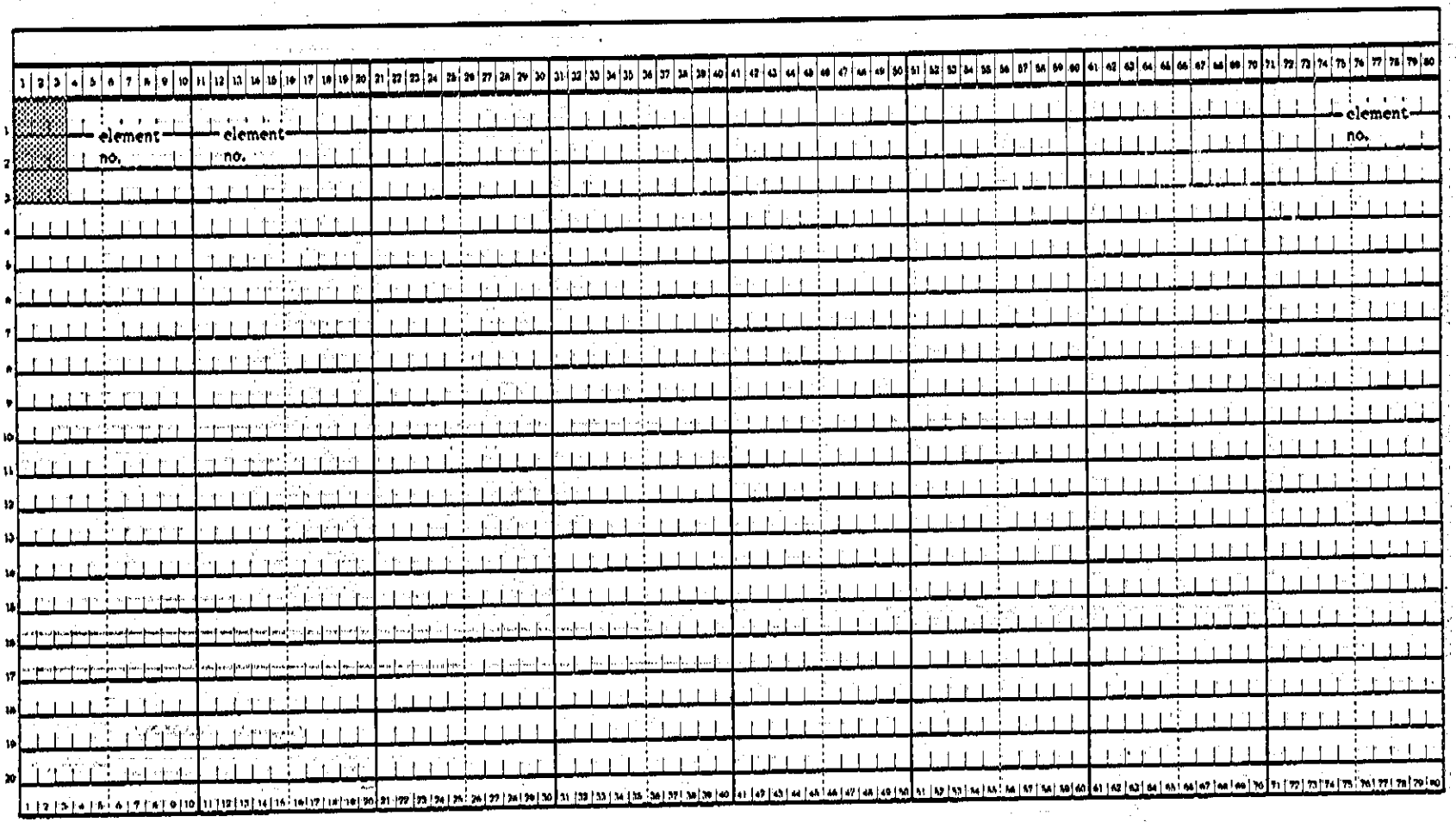
日付 / / ページ /

客先名

作業名 Deletion of Existing Data (DEL)

作成者名

	1–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80
1	element no.	element no.						element no.
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								



3-1-2 Extraction of Data from the Information File

A partial set of data is created by extracting data from the information file using a key code and/or sub-code. Then, the partial set is converted to a set of necessary information through logical operation of the key code.

Directive data and extraction indicating data require the utilization of this function of extraction, similar to the case of updating.

Directive data

RET	directive data for extraction
EOD	End of data

Extraction indicating data (Refer to Page 22)

As mentioned earlier, this consists of a key code and sub-codes. However, there may be two cases: the first only uses a key code, and the other uses both a key code and a sub-code.

For example, if the entire information concerning crude oil is necessary, only an appropriate key code (=1) is used, whereas if information concerning specific crude oil is necessary, then a sub-code must also be used.

Table 3-1-2 Table of Key Codes

Key Code	Classification
1	crude oil
2	petroleum products
3	gas
4	coal
5	other energy sources
6	consumer sector
7	oil refinery and gas plant
8	PERTAMINA Marketing region
9	SEAPED DEPOT
10	countries of transaction
11	domestic transportation
12	data category
13	sub-index 1
14	sub-index 2
15	year
16	month or quarter
17	data period

(Note) Sub-codes include names of individual crude oils and manufactured goods.

日付 / / ページ 1

客先名

作業名 Extraction Indicating Data

作成者名

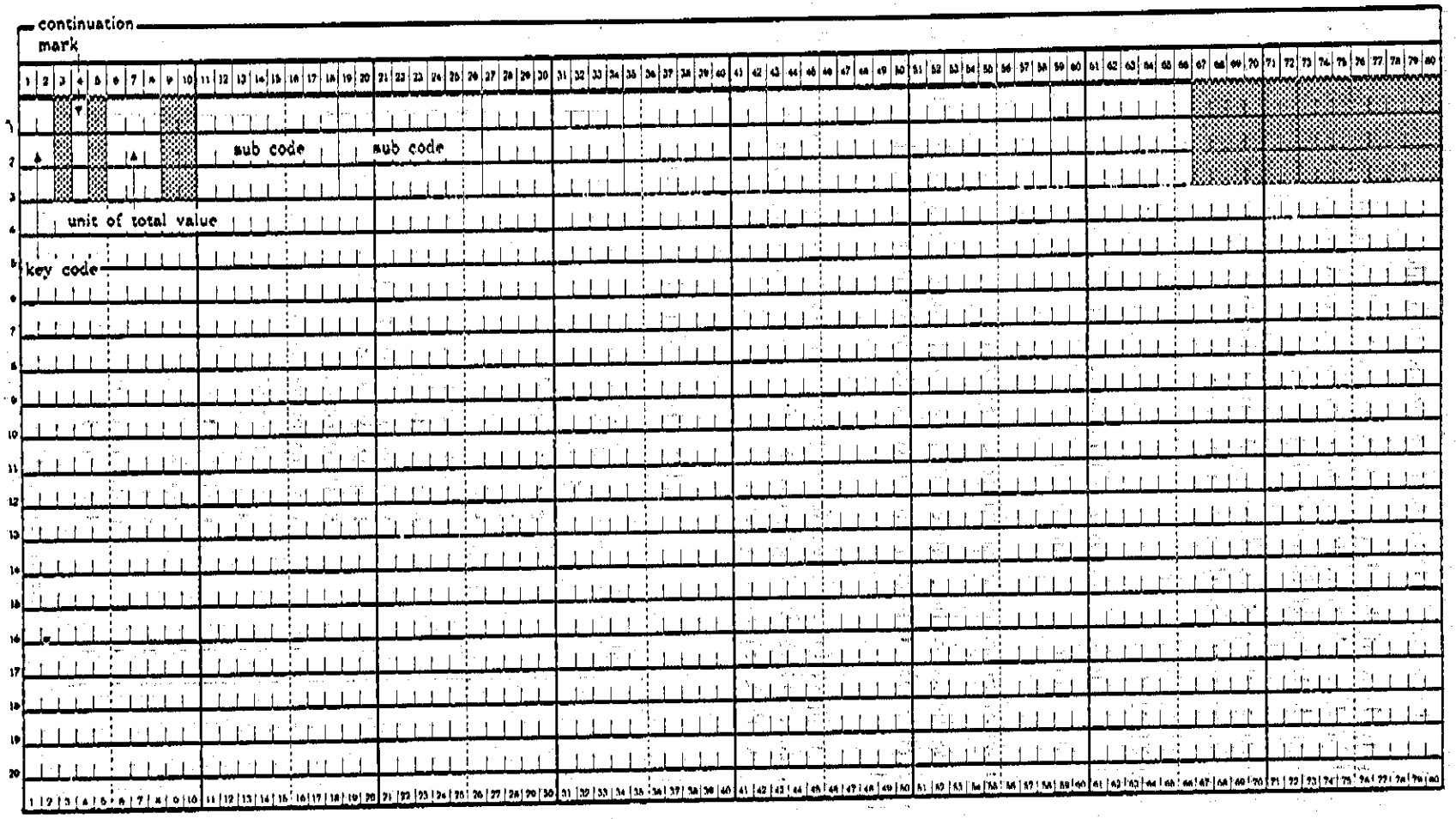
continuation mark

sub code

sub code

unit of total value

key code



If more than 8 sub-codes are used for one key code, the continuation column must be written in as shown in the example.

Col.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19 .....
	R	B	T																
	0	1																	
	1	6		C							0	4							0 5
	1	6									1	1							1 2
	1	5									1	9	7	6					
	9	9									0	1	*	1	5	*	1	4	

Fig. 3-1-4 The Case where More than Eight Sub-Codes are Used for One Key Code

There are two special types of key codes, "99" and "SV", which are used in the following cases.

"99" is used to write a logical expression of the key code to create a necessary set from a partial set (Refer to Fig. 3-1-4). When the sum of values of extracted data is desired, unit conversion of the individual values is performed by indicating a unit, such as BBL, in columns 6 through 8 of the "99" card so that the sum of the values will be printed out with a uniform unit. The built-in unit conversion table of the EDBS is shown on Page 24. If columns 6 through 8 are blank, no sum is printed. Furthermore, if a variable name included in the energy balance table is indicated in columns 73 through 80 of the "99" card, the sum, in addition to the variable name, will be transferred to an intermediate file. On the other hand, "SV" is used to transfer a set of extracted data to an intermediate file for editing purposes. A label, required to manage the extracted set for its transmission to the intermediate file, is indicated in columns 6 through 8 of the SV card.

3-1-3 Edition of Extracted Data

The EDBS edits extracted data, then prints out any number of tables from among the 95 shown on pages 28 and 29 specified by REPORT NO. and SUB NO. Data requiring use of this function consists of directive data and edition indicating data.

Directive data

OUT	directive data for edition
EOD	end of data

Unit Conversion Table

	BBL	KL	M3	MCF	BTU	KWH
BBL	1.0	0.159	0.159	5.16E-3		
KL	6.29	1.0	1.0	35.31E-3		
M3	6.29	1.0	1.0	35.31E-3		
MCF	178.11	28.32	28.32	1.0		
BTU					1.0	2.93E-4
KWH					3412.14	1.0

(Reference) A sample list of Information extraction

```
INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO          1         2         3         4         5         6         7         8
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
 1   (REST)  Refer to 3-1-5
INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO          1         2         3         4         5         6         7         8
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
 1   REST                      0         0
INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO          1         2         3         4         5         6         7         8
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
 1   01
 2   12        W
 3   14        1979
 4   95   BEL  01*12*14
*** END OF STEPH COUNTER X**
```

INDONESIAN ENERGY DATA BASE SYSTEM PAGE(4)

--- LIST OPTION ---

NO	CATE GORY	SUB ILX	COMMODITY	CONSUM SECTOR	REPT NTRY	MARKT REGN	SEA CORP	FOREIGN COUNTRY	DOMESTIC TRANSPOR	DATE YEAR	DATE Q M	AMOUNT	SC	UNIT	COMMENT
193	W		OCR01							1979	01	1646320.0E	0	BBL	
194	W		OCR02							1979	01	178363.0E	0	BBL	
195	W		OCR03							1979	01	263178.0E	0	BBL	
196	W		OCR04							1979	01	32199.0E	0	BBL	
197	W		OCR05							1979	01	222853.0E	0	BBL	
198	W		OCR06							1979	01	474835.0E	0	BBL	
199	W		OCR07							1979	01	610559.0E	0	BBL	
200	W		OCR08							1979	01	242286.0E	0	BBL	
201	W		OCR10							1979	01	469255.0E	0	BBL	
202	W		OCR11							1979	01	89176.0E	0	BBL	
203	W		OCR12							1979	01	102770.0E	0	BBL	
204	W		OCR13							1979	01	708158.0E	0	BBL	
205	W		OCR14							1979	01	311269.0E	0	BBL	
206	W		OCR15							1979	01	479556.0E	0	BBL	
207	W		OCR16							1979	01	75867.0E	0	BBL	
208	W		OCR17							1979	01	11526.0E	0	BBL	
209	W		OCR18							1979	01	505920.0E	0	BBL	
210	W		OCR19							1979	01	40874.0E	0	BBL	
211	W		OCR20							1979	01	112160.0E	0	BBL	
212	W		OCR22							1979	01	171730.0E	0	BBL	
213	W		OCR16							1979	01	22259.0E	0	M3	
214	W		OCR23							1979	01	30241.0E	0	M3	
215	W		OCR24							1979	01	40677.0E	0	M3	
216	W		OCR25							1979	01	12010.0E	0	M3	
217	W		OCR28							1979	01	44184.0E	0	M3	
218	W		OCR26							1979	01	10351.0E	0	M3	
219	W		OCR27							1979	01	19020.0E	0	M3	
220	W		OCR29							1979	01	10716.0E	0	M3	
221	W		OCR30							1979	01	16711.0E	0	KL	
893	W		OCR40		01					1979	01	68309.0E	0	KL	
895	W		OCR40		02					1979	01	62704.0E	0	KL	
897	W		OCR40		03					1979	01	278631.0E	0	KL	
899	W		OCR40		04					1979	01	512345.0E	0	KL	
901	W		OCR40		05					1979	01	705244.0E	0	KL	
903	W		OCR40		06					1979	01	732660.0E	0	KL	
905	W		OCR40		07					1979	01	890622.0E	0	KL	
907	W		OCR40		08					1979	01	40476.0E	0	KL	
909	W		OCR40		21					1979	01	289851.0E	0	KL	
910	W		OCR40		22					1979	01	-81137.0E	0	KL	
911	W		OCR40		23					1979	01	256132.0E	0	KL	
1366	W		OCR32		15					1979	01	1040544.0E	0	BBL	
TOTAL												32730352.0	0	BBL	

Edition indicating data (Refer to page 27)

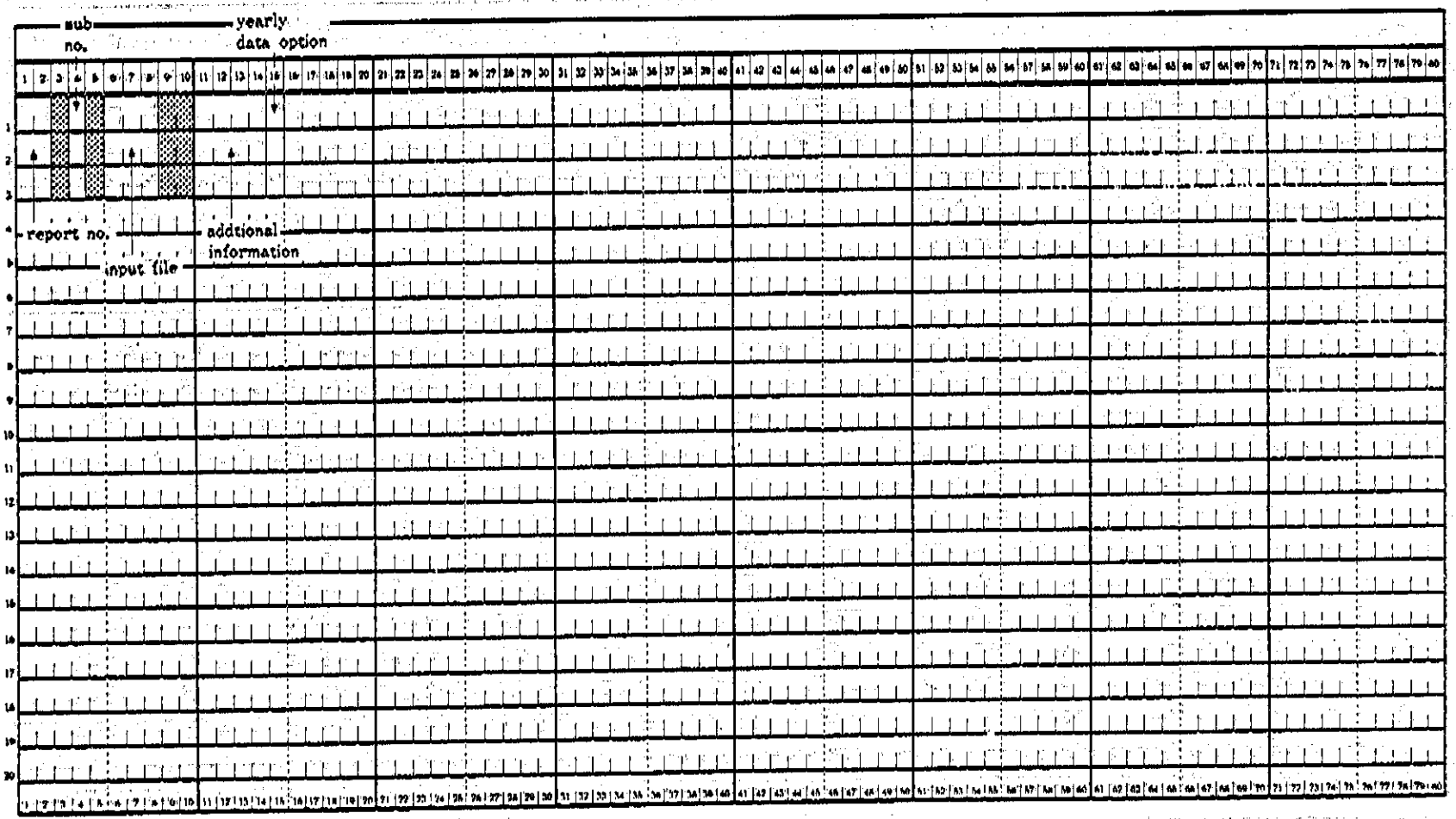
By writing in the label name (on the specified "SV" card) of the extracted information given for its transmission to an intermediate file at the input file columns, appropriate information is read from the intermediate file.

If a specified report edits information more than two years old (FORMAT on pages 28 and 29 is F1 or F2), the oldest year must be specified at ADDITIONAL INFORMATION.

Data input into the EDBS is currently monthly-based data. However, it will be more efficient to have yearly-based data for possible interface with the energy balance table in the future.

Therefore, the EDBS is equipped with a function called YEARLY DATA OPTION which not only edits a specific report, but also writes out yearly data on a disk with the format described on page 15 and page 16. If "G" is entered in YEARLY DATA OPTION, yearly-based data is created in the format shown on pages 34 through 37. Since this function has not yet been fully established, a detailed description is not given here.

Edition Indicating Data



Report no.	no.	Title	Y:cy F:fy M:month	Printing unit	no.	ROW	no.	COL	Matrix reduction	Format	Comments
02-1	1	crude oil production by company	Y	BBL	R1	company	C1	JAN to DEC	R	F1	
02-2			F				C2	APR to MAR			
02-3	2	crude oil production by field	Y	BBL	R2	crude oil field	C1		R	F1	
02-4			F				C2				
03-1	3	crude oil production by type of crude	Y	M.BBL	R3	type of crude	C3	5 years	R	F2	
03-2			F								
04-1	4	crude oil supply to refinery	Y	M.BBL	R4	type of crude	C4	indonesian refinery & C.P. deal	R	F3	
04-2			F								
04-3			M	BBL							
04-4			Y	M.BBL			C3		R	F2	
04-5			F								
05-1	5	refinery through-put	Y	M.BBL	R4		C4		R	F3	
05-2			F								
05-3			M	BBL							
05-4			Y	M.BBL			C3		R	F2	
05-5			F								
06-1	6	refinery products	Y	M.BBL & $10^{**}3$KT	R5	trough-put & products	C4			F3	
06-2			F								
06-3			M	BBL & KT							
06-4	7	refinery products	Y	BBL & KT			C1			F1	
06-5			F				C2				
06-6			Y	M.BBL & $10^{**}3$KT			C3			F2	
06-7			F								
07-1	8	crude oil export by destination	Y	M.BBL	R4		C5	foreign country	R&C	F4	
07-2			F								
07-3	9	crude oil export	Y	BBL			C6	JAN to DEC	R	F5	
07-4			F				C7	APR to MAR			
07-5			Y	M.BBL			C3		R	F2	
07-6			F								
08-1	10	crude oil export value by destination	Y	M.US$	R4		C5		R&C	F4	
08-2			F								
08-3	11	crude oil export value	Y	US$			C6		R	F5	
08-4			F				C7				
08-5			Y	M.US$			C3		R	F2	
08-6			F								
09-1	12	crude oil import by origin	Y	M.BBL	R4		C5		R&C	F4	
09-2			F								
09-3	13	crude oil import	Y	BBL			C6		R	F5	
09-4			F				C7				
09-5			Y	M.BBL			C3		R	F2	
09-6			F								
10-1	14	crude oil import value by destination	Y	M.US$	R4		C5		R&C	F4	
10-2			F								
10-3	15	crude oil import value	Y	US$			C6		R	F5	
10-4			F				C7				
10-5			Y	M.US$			C3		R	F2	
10-6			F								
11-1	16	products export by destination	Y	M.BBL & $10^{**}3$KT	R5	PRODUCTS	C5		C	F4	
11-2			F								
11-3	17	products export	Y	BBL & KT			C6			F5	
11-4			F				C7				
11-5			Y	M.BBL & $10^{**}3$KT			C3			F2	
11-6			F								
12-1	18	products export value by destination	Y	M.US$	R5		C5		C	F4	
12-2			F								
12-3	19	products export value	Y	US$			C6			F5	
12-4			F				C7				
12-5			Y	M.US$			C3			F2	
12-6			F								
13-1	20	products import by origin	Y	M.BBL & $10^{**}3$KT	R5		C5		C	F4	
13-2			F								
13-3	21	products import	Y	BBL & KT			C6			F5	
13-4			F				C7				
13-5			Y	M.BBL & $10^{**}3$KT			C3			F2	
13-6			F								
14-1	22	products import value by origin	Y	M.US$	R6		C5		C	F4	
14-2			F								
14-3	23	products import value	Y	US$			C6			F5	
14-4			F				C7				
14-5			Y	M.US$			C3			F2	
14-6			F								

Report no.	no.	Title	Y:cy F:fy M:month	Printing unit	no. ROW		no. COL		Matrix reduction	Format	Comments
15-1	24	BBM consumption by sector	Y	M.BBL	R7	cosumption	C8	BBM		F3	
15-2			F								
15-3			M	BBL							
15-4	25	(name of BBM) consumption by sector	Y	BBL			C1			F1	
15-5			F				C2				
15-6	26	BBM consumption by sector	Y	M.BBL			C3			F2	
15-7			F								
15-8	27	BBM consumption	Y	M.BBL	R8		C3			F2	
15-9			F								
16-1	28	products supply by marketing region	Y	M.BBL	R8		C9	marketing region		F3	
16-2			F								
16-3			M	BBL							

Report no.	no.	Title	Y:cy F:fy M:month	Printing unit	no. ROW		no. COL		Matrix reduction	Format
17-1	29	gas production by company	Y	MCF	R1	company	C1	JAN to DEC	R	F1
17-2			F				C2	APR to MAR		
17-3	30	gas production by field	Y	MCF	R3	gas field	C1	JAN to DEC	R	F1
17-4			F				C2	APR to MAR		
18-1	31	gas plant through-put	Y	10**3MCF	R9	gas field	C10	gas plant	R&C	F4
18-2			F							
18-3			M	MCF						
18-4			Y	10**3MCF			C3	five years	R	F2
18-5			F							
19-1	32	gas summary report	Y	10**3MCF	R1	company	C11	production own use transformat. consumption loss&flare	R	F3
19-2			F							
19-3			M							

(Reference) A sample list of edition and printing

```
INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  (RESE)  Refer to 3-1-5

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  RET                      0        0

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  02
 2  12        P
 3  14        1979
 4  99        02*12*14
*** END OF STEPX COUNTER X**

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  SV   FCE

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  01
 2  12        I
 3  14        1979
 4  99        01*12*14
*** END OF STEPX COUNTER X**

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  SV   E01

INDONESIAN ENERGY DATA BASE SYSTEM
                    --- INPUT DATA LIST ---
NO        1        2        3        4        5        6        7        8
----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 1  EO
```

```
I N D O N E S I A N   E N E R G Y   D A T A   B A S E   S Y S T E M

                          --- INPUT DATA LIST ---

   NO          1         2         3         4         5         6         7         8
        +---+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+

    1   OUT                       0         0

I N D O N E S I A N   E N E R G Y   D A T A   B A S E   S Y S T E M

                          --- INPUT DATA LIST ---

   NO          1         2         3         4         5         6         7         8
        +---+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+

    1   OF 1 FOI
NO CODE IN ROW   CODE=RFG      NO=  606
NO CODE IN ROW   CODE=RFG      NO=  627
NO CODE IN COL   CODE=         NO=  642
NO CODE IN COL   CODE=         NO=  643
NO CODE IN COL   CODE=         NO=  644
NO CODE IN COL   CODE=         NO=  645
NO CODE IN COL   CODE=         NO=  646
NO CODE IN COL   CODE=         NO=  647
NO CODE IN COL   CODE=         NO=  648
NO CODE IN COL   CODE=         NO=  649
NO CODE IN COL   CODE=         NO=  650
NO CODE IN COL   CODE=         NO=  651
NO CODE IN ROW   CODE=RFG      NO=  652
NO CODE IN COL   CODE=         NO=  653
NO CODE IN ROW   CODE=RFG      NO=  674
NO CODE IN COL   CODE=         NO=  928
NO CODE IN COL   CODE=         NO=  929
NO CODE IN COL   CODE=         NO=  654
```

INDONESIAN ENERGY DATA BASE SYSTEM (1)

REPORT NO: 6-1
RUN DATE :

REFINERY PRODUCTS CY1979 IN M.BBL.10E3 MT

INDONESIAN REFINERY

P. PRODUCTS	P.BRANDAN	DUMAI	SEI.PAKNING	SEI.SERONG	PLAJU	BALIKPAPAN	CILACAP	WONOKROMO	INDONESIA
THROUGH-PUT	157	2462	834	1546	1551	1239	2022	19	9831
AVIAT.GASOL.	0	0	0	0	0	0	0	0	0
SUPER GASOL.	0	0	0	0	0	0	0	0	0
PREMIUM GAS.	53	132	0	403	0	178	275	1	1042
JET FUEL	0	0	0	0	0	0	0	0	0
KEROSENE	36	418	175	149	0	306	432	0	1512
AUTOMOT.D.O	21	422	96	265	0	113	149	0	1066
INDUSTR.D.O	40	0	0	57	0	59	135	12	263
HEAVY FUEL O	3	30	3	67	0	128	732	4	967
BBM	115	1002	274	941	0	778	1723	17	4850
NAPHTHA	0	0	0	0	0	0	1	0	1
LOW SUL.W.R.	0	1387	478	647	0	526	0	0	3041
NON-BBM	0	1387	478	647	0	526	1	0	3042
LPG	0	0	0	0	0	0	0	0	0
LUBRICANTS	0	0	0	0	0	0	0	0	0
SOLVENTS	0	0	0	0	0	0	0	0	0
ASPHALTS	0	0	0	0	0	0	0	0	0
GREASE	0	0	0	0	0	0	0	0	0
WAXES	0	0	0	0	0	0	0	0	0
PETROL.COKE	0	0	0	0	0	0	0	0	0
POLITAM	0	0	0	0	0	0	0	0	0
OTHERS	0	0	0	0	0	0	0	0	0
MIDDLE DIST.	32	35	77	110	0	-15	31	0	270
FEEDSTOCK	0	0	0	0	0	0	0	0	0
ASPH.BASE	0	0	0	0	0	0	0	0	0
LUB.BASE	0	0	0	0	0	0	0	0	0
INTERMEDIATE	32	35	77	110	0	-15	31	0	270

INDONESIAN ENERGY DATA BASE SYSTEM (2)

REPORT NO: 6-1
RUN DATE :

REFINERY PRODUCTS CY1979 IN M.BBL.10E3 MT

C.P. DEAL

P. PRODUCTS	AIR CHAAAN	JURONG	BUKOM	P.MERLIMAU	C.P.DEAL	TOTAL
THROUGH-PUT	445	1156	2238	0	3839	13670
AVIAT.GASOL.	0	0	0	0	0	0
SUPER GASOL.	0	0	34	0	34	34
PREMIUM GAS.	49	130	310	0	489	1531
JET FUEL	0	0	0	0	0	0
KEROSENE	0	486	414	0	900	2412
AUTOMOT.D.O	192	113	536	0	841	1907
INDUSTR.D.O	0	0	0	0	0	263
HEAVY FUEL O	0	290	0	0	290	1257
BBM	241	1019	1294	0	2554	7404
NAPHTHA	33	15	51	0	99	100
LOW SUL.W.R.	154	0	792	0	946	3987
NON-BBM	187	15	843	0	1045	4087
LPG	0	0	0	0	0	0
LUBRICANTS	0	0	0	0	0	0
SOLVENTS	0	0	0	0	0	0
ASPHALTS	0	0	0	0	0	0
GREASE	0	0	0	0	0	0
WAXES	0	0	0	0	0	0
PETROL.COKE	0	0	0	0	0	0
POLITAM	0	0	0	0	0	0
OTHERS	0	0	0	0	0	0
MIDDLE DIST.	0	0	0	0	0	270
FEEDSTOCK	0	0	0	0	0	0
ASPH.BASE	0	0	0	0	0	0
LUB BASE	0	0	0	0	0	0
INTERMEDIATE	0	0	0	0	0	270

(Reference) Creation of yearly-based data

YEARLY DATA GENERATION

I. Crude oil production

1) Report no.02-3 (Calendar Year)

(1978)

	JAN.....NOV	DEC	TOTAL
Crude oil field			
TOTAL			

```
Y1978   03BBL
P OCR ..... 001
P OCR ..... 002
P OCR ..... 003
P OCR ..... 004
.
.
.
P OCR ..... 999
END
```

Crude oil field

2) Report no.02-4 (Fiscal Year)

Data frequency : P instead of Y

II. Crude oil supply

1) Report no.04-1 (Calendar Year)

	Refinery	TOTAL
Type of crude oil	(1)	(3)
TOTAL	(2)	(4)

```
Y1978   03BBL
S OCR ..... 01   01
S OCR ..... 01   02    (1)
.
.
S OCR ..... 99   01    (2)
.
.
S OCR ..... 01   99    (3)
.
.
S OCR ..... 99   99    (4)
END         Type Refinery
            of
            crude
            oil
```

2) Report no.04-2 (Fiscal Year)

Data frequency : P instead of Y

III. Refinery through-put

Same as 'Crude oil supply', but category is T instead of S.

1) Report no.05-1 (Calendar Year)

2) Report no.05-2 (Fiscal Year)

IV. Refinery products

1) Report no.06-1 (Calendar Year)

	Refinery	TOTAL
Crude oil through-put		
Petroleum products	(1)	(2)
Others	(3)	(4)
Intermediate products	(1)	(2)

```
Y1978   03BBL
P AGS&REF ..... 01
P PGS&REF ..... 01
.
.
P LSR&REF ..... 08    (1)
.
.
P AGS&REF ..... 99
P PGS&REF ..... 99    (2)
.              Refinery
END
'Y1978   03 MT
P LUB&REF ..... 01
P SOL&REF ..... 01    (3)
.
.
P LUB&REF ..... 99
P SOL&REF ..... 99    (4)
.              Refinery
END
```

2) Report no.06-2 (Fiscal Year)

Data frequency : F instead of Y

V. EXPORT and IMPORT

V-1. Crude oil export

1) Report no 07-1 (Calendar Year)

	Destination	TOTAL
Type of crude oil	(1)	(2)
TOTAL	(3)	(4)

```
Y1978  03BBL
E OCR  ..... 01  01
E OCR  ..... 01  02    (1)
.
.
E OCR  ..... 01  99    (2)
.
.
E OCR  ..... 99  01    (3)
.
.
E OCR  ..... 99  99    (4)
END
```

Type of crude oil — Foreign country

2) Report no.07-2 (Fiscal Year)

Data frequency : F instead of Y

3) Report no.08-1 (Calendar Year)

Crude oil export value.

Category : EV instead of E
Unit : US$ instead of BBL

4) Report no.08-2 (Fiscal Year)

Data frequency : F instead of Y

V-2. Crude oil import

1) Report no.09-1 (Calendar Year)

Same as Crude oil export and

Category : I instead of E

2) Report no.09-2 (Fiscal Year)

Data frequency : F instead of Y

3) Report no.10-1 (Calendar Year)

Same as Crude oil export value and

Category : IV instead of EV

4) Report no.10-2 (Fiscal Year)

Data frequency : F instead of Y

V-3. Products export

1) Report no.11-1 (Calendar Year)

	Destination	TOTAL
Petroleum products	(1)	(2)
Others	(3)	(4)
Intermediate products	(1)	(1)

```
Y1978   03BBL
E AGS ..... 01
E PGS ..... 03    (1)
.
.
E AGS ..... 99    (2)
.
.
END
Y1978   03 MT
E LPG ..... 01
E LPG ..... 03    (3)
.
.
E LPG ..... 99
E LUB ..... 99
.
.
END
```

2) Report no.11-2 (Fiscal Year)

Data frequency : F instead of Y

3) Report no.12-1 (Calendar Year)

Products export value.

Category : EV instead of E
Unit : US$ instead of BBL or MT

4) Report no.12-2 (Fiscal Year)

Data frequency : F instead of Y

V-4. Products import

1) Report no.13-1 (Calendar Year)

Same as Products export and

Category : I instead of E

2) Report no.13-2 (Fiscal Year)

Data frequency : F instead of Y

3) Report no.14-1 (Calendar Year)

Same as Products export value and

Category : IV instead of EV

4) Report no.14-2 (Fiscal Year)

Data frequency : F instead of Y

VI. BBM consumption

1) Report no.15-1 (Calendar Year)

	BBM	TOTAL
Consumption sector	(1)	(2)
TOTAL		

```
Y1978   03BBL
C AGS&AGR .....
C AGS&FIS .....
C PGS&AGR .....   (1)
.
.
C BBM&AGR .....
C BBM&FIS .....   (2)
.
.
END
```

2) Report no.15-2 (Fiscal Year)

Data frequency : F instead of Y

3-1-4 Printing of Information Files (Refer to page 39)

Any contents of the information file can be printed out. By specifying the record number of the information file, partial printing is also possible.

In addition, the EDBS provides a function to print major tables and LINK ADDRESSs of the ELEMENT FILE in order to check the system's list structure.

3-1-5 Structure of the Data Deck

The first card of the data deck must be either "INIT" or "REST". If INIT is placed at the beginning, an initial state where all of the tables, files, and counters have been cleared is established. If REST is used, a restart is initiated based on previously stored information (Refer to Fig. 3-1-5).

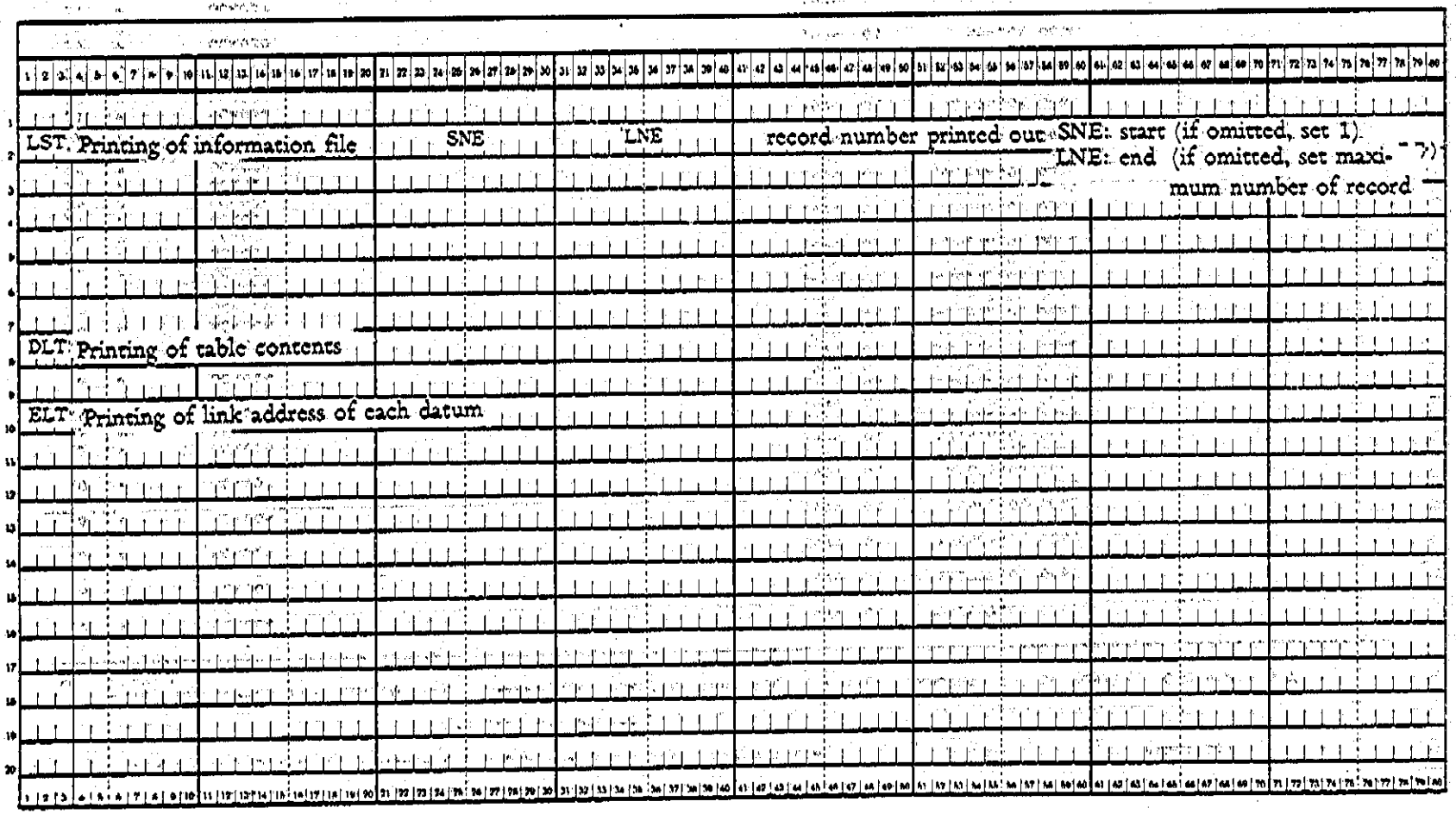
日付 / / ページ /

客先名 ＿＿＿＿＿＿＿＿

作業名 ＿＿＿＿＿＿＿＿

作成者名 ＿＿＿＿＿＿＿＿

LST.	Printing of information file	SNE	LNE	record number printed out	SNE: start (if omitted, set 1) LNE: end (if omitted, set maximum number of record)
DLT	Printing of table contents				
ELT	Printing of link address of each datum				



(Reference) A sample list of printing of information file

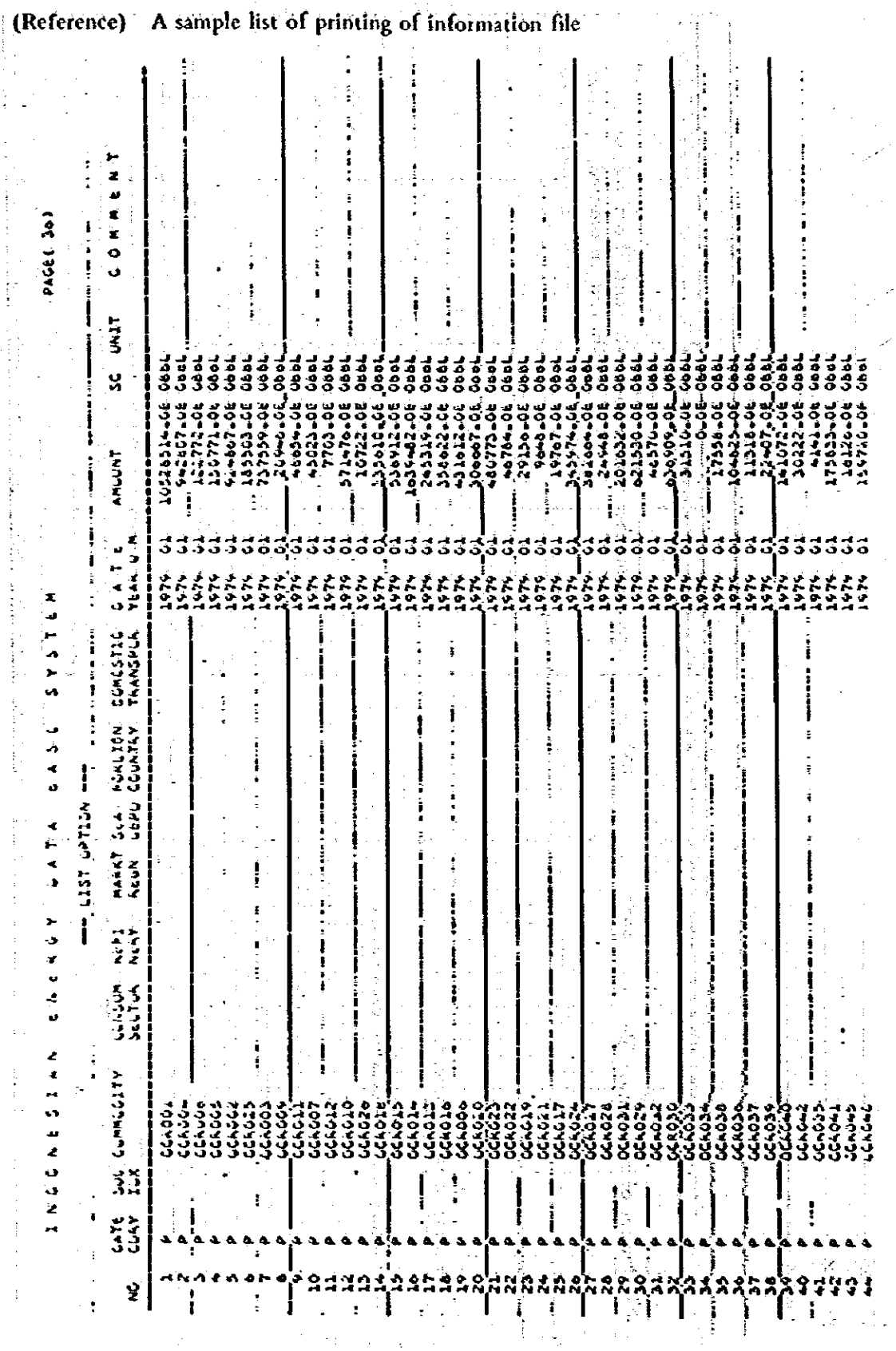
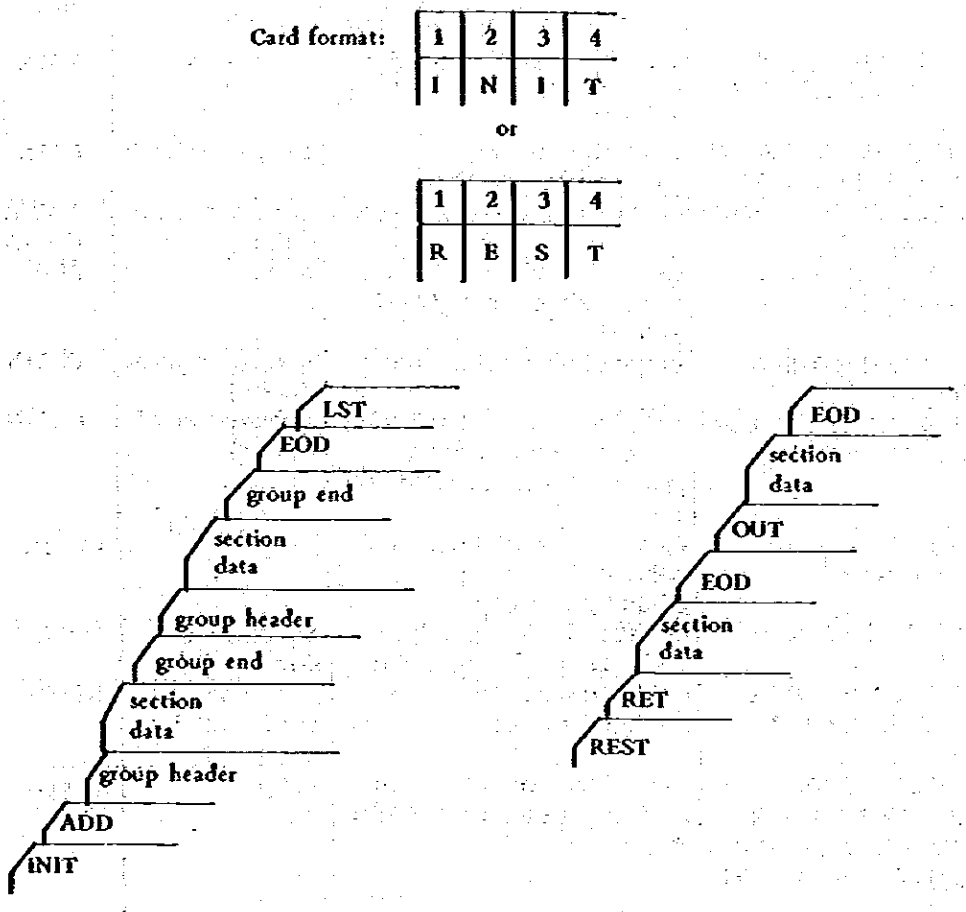


Fig. 3-1-5 An Example of the Data Deck Structure



3-1-6 Error Message

Fig. 3-1-6 Error Message

NO.	ERROR MESSAGE	EXPLANATION	TREATMENT	Printed at:
1	****** NO DATA INIT OR REST *****,CHECK DATA	the first card of data deck must be 'REST' or "INIT"	treats as 'REST'	MAIN
2	***** THIS DATA READ AT (card no)+1 IS WRONG	detected wrong directive	skips to EOD	MAIN
3	WE CAN NOT ACCEPT THIS DATA, SO SKIP	commodity code is wrong	ignores the data	ADATAI CDATAI
4	EXCEEDED UNIT TABLE LIMIT=(length)	exceeded the limit of unit table in COMMON /UNITBL/	stop	ADD
5	ILLEGAL MASTER IDENT NAME (name)	unmatched master name	stop(program error)	CHAIN
6	NEXT ADDRESS ISN'T ZERO --- PROGRAM ERROR	if element is tail,the link address which points to next must be zero	stop(program error)	CHAIN
7	EXCEEDED NAME TABLE LIMIT=(length)	exceeded the limit of name entry table in COMMON/NAMTBL/	stop	CHAIN
8	*** ILLEGAL KEY CODE RDATAI ***	detected illegal key code in retrieval data	ignores the data	RDATAI
9	**** CORRECT 99 DATA RETVAL AT STEMP ****	on 99 card, operand must be number	operand is replaced by zero	STEPM
10	*** AT SUBROUTINE STEPM COUNTER NUMBER OF OPERAND AND OPERATOR =(number)>60=DIMENSION OF ST1	exceeded the limit of working area in COMMON /STEP/	stop	STEPM
11	*** AT SUBROUTINE STEPM COUNTER NUMBER OF OP.DEC AND OPERATOR =(number) 50=DIMENSION OF ST2	exceeded the limit of working area in COMMON /STEP/	stop	STEPM
12	*** EXCEEDED NAGTBL ***	exceeded the limit of aggregation file in COMMON/AGFIL/	stop see Table. III-1	LOGOPE
13	EXCEEDED AGFID	exceeded the limit of aggregation file in COMMON/AGFIL/	stop see Table. III-1	AGFILE
14	PROGRAM MISTAKE	unmatched master name	stop(program error)	AGFILE
15	SUB-EQUATN IS ILLEGAL, CHECK AGAIN	detected illegal expression on 99 card	stop	MSTEP

NO.	ERROR MESSAGE	EXPLANATION	TREATMENT	Printed at:
16	EXCEEDED MAXKEY	exceeded the limit of working area in COMMON /MAXKEY/	stop	MSTEP
17	EXCEEDED KOID	exceeded the limit of working area in COMMON /OPETBL/	stop	MSTEP
18	EXCEEDED OUTPUT AREA	exceeded the limit of working area LETR in COMMON/OPETBL/	stop	REORDR
19	EXCEEDED INTERMEDIATE STACK	exceeded the limit of working area STACK	stop	REORDR
20	ILLEGAL UNIT CODE DETECTED : (code)	unit code on 99 card is not in conversion table	converting factor=1.0	LIST
21	ILLEGAL UNIT CODE DETECTED : (code) NO ACCOUNT	unit code of retrieved data is not in conversion table	this value is not counted	LIST
22	ILLEGAL CHARACTER DETECTED (2 digits)	both 2 digits must be number	replaced by zero	DEC1
23	EXCEEDED FPTBL LIMIT=(length)	exceeded the limit of file position table in COMMON/FPTBL/	stop see Table. III-1	SFILE
24	CHECK INPUT DATA : (header card)	it's not necessary for code,symbol VS. name table	caution message,skips to END	STRTBL
25	CHECK PRINT TYPE : (type)	type of read format must be 1 to 8	(program error)	TABLE
26	CHECK PRINT J= (table no.)	exceeded the limit of code,symbol VS. name table	stop	TABLE
27	MAXIMUM LENGTH EXCEEDED etc.	exceeded the limit of ROW or COL in COMMON /MAT/	stop	EXC
28	DETECTED WRONG CODE etc.	settled code of COMMON /ADINF/ is wrong	this code is not entered into ROW or COL	WRONG
29	NO CODE IN C.O.F. CODE=(code) NO=(element no.)	no code of crude oil field in COMMON/COF/	ignores the data	MATRIX
30	NO CODE IN ROW CODE=(code) NO=(element no.)	no code in ROW of COMMON/MAT/	ignores the data	MATRIX
31	NO CODE IN COL CODE=(code) NO=(element no.)	no code in COL of COMMON/MAT/	ignores the data	MATRIX

NO.	ERROR MESSAGE	EXPLANATION	TREATMENT	Printed at:
32	NO UNIT-CODE IN CONVERSION TABLE CODE=(code)	printing unit or data unit is not in unit conversion table	converting factor=1.0	MATRIX
33	NO INPUT FILE IN INTERMEDIATE FILE FILE=(file ident)	file name on output data is not in file position table of COMMON /FPTBL/	caution message	MATRIX
34	FOR ROW REDUCTION, DATA 999 CAN NOT FOUND	could not find a toal column	stop(program error)	REDUCE
35	DETECTED WRONG LETTER IN DEC4 EXPR=(4 digits)	all of 4 digits must be number	replaced by zero	DEC4

3-2 Future Improvement of Energy Supply-Demand Data Bank

3-2-1 Preparation of Input Data

(1) After proceeded with the steps of task, that is implementation of input data, more than about 200,000 items have already been prepared. But it may not be said that implementation of the data is completely finished in the sense of checking the data and so forth.

Hereafter, obtaining many kinds of output tabulations and verifying the errors caused by the mol-definition and the lack of data, it would be necessary to make every effort for the data base to be most precise and reliable finally.

(2) At the present time, the kinds of data prepared are limited to the following ones, that is to say; the crude oil and the related products, the natural gas and the related products and the coal.

The data about the all kinds of commodities that would appear in the column of the Energy Balance Table except the data finally made sure that can not be collected should be prepared, so it is necessary to collect the data as soon as possible with the help of sections or organizations related and to make sure that the data base be complete.

(3) At present, the data is prepared for the period from January 1974 to June 1979 and the data after July 1979 must be prepared and inplemented continuously.

As the initialization phase, all the data for the period mentioned above was arranged at a time, but hereafter the data should be arranged and generated to the data base monthly in the routinized base.

All the data can not be necessarily obtained from Migas and Pertamina, it would be necessary to establish the procedure so as to be able to get the data related continuously and in the routinized base with the help of organizations related.

3-2-2 Energy Supply-Demand Data Bank System

The EDBS employs the concept of "list structure" to extensively process diversified and massive data related to energy in order to attain high utilization efficiency. However, the volume of input data turned out to be more than three times greater than both the Indonesian and Japanese sides had expected, totaling 200,000 cases. Thus, provisional modification of the system was performed to enable the acceptance the 200,000 cases of data. It is clear that the relationship between computer processing time and volume of data is described by an exponential increase rather than a linear one. As a result, it is difficult to attain efficient operation of the present system when handling such a volume of massive data. Moreover, the system requires an enormous capacity of disks to maintain the massive data.

Although drastic modification of the present system's basic concept is not required for efficient operation of the EDBS, the file structure, method of maintaining the original data, and other aspects must be reviewed. This may result in the necessity of implementing measures, such as the introduction of auxiliary files.

The project for this fiscal year concentrated on the technical cut-over of the basic concept of the system, and did not attend to through studies on the operation of the system. However, it seems necessary, for the efficient operation of the EDBS, to establish a back up system for the maintenance of the information file which was constructed from the original data. In other words, should problems stemming from the computer itself, or those from the EDBS, be generated during the updating of a file, some measures must be taken to assure a smooth restarting.

Data period

Regarding the data period, all data were input to the system on a monthly basis throughout this fiscal year. It is more efficient in the cases where data are dealt with to some extent on a macro basis – such as for the forecast of energy supply and demand, and energy balance table – to input data on a half-yearly or yearly basis. As mentioned earlier, a function which automatically creates yearly-based data for some types of data was included in the EDBS experimentally, but the function has not been fully established as of get. The mechanism as constructed experimentally is basically sufficient for the function, and therefore expansion of the mechanism to cover the overall data is required.

In view of effective utilization of the data bank to meet the objectives, it may be advisable to divide the data bank into multiple data banks depending on function and usage – such as a micro data base and a macro data base – rather than to unreasonably attempt to formulate a single data bank. If linkage to the energy balance tables and the energy supply-demand forecast model prepared in this fiscal year is taken into account, the data bank can be improved by transmitting information using a macro-based data bank, furthermore inputing data regarding population and economy in general together with energy-related data into the macro data base. This would also lead to expansion of the scope of utilization, and improvement of the forecast model.

Timeliness of data

The EDBS provides functions for retrieval of necessary information from the information file, edition, and printout. These functions are required for immediate response.

The present system was designed to operate on a batch basis. By considering a possible shift to an interactive system, timeliness of the information could be strengthened so as to markedly improve the effective utilization of information.

4. Energy Balance Table

4-1. Concept of Energy Balance Table

Now that no one can deny a fact that quantities of energy resources are limited, how efficiently use the limited energy is becoming a common subject to all the nations in the world.

To outline and analize energy economics of a nation, it is essentially required to grasp following factors; domestic production of energy, import and export of energy, transformation process of energy, supply process of energy to final consumption sector and correlation among different types of energy resources.

To indicate a flow of energy in the form of a statistical tabular statement, it is considered optimum to introduce a matrix mode in which various types of energy resources are put lengthwise as columns and individual fields of economic activities crosswise as rows. Fig. 4-1-1 shown below represents a matrix prepared as aforementioned.

To prepare an energy balance table, supply conditions of energy deduced from domestic energy production, energy import and export and stock change are to be drawn up first. To be indicated secondly is transformation from primary energy into processed energy (secondary energy) and energy requirements in energy industries engaged in such a transformation. The last step is to indicate types and quantities of energy used in final comsumption sector.

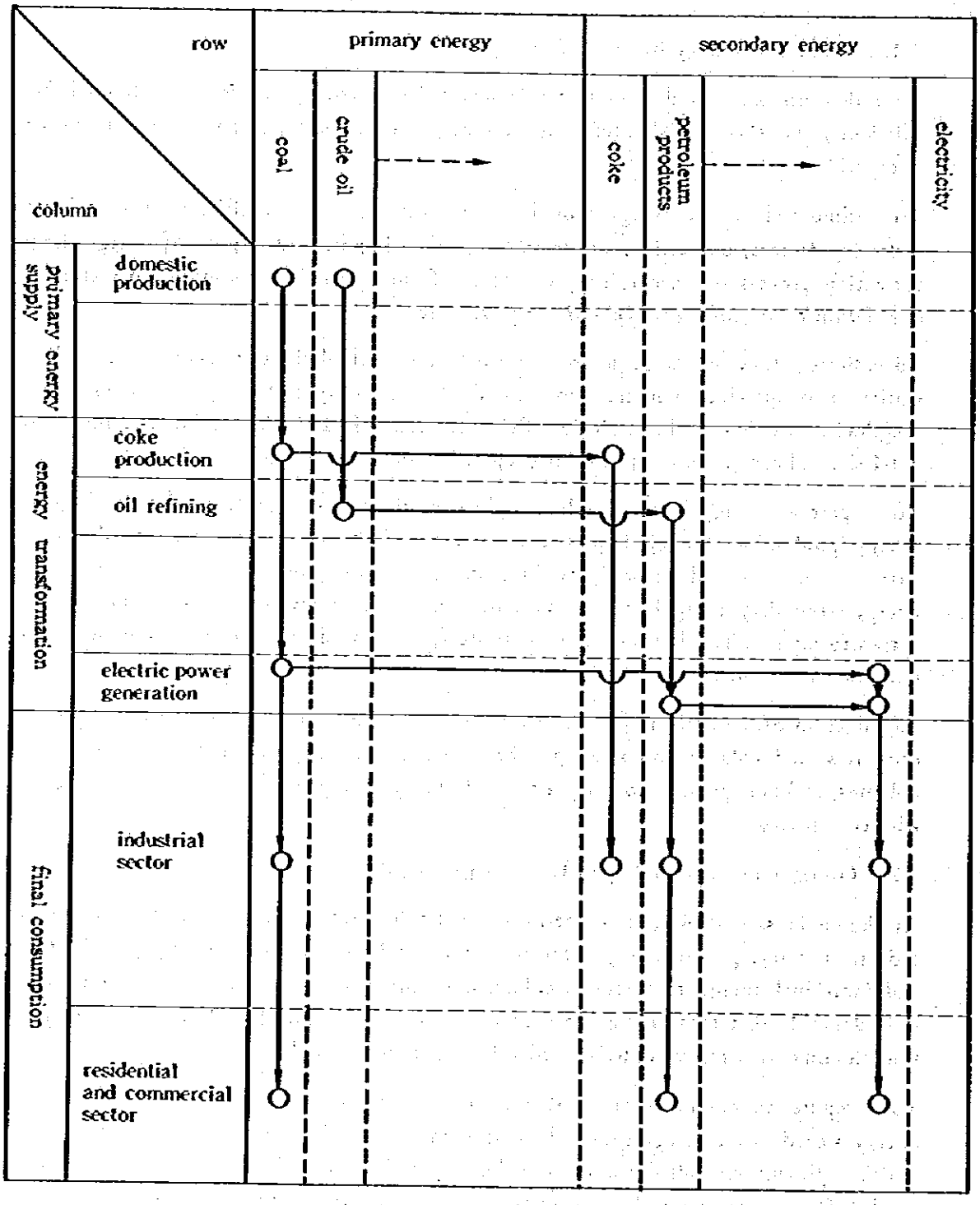
Introduction of a matrix mode, in other words, stating quantative output and input for each row and column and striking a balance between supply and demand concerning columns, makes it possible to grasp a flow of energy as a whole from a quantative aspect with consistency.

4-2. Configuration and Coding of Energy Balance Table

As shown in section 4-1, in a energy balance table, supply sources of primary energy, industries carrying out energy transformation and end consumers are put in rows and individual energy resources in columns. To make an analysis and map out policies, it is desirable that these items are subdivided as much as possible although accuracy of statistics on energy resources to be used as basic data is essential.

To compute an energy balance table with a computer by recalling basic statistics on energy stored in an energy supply-demand data bank, it is indispensable to decide codes which represent individual rows and columns of the energy balance table and establish display formats of energy basic statistics and energy balance expression. Given in Table 4-2-1 and 4-2-2 is configuration and codes of rows and columns of an energy balance table

Fig. 4-1-1 Schematization of Concept of Energy Balance Table



prepared for Indonesia. A notable feature of the energy balance table prepared for Indonesia is that fuel consumption attendant upon petroleum products and raw material consumption by the chemical industry are clearly marked off. Although naphtha is included in fuel oil total when an energy balance table is to be prepared for Japan, it is not in preparing one for Indonesia. Further, chemical industry's raw material consumption is specifically established as the 59th row in the Indonesian energy balance table.

Table 4-2-1 Configuration and Codes of Rows of Energy Balance Table

Row No.	Coding Symbol	Title
(1)	Primary Energy Supply Sector	
R01	P	Domestic production
R02	I	Import
R03	E	Export
R04	B	(International uplift)
R05	W	Stock change
R06		Primary Energy Supply Sector Total EBR06 = EBR01 + EBR02 + EBR03 + EBR05
(2)	Energy Transformation Sector (category T: input, P: output)	
R07	REF	Oil refining
R08	NGL	NGL (LNG, condensed natural gas and field LPS) production
R09	MOH EOH	Fuel alcohol production
R10	PLG	Petrochemical LPG production
R11	PUB	Public utilities' electric power generation
R12	PUP	Pump-up hydroelectric power generation
R13	AUT	Private electric power generation (Auto generation)
R14	TWG	Town gas production
R15	COK	Coke
R16	BPQ	Briquet
R17		Energy Transformation Sector Total EBR17 = EBR07 + EBR08 + EBR09 + EBR10 + EBR11 + EBR12 + EBR13 + EBR14 + EBR15 + EBR16
(3)	Energy Industry Own-use Sector (Category H: own-use, L: loss)	
R18	CRF	Crude oil field
R19	NGF	Natural gas field
R20	REF	Refinery
R21	NGL	NGL plant
R22	MOH EOH	Fuel alcohol plant

Row No.	Coding Symbol	Title
R23	PUB	Public utility
R24	TWG	Town gas plant
R25	COK	Coke plant
R26	BRQ	Briquet producer
R27	CMN	Coal mine
R28	FAL	Flare and losses
R29		Energy Industry Own-use Sector Total EBR29 = EBR18 + EBR19 + EBR20 + EBR21 + EBR22 + EBR23 + EBR24 + EBR25 + EBR26 + EBR27 + EBR28
R30		Statistical difference EBR30 = EBR31 – (EBR06 + EBR17 + EBR29)
(3)	Final Energy Consumption Sector (Category C: Final consumption, A: Auto generation)	
R31		Final consumption EBR31 = EBR33 + EBR49 + EBR52 + EBR58 + EBR59 + EBR60
R32		Final energy consumption EBR32 = EBR31 – EBR59 – EBR60
R33	TIN	Industry (Total) EBR33 = EBR34 + EBR35 + EBR36 + EBR37 + EBR38
R34	AGR FRT	Agriculture and Forestry
R35	FIS	Fishery
R36	MIN	Mining (excluding energy sector)
R37	CON	Construction
R38		Manufacturing (Total) EBR38 = EBR39 + EBR40 + EBR41 + EBR42 + EBR43 + EBR44 + EBR45 + EBR46 + EBR47 + EBR48
R39	FOD	Foods
R40	TXT	Textile
R41	RUB	Rubber
R42	PAP	Paper and pulp
R43	FCH	Chemistry (Fuel use in Chemistry)
R44	CAC	Ceramics and cements
R45	IAS	Iron and steel
R46	NFM	Non-ferrous metals
R47	MAC	Metal fabrication and machinery
R48	SWO	Small wares and others
R49	RAC	Residential and Commercial (Total) EBR49 = EBR50 + EBR51
R50	RES	Residential
R51	COM	Commercial

Row No.	Coding Symbol	Title
R52	TOR	Transportation (Total) EBR52 = EBR53 + EBR54 + EBR55 + EBR56 + EBR57
R53	AIR	Air transportation
R54	ROD	Road transportation
R55	RLW	Railways
R56	NAV	Internal navigation (including river)
R57	IUL	International uplift
R58	GAF	Others (Government (GOV), Forces (FOR), etc.)
R59	RCH	Raw material consumption in chemical industry
R60	NEN (others)	Other non-energy consumption (Asphalts, Waxes, Lubricants, Solvents and Grease)
R61	TCH	Final consumption in chemical industry TCH = FCH + RCH

Table 4-2-2 Configuration and Codes of Columns of Energy Balance Table

Column No.	Coding Symbol	Used Unit	Title
C01	TCO	T	Total of coal EBC01 = EBC02 + EBC03 + EBC04 + EBC05
C02	CCO	T	Coking coal
C03	SCO	T	Steam coal
C04	ACO	T	Anthracite
C05	LCO	T	Lignite
C06	TCR	BBL	Total of crude oil EBC06 = EBC07 + EBC08
C07	OCR	BBL	Original crude oil
C08	RCR	BBL	Reduced crude oil
C09	PET	KL	Petroleum products EBC09 = EBC10 + EBC21 + EBC22 + EBC23 + EBC24 + EBC25 + EBC26 + EBC27 + EBC28
C10	BBM	KL	Total of domestic fuel oil EBC10 = EBC11 + EBC15 + EBC16 + EBC17 + EBC20
C11	TGS	KL	Total of gasoline EBC11 = EBC12 + EBC13 + EBC14
C12	AGS	KL	Aviation gasoline
C13	SGS	KL	Super gasoline
C14	PGS	KL	Premium gasoline
C15	JET	KL	Jet fuel
C16	KER	KL	Kerosene

Column No.	Coding Symbol	Used Unit	Title
C17	TDO	KL	Total of diesel oil EBC17 = EBC18 + EBC19
C18	ADO	KL	Automotive diesel oil
C19	IDO	KL	Industrial diesel oil
C20	HFO	KL	Heavy fuel oil
C21	NAP	BBL	Naphtha
C22	LSR	BBL	Low sulfur waxy residue
C23	LUB	BBL	Lubricants
C24	SOL	BBL	Solvents
C25	ASP GRE WAX	BBL	Others (Asphalts + Grease + Waxes)
C26	PCK	BBL	Petroleum coke
C27	RFG	BBL	Refinery gas
C28	LPG	BBL	LPG
C29	TNG	MCF	natural gas
C30	NGL	BBL	NGL (Condensed natural gas)
C31	LNG	CM	LNG
C32	MOH	MT	Methanol
C33	TWG	CM	Town gas
C34	COK	MT	Coke
C35	CKG	CM	Coke oven gas
C36	BFG	CM	Blast furnace gas
C37	BRQ	T	Briquet
C38	WOD	CM	Wood
C39	CHR	T	Charcoal
C40	EOH	T	Fuel ethanol from biomass
C41	AGW	CM	Agricultural wastes
C42	TEL	KWH	Total of electricity EBC42 = EBC43 + EBC49
C43	PEL	KWH	Total of Public utility
C44	TPE	KWH	PUB by thermal generation
C45	HPE	KWH	PUB by hydro-generation
C46	PPE	KWH	PUB by pump-up hydro-generation
C47	NPE	KWH	PUB by nuclear generation
C48	GPE	KWH	PUB by geothermal (and other generation)
C49	TOE	KWH	Total of auto-generation
C50	TAE	KWH	Auto by thermal generation
C51	HAE	KWH	Auto by hydro-generation
C52	OAE	KWH	Auto by other generation
C53		Total	

4-3. Basic Statistics on Energy

It is basic statistics on individual energy resources that form the basis of an energy balance table.

When establishment of an energy supply-demand data bank, a part of this project, is completed and all the basic data are compiled in a computer file, it becomes possible to recall basic statistics by type of energy and by period, such as monthly basis, quarterly basis, annual basis and fiscal year basis. For calculating data shown in the energy balance table prepared this time, however, it was not possible to use the data bank because establishment of the bank was carried out in parallel with preparation of the energy balance table and all the basic statistics were not input in the bank. Accordingly, basic statistics by type of energy were obtained from various materials prepared by the Ministry of Mining and Energy for the 1969–1978 period on annual basis. Some data which were not available were calculated on a resonable supposition which could make supply and demand well balanced.

In the collected statistics, units peculiar to individual energy resources are used, which means a principal table which forms the base of the energy balance table contains a variety of units. Accordingly, it is not possible during this stage to carry out addition and substraction of values among different types of energy resources expressed with different units nor to calculate total energy demand of a nation. One of the purposes of an energy balance table is to establish a unit common to all the types of energy resources which enables us to carry out addition and substraction of values among different types of energy resources, calculate total energy demand and indicate quantative variation among alternative energy in the table to some extent.

There are various kinds of units, such as price, thermal quantity, horsepower and Kwh, which can be adopted as a common unit. Because the subject is energy, it is desirable to adopt a unit of thermal quantity, such as calorie and joule. Apart from such a viewpoint, it has been usual to adopt a unit of thermal quantity as a unified unit because it is most popular to use energy as sources of heat. For example, expressions such as "tons in terms of coal equivalent" and "tons in terms of oil equivalent" should be more clearly defined based on thermal quantity.

Now, combustion heat is usually adopted as a thermal quantity scale factor to convert values of different energy resources presented with different units into values to be presented in the form of thermal quantity, the unified unit. It should be noted, however, combustion heat value depending on production place and property of products even among a type of energy. Accordingly, to obtain an exact value, it is required to obtain combustion heat and quantity of products by place of production and property, which are summed up to gain total quantity of a type of energy. Such as operation requires a considerable labor and time and is virtually impractical.

The secondaly desirable measure is to prepare average value of combustion heat by type of energy resource based on a certain method which can be accepted as a standard. To practise such a measure, it is required to establish a standard method to measure combustion heat, continue to take samples of products of various origins and properties and measure combustion heat of the samples to collect data of numerical value which enable us to obtain average value of combustion heat of individual energy resources.

In this light, data which enable us to obtain average value of combustion heat are not available in Indonesia at present. Moreover, it seems that a system which permits us to conduct experiments to obtain average value of combustion heat is not yet established, either. To prepare the energy balance table this time, a thermal quantity scale factor used in "Energy Data on Developing Countries Vol II" prepared by OECD was referred to except a few cases.

While tons coal equivalent is used as a unified unit of thermal quantity, 1 TCE (tons coal equivalent) is defined as 7×10^6 Kcal. This is because of a strong request made by Indonesia, who considers to give a priority to coal in future energy policies of the nation.

4-4. Construction of Equation System of Energy Balances

It is necessary to construct equations of calculation required for preparing an energy balance table. Listed below are all the equations constructed.

It will be worthy to explain codes of items of basic statistics by type of energy. A code of an item consists of a-character code representing a category and combination of three-character codes, one representing an energy activity sector and the other type of energy (See Table 4-2-1 and 4-2-2). In other words, general form to express an item code is as follows;

A-character code	Three-character code	&	Three-character code
representing a category	representing type of energy		representing an economic activity sector

(ex. POCR; domestic production of crude oil, CAGS & AIR; consumption of aviation gasoline for air transportation).

Codes explained above are used for indicating items of individual statistics in equations.

To set codes of thermal quantity scale factors for individual energy resources, a-letter code "F" representing thermal quantity factor is combined with three-letter codes representing individual energy resources (ex. FSCO; general-purposes coal thermal quantity scale factor, FOCR; crude oil thermal quantity scale factor).

EDCATION SYSTEM OF ENERGY BALANCES

(1) Coking Coal

1. Import
EBC02052 = ECCC*FCC0

2. Stock Change
EBC02055 = (EBCC0(-1)-BCC01*FCC0

3. Total of Primary Energy Supply
EBC02036 = EBC02022-EBC02055

4. Transformation to Town Gas
EBC02014 = -TCCC*TVG*FCC0

5. Transformation to Coke
EBC02015 = -TCCC*TVC*FCC0

6. Total of Energy Transformation Sector
EBC02011 = EBC02014-EBC02015

7. Losses
EBC02028 = -LCCC*FCC0

8. Total of Energy Industry Own Use Sector
EBC02029 = EBC02028

9. Statistical Difference
EBC02030 = -EBC02036-EBC02011-EBC02029

(2) Steam Coal

10. Domestic Production
EBC03051 = PSCC*FSC0

11. Export
EBC03033 = -ESCC*FSC0

12. Stock Change
EBC03055 = EBSC0(-1)-BSC01*FSC0

13. Total of Primary Energy Supply
EBC03036 = EBC03031-EBC03033-EBC03055

14. Transformation to Electricity in Public Utility
EBC03014 = -TSCC*LPU*FSC0

15. Transformation to Electricity by Auto Generation
EBC03013 = -TSCC*LIT*FSC0

16. Transformation to Town Gas
EBC03016 = -TSCC*TVG*FSC0

17. Transformation to Briquet
EBC03015 = -TSCC*TBQ*FSC0

18. Total of Energy Transformation Sector
EBC03017 = EBC03011-EBC03013-EBC03014-EBC03015

19. Own Use in Coal Mine
EBC03027 = -ESCC*CMU*FSC0

20. Losses
EBC03028 = -LSCC*FSC0

21. Total of Energy Industry Own Use Sector
EBC03029 = EBC03027-EBC03028

22. Final Energy Consumption in Ceramics and Cements
EBC03044 = CSCC*CRC*FIC0

23. Final Energy Consumption in Small Users and Others
EBC03045 = CSCC*SOC*FSC0

24. Total of Final Energy Consumption in Manufacturing
EBC03038 = EBC03041-EBC03045

25. Final Energy Consumption in Mining
EBC03036 = CSCC*MIN*FSC0

26. Total of Final Energy Consumption in Industry Sector
EBC03033 = EBC03036-EBC03038

27. Final Energy Consumption in Railways
EBC03055 = CSCC*TRA*FSC0

28. Total of Final Energy Consumption in Transportation Sector
EBC03052 = EBC03055

29. Total of Final Energy Consumption
EBC03032 = EBC03033-EBC03052

30. Final Consumption
EBC03031 = EBC03032

31. Statistical Difference
EBC03030 = EBC03031-EBC03036-EBC03011-EBC03029

(3) Anthracite

32. Domestic Production
EBC04031 = PBCC*FBC0

33. Export
EBC04033 = -EBCC*FBC0

34. Stock Change
EBC04055 = (EBC0(-1)-BBC01*FBC0

35. Total of Primary Energy Supply
EBC04036 = EBC04031-EBC05033-EBC04055

36. Own Use in Coal Mine
EBC04027 = -BBCC*CMU*FBC0

37. Losses
EBC04028 = -LBCC*FBC0

38. Total of Energy Industry Own Use Sector
EBC04029 = EBC04027-EBC04028

39. Final Energy Consumption in Non-Ferrous Metals
EBC04045 = CBCC*NFM*FBC0

40. Total of Final Energy Consumption in Manufacturing
EBC04038 = EBC04045

41. Final Energy Consumption in Mining
EBC04036 = CBCC*MIN*FBC0

42. Total of Final Energy Consumption in Industry Sector
EBC04033 = EBC04036-EBC04038

43. Total of Final Energy Consumption
EBC04032 = EBC04033

44. Non-Energy Consumption
EBC04050 = CBCC*NEN*FBC0

45. Final Consumption
EBC04031 = EBC04032-EBC04050

46. Statistical Difference
EBC04030 = EBC04031-EBC04036-EBC04011-EBC04029

(4) Lignite

47. Domestic Production
EBC05031 = PLCC*FLC0

48. Stock Change
EBC05035 = (WLCO(-1)-WLCO)*PLCO

49. Total of Primary Energy Supply
EBC05036 = EBC05031+EBC05035

50. Losses
EBC05028 = -LLCO*PLCO

51. Total of Energy Industry Own Use Sector
EBC05029 = EBC05028

52. Final Energy Consumption in Ceramics and Cements
EBC05044 = CLCO*LCC*PLCO

53. Total of Final Energy Consumption in Manufacturing
EBC05030 = EBC05044

54. Total of Final Energy Consumption in Industry Sector
EBC05033 = EBC05030

55. Total of Final Energy Consumption
EBC05032 = EBC05033

56. Final Consumption
EBC05031 = EBC05032

57. Statistical Difference
EBC05034 = EBC05031-EBC05036-EBC05029

(5) Total of Coal

58. Domestic Production
EBC01031 = EBC03031-EBC04031-EBC05031

59. Import
EBC01032 = EBC02032

60. Export
EBC01033 = EBC03033-EBC04033

61. Stock Change
EBC01035 = EBC02035-EBC03035-EBC05035

62. Total of Primary Energy Supply
EBC01036 = EBC02036-EBC03036-EBC04036-EBC05036
+ EBC01031-EBC01032-EBC01033-EBC01035

63. Transformation to Electricity in Public Utility
EBC01011 = EBC03011

64. Transformation to Electricity by Auto Generation
EBC01013 = EBC03013

65. Transformation to Town Gas
EBC01014 = EBC02014-EBC03014

66. Transformation to Coke
EBC01015 = EBC02015

67. Transformation to Briquet
EBC01016 = EBC03016

68. Total of Energy Transformation Sector
EBC01012 = EBC02012-EBC03012
+ EBC01011-EBC01013-EBC01014-EBC01015-EBC01016

69. Own Use in Coal Mine
EBC01022 = EBC03022-EBC04022

70. Losses
EBC01028 = EBC02028-EBC03028-EBC04028-EBC05028

71. Total of Energy Industry Own Use Sector
EBC01029 = EBC02029-EBC03029-EBC04029-EBC05029
+ EBC01022-EBC01028

72. Final Energy Consumption in Ceramics and Cements
EBC01044 = EBC03044-EBC05044

73. Final Energy Consumption in Non-Ferrous Metals
EBC01045 = EBC04045

74. Final Energy Consumption in Small Users and Others
EBC01048 = EBC03048

75. Total of Final Energy Consumption in Manufacturing
EBC01030 = EBC03030-EBC04030-EBC05030
+ EBC01044-EBC01045-EBC01048

76. Final Energy Consumption in Mining
EBC01036 = EBC03036-EBC04036

77. Total of Final Energy Consumption in Industry Sector
EBC01033 = EBC03033-EBC04033-EBC05033
+ EBC01030-EBC01036

78. Final Energy Consumption in Railways
EBC01055 = EBC03055

79. Total of Final Energy Consumption in Transportation Sector
EBC01052 = EBC03052
+ EBC01055

80. Total of Final Energy Consumption
EBC01032 = EBC03032-EBC04032-EBC05032
+ EBC01033+EBC01052

81. Non-Energy Consumption
EBC01065 = EBC04065

82. Final Consumption
EBC01031 = EBC03031-EBC04031-EBC05031
+ EBC01032-EBC01033

83. Statistical Difference
EBC01034 = EBC02032-EBC03032-EBC04032-EBC05034
+ EBC01031-EBC01036-EBC01032-EBC01033

84. Domestic Production
EBC01031 = PDCB*DCB

85. Import
EBC01032 = IDCB*DCB

86. Export
EBC01033 = -EDCB*DCB

87. Stock Change
EBC01035 = (DDCB(-1)-DDCB)*DCB

88. Total of Primary Energy Supply
EBC01036 = EBC01031+EBC01032-EBC01033-EBC01035

89. Transformation to Petroleum Products in Refinery
EBC01037 = -EDCB*RTE*DCB

90. Total of Energy Transformation Sector
EBC01012 = EBC01037

91. Own Use in Crude Oil Field
EBC01018 = -EDCB*RCF*DCB

92. Own Use in Refinery
EBC01028 = -EDCB*RTE*DCB

93. Losses
EBC01028 = -LDCB*DCB

94. Total of Energy Industry Own Use Sector
EBC01029 = EBC01018-EBC01028-EBC01028

95. Statistical Difference
EBC01034 = -EBC01036-EBC01012-EBC01029

(6) Original Crude Oil

(1) Reduced Crude Oil

96. Export
EBC50852 = EB35*F835+3LB5*FLB5

97. Stock Change
EBC50835 = (FB35(-1)-WB55)*F835+(WB55(-1)-PLB5)*FLB5

98. Total of Primary Energy Supply
EBC50836 = EBC50852-EBC50835

99. Transformation to Petroleum Products in Refinery
EBC50851 = -F835EBC*F835-PLB5EBC*FLB5

100. Total of Energy Transformation Sector
EBC50817 = EBC50851

101. Losses
EBC50828 = -LB35*F835-LLB5*FLB5

102. Total of Energy Industry Own Use Sector
EBC50829 = EBC50828

103. Statistical Difference
EBC50830 = -EBC50836-EBC50817-EBC50829

(2) Total of Crude Oil

104. Domestic Production
EBC01831 = EBC01931

105. Import
EBC01832 = EBC01832-EBC02832

106. Export
EBC01833 = EBC01833

107. Stock Change
EBC01835 = EBC01835-EBC02835

108. Total of Primary Energy Supply
EBC01836 = EBC01836-EBC01836
+ EBC01831-EBC01832-EBC01833-EBC01835

109. Transformation to Petroleum Products in Refinery
EBC01851 = EBC01931-EBC01833

110. Total of Energy Transformation Sector
EBC01817 = EBC01817-EBC01817
+ EBC01851

111. Own Use in Crude Oil Field
EBC01828 = EBC01828

112. Own Use in Refinery
EBC01829 = EBC01829

113. Losses
EBC01828 = EBC01828-EBC01828

114. Total of Energy Industry Own Use Sector
EBC01829 = EBC01829-EBC01829
+ EBC01828-EBC01828-EBC01828

115. Statistical Difference
EBC01830 = EBC01836-EBC01830
+ -EBC01836-EBC01817-EBC01829

(3) Aviation Gasoline

116. Import
EBC12832 = IB35*F835

117. Export
EBC12833 = -EB35*F835

118. Bunker
EBC12834 = -BB35*F835

119. Stock Change
EBC12835 = (WB35(-1)-WB55)*F835

120. Total of Primary Energy Supply
EBC12836 = EBC12832-EBC12833-EBC12835

121. Transformation from Crude Oil to Refinery
EBC12851 = F835EBC*F835

122. Total of Energy Transformation Sector
EBC12817 = EBC12851

123. Losses
EBC12828 = -LB35*F835

124. Total of Energy Industry Own Use Sector
EBC12829 = EBC12828

125. Total of Consumption in Industry Sectors
(Intermediate Variable)
C0350718 = EB35EBC*F835EBC+C035EB30+C035EB31+C035EB32
+C035EB3C+C035EB40

126. Final Consumption in Air Transportation
EBC12853 = (C035EB39+C035EB3C)*F835

127. Final Energy Consumption in International Bunkers
EBC12857 = C035EB34*F835

128. Total of Final Energy Consumption in Transportation Sector
EBC12852 = EBC12853-EBC12857

129. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC12858 = C035EB3F*F835

130. Total of Final Energy Consumption
EBC12832 = EBC12852-EBC12858

131. Final Consumption
EBC12831 = EBC12832

132. Statistical Difference
EBC12830 = EBC12831-EBC12836-EBC12817-EBC12829

(4) Super Gasoline

133. Import
EBC13832 = BB35*F835

134. Stock Change
EBC13835 = (WB35(-1)-BB35)*F835

135. Total of Primary Energy Supply
EBC13836 = EBC13832-EBC13835

136. Transformation from Crude Oil to Refinery
EBC13851 = F835EBC*F835

137. Total of Energy Transformation Sector
EBC13817 = EBC13851

138. Losses
EBC13828 = -LB35*F835

139. Total of Energy Industry Own Use Sector
EBC13829 = EBC13828

140. Total of Consumption in Industry Sectors
(Intermediate Variable)
C035EB18 = BB35EBC*F835EBC+C035EB39+C035EB3C+C035EB40
+C035EB4C

141. Final Energy Consumption in Road Transportation
EBC13854 = (CSGS&RDB-CSGS&TIN)*FPGS

142. Total of Final Energy Consumption in Transportation Sector
EBC13852 = EBC13854

143. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC13858 = CSGS&CAF*FPGS

144. Total of Final Energy Consumption
EBC13832 = EBC13852-EBC13858

145. Final Consumption
EBC13831 = EBC13832

146. Statistical Difference
EBC13830 = EBC13831-EBC13806-EBC13817-EBC13829

(11) Premium Gasoline

147. Import
EBC14802 = EPGS*FPGS

148. Export
EBC14803 = -EPGS*FPGS

149. Stock Change
EBC14805 = (NPGS(-1)-NPGS)*FPGS

150. Total of Primary Energy Supply
EBC14806 = EBC14802-EBC14803-EBC14805

151. Transformation from Crude Oil in Refinery
EBC14817 = FPGS&REF*FPGS

(12) Total of Gasoline

163. Import
EBC11802 = EBC12802-EBC13802-EBC14802

164. Export
EBC11803 = EBC12803-EBC14803

165. Bunker
EBC11804 = EBC12804

166. Stock Change
EBC11805 = EBC12805-EBC13805-EBC14805

167. Total of Primary Energy Supply
EBC11806 = EBC12806-EBC13806-EBC14806
= EBC11802-EBC11803-EBC11805

168. Transformation from Crude Oil in Refinery
EBC11807 = EBC12807-EBC13807-EBC14807

169. Total of Energy Transformation Sector
EBC11817 = EBC12817-EBC13817-EBC14817
= EBC11807

170. Losses
EBC11828 = EBC12828-EBC13828-EBC14828

171. Total of Energy Industry Own Use Sector
EBC11829 = EBC12829-EBC13829-EBC14829
= EBC11828

172. Final Consumption in Air Transportation
EBC11853 = EBC12853

173. Final Energy Consumption in Road Transportation
EBC11854 = EBC13854-EBC14854

174. Final Energy Consumption in Internal Navigation
EBC11856 = EBC14856

152. Total of Energy Transformation Sector
EBC14817 = EBC14817

153. Losses
EBC14828 = -EPGS*FPGS

154. Total of Energy Industry Own Use Sector
EBC14829 = EBC14828

155. Total of Consumption in Industry Sectors
(Intermediate Variable)
CPGS&TIN = [illegible]

156. Final Energy Consumption in Road Transportation
EBC14854 = (CPGS&RDB-CPGS&TIN)*FPGS

157. Final Energy Consumption in Internal Navigation
EBC14856 = CPGS&NAV*FPGS

158. Total of Final Energy Consumption in Transportation Sector
EBC14852 = EBC14854-EBC14856

159. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC14858 = CPGS&CAF*FPGS

160. Total of Final Energy Consumption
EBC14832 = EBC14852-EBC14858

161. Final Consumption
EBC14831 = EBC14832

162. Statistical Difference
EBC14830 = EBC14831-EBC14806-EBC14817-EBC14829

175. Final Energy Consumption in International Uplift
EBC11857 = EBC12857

176. Total of Final Energy Consumption in Transportation Sector
EBC11852 = EBC12852-EBC13852-EBC14852
= EBC11853-EBC11854-EBC11856-EBC11857

177. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC11858 = EBC12858-EBC13858-EBC14858

178. Total of Final Energy Consumption
EBC11832 = EBC12832-EBC13832-EBC14832
= EBC11852-EBC11858

179. Final Consumption
EBC11831 = EBC12831-EBC13831-EBC14831
= EBC11832

180. Statistical Difference
EBC11830 = EBC12830-EBC13830-EBC14830
= EBC11831-EBC11806-EBC11817-EBC11829

(13) Jet Fuel

181. Import
EBC15802 = EJET*FJET

182. Export
EBC15803 = -EJET*FJET

183. Bunker
EBC15804 = -BJET*FJET

184. Stock Change
EBC15805 = (NJET(-1)-NJET)*FJET

185. Total of Primary Energy Supply
EBC15806 = EBC15802-EBC15803-EBC15805

186. Transformation from Crude Oil to Refinery
EBC15833 = BJETBEF*FJET

187. Total of Energy Transformation Sector
EBC15831 = EBC15832

188. Losses
EBC15828 = -EJET*FJET

189. Total of Energy Industry Own Use Sector
EBC15829 = EBC15828

190. Total of Consumption in Industry Sector
(Intermediate Variable)
CJETOTIN = BJETBCBF-CJETBIEF-CJETBIBC-CJETBTBT-CJETBTIN
+CJETBCOM+CJETBSMO

191. Final Energy Consumption in Air Transportation
EBC15853 = ECJETAIR-CJETBIEF*FJET

192. Final Energy Consumption in International Splits
EBC15857 = CJETBAIR*FJET

193. Total of Final Energy Consumption in Transportation Sector
EBC15852 = EBC15853-EBC15857

194. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC15858 = CJETBCOM*FJET

195. Total of Final Energy Consumption
EBC15832 = EBC15852-EBC15858

196. Final Consumption
EBC15831 = EBC15832

197. Statistical Difference
EBC15830 = EBC15831-EBC15836-EBC15837-EBC15829

(14) Kerosene

198. Import
EBC16932 = IKER*FKER

199. Stock Change
EBC16935 = (KERE[-1]-KER1)*FKER

200. Total of Primary Energy Supply
EBC16936 = EBC16932-EBC16935

201. Transformation from Crude Oil to Refinery
EBC16937 = PKEBBBEF*FKER

202. Transformation to Town Gas
EBC16814 = -TKERATG*FKER

203. Total of Energy Transformation Sector
EBC16831 = EBC16837-EBC16814

204. Losses
EBC16928 = -KERE*FKER

205. Total of Energy Industry Own Use Sector
EBC16929 = EBC16828

206. Total of Consumption in Industry Sector
(Intermediate Variable)
CKERAIN = BKERBCBF-CKERBIEF-BKERBIBC-CKERBTBT-CKERBTIN
+CKERBIBF

207. Total of Final Energy Consumption in Residential and Commercial Sector
EBC16849 = (CKERBIBC-CKERBIBF)*FKER

208. Total of Final Energy Consumption
EBC16832 = EBC16849

209. Final Consumption
EBC16831 = EBC16832

210. Statistical Difference
EBC16930 = EBC16831-EBC16836-EBC16937-EBC16829

(15) Automotive Diesel Oil

211. Import
EBC18932 = EADO*FADO

212. Export
EBC18933 = -EADO*FADO

213. Bunkr
EBC18834 = -BADO*FADO

214. Stock Change
EBC18835 = (BADO[-1]-BADO1*FADO

215. Total of Primary Energy Supply
EBC18836 = EBC18932-EBC18833-EBC18835

216. Transformation from Crude Oil to Refinery
EBC18837 = PADOBBEF*FADO

217. Transformation to Electricity in Public Utility
EBC18814 = -TADOPUB*FADO

218. Total of Consumption by Auto Generation
(Intermediate Variable)
BADOAUT = BADOBCBF-BADOBIEF-BADOBIBC-BADOBCOM-BADOBIOO
+BADOBTBT-BADOBTIN-BADOBIBF-BADOBSMO-BADOBAGR
+BADOBTAG-BADOBTPU-BADOBTIF-BADOBTAC-BADOBSMO-BADOBTAG
-BADOBTAF-BADOBTBF-BADOBTIF-BADOBPUB-BADOBTAG

219. Transformation to Electricity by Auto Generation
EBC18813 = -EADOAUT*FADO

220. Transformation to Town Gas
EBC18814 = -TADOATG*FADO

221. Total of Energy Transformation Sector
EBC18842 = EBC18837-EBC18811-EBC18813-EBC18814

222. Own Use in Crude Oil Field
EBC18818 = -BADOBCBF*FADO

223. Own Use in Refinery
EBC18829 = -BADOBIEF*FADO

224. Own Use in Public Utility
EBC18823 = -BADOBPUB*FADO

225. Own Use in Town Gas Producers
EBC18824 = -BADOBTG*FADO

226. Losses
EBC18828 = -LADO*FADO

227. Total of Energy Industry Own Use Sector
EBC18829 = EBC18818-EBC18829-EBC18823-EBC18824-EBC18828

228. Final Energy Consumption in Foods
EBC18833 = CADOBFOC*FADO

229. Final Energy Consumption in Textile
EBC18834 = CADOBTEX*FADO

230. Final Energy Consumption in Rubber
EBC18841 = CADOBRUB*FADO

231. Final Energy Consumption in Paper and Pulp
EBC18842 = CADOBPAP*FADO

232. Final Energy Consumption in Chemical Industry
EBC18843 = CADOBCHA*FADO

233. Final Energy Consumption in Ceramics and Cements
EBC18844 = CADOBCER*FADO

234. Final Energy Consumption in Iron and Steel
EIC18845 = CAIC6TA5T*F30

235. Final Energy Consumption in Non-Ferrous Metals
EIC18846 = CAIC6APA6*F30

236. Final Energy Consumption in Metal Fabrication and Machinery
EIC18847 = CAIC6A6C6*F30

237. Final Energy Consumption in Small Farms and Others
EIC18848 = CAIC65C65*F30

238. Total of Final Energy Consumption in Manufacturing
EIC18930 = EIC18838+EIC18840+EIC18841+EIC18842+EIC18843
+EIC18844+EIC18845+EIC18846+EIC18847+EIC18848

239. Final Energy Consumption in Agriculture and Forestry
EIC18834 = (CAIC6ACA+CAIC6FT7)*F30

240. Final Energy Consumption in Fishery
EIC18835 = CAIC6F15*F30

241. Final Energy Consumption in Mining
EIC18836 = CAIC6M1A*F30

242. Final Energy Consumption in Construction
EIC18837 = CAIC6C6A*F30

243. Total of Final Energy Consumption in Industry Sector
EIC18833 = EIC18834+EIC18835+EIC18836+EIC18837+EIC18838

244. Final Energy Consumption in Air Transportation
EIC18853 = CAIC611A*F30

245. Final Energy Consumption in Road Transportation
EIC18854 = CAIC61C6*F30

246. Final Energy Consumption in Railways
EIC18855 = CAIC6R1A*F30

247. Final Energy Consumption in Internal Navigation
EIC18856 = CAIC6II*F30

248. Final Energy Consumption in International Hylift
EIC18857 = CAIC61L*F30

249. Total of Final Energy Consumption in Transportation Sector
EIC18852 = EIC18853+EIC18854+EIC18855+EIC18856+EIC18857

250. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EIC18858 = CAIC6C6*F30

251. Total of Final Energy Consumption
EIC18832 = EIC18833+EIC18852+EIC18858

252. Final Consumption in Chemical Industry
EIC18841 = EIC18843

253. Final Consumption
EIC18831 = EIC18832

254. Statistical Difference
EIC18930 = EIC18831-EIC18836-EIC18837-EIC18929

(18) Industrial Diesel Oil

255. Import
EIC13852 = IIC6*F30

256. Export
EIC13853 = -EIC6*F30

257. Bunker
EIC13854 = -BIC6*F30

258. Stock Change
EIC13855 = (BIC6(-11-0130,9F130

259. Total of Primary Energy Supply
EIC13856 = EIC13852-EIC13853-EIC13855

260. Transformation from Crude Oil in Refinery
EIC13807 = EIC6AEF*F130

261. Transformation to Electricity in Public Utility
EIC13811 = -EIC6APC6*F130

262. Total of Consumption by Auto Generation
(Intermediate Variable)
EIC6A6E = EIC6A1C+EIC6AF17+EIC6A1E+EIC6A6C+EIC6AF30
+EIC6A71+EIC6A7F+EIC6A7AP+EIC6APCA+EIC6A6AC
+EIC6A1A+EIC6A1FA+EIC6A6AC+EIC6A6AC+EIC6A1E
+EIC6A1P+EIC6A6AP+EIC6A6EP+EIC6A7CP+EIC6A7W2

263. Transformation to Electricity by Auto Generation
EIC13813 = -EIC6A1E*F130

264. Transformation to Town Gas
EIC13814 = -EIC6ATGC*F1C0

265. Total of Energy Transformation Sector
EIC13817 = EIC13807+EIC13811+EIC13813+EIC13814

266. Own Use in Crude Oil Field
EIC13810 = -EIC6C1E*F130

267. Own Use in Refinery
EIC13820 = -EIC6AEF*F130

268. Own Use in Public Utility
EIC13823 = -EIC6APC6*F130

269. Own Use in Town Gas Producers
EIC13824 = -EIC6ATG*F130

270. Losses
EIC13828 = -EIC6*F130

271. Total of Energy Industry Own Use Sector
EIC13826 = EIC13810-EIC13820-EIC13823-EIC13824-EIC13828

272. Final Energy Consumption in Foods
EIC13839 = CIC6AFOC*F130

273. Final Energy Consumption in Textile
EIC13840 = CIC6ATII*F130

274. Final Energy Consumption in Paper
EIC13841 = CIC6APC6*F130

275. Final Energy Consumption in Paper and Pulp
EIC13842 = CIC6APAP*F130

276. Final Energy Consumption in Chemical Industry
EIC13843 = CIC6AFCA*F130

277. Final Energy Consumption in Ceramics and Cements
EIC13844 = CIC6AC6C*F130

278. Final Energy Consumption in Iron and Steel
EIC13845 = CIC6AIS*F130

279. Final Energy Consumption in Metal Fabrication and Machinery
EIC13847 = CIC6A6C*F130

280. Final Energy Consumption in Small Farms and Others
EIC13848 = CIC6A6C6*F1C0

281. Total of Final Energy Consumption in Manufacturing
EIC13838 = EIC13839+EIC13840+EIC13841+EIC13842+EIC13843
+EIC13844+EIC13845+EIC13847+EIC25*F

282. Final Energy Consumption in Agriculture and Forestry
EIC13834 = (CIC6ACIC+CIC6AFT1*F130

283. Final Energy Consumption in Mining
EIC13836 = CIC6A6C6*F130

284. Final Consumption in Construction
EBC1$837 = CIBC&CON*FIDO

285. Total of Final Energy Consumption in Industry Sector
EBC1$838 = EBC1$834-EBC1$836-EBC1$837-EBC1$838

286. Final Energy Consumption in Road Transportation
EBC1$854 = CIBC&ROC*FIDO

287. Final Energy Consumption in Railways
EBC1$855 = CIBC&RAW*FIDO

288. Final Energy Consumption in Internal Navigation
EBC1$856 = CIBC&RAI*FIDO

289. Final Energy Consumption in International Uplift
EBC1$857 = CIBC&IUL*FIDO

290. Total of Final Energy Consumption in Transportation Sector
EBC1$852 = EBC1$854-EBC1$855-EBC1$856-EBC1$857

291. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC1$858 = CIBC&OAF*FIDO

292. Total of Final Energy Consumption
EBC1$832 = EBC1$833-EBC1$852-EBC1$858

293. Final Consumption in Chemical Industry
EBC1$841 = EBC1$843

294. Final Consumption
EBC1$831 = EBC1$832

295. Statistical Difference
EBC1$830 = EBC1$831-EBC1$836-EBC1$837-EBC1$829

308. Own Use in Public Utility
EBC1$823 = EBC1$823-EBC1$823

309. Own Use in Town Gas Producers
EBC1$824 = EBC1$824-EBC1$824

310. Losses
EBC1$828 = EBC1$828-EBC1$828

311. Total of Energy Industry Own Use Sector
EBC1$829 = EBC1$829-EBC1$829

312. Final Energy Consumption in Foods
EBC1$839 = EBC1$839-EBC1$839

313. Final Energy Consumption in Textile
EBC1$840 = EBC1$840-EBC1$840

314. Final Energy Consumption in Rubber
EBC1$841 = EBC1$841-EBC1$841

315. Final Energy Consumption in Paper and Pulp
EBC1$842 = EBC1$842-EBC1$842

316. Final Energy Consumption in Chemical Industry
EBC1$843 = EBC1$843-EBC1$843

317. Final Energy Consumption in Ceramics and Cements
EBC1$844 = EBC1$844-EBC1$844

318. Final Energy Consumption in Iron and Steel
EBC1$845 = EBC1$845-EBC1$845

319. Final Energy Consumption in Non-Ferrous Metals
EBC1$846 = EBC1$846

320. Final Energy Consumption in Metal Fabrication and Machinery
EBC1$847 = EBC1$847-EBC1$847

(17) Total of Diesel Oil

296. Import
EBC1$832 = EBC1$832-EBC1$832

297. Export
EBC1$833 = EBC1$833-EBC1$833

298. Bunker
EBC1$834 = EBC1$834-EBC1$834

299. Stock Change
EBC1$835 = EBC1$835-EBC1$835

300. Total of Primary Energy Supply
EBC1$836 = EBC1$836-EBC1$836
= EBC1$832-EBC1$833-EBC1$835

301. Transformation from Crude Oil in Refinery
EBC1$837 = EBC1$837-EBC1$837

302. Transformation to Electricity in Public Utility
EBC1$811 = EBC1$811-EBC1$811

303. Transformation to Electricity by Auto Generation
EBC1$813 = EBC1$813-EBC1$813

304. Transformation to Town Gas
EBC1$814 = EBC1$814-EBC1$814

305. Total of Energy Transformation Sector
EBC1$817 = EBC1$817-EBC1$817
= EBC1$837-EBC1$811-EBC1$813-EBC1$814

306. Own Use in Crude Oil Field
EBC1$818 = EBC1$818-EBC1$818

307. Own Use in Refinery
EBC1$820 = EBC1$820-EBC1$820

321. Final Energy Consumption in Small Wares and Others
EBC1$848 = EBC1$848-EBC1$848

322. Total of Final Energy Consumption in Manufacturing
EBC1$838 = EBC1$838-EBC1$838
= EBC1$839-EBC1$840-EBC1$841-EBC1$842-EBC1$843
-EBC1$844-EBC1$845-EBC1$846-EBC1$847-EBC1$848

323. Final Energy Consumption in Agriculture and Forestry
EBC1$834 = EBC1$834-EBC1$834

324. Final Energy Consumption in Fishery
EBC1$835 = EBC1$835

325. Final Energy Consumption in Mining
EBC1$836 = EBC1$836-EBC1$836

326. Final Energy Consumption in Construction
EBC1$837 = EBC1$837-EBC1$837

327. Total of Final Energy Consumption in Industry Sector
EBC1$833 = EBC1$833-EBC1$833
= EBC1$834-EBC1$835-EBC1$836-EBC1$837-EBC1$838

328. Final Energy Consumption in Air Transportation
EBC1$853 = EBC1$853

329. Final Energy Consumption in Road Transportation
EBC1$854 = EBC1$854-EBC1$854

330. Final Energy Consumption in Railways
EBC1$855 = EBC1$855-EBC1$855

331. Final Energy Consumption in Internal Navigation
EBC1$856 = EBC1$856-EBC1$856

332. Final Energy Consumption in International Uplift
EBC1$857 = EBC1$857-EBC1$857

333. Total of Final Energy Consumption in Transportation Sector
EBC17852 = EBC18852-EBC19852
= EBC17853-EBC17854-EBC17855-EBC17856-EBC17857

334. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC17858 = EBC18858-EBC19858

335. Total of Final Energy Consumption
EBC17832 = EBC18832-EBC19832
= EBC17833-EBC17852-EBC17858

336. Final Consumption in Chemical Industry
EBC17861 = EBC18861-EBC19861

337. Final Consumption
EBC17831 = EBC18831-EBC19831
= EBC17832

338. Statistical Difference
EBC17830 = EBC18830-EBC19830
= EBC17831-EBC17836-EBC17847-EBC17829

(18) Heavy Fuel Oil

339. Import
EBC20832 = IHFO*FHFO

340. Export
EBC20833 = -EHFO*FHFO

341. Bunker
EBC20834 = -BHFO*FHFO

342. Stock Change
EBC20835 = (HHFO1-1)-HHFO1*FHFO

343. Total of Primary Energy Supply
EBC20836 = EBC20832-EBC20833-EBC20835

344. Transformation from Crude Oil in Refinery
EBC20837 = PHFO*REF*FHFO

345. Transformation to Electricity in Public Utility
EBC20841 = -THFO*PUB*FHFO

346. Total of Consumption by Auto Generation (Intermediate Variable)
THFO*GT = [illegible]

347. Transformation to Electricity by Auto Generation
EBC20843 = -THFO*GT*FHFO

348. Transformation to Town Gas
EBC20844 = -THFO*TWG*FHFO

349. Total of Energy Transformation Sector
EBC20847 = EBC20837-EBC20841-EBC20843-EBC20844

350. Own Use in Crude Oil Field
EBC20848 = -EHFO*CRF*FHFO

351. Own Use in Refinery
EBC20850 = -EHFO*REF*FHFO

352. Own Use in Public Utility
EBC20853 = -EHFO*PUB*FHFO

353. Losses
EBC20858 = -LHFO*FHFO

354. Total of Energy Industry Own Use Sector
EBC20859 = EBC20848-EBC20850-EBC20853-EBC20858

355. Final Energy Consumption in Foods
EBC20839 = CHFO*FOO*FHFO

356. Final Energy Consumption in Textile
EBC20849 = CHFO*TEX*FHFO

357. Final Energy Consumption in Rubber
EBC20841 = CHFO*RUB*FHFO

358. Final Energy Consumption in Paper and Pulp
EBC20842 = CHFO*PAP*FHFO

359. Final Energy Consumption in Chemical Industry
EBC20843 = CHFO*CHM*FHFO

360. Final Energy Consumption in Ceramics and Cements
EBC20844 = CHFO*CEC*FHFO

361. Final Energy Consumption in Iron and Steel
EBC20845 = CHFO*IAS*FHFO

362. Final Energy Consumption in Non-Ferrous Metals
EBC20846 = CHFO*NFM*FHFO

363. Final Energy Consumption in Metal Fabrication and Machinery
EBC20847 = CHFO*MAC*FHFO

364. Final Energy Consumption in Small Wares and Others
EBC20848 = CHFO*SWO*FHFO

365. Total of Final Energy Consumption in Manufacturing
EBC20838 = EBC20839-EBC20840-EBC20841-EBC20842-EBC20843
-EBC20844-EBC20845-EBC20846-EBC20847-EBC20848

366. Final Energy Consumption in Agriculture and Forestry
EBC20834 = (CHFO*AGR-CHFO*FRI)*FHFO

367. Final Energy Consumption in Mining
EBC20836 = CHFO*MIN*FHFO

368. Final Energy Consumption in Construction
EBC20837 = CHFO*CON*FHFO

369. Total of Final Energy Consumption in Industry Sector
EBC20833 = EBC20834-EBC20836-EBC20837-EBC20838

370. Final Energy Consumption in Road Transportation
EBC20854 = CHFO*ROA*FHFO

371. Final Energy Consumption in Railways
EBC20855 = CHFO*RAI*FHFO

372. Final Energy Consumption in Internal Navigation
EBC20856 = CHFO*RAI*FHFO

373. Final Energy Consumption in International Uplift
EBC20857 = CHFO*IUL*FHFO

374. Total of Final Energy Consumption in Transportation Sector
EBC20852 = EBC20854-EBC20855-EBC20856-EBC20857

375. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC20858 = CHFO*OAT*FHFO

376. Total of Final Energy Consumption
EBC20832 = EBC20833-EBC20852-EBC20858

377. Final Consumption in Chemical Industry
EBC20861 = EBC20843

378. Final Consumption
EBC20831 = EBC20832

379. Statistical Difference
EBC20830 = EBC20831-EBC20836-EBC20847-EBC20829

(19) Total of Fuel Oil

388. Export
EBC(9)032 = EBC(1)032-EBC(5)032-EBC(6)032-EBC(7)032-EBC(2)032

389. Import
EBC(9)033 = EBC(1)033-EBC(5)033-EBC(7)033-EBC(2)033

390. Bunker
EBC(9)034 = EBC(1)034-EBC(5)034-EBC(7)034-EBC(2)034

391. Stock Change
EBC(9)035 = EBC(1)035-EBC(5)035-EBC(6)035-EBC(7)035-EBC(2)035

392. Total of Primary Energy Supply
EBC(9)036 = EBC(1)036-EBC(5)036-EBC(6)036-EBC(7)036-EBC(2)036
+ EBC(9)032-EBC(9)033-EBC(9)035

393. Transformation from Crude Oil in Refinery
EBC(9)037 = EBC(1)037-EBC(5)037-EBC(6)037-EBC(7)037-EBC(2)037

394. Transformation to Electricity in Public Utility
EBC(9)038 = EBC(7)038-EBC(2)038

395. Transformation to Electricity by Auto Generation
EBC(9)039 = EBC(7)039-EBC(2)039

396. Transformation to Town Gas
EBC(9)040 = EBC(6)040-EBC(7)040-EBC(2)040

397. Total of Energy Transformation Sector
EBC(9)041 = EBC(1)041-EBC(5)041-EBC(6)041-EBC(7)041-EBC(2)041
+ EBC(9)037-EBC(9)038-EBC(9)039-EBC(9)040

398. Own Use in Crude Oil Field
EBC(9)042 = EBC(7)042-EBC(2)042

399. Own Use in Refinery
EBC(9)043 = EBC(7)043-EBC(2)043

400. Own Use in Public Utility
EBC(9)044 = EBC(7)044-EBC(2)044

401. Own Use in Town Gas Producers
EBC(9)045 = EBC(7)045

402. Losses
EBC(9)046 = EBC(1)046-EBC(5)046-EBC(6)046-EBC(7)046-EBC(2)046

403. Total of Energy Industry Own Use Sector
EBC(9)047 = EBC(1)047-EBC(5)047-EBC(6)047-EBC(7)047-EBC(2)047
+ EBC(9)041-EBC(9)042-EBC(9)043-EBC(9)044-EBC(9)046

404. Final Energy Consumption in Goods
EBC(9)048 = EBC(7)048-EBC(2)048

405. Final Energy Consumption in Textile
EBC(9)049 = EBC(7)049-EBC(2)049

406. Final Energy Consumption in Rubber
EBC(9)050 = EBC(7)050-EBC(2)050

407. Final Energy Consumption in Paper and Pulp
EBC(9)051 = EBC(7)051-EBC(2)051

408. Final Energy Consumption in Chemical Industry
EBC(9)052 = EBC(7)052-EBC(2)052

409. Final Energy Consumption in Ceramics and Cements
EBC(9)053 = EBC(7)053-EBC(2)053

410. Final Energy Consumption in Iron and Steel
EBC(9)054 = EBC(7)054-EBC(2)054

411. Final Energy Consumption in Non-Ferrous Metals
EBC(9)055 = EBC(7)055-EBC(2)055

412. Final Energy Consumption in Metal Fabrication and Machinery
EBC(9)056 = EBC(7)056-EBC(2)056

413. Final Energy Consumption in Small Works and Others
EBC(9)057 = EBC(7)057-EBC(2)057

414. Total of Final Energy Consumption in Manufacturing
EBC(9)058 = EBC(7)058-EBC(2)058
= EBC(9)048-EBC(9)049-EBC(9)050-EBC(9)051-EBC(9)052-EBC(9)053
+EBC(9)054-EBC(9)055-EBC(9)056-EBC(9)057-EBC(9)058

415. Final Energy Consumption in Agriculture and Forestry
EBC(9)059 = EBC(7)059-EBC(2)059

416. Final Energy Consumption in Fishery
EBC(9)060 = EBC(7)060

417. Final Energy Consumption in Mining
EBC(9)061 = EBC(7)061-EBC(2)061

418. Final Energy Consumption in Construction
EBC(9)062 = EBC(7)062-EBC(2)062

419. Total of Final Energy Consumption in Industry Sector
EBC(9)063 = EBC(7)063-EBC(2)063
= EBC(9)059-EBC(9)060-EBC(9)061-EBC(9)062

420. Total of Final Energy Consumption in Residential and Commercial Sector
EBC(9)064 = EBC(6)064

421. Final Energy Consumption in Air Transportation
EBC(9)065 = EBC(1)065-EBC(5)065-EBC(7)065

422. Final Consumption in Rail Transportation
EBC(9)066 = EBC(1)066-EBC(7)066-EBC(2)066

423. Final Energy Consumption in Railways
EBC(9)067 = EBC(7)067-EBC(2)067

424. Final Energy Consumption in Internal Navigation
EBC(9)068 = EBC(1)068-EBC(7)068-EBC(2)068

425. Final Energy Consumption in International Uplift
EBC(9)069 = EBC(1)069-EBC(5)069-EBC(7)069-EBC(2)069

426. Total of Final Energy Consumption in Transportation Sector
EBC(9)070 = EBC(1)070-EBC(5)070-EBC(7)070-EBC(2)070
+ EBC(9)065-EBC(9)066-EBC(9)067-EBC(9)068-EBC(9)069

427. Final Energy Consumption in Other Sectors
(Government, Forces, etc.)
EBC(9)071 = EBC(1)071-EBC(5)071-EBC(7)071-EBC(2)071

428. Total of Final Energy Consumption
EBC(9)072 = EBC(1)072-EBC(5)072-EBC(6)072-EBC(7)072-EBC(2)072
+ EBC(9)063-EBC(9)064-EBC(9)070-EBC(9)071

429. Final Consumption in Chemical Industry
EBC(9)073 = EBC(7)073-EBC(2)073
+ EBC(9)052

430. Final Consumption
EBC(9)074 = EBC(1)074-EBC(5)074-EBC(6)074-EBC(7)074-EBC(2)074
+ EBC(9)072

431. Statistical Difference
EBC(9)075 = EBC(1)075-EBC(5)075-EBC(6)075-EBC(7)075-EBC(2)075
+ EBC(9)036-EBC(9)037-EBC(9)038-EBC(9)039-EBC(9)040-EBC(9)042-EBC(9)043-EBC(9)044-EBC(9)045-EBC(9)046-EBC(9)047-EBC(9)074

(20) Naphtha

426. Export
EBC(2)032 = -EBC(9)032

427. Stock Change
EBC(2)035 = (EBC(-1)-EBC(0))*EBC(1)

428. Total of Primary Energy Supply
EBC(2)036 = EBC(2)032-EBC(2)035

440. Final Consumption
EBC21B34 = EBC21B32-EBC21B33

441. Statistical Difference
EBC21B30 = EBC21B31-EBC21B36-EBC21B12-EBC21B29

(21) Low Sulfur Waxy Residue

442. Export
EBC22B03 = -ELSR*FLSR

443. Stock Change
EBC22B05 = (WLSR(-1)-WLSR)*FLSR

444. Total of Primary Energy Supply
EBC22B06 = EBC22B03-EBC22B05

445. Transformation from Crude Oil in Refinery
EBC22B07 = PLSR&REF*FLSR

446. Total of Energy Transformation Sector
EBC22B12 = EBC22B07

447. Own Use in Refinery
EBC22B20 = -SLSR&REF*FLSR

448. Losses
EBC22B20 = -LLSR*FLSR

449. Total of Energy Industry Own Use Sector
EBC22B29 = EBC22B20-EBC22B28

450. Statistical Difference
EBC22B30 = EBC22B31-EBC22B36-EBC22B12-EBC22B29

(23) Solvents

452. Import
EBC24B02 = ISOL*FSOL

453. Export
EBC24B03 = -ESOL*FSOL

454. Stock Change
EBC24B05 = (WSOL(-1)-WSOL)*FSOL

455. Total of Primary Energy Supply
EBC24B06 = EBC24B02-EBC24B03-EBC24B05

456. Transformation from Crude Oil in Refinery
EBC24B07 = PSOL&REF*FSOL

457. Total of Energy Transformation Sector
EBC24B12 = EBC24B07

458. Own Use in Refinery
EBC24B20 = -SSOL&REF*FSOL

459. Losses
EBC24B28 = -LSOL*FSOL

470. Total of Energy Industry Own Use Sector
EBC24B29 = EBC24B20-EBC24B28

471. Non-Energy Consumption
EBC24B60 = CSOL&REF*FSOL

472. Final Consumption
EBC24B31 = EBC24B60

473. Statistical Difference
EBC24B30 = EBC24B31-EBC24B36-EBC24B12-EBC24B29

427. Transformation from Crude Oil in Refinery
EBC21B07 = PNAP&REF*FNAP

428. Transformation in Methanol
EBC21B09 = -TNAP&EMA*FNAP

429. Total of Energy Transformation Sector
EBC21B12 = EBC21B07-EBC21B09

430. Own Use in Refinery
EBC21B20 = -SNAP&REF*FNAP

431. Own Use in Methanol Plant
EBC21B22 = -SNAP&EMA*FNAP

432. Losses
EBC21B28 = -LNAP*FNAP

433. Total of Energy Industry Own Use Sector
EBC21B29 = EBC21B20-EBC21B22-EBC21B28

434. Final Energy Consumption in Chemical Industry
EBC21B43 = CNAP&CHE*FNAP

435. Total of Final Energy Consumption in Manufacturing
EBC21B38 = EBC21B43

436. Total of Final Energy Consumption in Industry Sector
EBC21B33 = EBC21B38

437. Final Energy Consumption
EBC21B32 = EBC21B33

438. Raw Material Consumption in Chemical Industry
EBC21B59 = CNAP&CHE*FNAP

439. Final Consumption in Chemical Industry
EBC21B61 = EBC21B43-EBC21B59

(22) Lubricants

451. Import
EBC23B02 = ILUB*FLUB

452. Stock Change
EBC23B05 = (WLUB(-1)-WLUB)*FLUB

453. Total of Primary Energy Supply
EBC23B06 = EBC23B02-EBC23B05

454. Transformation from Crude Oil in Refinery
EBC23B07 = PLUB&REF*FLUB

455. Total of Energy Transformation Sector
EBC23B12 = EBC23B07

456. Own Use in Refinery
EBC23B20 = -SLUB&REF*FLUB

457. Losses
EBC23B28 = -LLUB*FLUB

458. Total of Energy Industry Own Use Sector
EBC23B29 = EBC23B20-EBC23B28

459. Non-Energy Consumption
EBC23B60 = CLUB&REF*FLUB

460. Final Consumption
EBC23B31 = EBC23B60

461. Statistical Difference
EBC23B30 = EBC23B31-EBC23B36-EBC23B12-EBC23B29

(24) Other Petroleum Products
- Asphalts, Grease, Waxes -

474. Import
EBC25802 = [illegible]

475. Export
EBC25803 = [illegible]

476. Stock Change
EBC25805 = [illegible]

477. Total of Primary Energy Supply
EBC25806 = EBC25802-EBC25803-EBC25805

478. Transformation from Crude Oil in Refinery
EBC25807 = [illegible]

479. Total of Energy Transformation Sector
EBC25812 = EBC25807

480. Own Use in Refinery
EBC25820 = [illegible]

481. Losses
EBC25828 = [illegible]

482. Total of Energy Industry Own Use Sector
EBC25829 = EBC25820-EBC25828

483. Non-Energy Consumption
EBC25830 = [illegible]

484. Final Consumption
EBC25831 = EBC25830

485. Statistical Difference
EBC25830 = EBC25831-EBC25806-EBC25812-EBC25829

488. Final Consumption
EBC26831 = EBC26832-EBC26860

489. Statistical Difference
EBC26830 = EBC26831-EBC26806-EBC26812-EBC26829

(26) Refinery Gas

500. Transformation from Crude Oil in Refinery
EBC27807 = [illegible]

501. Total of Energy Transformation Sector
EBC27812 = EBC27807

502. Own Use in Refinery
EBC27820 = [illegible]

503. Losses
EBC27828 = [illegible]

504. Total of Energy Industry Own Use Sector
EBC27829 = EBC27820-EBC27828

505. Statistical Difference
EBC27830 = -EBC27812-EBC27829

(27) LPG

506. Import
EBC25802 = [illegible]

507. Export
EBC25803 = [illegible]

(25) Petroleum Coke

486. Stock Change
EBC25805 = [illegible]

487. Total of Primary Energy Supply
EBC25806 = EBC25805

488. Transformation from Crude Oil in Refinery
EBC25807 = [illegible]

489. Total of Energy Transformation Sector
EBC25812 = EBC25807

490. Own Use in Refinery
EBC25820 = [illegible]

491. Losses
EBC25828 = [illegible]

492. Total of Energy Industry Own Use Sector
EBC25829 = EBC25820-EBC25828

493. Final Energy Consumption in Non-Ferrous Metals
EBC25845 = [illegible]

494. Total of Final Energy Consumption in Manufacturing
EBC25838 = EBC25845

495. Total of Final Energy Consumption in Industry Sector
EBC25833 = EBC25838

496. Total of Final Energy Consumption
EBC25832 = EBC25833

497. Non-Energy Consumption
EBC25860 = [illegible]

508. Stock Change
EBC25805 = [illegible]

509. Total of Primary Energy Supply
EBC25806 = EBC25802-EBC25803-EBC25805

510. Transformation from Crude Oil in Refinery
EBC25807 = [illegible]

511. Transformation to DOL
EBC25808 = [illegible]

512. Total of Energy Transformation Sector
EBC25812 = EBC25807-EBC25808

513. Own Use in Refinery
EBC25820 = [illegible]

514. Losses
EBC25828 = [illegible]

515. Total of Energy Industry Own Use Sector
EBC25829 = EBC25820-EBC25828

516. Final Energy Consumption in Small Wares and Others
EBC25845 = [illegible]

517. Total of Final Energy Consumption in Manufacturing
EBC25838 = EBC25845

518. Final Energy Consumption in Fishery
EBC25835 = [illegible]

519. Total of Final Energy Consumption in Industry Sector
EBC25833 = EBC25835-EBC25838

520. Total of Final Energy Consumption in Residential and Commercial Sector
EBC25849 = [illegible]

521. Final Energy Consumption in Road Transportation
EBC28854 = CLPG&RCB*FLGP

522. Total of Final Energy Consumption in Transportation Sector
EBC28852 = EBC28854

523. Total of Final Energy Consumption
EBC28832 = EBC28833-EBC28849-EBC28852

524. Raw Material Consumption in Chemical Industry
EBC28859 = CLPG&RCB*FLPG

525. Final Consumption in Chemical Industry
EBC28861 = EBC28859

526. Final Consumption
EBC28831 = EBC28832-EBC28859

527. Statistical Difference
EBC28830 = EBC28831-EBC28836-EBC28817-EBC28829

(28) Total of Petroleum Products

528. Import
EBC05802 = EBC10802-EBC23802-EBC24802-EBC25802-EBC28802

529. Export
EBC05803 = EBC10803-EBC21803-EBC22803-EBC24803-EBC25803
-EBC28803

530. Bunker
EBC05804 = EBC10804

531. Stock Change
EBC05805 = EBC10805-EBC21805-EBC22805-EBC23805-EBC24805
-EBC25805-EBC26805-EBC28805

532. Total of Primary Energy Supply
EBC05806 = EBC10806-EBC21806-EBC22806-EBC23806-EBC24806
-EBC25806-EBC26806-EBC28806
= EBC05802-EBC05803-EBC05805

533. Transformation from Crude Oil in Refinery
EBC05807 = EBC10807-EBC21807-EBC22807-EBC23807-EBC24807
-EBC25807-EBC26807-EBC28807-EBC28807

534. Transformation to DOL
EBC05808 = EBC28808

535. Transformation to Methanol
EBC05809 = EBC28809

536. Transformation to Electricity in Public Utility
EBC05811 = EBC10811

537. Transformation to Electricity by Auto Generation
EBC05813 = EBC10813

538. Transformation to Town Gas
EBC05814 = EBC10814

539. Total of Energy Transformation Sector
EBC05817 = EBC10817-EBC21817-EBC22817-EBC23817-EBC24817
-EBC25817-EBC26817-EBC28817-EBC28817
= EBC05807-EBC05808-EBC05811-EBC05813-EBC05814

540. Own Use in Crude Oil Field
EBC05818 = EBC10818

541. Own Use in Refinery
EBC05820 = EBC10820-EBC21820-EBC22820-EBC23820-EBC24820
-EBC25820-EBC26820-EBC28820-EBC28820

542. Own Use in Methanol Plant
EBC05822 = EBC21822

543. Own Use in Public Utility
EBC05823 = EBC10823

544. Own Use in Town Gas Producers
EBC05824 = EBC10824

545. Losses
EBC05828 = EBC10828-EBC21828-EBC22828-EBC23828-EBC24828
-EBC25828-EBC26828-EBC28828-EBC28828

546. Total of Energy Industry Own Use Sector
EBC05829 = EBC10829-EBC21829-EBC22829-EBC23829-EBC24829
-EBC25829-EBC26829-EBC28829-EBC28829
= EBC05818-EBC05820-EBC05822-EBC05823-EBC05824
-EBC05828

547. Final Energy Consumption in Foods
EBC05839 = EBC10839

548. Final Energy Consumption in Textile
EBC05840 = EBC10840

549. Final Energy Consumption in Rubber
EBC05841 = EBC10841

550. Final Energy Consumption in Paper and Pulp
EBC05842 = EBC10842

551. Final Energy Consumption in Chemical Industry
EBC05843 = EBC10843-EBC21843

552. Final Energy Consumption in Ceramics and Cements
EBC05844 = EBC10844

553. Final Energy Consumption in Iron and Steel
EBC05845 = EBC10845

554. Final Energy Consumption in Non-Ferrous Metals
EBC05846 = EBC10846-EBC26846

555. Final Energy Consumption in Metal Fabrication and Machinery
EBC05847 = EBC10847

556. Final Energy Consumption in Small Wares and Others
EBC05848 = EBC10848-EBC26848

557. Total of Final Energy Consumption in Manufacturing
EBC05838 = EBC10838-EBC21838-EBC26838-EBC28838
= EBC05839-EBC05840-EBC05841-EBC05842-EBC05843
-EBC05844-EBC05845-EBC05846-EBC05847-EBC05848

558. Final Energy Consumption in Agriculture and Forestry
EBC05834 = EBC10834

559. Final Energy Consumption in Fishery
EBC05835 = EBC10835-EBC26835

560. Final Energy Consumption in Mining
EBC05836 = EBC10836

561. Final Energy Consumption in Construction
EBC05837 = EBC10837

562. Total of Final Energy Consumption in Industry Sector
EBC05833 = EBC10833-EBC21833-EBC26833-EBC28833
= EBC05834-EBC05835-EBC05836-EBC05837-EBC05838

563. Total of Final Energy Consumption in Residential and Commercial Sector
EBC05849 = EBC10849-EBC26849

564. Final Energy Consumption in Air Transportation
EBC05853 = EBC10853

565. Final Energy Consumption in Road Transportation
EBC05854 = EBC10854-EBC26854

566. Final Energy Consumption in Railways
EBC05855 = EBC10855

567. Final Energy Consumption in External Navigation
EBC05856 = EBC10856

568. Final Energy Consumption in International Uplift
EBC09857 = EBC10857

569. Total of Final Energy Consumption in Transportation Sector
EBC09852 = EBC10852-EBC20852
= EBC09853-EBC09854-EBC09855-EBC09856-EBC09857

570. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC09858 = EBC10858

571. Total of Final Energy Consumption
EBC09832 = EBC10832-EBC21832-EBC26832-EBC28832
= EBC09833-EBC09843-EBC09852-EBC09858

572. Raw Material Consumption in Chemical Industry
EBC09859 = EBC21859-EBC28859

573. Non-Energy Consumption
EBC09860 = EBC23860-EBC24860-EBC25860-EBC26860

574. Final Consumption in Chemical Industry
EBC09861 = EBC10861-EBC21861-EBC28861
= EBC09843-EBC09859

575. Final Consumption
EBC09831 = EBC10831-EBC21831-EBC23831-EBC24831-EBC25831
+EBC26831-EBC28831
= EBC09832-EBC09859-EBC09860

576. Statistical Difference
EBC09830 = EBC10830-EBC21830-EBC22830-EBC23830-EBC24830
+EBC25830-EBC26830-EBC27830-EBC28830
= EBC09831-EBC09836-EBC09817-EBC09829

(29) Natural Gas

577. Domestic Production
EBC29821 = PTNG*FTNG

578. Total of Primary Energy Supply
EBC29826 = EBC29831

579. Transformation to NGL
EBC29828 = -TTNGNGL*FTNG

580. Transformation to Methanol
EBC29829 = -TTNGNEMA*FTNG

581. Transformation to Electricity in Public Utility
EBC29811 = -TTNGNPGB*FTNG

582. Transformation to Town Gas
EBC29814 = -TTNGNTNG*FTNG

583. Total of Energy Transformation Sector
EBC29817 = EBC29828-EBC29829-EBC29811-EBC29814

584. Own Use in Natural Gas Field
EBC29819 = -STNGNNGF*FTNG

585. Own Use in Refinery
EBC29820 = -STNGNRFF*FTNG

586. Own Use in NGL Plant
EBC29821 = -STNGNNGL*FTNG

587. Own Use in Methanol Plant
EBC29822 = -STNGNEMP*FTNG

588. Own Use in Public Utility
EBC29823 = -STNGNPGB*FTNG

589. Own Use in Town Gas Producers
EBC29824 = -STNGNTNG*FTNG

590. Flare and Losses
EBC29828 = -LTNG*FTNG

591. Total of Energy Industry Own Use Sector
EBC29829 = EBC29819-EBC29820-EBC29821-EBC29822-EBC29823
+EBC29824-EBC29828

592. Final Energy Consumption in Chemical Industry
EBC29843 = CTNGNCA*FTNG

593. Final Energy Consumption in Ceramics and Cements
EBC29844 = CTNGNCAC*FTNG

594. Final Energy Consumption in Small Wares and Others
EBC29848 = CTNGNSWO*FTNG

595. Total of Final Energy Consumption in Manufacturing
EBC29838 = EBC29843-EBC29844-EBC29848

596. Total of Final Energy Consumption in Industry Sector
EBC29833 = EBC29838

597. Total of Final Energy Consumption in Residential and Commercial Sector
EBC29849 = CTNGNRAC*FTNG

598. Total of Final Energy Consumption
EBC29832 = EBC29833-EBC29849

599. Raw Material Consumption in Chemical Industry
EBC29859 = CTNGNPCA*FTNG

600. Final Consumption in Chemical Industry
EBC29861 = EBC29843-EBC29859

601. Final Consumption
EBC29831 = EBC29832-EBC29859

602. Statistical Difference
EBC29830 = EBC29831-EBC29836-EBC29817-EBC29829

(30) NGL (Condensed Natural Gas)

603. Export
EBC30833 = -ECON*FCON

604. Total of Primary Energy Supply
EBC30836 = EBC30833

605. Transformation to NGL
EBC30838 = PCONNGL*FCON

606. Transformation to Methanol
EBC30839 = -TCONNEMA*FCON

607. Total of Energy Transformation Sector
EBC30817 = EBC30838-EBC30839

608. Statistical Difference
EBC30830 = -EBC30836-EBC30817

(31) LNG

609. Export
EBC31833 = -ELNG*FLNG

610. Total of Primary Energy Supply
EBC31836 = EBC31833

611. Transformation to NGL
EBC31838 = PLNGNGL*FLNG

612. Total of Energy Transformation Sector
EBC31817 = EBC31838

613. Statistical Difference
EBC31830 = -EBC31836-EBC31817

(32) Methanol

614. Export
EBC32903 = -EMC4*FMC4

615. Total of Primary Energy Supply
EBC32906 = EBC32903

616. Transformation to Methanol
EBC32909 = FMC4EMA*FMC4

617. Total of Energy Transformation Sector
EBC32917 = EBC32909

618. Final Energy Consumption in Road Transportation
EBC32954 = CMC4RDG*FMC4

619. Total of Final Energy Consumption in Transportation Sector
EBC32952 = EBC32954

620. Total of Final Energy Consumption
EBC32932 = EBC32952

621. Raw Material Consumption in Chemical Industry
EBC32959 = CMC4RCM*FMC4

622. Final Consumption in Chemical Industry
EBC32961 = EBC32959

623. Final Consumption
EBC32931 = EBC32932-EBC32959

624. Statistical Difference
EBC32930 = EBC32931-EBC32906-EBC32917

(33) Town Gas

625. Transformation to Town Gas
EBC33814 = BTWG&TWG*FTWG

626. Total of Energy Transformation Sector
EBC33817 = EBC33814

627. Own Use in Town Gas Producers
EBC33824 = -BTWG&TWG&FTWG

628. Losses
EBC33828 = -LTWG*FTWG

629. Total of Energy Industry Own Use Sector
EBC33829 = EBC33824-EBC33828

630. Final Energy Consumption in Ceramics and Cements
EBC33844 = CTWG&CAC&FTWG

631. Total of Final Energy Consumption in Manufacturing
EBC33838 = EBC33844

632. Total of Final Energy Consumption in Industry Sector
EBC33833 = EBC33838

633. Total of Final Energy Consumption in Residential and Commercial Sector
EBC33843 = CTWG&RAC*FTWG

634. Total of Final Energy Consumption
EBC33832 = EBC33833-EBC33843

635. Final Consumption
EBC33834 = EBC33832

636. Statistical Difference
EBC33830 = EBC33831-EBC33817-EBC33829

(34) Coke

637. Export
EBC34902 = ICOK*FCOK

638. Stock Change
EBC34905 = (WCOK(-1)-WCOK)*FCOK

639. Total of Primary Energy Supply
EBC34906 = EBC34902-EBC34905

640. Transformation to Town Gas
EBC34814 = PCOK&TWG*FTWG

641. Transformation to Coke
EBC34815 = PCOK&COK*FTWG

642. Total of Energy Transformation Sector
EBC34817 = EBC34814-EBC34815

643. Final Energy Consumption in Iron and Steel
EBC34845 = CCOK&TRG*FCOK

644. Final Energy Consumption in Small Wares and Others
EBC34849 = CCOK&SWG*FCOK

645. Total of Final Energy Consumption in Manufacturing
EBC34838 = EBC34845-EBC34849

646. Total of Final Energy Consumption in Industry Sector
EBC34833 = EBC34838

647. Total of Final Energy Consumption
EBC34832 = EBC34833

648. Final Consumption
EBC34831 = EBC34832

649. Statistical Difference
EBC34930 = EBC34931-EBC34906-EBC34917

(35) Coke Oven Gas

650. Transformation to Town Gas
EBC35814 = -TCOG&TWG*FCOG

651. Transformation to Coke
EBC35815 = PCOG&COK*FCOG

652. Total of Energy Transformation Sector
EBC35817 = EBC35814-EBC35815

653. Own Use in Coke Plant
EBC35825 = -SCOG&COK*FCOG

654. Total of Energy Industry Own Use Sector
EBC35829 = EBC35825

655. Statistical Difference
EBC35830 = -EBC35817-EBC35829

(36) Briquet

656. Stock Change
EBC31905 = (WBRQ(-1)-WBRQ)*FBRQ

657. Total of Primary Energy Supply
EBC31906 = EBC31905

658. Transformation to Briquet
EBC31916 = PBRQ&BRQ*FBRQ

659. Total of Energy Transformation Sector
EBC37817 = EBC37816

660. Final Energy Consumption in Ceramics and Cements
EBC37844 = CBRGBCBC*FBR0

661. Total of Final Energy Consumption in Manufacturing
EBC37838 = EBC37844

662. Total of Final Energy Consumption in Industry Sector
EBC37833 = EBC37838

663. Total of Final Energy Consumption in Residential and Commercial Sector
EBC37849 = CBRGBRAC*FBR0

664. Total of Final Energy Consumption
EBC37832 = EBC37833-EBC37849

665. Final Consumption
EBC37831 = EBC37832

666. Statistical Difference
EBC37830 = EBC37831-EBC37806-EBC37812

(37) Wood

667. Domestic Production
EBC38831 = PWOD*FWOD

668. Stock Change
EBC38825 = (WWOD(-1)-WWOD)*FWOD

669. Total of Primary Energy Supply
EBC38806 = EBC38831-EBC38825

670. Final Energy Consumption in Ceramics and Cements
EBC38844 = CWOD6CBC*FWOD

671. Total of Final Energy Consumption in Manufacturing
EBC38838 = EBC38844

672. Final Energy Consumption in Agriculture and Forestry
EBC38834 = (CWOD6AGR-CWOD6FRT)*FWOD

673. Total of Final Energy Consumption in Industry Sector
EBC38833 = EBC38834-EBC38838

674. Total of Final Energy Consumption in Residential and Commercial Sector
EBC38849 = CWOD6RAC*FWOD

675. Final Energy Consumption in Railways
EBC38855 = CWOD6RLW*FWOD

676. Total of Final Energy Consumption in Transportation Sector
EBC38852 = EBC38855

677. Total of Final Energy Consumption
EBC38832 = EBC38833-EBC38849-EBC38852

678. Final Consumption
EBC38831 = EBC38832

679. Statistical Difference
EBC38830 = EBC38831-EBC38806

(38) Charcoal

680. Domestic Production
EBC39831 = PCHR*FCHR

681. Stock Change
EBC39825 = (WCHR(-1)-WCHR)*FCHR

682. Total of Primary Energy Supply
EBC39806 = EBC39831-EBC39825

683. Total of Final Energy Consumption in Residential and Commercial Sector
EBC39849 = CCHRRAC*FCHR

684. Total of Final Energy Consumption
EBC39832 = EBC39849

685. Final Consumption
EBC39834 = EBC39832

686. Statistical Difference
EBC39830 = EBC39831-EBC39806

(39) Fuel Ethanol (from Biomass)

687. Domestic Production
EBC40831 = PEFA*FEFA

688. Export
EBC40833 = -EEFA*FEFA

689. Stock Change
EBC40825 = (WEFA(-1)-WEFA)*FEFA

690. Total of Primary Energy Supply
EBC40806 = EBC40831-EBC40833-EBC40825

691. Final Energy Consumption in Road Transportation
EBC40854 = CEFA1RCA*FEFA

692. Total of Final Energy Consumption in Transportation Sector
EBC40852 = EBC40854

693. Total of Final Energy Consumption
EBC40832 = EBC40852

694. Raw Material Consumption in Chemical Industry
EBC40859 = CEFA1RCA*FEFA

695. Final Consumption in Chemical Industry
EBC40861 = EBC40859

696. Final Consumption
EBC40831 = EBC40832-EBC40859

697. Statistical Difference
EBC40830 = EBC40831-EBC40806

(40) Agricultural Wastes

698. Domestic Production
EBC41821 = PAGW*FAGW

699. Total of Primary Energy Supply
EBC41806 = EBC41821

700. Final Energy Consumption in Ceramics and Cements
EBC41844 = CAGW6CBC*FAGW

701. Total of Final Energy Consumption in Manufacturing
EBC41838 = EBC41844

702. Final Energy Consumption in Agriculture and Forestry
EBC41834 = (CAGW6AGR-CAGW6FRT)*FAGW

703. Total of Final Energy Consumption in Industry Sector
EBC41833 = EBC41834-EBC41838

194. Total of Final Energy Consumption in Residential and Commercial Sector
EBC41941 = C4EVEE9CB/ACW

195. Total of Final Energy Consumption
EBC41932 = EBC41933-EBC41941

196. Final Consumption
EBC41931 = EBC41932

197. Statistical Difference
EBC41930 = EBC41931-EBC41936

(41) Thermal Generation in Public Utility

198. Total of Primary Energy Supply
EBC44936 = -(1EBC41911-EBC45911-EBC23911)

199. Transformation to Electricity in Public Utility
EBC44911 = -TTFEEPC8*/FELB

200. Total of Energy Transformation Sector
EBC45911 = EBC44911

201. Losses
EBC44928 = -EBC44936-EBC44911

202. Total of Energy Industry Own Use Sector
EBC44929 = EBC44928

(42) Hydro Generation in Public Utility

203. Domestic Production
EBC45931 = PEFF*/FELE

(43) Geothermal and Other Generation in Public Utility

225. Domestic Production
EBC43931 = PGFE*/FELE

226. Total of Primary Energy Supply
EBC43936 = EBC45931

227. Transformation to Electricity in Public Utility
EBC45911 = -TGFEEP.B*/FELE

228. Total of Energy Transformation Sector
EBC45911 = EBC45911

229. Losses
EBC45928 = -EBC45936-EBC45911

230. Total of Energy Industry Own Use Sector
EBC45929 = EBC45928

(45) Total of Public Utility

231. Total of Primary Energy Supply
EBC43936 = EBC45936+EBC45936-EBC42936-EBC45936

232. Transformation to Electricity in Public Utility
EBC43911 = -(EBC44911-EBC45911-EBC47911+EBC45911)

233. Total of Energy Transformation Sector
EBC43912 = EBC43911

234. Own Use in Crude Oil Field
EBC434.8 = -EFELECE*/FELB

235. Own Use in Natural Gas Field
EBC43513 = -EFELEGC*FELB

204. Total of Primary Energy Supply
EBC45936 = EBC45931

205. Transformation to Electricity in Public Utility
EBC45911 = -TWFEP.B*/FELB

206. Total of Energy Transformation Sector
EBC45911 = EBC45911

207. Losses
EBC45928 = -EBC45936-EBC45911

208. Total of Energy Industry Own Use Sector
EBC45929 = EBC45928

(43) Nuclear Generation in Public Utility

209. Domestic Production
EBC43931 = PNFE*/FELE

229. Total of Primary Energy Supply
EBC43936 = EBC43931

221. Transformation to Electricity in Public Utility
EBC47911 = -TNFEEP.B*/FELE

222. Total of Energy Transformation Sector
EBC47912 = EBC47911

223. Losses
EBC43928 = -EBC43936-EBC43911

224. Total of Energy Industry Own Use Sector
EBC43929 = EBC43928

236. Own Use in Refinery
EBC43929 = -EFELEREB*/FELB

237. Own Use in NGL Plant
EBC43921 = -EFELEPGL*/FELB

238. Own Use in Public Utility
EBC43923 = -EFELEPGB*/FELB

239. Own Use in Town Gas Producers
EBC43924 = -EFELETGP*/FELB

240. Own use in Briquet
EBC43926 = -EFELEBRC*/FELB

241. Final Energy Consumption in Foods
EBC43939 = CFELEFOC*/FELB

242. Final Energy Consumption in Textile
EBC43943 = CFELETEC*/FELB

243. Final Energy Consumption in Paper
EBC43941 = CFELEP.B*/FELB

244. Final Energy Consumption in Paper and Pulp
EBC43942 = CFELEPAC*/FELB

245. Final Energy Consumption in Chemical Industry
EBC43943 = CFELECHC*/FELB

246. Final Energy Consumption in Ceramics and Cements
EBC43944 = CFELECAC*/FELB

247. Final Energy Consumption in Iron and Steel
EBC43945 = CFELEIRC*/FELB

248. Final Energy Consumption in Non-Ferrous Metals
EBC43946 = CFELENFC*/FELB

749. Final Energy Consumption in Metal Fabrication and Machinery
EBC43847 = CPELBMAC*FELO

750. Final Energy Consumption in Small Wares and Others
EBC43848 = CPELBSWO*FELO

751. Total of Final Energy Consumption in Manufacturing
EBC43838 = EBC43839+EBC43840+EBC43841+EBC43842+EBC43843
+EBC43844+EBC43845+EBC43846+EBC43847+EBC43848

752. Final Energy Consumption in Agriculture and Forestry
EBC43834 = (CPELBEGP+CPELBFBT)*FELO

753. Final Energy Consumption in Mining
EBC43836 = CPELBMIN*FELO

754. Final Energy Consumption in Construction
EBC43837 = CPELBCON*FELO

755. Total of Final Energy Consumption in Industry Sector
EBC43833 = CPELBTIN*FELO

756. Total of Final Energy Consumption in Residential and Commercial Sector
EBC43849 = CPELBRAC*FELO

757. Final Energy Consumption in Railways
EBC43855 = CPELBRLW*FELO

758. Total of Final Energy Consumption in Transportation Sector
EBC43852 = EBC43855

759. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC43858 = CPELBCAE*FELO

760. Total of Final Energy Consumption
EBC43832 = EBC43833+EBC43849+EBC43852+EBC43858

761. Final Consumption in Chemical Industry
EBC43861 = EBC43843

762. Final Consumption
EBC43831 = EBC43832

763. Losses
EBC43828 = EBC43831+EBC43817+EBC43818+EBC43819+EBC43820
+EBC43821+EBC43823+EBC43824+EBC43826

764. Total of Energy Industry Own Use Sector
EBC43829 = EBC43818+EBC43819+EBC43820+EBC43821+EBC43823
+EBC43824+EBC43826+EBC43828

(48) Thermal Auto Generation

765. Total of Primary Energy Supply
EBC51806 = -(EBC51813+EBC51813)

766. Transformation to Electricity by Auto Generation
EBC51813 = -EBC51806*FELO/FELI

767. Total of Energy Transformation Sector
EBC51812 = EBC51813

768. Losses
EBC51828 = -EBC51806-EBC51813

769. Total of Energy Industry Own Use Sector
EBC51829 = EBC51828

(49) Hydro Auto Generation

770. Domestic Production
EBC51806 = PAHE*FELI

771. Total of Primary Energy Supply
EBC51806 = EBC51801

772. Transformation to Electricity by Auto Generation
EBC51813 = -THAEAHYI*FELO

773. Total of Energy Transformation Sector
EBC51812 = EBC51813

774. Losses
EBC51828 = -EBC51806-EBC51813

775. Total of Energy Industry Own Use Sector
EBC51829 = EBC51828

(48) Other Auto Generation

776. Domestic Production
EBC52801 = PCAE*FELI

777. Total of Primary Energy Supply
EBC52806 = EBC52801

778. Transformation to Electricity by Auto Generation
EBC52813 = -THAEAHYI*FELO

779. Total of Energy Transformation Sector
EBC52812 = EBC52813

780. Losses
EBC52828 = -EBC52806-EBC52813

781. Total of Energy Industry Own Use Sector
EBC52829 = EBC52828

(49) Total of Auto Generation

782. Total of Primary Energy Supply
EBC43806 = EBC51806+EBC51806+EBC52806

783. Transformation to Electricity by Auto Generation
EBC43813 = -(EBC51813+EBC51813+EBC52813)

784. Total of Energy Transformation Sector
EBC43812 = EBC43813

785. Own Use in Crude Oil Field
EBC43818 = (BBDC&CRF*FADO+BIDC&CRF*FIDO+BNFC&CRF*FNFO)
*FELO/FELI

786. Own Use in Refinery
EBC43820 = (BBDC&REF*FADO+BIDC&REF*FIDO+BNFC&REF*FNFO)
*FELO/FELI

787. Own Use in Public Utility
EBC43823 = (BBDC&PUB*FADO+BIDC&PUB*FIDO+BNFC&PUB*FNFO)
*FELO/FELI

788. Own Use in Town Gas Producers
EBC43824 = (BBDC&TWG*FADO+BIDC&TWG*FIDO+BNFC&TWG*FNFO)
*FELO/FELI

789. Own Use in Mining
EBC43827 = EBC43813*FELO/FELI

790. Final Energy Consumption in Foods
EBC43839 = (BBDC&FOD*FADO+BIDC&FOD*FIDO+BNFC&FOD*FNFO)
*FELO/FELI

791. Final Energy Consumption in Textile
EBC43840 = (BBDC&TXT*FADO+BIDC&TXT*FIDO+BNFC&TXT*FNFO)
*FELO/FELI

792. Final Energy Consumption in Rubber
EBC43841 = (BBDC&RUB*FADO+BIDC&RUB*FIDO+BNFC&RUB*FNFO)
*FELO/FELI

793. Final Energy Consumption in Paper and Pulp
EBC43942 = (EBC04[A]*EBC-B[BC04[A]*EBC-EBF[A]*FWF)
*FELO/FELE

794. Final Energy Consumption in Chemical Industry
EBC43943 = (EBC04[Ch]*EBC-B[BC04[Ch]*EBC-EBF[Ch]*FWF)
*FELO/FELE

795. Final Energy Consumption in Ceramics and Cements
EBC43944 = (EBC04[Cr]*EBC-B[BC04[Cr]*EBC-EBF[Cr]*FWF)
*FELO/FELE

796. Final Energy Consumption in Iron and Steel
EBC43945 = (EBC04[I]*EBC-B[BC04[I]*EBC-EBF[I]*FWF)
*FELO/FELE

797. Final Energy Consumption in Non-Ferrous Metals
EBC43946 = (EBC04[Fr]*EBC-B[BC04[Fr]*EBC-EBF[Fr]*FWF)
*FELO/FELE

798. Final Energy Consumption in Metal Fabrication and Machinery
EBC43947 = (EBC04[M]*EBC-B[BC04[M]*EBC-EBF[M]*FWF)
*FELO/FELE

799. Final Energy Consumption in Small Units and Others
EBC43948 = (EBC04[Sc]*EBC-B[BC04[Sc]*EBC-EBF[Sc]*FWF)
*FELO/FELE

800. Total of Final Energy Consumption in Manufacturing
EBC43938 = EBC43939+EBC43940+EBC43941+EBC43942+EBC43943
+EBC43944+EBC43945+EBC43946+EBC43947+EBC43948

801. Final Energy Consumption in Agriculture and Forestry
EBC43934 = (EBC04[Ag]*EBC-B[BC04[Ag]*EBC-EBF[Ag]*FWF)
*FELO/FELE+(EBC04[F]*EBC-B[BC04[F]*EBC-EBF[F]*FWF
*FACT)*FELO/FELE

802. Final Energy Consumption in Mining
EBC43936 = (EBC04[Cm]*EBC-B[BC04[Cm]*EBC-EBF[Cm]*FWF)
*FELO/FELE

803. Final Energy Consumption in Construction
EBC43937 = (EBC04[Cn]*EBC-B[BC04[Cn]*EBC-EBF[Cn]*FWF)
*FELO/FELE-EBC51[3])

804. Total of Final Energy Consumption in Industry Sector
EBC43933 = EBC43934+EBC43936+EBC43937+EBC43938

805. Total of Final Energy Consumption in Residential and Commercial Sector
EBC43949 = (EBC04[R]*EBC-B[BC04[R]*EBC-EBF[R]*FWF)
*FELO/FELE

806. Total of Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC43958 = (EBC04[A]*EBC-B[BC04[A]*EBC-EBF[A]*FWF)
*FELO/FELE

807. Total of Final Energy Consumption
EBC43932 = EBC43933+EBC43949+EBC43958

808. Final Consumption in Chemical Industry
EBC43961 = EBC43943

809. Final Consumption
EBC43931 = EBC43932

810. Losses
EBC43926 = EBC43921-EBC43915-EBC43918-EBC43922-EBC43923
-EBC43924-EBC43927

811. Total of Energy Industry Own Use Sector
EBC43928 = EBC43918-EBC43922-EBC43923-EBC43924-EBC43927
-EBC43929

6501 Total of Electricity

812. Total of Primary Energy Supply
EBC42906 = EBC43934-EBC43926

813. Transformation to Electricity in Public Utility
EBC42811 = EBC43811

814. Transformation to Electricity by Auto Generation
EBC42813 = EBC43813

815. Total of Energy Transformation Sector
EBC42819 = EBC43817-EBC43818
+ EBC42811+EBC42813

816. Own Use in Crude Oil Field
EBC42810 = EBC43815-EBC43818

817. Own Use in Natural Gas Field
EBC42819 = EBC43819

818. Own Use in Refinery
EBC42820 = EBC43820-EBC43820

819. Own Use in NGL Plant
EBC42821 = EBC43821

820. Own Use in Public Utility
EBC42823 = EBC43823-EBC43823

821. Own Use in Town Gas Producers
EBC42824 = EBC43824-EBC43824

822. Own Use in Briquet
EBC42826 = EBC43826

823. Own Use in Piping
EBC42827 = EBC43827

824. Final Energy Consumption in Foods
EBC42833 = EBC43833-EBC43933

825. Final Energy Consumption in Textile
EBC42843 = EBC43841-EBC43843

826. Final Energy Consumption in Rubber
EBC42841 = EBC43841-EBC43843

827. Final Energy Consumption in Paper and Pulp
EBC42842 = EBC43842-EBC43842

828. Final Energy Consumption in Chemical Industry
EBC42843 = EBC43843-EBC43843

829. Final Energy Consumption in Ceramics and Cements
EBC42844 = EBC43844-EBC43844

830. Final Energy Consumption in Iron and Steel
EBC42845 = EBC43845-EBC43845

831. Final Energy Consumption in Non-Ferrous Metals
EBC42845 = EBC43845-EBC43845

832. Final Energy Consumption in Metal Fabrication and Machinery
EBC42847 = EBC43847-EBC43847

833. Final Energy Consumption in Small Units and Others
EBC42848 = EBC43848-EBC43848

834. Total of Final Energy Consumption in Manufacturing
EBC42838 = EBC43838+EBC43838
+ EBC42833-EBC42835-EBC42841-EBC42842-EBC42843
-EBC42844-EBC42845-EBC42845-EBC42847-EBC42848

835. Final Energy Consumption in Agriculture and Forestry
EBC42834 = EBC43834-EBC43834

836. Final Energy Consumption in Mining
EBC42836 = EBC43836-EBC43836

837. Final Energy Consumption in Construction
EBC42837 = EBC43837-EBC43937

838. Total of Final Energy Consumption in Industry Sector
EBC42833 = EBC43833-EBC43833
+ EBC42834-EBC42835-EBC42836-EBC42837-EBC42838

839. Total of Final Energy Consumption in Residential and Commercial Sector
EBC42840 = EBC43840-EBC43840

840. Final Energy Consumption in Railways
EBC42855 = EBC43855

841. Total of Final Energy Consumption in Transportation Sector
EBC42852 = EBC43852
+ EBC42855

842. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC42858 = EBC43858-EBC43858

843. Total of Final Energy Consumption
EBC42832 = EBC43832-EBC43832
+ EBC42833-EBC42840-EBC42852-EBC42858

844. Final Consumption in Chemical Industry
EBC42861 = EBC43861-EBC45861
+ EBC429+3

845. Final Consumption
EBC42831 = EBC43831-EBC45831
+ EBC42832

848. Losses
EBC42828 = EBC43828-EBC45828
+ EBC42831-EBC42841-EBC42842-EBC42849-EBC42828
-EBC42821-EBC42823-EBC42824-EBC42826-EBC42827

847. Total of Energy Industry Own Use Sector
EBC42829 = EBC43829-EBC45829
+ EBC42828-EBC42815-EBC42825-EBC42827-EBC42821
+EBC42824-EBC42826-EBC42827-EBC42828

850. Transformation Losses by Auto Generation
EBC53813 = EBC01813-EBC05813-EBC42813-EBC513J-EBC51828
+EBC52813-EBC52828

859. Transformation Losses in Town Gas Producers
EBC53814 = EBC01814-EBC05814-EBC25814-EBC34814-EBC34814
+EBC35814

869. Transformation Losses in Coke
EBC53815 = EBC01815-EBC34815-EBC35815

861. Transformation Losses in Briquet
EBC53816 = EBC01816-EBC37816

862. Total of Transformation Losses
EBC53812 = EBC53837-EBC53838-EBC53858-EBC53811-EBC53813
+EBC53814-EBC53815-EBC53816

863. Own Use in Crude Oil Field
EBC53818 = EBC06818-EBC05818-EBC42818

864. Own Use in Natural Gas Field
EBC53819 = EBC23819-EBC42819

865. Own Use in Refinery
EBC53820 = EBC06820-EBC05820-EBC25820-EBC42820

866. Own Use in NGL Plant
EBC53821 = EBC23821-EBC42824

867. Own Use in Methanol Plant
EBC53822 = EBC05822-EBC25822

868. Own Use in Public Utility
EBC53823 = EBC05823-EBC25823-EBC42823

869. Own Use in Town Gas Producers
EBC53824 = EBC05824-EBC25824-EBC31824-EBC42824

(51) Ground Total

849. Domestic Production
EBC53821 = EBC01821-EBC05821-EBC25821-EBC34821-EBC35821
+EBC42821-EBC51821-EBC52821-EBC47821-EBC48821
+EBC51901-EBC52821

849. Import
EBC53832 = EBC01852-EBC04832-EBC05832-EBC34832

859. Export
EBC53833 = EBC01833-EBC04833-EBC05833-EBC25833-EBC34833
+EBC32833-EBC42833

851. Bunker
EBC53834 = EBC45834

852. Stock Change
EBC53835 = EBC01835-EBC04835-EBC05835-EBC34835-EBC37835
+EBC38835-EBC39835-EBC45835

853. Total of Primary Energy Supply
EBC53836 = EBC01836-EBC04836-EBC05836-EBC25836-EBC34836
-EBC37836-EBC38836-EBC39836-EBC42836-EBC45836
+EBC47836-EBC48836-EBC51836-EBC52836-EBC53836
+EBC45836-EBC51836-EBC52836
= EBC53821-EBC53832-EBC53833-EBC53835

854. Transformation Losses in Refinery
EBC53837 = EBC06837-EBC05837

855. Transformation Losses in NGL Plant
EBC53838 = EBC05838-EBC23838-EBC34838-EBC37838

856. Transformation Losses in Methanol Plant
EBC53839 = EBC05839-EBC25839-EBC34839-EBC42839

857. Transformation Losses in Public Utility
EBC53811 = EBC01811-EBC05811-EBC25811-EBC42811-EBC56811
-EBC45828-EBC42811-EBC42822-EBC53811-EBC43828

818. Own Use in Coke Producers
EBC53825 = EBC35825

817. Own Use in Briquet Producers
EBC53826 = EBC42826

812. Own Use in Mining
EBC53827 = EBC01827-EBC42827

813. Flare and Losses
EBC53828 = EBC01828-EBC04828-EBC05828-EBC33828-EBC42828

814. Total of Energy Industry Own Use Sector
EBC53829 = EBC01829-EBC06829-EBC05829-EBC25829-EBC33829
+EBC35829-EBC42829
= EBC53818-EBC53819-EBC53820-EBC53821-EBC53822
+EBC53823-EBC53824-EBC53825-EBC53826-EBC53827
+EBC53828

875. Final Energy Consumption in Foods
EBC53838 = EBC58838-EBC42838

876. Final Energy Consumption in Textile
EBC53843 = EBC45+3-EBC42+3

817. Final Energy Consumption in Rubber
EBC53841 = EBC05841-EBC42841

878. Final Energy Consumption in Paper and Pulp
EBC53842 = EBC45842-EBC42842

829. Final Energy Consumption in Chemical Industry
EBC53843 = EBC05843-EBC25843-EBC42843

869. Final Energy Consumption in Ceramics and Cements
EBC53844 = EBC01844-EBC55844-EBC25844-EBC33844-EBC13844
+EBC38844-EBC41833-EBC42844

381. Final Energy Consumption in Iron and Steel
EBC53845 = EBC25845-EBC43845-EBC42845

802. Final Energy Consumption in Non-Ferrous Metals
EBC53048 = EBC01848-EBC05848-EBC42848

803. Final Energy Consumption in Metal Fabrication and Machinery
EBC53047 = EBC05347-EBC34847-EBC42847

804. Final Energy Consumption in Small Users and Others
EBC53048 = EBC01848-EBC05848-EBC25848-EBC42848

805. Total of Final Energy Consumption in Manufacturing
EBC53038 = EBC01838-EBC05838-EBC25838-EBC33838-EBC34838
+EBC37838-EBC38838-EBC41838-EBC42838
= EBC53042-EBC53043-EBC53044-EBC53045-EBC53046
+EBC53047-EBC53048

806. Final Energy Consumption in Agriculture and Forestry
EBC53034 = EBC05834-EBC38834-EBC41834-EBC42834

807. Final Energy Consumption in Fishery
EBC53035 = EBC05835

808. Final Energy Consumption in Mining
EBC53026 = EBC01826-EBC05826-EBC42826

809. Final Energy Consumption in Construction
EBC53027 = EBC05827-EBC42827

810. Total of Final Energy Consumption in Industry Sector
EBC53033 = EBC01833-EBC05833-EBC25833-EBC33833-EBC34833
+EBC37833-EBC38833-EBC41833-EBC42833
= EBC53034-EBC53035-EBC53036-EBC53037-EBC53038

811. Total of Final Energy Consumption in Residential and Commercial Sector
EBC53043 = EBC05843-EBC25843-EBC33843-EBC34843-EBC38843
+EBC39843-EBC41843-EBC42843

812. Final Energy Consumption in Air Transportation
EBC53051 = EBC05851

813. Final Energy Consumption in Road Transportation
EBC53054 = EBC05854-EBC32854-EBC42854

814. Final Energy Consumption in Railways
EBC53055 = EBC01855-EBC03855-EBC38855-EBC42855

815. Final Energy Consumption in Internal Navigation
EBC53056 = EBC05856

816. Final Energy Consumption in International Uplift
EBC53057 = EBC05857

817. Total of Final Energy Consumption in Transportation Sector
EBC53052 = EBC01852-EBC05852-EBC32852-EBC38852-EBC42852
+EBC42852
= EBC53053-EBC53054-EBC53055-EBC53056-EBC53057

818. Final Energy Consumption in Other Sectors (Government, Forces, etc.)
EBC53058 = EBC05858-EBC42858

819. Total of Final Energy Consumption
EBC53032 = EBC01832-EBC05832-EBC25832-EBC32832-EBC33832
+EBC34832-EBC37832-EBC38832-EBC41832
= EBC53033-EBC53043-EBC53052-EBC53058

820. Raw Material Consumption in Chemical Industry
EBC53059 = EBC05859-EBC25859-EBC32059-EBC42859

821. Non-Energy Consumption
EBC53060 = EBC01860-EBC05860

822. Final Consumption in Chemical Industry
EBC53061 = EBC05861-EBC25861-EBC32861-EBC42861-EBC42861
= EBC53043-EBC53059

823. Final Consumption
EBC53031 = EBC01831-EBC05831-EBC25831-EBC32831-EBC33831
+EBC34831-EBC37831-EBC38831-EBC39831-EBC41831
+EBC42831
= EBC53032-EBC53052-EBC53060

824. Statistical Difference
EBC53030 = EBC01830-EBC05830-EBC25830-EBC32830-EBC33830
+EBC34830-EBC37830-EBC38830-EBC39830-EBC41830-EBC42830
= EBC53031-EBC53032-EBC53061

4-5. Software for Preparation of Energy Balance Table

As mentioned in sections 4-3 and 4-4, we collected basic statistics on energy and built up equations of calculation required for preparing an energy balance table. Needless to say, it is possible to prepare an energy balance table by making manual calculation based on basic statistics on energy and equations of calculation. However, it is desirable to develop computer software so as to realize faster data processing. As indicated in the proceding chapter (Chapter 3), an energy supply-demand data bank system was developed in this project which was capable of storing micro data, aggregating them into basic statistics on energy and generating such statistics as an output. Accordingly, if the energy supply-demand data bank system could be linked with preparation of an energy balance table, it would become possible for us to grasp the flow of energy much faster.

For developing software for preparation of an energy balance table, we set up the following three points as basic policies.

The first point is to link the energy supply-demand data bank system of which development has already completed as mentioned before with our preparation of the energy balance table by some means, in other words, to receive basic statistics on energy from the data bank which can aggregate micro data and output the results and make the best use of them in our preparing the energy balance table. However, data scheduled to be stored in the energy supply-demand data bank system this year are primarily those on oil and gas and data on electric power, coal and other types of energy are not scheduled to. Accordingly, it is required to acquire a function to read out data on the latter types of energy from descriptions contained in cards. As a method to link the energy supply-demand data bank with our preparation of the tabular statement, following is considered; to set an intermediate file and, using an energy supply-demand data bank system, to output basic statistics on energy into the intermediate file first. The basic statistics on energy are then input into a program of energy balance table.

The second point is related to configuration of the energy balance table, that is, to write numbers and titles of rows and columns directly in the program without giving them as data. When configuration should be changed, we can complete such operations only when we change FORTRAN statements and numbers of data contained in the program. Changes in configuration of the table are required only when a number of items of energy should be newly added or a comprehensive change in structure of industries is needed. It is considered that processes to change the program in accordance with such new requirements are not so troublesome.

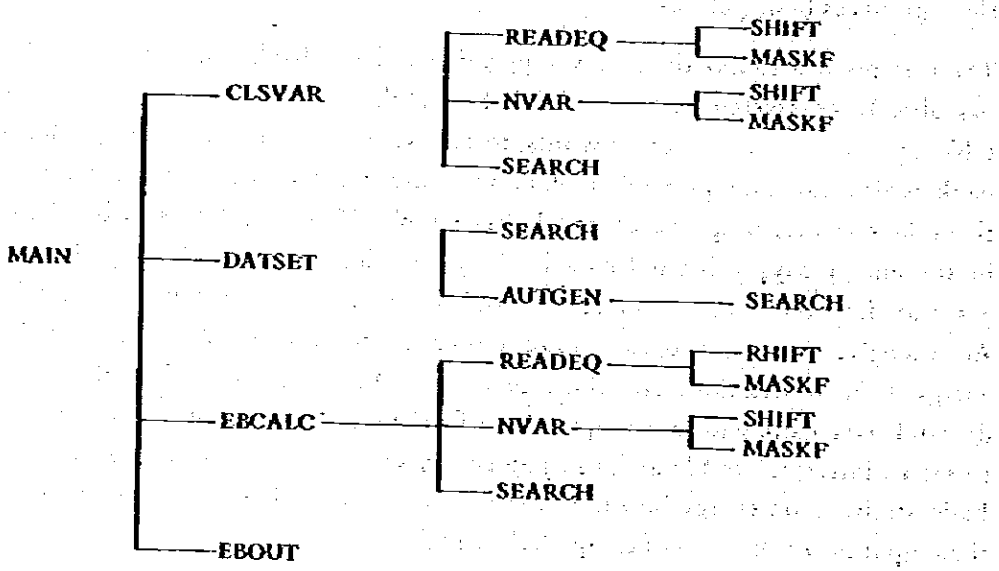
The third point is to give codes to equations of energy balance without writing them directly in the program. Because Indonesia is still on the way in establishing a system of basic statistics on energy and it is quite probable that methods to collect statistics will be changed substantially, which means that equations of calculation of the energy

balance table should also be changed frequently. Such being the situation, it will be extremely troublesome to change the program every time such a need arises and to compile a program newly. To avoid such a trouble, it is necessary to attach a function to the program to read equations of calculation as data and make calculations by decoding them.

While we were engaged in preparation of software in accordance with the aforementioned three points established as basic policies, the third point, in particular, is considered to form a special feature of softwear.

Fig. 4-5-1 shows configuration of the program in which correlation between a main program and subroutines is indicated.

Fig. 4-5-1 Configuration of Program



To read equations of energy balance as data, recall basic statistics on energy stored in the energy supply-demand data bank, make calculations in accordance with equations of energy balance and output an energy balance table, the following four steps are required.

1. To read out equations of energy balance from a permanent file, extract variables other than those indicated in each column of the energy balance table, that is, variables representing basic statistics on energy and variable names of intermediate variables from the equations, and prepare a position where values of these variables are to be stored (subroutine CLSVAR).

2. To read variable values extracted in a manner mentioned above from a file prepared using an energy supply-demand data bank reference system or paper cards, and prepare variable values required for calculations (subroutine DATSET).

List of Energy Balance Calculation Program

```
C
C       MAIN PROGRAM FOR ENERGY BALANCES                                  MAIN0010
C                                                                         MAIN0020
      COMMON /OPT/ FREQ,IY,IQ,IFMA,IFOU,IFAUT                             MAIN0030
C                                                                         MAIN0040
C                                                                         MAIN0050
      DATA KRD/5/                                                         MAIN0060
C                                                                         MAIN0070
C                                                                         MAIN0080
C                                                                         MAIN0090
100   FORMAT(A4,2I4)                                                      MAIN0100
101   FORMAT(3I4)                                                         MAIN0110
C                                                                         MAIN0120
C       READ FREQUENCY,YEAR,QUARTER                                       MAIN0130
C                                                                         MAIN0140
      READ(KRD,100) FREQ,IY,IQ                                            MAIN0150
C                                                                         MAIN0160
C       READ OPTIONS                                                      MAIN0170
C                                                                         MAIN0180
C        IFMA=1:  ALL DATA ARE READ MANUALLY, IFMA=0: MOST OF DATA        MAIN0190
C                 ARE CALLED FROM E.D.B.                                  MAIN0200
C        IFOU=1:  ORIGINAL UNIT TABLE, IFOU=0: COMMON UNIT TABLE;         MAIN0210
C        IFAUT=1: AUTO-GENERATION DATA ARE CALCULATED, IFAUT=0:           MAIN0220
C                 AUTO-GENERATION DATA ARE READ MANUALLY                  MAIN0230
C                                                                         MAIN0240
      READ(KRD,101) IFMA,IFOU,IFAUT                                       MAIN0250
C                                                                         MAIN0260
C       READ EQUATIONS AND CLASSIFY VAR. NAMES                            MAIN0270
C                                                                         MAIN0280
      CALL CLOVAR                                                         MAIN0290
C                                                                         MAIN0300
C       SET ORIGINAL RAW DATA                                             MAIN0310
C                                                                         MAIN0320
      CALL DATSET                                                         MAIN0330
C                                                                         MAIN0340
C       CALC. ENERGY BALANCES TABLE                                       MAIN0350
C                                                                         MAIN0360
      CALL EBCALC                                                         MAIN0370
C                                                                         MAIN0380
C       PRINT OUT ENERGY BALANCES TABLE                                   MAIN0390
C                                                                         MAIN0400
      CALL EBOUT                                                          MAIN0410
C                                                                         MAIN0420
C                                                                         MAIN0430
      STOP                                                                MAIN0440
      END                                                                 MAIN0450
```

```
      SUBROUTINE CLOVAR                                                   CLVR0010
C                                                                         CLVR0020
C                                                                         CLVR0030
      COMMON /VAR/ NENDO1(100),NENDO2(100),VENDO(100),NEXO1(600),         CLVR0040
     *             NEXO2(600),VEXO(600),NEXO,NENDO                        CLVR0050
      COMMON /KUT/ MEQ(80),IEQ(80)                                        CLVR0060
C                                                                         CLVR0070
C                                                                         CLVR0080
      DATA KRD/5/,LST/6/                                                  CLVR0090
      DATA ICE/'E   '/,ICB/'B   '/,ICC/'C   '/                            CLVR0100
C                                                                         CLVR0110
C                                                                         CLVR0120
200   FORMAT(1H1)                                                         CLVR0130
201   FORMAT((1H ,12(2A4,2X)))                                            CLVR0140
C                                                                         CLVR0150
C       READ EQUATIONS                                                    CLVR0160
C                                                                         CLVR0170
      WRITE(LST,200)                                                      CLVR0180
      NEXO=0                                                              CLVR0190
      NENDO=0                                                             CLVR0200
    5 CALL READEQ(IEND)                                                   CLVR0210
      IF(IEND.EQ.1) GO TO 50                                              CLVR0220
C                                                                         CLVR0230
C                                                                         CLVR0240
      ID=1                                                                CLVR0250
   10 IF(ID.GT.80) GO TO 5                                                CLVR0260
      IF(MEQ(ID).GT.0) GO TO 15                                           CLVR0270
      ID=ID+1                                                             CLVR0280
      GO TO 10                                                            CLVR0290
C                                                                         CLVR0300
C                                                                         CLVR0310
   15 IF(MEQ(ID).EQ.ICE.AND.MEQ(ID).EQ.ICB.AND.MEQ(ID).EQ.ICC) GO TO 20   CLVR0320
      IF(ID.GT.1) GO TO 25                                                CLVR0330
      GO TO 25                                                            CLVR0340
C                                                                         CLVR0350
C       VAR. NAME EDC**R** CASE                                           CLVR0360
C                                                                         CLVR0370
   20 ID=ID+8                                                             CLVR0380
      GO TO 10                                                            CLVR0390
C                                                                         CLVR0400
C       ENDOGRESSIVE VAR. NAME CASE                                       CLVR0410
C                                                                         CLVR0420
   25 CALL NVAR(NENDOA,NENDOB,ID)                                         CLVR0430
      IF(NENDO.EQ.0) GO TO 30                                             CLVR0440
      CALL SEARCH(NENDOA,NENDOB,NENDO1,NENDO2,NENDO,ISEA,IENDO)           CLVR0450
      IF(ISEA.EQ.1) GO TO 10                                              CLVR0460
   30 NENDO=NENDO+1                                                       CLVR0470
      NENDO1(NENDO)=NENDOA                                                CLVR0480
      NENDO2(NENDO)=NENDOB                                                CLVR0490
      GO TO 10                                                            CLVR0500
C                                                                         CLVR0510
C       EXOGRESSIVE VAR. NAME CASE                                        CLVR0520
C                                                                         CLVR0530
   35 CALL NVAR(NEXOA,NEXOB,ID)                                           CLVR0540
      IF(NENDO.EQ.0) GO TO 40                                             CLVR0550
      CALL SEARCH(NEXOA,NEXOB,NENDO1,NENDO2,NENDO,ISEA,IENDO)             CLVR0560
      IF(ISEA.EQ.1) GO TO 10                                              CLVR0570
   40 IF(NEXO.EQ.0) GO TO 45                                              CLVR0580
      CALL SEARCH(NEXOA,NEXOB,NEXO1,NEXO2,NEXO,ISEA,IEXO)                 CLVR0590
      IF(ISEA.EQ.1) GO TO 10                                              CLVR0600
   45 NEXO=NEXO+1                                                         CLVR0610
      NEXO1(NEXO)=NEXOA                                                   CLVR0620
      NEXO2(NEXO)=NEXOB                                                   CLVR0630
      GO TO 10                                                            CLVR0640
C                                                                         CLVR0650
C                                                                         CLVR0660
   50 WRITE(6,201) (NENDO1(I),NENDO2(I),I=1,NENDO)                        CLVR0670
      WRITE(6,201) (NEXO1(I),NEXO2(I),I=1,NEXO)                           CLVR0680
      RETURN                                                              CLVR0690
      END                                                                 CLVR0700
```

```
      SUBROUTINE READEQ(IEND)                                          RDEQ0010
C                                                                      RDEQ0020
C                                                                      RDEQ0030
      COMMON /EQT/ MEQ(80),NEQ(80)                                     RDEQ0040
C                                                                      RDEQ0050
C                                                                      RDEQ0060
      DATA MASK/Z000000FF/                                             RDEQ0070
C                                                                      RDEQ0080
C                                                                      RDEQ0090
100   FORMAT(80A1)                                                     RDEQ0100
C                                                                      RDEQ0110
C                                                                      RDEQ0120
C         READ EQUATIONS                                               RDEQ0130
C                                                                      RDEQ0140
      REWIND 15                                                        RDEQ0150
      READ(15,100,END=20) MEQ                                          RDEQ0160
C                                                                      RDEQ0170
C     CALC. OF CLASSIFICATION INDICATOR NEQ                            RDEQ0180
C                                                                      RDEQ0190
      DO 10 I=1,80                                                     RDEQ0200
      MEQN=MEQ(I)                                                      RDEQ0210
      CALL SHIFT(MEQN,-24,MEQN)                                        RDEQ0220
      CALL MASKF(MEQN,'AND',MASK,MEQN)                                 RDEQ0230
      NEQ(I)=MEQN+192                                                  RDEQ0240
   10 CONTINUE                                                         RDEQ0250
      IEND=0                                                           RDEQ0260
      GO TO 30                                                         RDEQ0270
   20 IEND=1                                                           RDEQ0280
   30 RETURN                                                           RDEQ0290
      END
```

```
      SUBROUTINE NVAR(NVARA,IVAR,I0)                                   NVAR0010
C                                                                      NVAR0020
C                                                                      NVAR0030
      DIMENSION MASK(4),NV(8)                                          NVAR0040
      COMMON /EQT/ MEQ(80),NEQ(80)                                     NVAR0050
C                                                                      NVAR0060
      DATA MASK/ZFF000000,Z00FF0000,Z0000FF00,Z000000FF/               NVAR0070
      DATA IBLANK/'  '/                                                NVAR0080
      DATA ISC1/'&  '/,ISC2/'(  '/,ISC3/'=  '/,ISC4/')  '/,            NVAR0090
     *     ISC5/')  '/                                                 NVAR0100
C                                                                      NVAR0110
C                                                                      NVAR0120
      IF(MEQ(I0+4).EQ.ISC1) GO TO 30                                   NVAR0130
      IF(MEQ(I0+4).EQ.ISC4.AND.MEQ(I0+5).EQ.ISC3.AND.                  NVAR0140
     *   MEQ(I0+6).EQ.ISC4.AND.MEQ(I0+7).EQ.ISC5) GO TO 30             NVAR0150
C                                                                      NVAR0160
C         4 CHARACTERS CASE                                            NVAR0170
C                                                                      NVAR0180
      DO 10 I=1,4                                                      NVAR0190
      NV(I)=MEQ(I0+I-1)                                                NVAR0200
   10 CONTINUE                                                         NVAR0210
      DO 20 I=5,8                                                      NVAR0220
      NV(I)=IBLANK                                                     NVAR0230
   20 CONTINUE                                                         NVAR0240
      I0=I0+4                                                          NVAR0250
      GO TO 50                                                         NVAR0260
C                                                                      NVAR0270
```

```
C         8 CHARACTERS CASE                                            NVAR0300
C                                                                      NVAR0310
   30 DO 40 I=1,8                                                      NVAR0320
      NV(I)=MEQ(I0+I-1)                                                NVAR0330
   40 CONTINUE                                                         NVAR0340
      I0=I0+8                                                          NVAR0350
C                                                                      NVAR0360
C         EXTRACTION OF VAR. NAME                                      NVAR0370
C                                                                      NVAR0380
   50 NVARA=0                                                          NVAR0390
      NVARB=0                                                          NVAR0400
      DO 70 I=1,8                                                      NVAR0410
      N=I-1                                                            NVAR0420
      IF(I.GT.4) N=I-5                                                 NVAR0430
      IVAR=NV(I)                                                       NVAR0440
      CALL SHIFT(IVAR,-8*N,IVAR)                                       NVAR0450
      MASK=MASK(N+1)                                                   NVAR0460
      CALL MASKF(IVAR,'AND',MASK,IVAR)                                 NVAR0470
      IF(I.GT.4) GO TO 60                                              NVAR0480
      CALL MASKF(NVARA,'OR',IVAR,NVARA)                                NVAR0490
      GO TO 70                                                         NVAR0500
   60 CALL MASKF(NVARB,'OR',IVAR,NVARB)                                NVAR0510
   70 CONTINUE                                                         NVAR0520
      RETURN                                                           NVAR0530
      END                                                              NVAR0540
```

```
      SUBROUTINE SEARCH(NVARA,NVARB,NVAR1,NVAR2,NVAR,ISEA,IVAR)        SEAR0010
C                                                                      SEAR0020
C                                                                      SEAR0030
      DIMENSION NVAR1(NVAR),NVAR2(NVAR)                                SEAR0040
C                                                                      SEAR0050
C         SEARCH THE SAME VAR. NAME                                    SEAR0060
C                                                                      SEAR0070
      ISEA=0                                                           SEAR0080
      IF(NVAR.EQ.0) GO TO 30                                           SEAR0090
      DO 10 IVAR=1,NVAR                                                SEAR0100
      IF(NVAR1(IVAR).EQ.NVARA.AND.NVAR2(IVAR).EQ.NVARB) GO TO 20       SEAR0110
   10 CONTINUE                                                         SEAR0120
      GO TO 30                                                         SEAR0130
   20 ISEA=1                                                           SEAR0140
   30 RETURN                                                           SEAR0150
      END                                                              SEAR0160
```

```
      SUBROUTINE DATSET                                                DSET0010
C                                                                      DSET0020
C                                                                      DSET0030
      INTEGER END                                                      DSET0040
      COMMON /VAR/ NEND01(100),NEND02(100),VEND0(100),NEX01(600),      DSET0050
     *             NEX02(600),VEX0(600),NEX0,NEND0                     DSET0060
      COMMON /OPT/ KEY0,IY,IM,IMHA,IPOI,IPAUT                          DSET0070
C                                                                      DSET0080
```

```
C                                                                       DSET0090
      DATA END/'END '/,BLANK/'    '/                                    DSET0100
      DATA KRD/5/,LST/6/                                                DSET0110
C                                                                       DSET0120
C                                                                       DSET0130
  100 FORMAT(2A4,2X,F15.0)                                              DSET0140
  101 FORMAT(2A4,2X,E11.3)                                              DSET0150
  200 FORMAT(1H ,'E001  VAR. NAME ',2A4,' IS NOT FOUND')                DSET0160
  201 FORMAT(1H ,'E002  VARLUE OF ',2A4,' IS NOT AVAILABLE')            DSET0170
C                                                                       DSET0180
C                                                                       DSET0190
      DO 5 I=1,NEXO                                                     DSET0200
      VEXO(I)=BLANK                                                     DSET0210
    5 CONTINUE                                                          DSET0220
C                                                                       DSET0230
C         CALL ORIGINAL DATA FROM TEMP. FILE MADE BY E.D.B. SYSTEM      DSET0240
C                                                                       DSET0250
      IF(IFHA.EQ.1) GO TO 30                                            DSET0260
      REWIND 10                                                         DSET0270
   10 READ(10,100,END=30) NEXOA,NEXOB,VEXOV                             DSET0280
   15 CALL SEARCH(NEXOB,NEXOB,NEXO1,NEXO2,ISEA,IEXO)                    DSET0290
      IF(ISEA.EQ.1) GO TO 20                                            DSET0300
      WRITE(6,200) NEXOA,NEXOB                                          DSET0310
      GO TO 10                                                          DSET0320
C                                                                       DSET0330
C                                                                       DSET0340
   20 IF(IFAUT.EQ.0) GO TO 25                                           DSET0350
      CALL AUTOGEN(NEXOA,NEXOB,VEXOV,IEXO,IAUT)                         DSET0360
      IF(IAUT.EQ.0) GO TO 25                                            DSET0370
      GO TO 10                                                          DSET0380
C                                                                       DSET0390
C                                                                       DSET0400
   25 IF(VEXO(IEXO).EQ.BLANK) VEXO(IEXO)=0.0                            DSET0410
      VEXO(IEXO)=VEXO(IEXO)*VEXOV                                       DSET0420
      GO TO 10                                                          DSET0430
C                                                                       DSET0440
C         READ MANUAL DATA FROM CARDS                                   DSET0450
C                                                                       DSET0460
   30 READ(KRD,100) NEXOA,NEXOB,VEXOV                                   DSET0470
      IF(NEXOA.EQ.END) GO TO 45                                         DSET0480
      CALL SEARCH(NEXOA,NEXOB,NEXO1,NEXO2,NEXO,ISEA,IEXO)              DSET0490
      IF(ISEA.EQ.1) GO TO 35                                            DSET0500
      WRITE(6,200) NEXOA,NEXOB                                          DSET0510
      GO TO 30                                                          DSET0520
C                                                                       DSET0530
C                                                                       DSET0540
   35 IF(IFAUT.EQ.0) GO TO 40                                           DSET0550
      CALL AUTOGEN(NEXOA,NEXOB,VEXOV,IEXO,IAUT)                         DSET0560
      IF(IAUT.EQ.0) GO TO 40                                            DSET0570
      GO TO 30                                                          DSET0580
C                                                                       DSET0590
C                                                                       DSET0600
   40 IF(VEXO(IEXO).EQ.BLANK) VEXO(IEXO)=0.0                            DSET0610
      VEXO(IEXO)=VEXO(IEXO)*VEXOV                                       DSET0620
      GO TO 30                                                          DSET0630
C                                                                       DSET0640
C         READ CONVERSION FACTORS FROM CARDS                            DSET0650
C                                                                       DSET0660
   45 READ(KRD,101) NEXOA,NEXOB,VEXOV                                   DSET0670
      IF(NEXOA.EQ.END) GO TO 55                                         DSET0680
      CALL SEARCH(NEXOA,NEXOB,NEXO1,NEXO2,NEXO,ISEA,IEXO)              DSET0690
      IF(ISEA.EQ.1) GO TO 50                                            DSET0700
      WRITE(6,200) NEXOA,NEXOB                                          DSET0710
      GO TO 45                                                          DSET0720
C                                                                       DSET0730
C                                                                       DSET0740
   50 VEXO(IEXO)=VEXO(IEXO)*VEXOV                                       DSET0750
      GO TO 45                                                          DSET0760
C                                                                       DSET0770
C         CHECK DATA AVAILABILITY                                       DSET0780
C                                                                       DSET0790
   55 DO 60 I=1,NEXO                                                    DSET0800
      IF(VEXO(I).NE.BLANK) GO TO 60                                     DSET0810
      WRITE(6,201) NEXO1(I),NEXO2(I)                                    DSET0820
      VEXO(I)=0.0                                                       DSET0830
   60 CONTINUE                                                          DSET0840
      RETURN                                                            DSET0850
      END                                                               DSET0860
```

```
      SUBROUTINE AUTOGEN(NEXOA,NEXOB,VEXOV,IEXO,IAUT)                   AGEN0010
C                                                                       AGEN0020
C                                                                       AGEN0030
      DIMENSION IA(6),IC(6),IT(6),IND(24),RATIO(3,6)                    AGEN0040
      COMMON /VAR/ NEND01(100),NEND02(100),VEND0(100),NEXO1(600),       AGEN0050
     *             NEXO2(600),VEXO(600),NEXO,NEND0                      AGEN0060
C                                                                       AGEN0070
C                                                                       AGEN0080
      DATA IC /'CADO','CIDO','CMFO','MADO','MIDO','MMFO'/,              AGEN0090
     *     IA /'AADO','AIDO','AMFO','AADO','AIDO','AMFO'/,              AGEN0100
     *     IT /'CADO','CIDO','CMFO','CADO','CIDO','CMFO'/               AGEN0110
      DATA IND/'&AGR','&FMT','&MIN','&CON','&FOD','&TXT','&RUB','&PAP', AGEN0120
     *         '&PCH','&CAC','&IAS','&NFM','&MAC','&ZNO',               AGEN0130
     *         'ACR','&NGP','&NEF','&NGL','&EMF','&PUB','&TWO','&COK',  AGEN0140
     *         '&URO','&CRU'/                                           AGEN0150
     *                                                                  AGEN0160
      DATA IRD/'&ROD',BLANK/'    '/                                     AGEN0170
      DATA RATIO/ 0.45,  0.45,  0.10,                                   AGEN0180
     *            1.00,  0.00,  0.00,                                   AGEN0190
     *            1.00,  0.00,  0.00,                                   AGEN0200
     *            0.45,  0.45,  0.10,                                   AGEN0210
     *            1.00,  0.00,  0.00,                                   AGEN0220
     *            1.00,  0.00,  0.00,                                   AGEN0230
C                                                                       AGEN0240
C         CLASSIFY INTO CONSUMPTION, AUTO-GENERATION,                   AGEN0250
C         AND TRANSPONTATION                                            AGEN0260
C           *** AUTOMOTIVE AND INDUSTRIAL DIESEL OIL ***                AGEN0270
C           *** AND HEAVY FUEL OIL CASES             ***                AGEN0280
C                                                                       AGEN0290
      IAUT=0                                                            AGEN0300
      DO 10 IX=1,6                                                      AGEN0310
      IF(IC(IX).EQ.NEXOA) GO TO 20                                      AGEN0320
   10 CONTINUE                                                          AGEN0330
      GO TO 90                                                          AGEN0340
C                                                                       AGEN0350
C         FINAL CONSUMPTION CASE                                        AGEN0360
C                                                                       AGEN0370
   20 IF(IX.GE.4) GO TO 40                                              AGEN0380
      DO 30 II=1,14                                                     AGEN0390
      IF(IND(II).EQ.NEXOB) GO TO 60                                     AGEN0400
   30 CONTINUE                                                          AGEN0410
      GO TO 90                                                          AGEN0420
C                                                                       AGEN0430
C         OWN-USE CASE                                                  AGEN0440
C                                                                       AGEN0450
   40 DO 50 II=15,24                                                    AGEN0460
      IF(IND(II).EQ.NEXOB) GO TO 60                                     AGEN0470
```

```
   50 CONTINUE                                                          AGEN0480
      GO TO 90                                                          AGEN0490
C                                                                       AGEN0500
C        CONSUMPTION IN INDUSTRY                                        AGEN0510
C                                                                       AGEN0520
   60 IF(VEXO(IEXO).EQ.BLANK) VEXO(IEXO)=0.0                            AGEN0530
      VEXO(IEXO)=VEXO(IEXO)+VEXOV*RATIO(1,IX)                           AGEN0540
C                                                                       AGEN0550
C        AUTO-GENERATION                                                AGEN0560
C                                                                       AGEN0570
      NEXOA=IA(IX)                                                      AGEN0580
      CALL SEARCH(NEXOA,NEXOB,NEXO1,NEXO2,NEXO,ISEA,IEXO)               AGEN0590
      IF(ISEA.EQ.0) GO TO 70                                            AGEN0600
      IF(VEXO(IEXO).EQ.BLANK) VEXO(IEXO)=0.0                            AGEN0610
      VEXO(IEXO)=VEXO(IEXO)+VEXOV*RATIO(2,IX)                          AGEN0620
C                                                                       AGEN0630
C        TRANSPORTATION                                                 AGEN0640
C                                                                       AGEN0650
   70 NEXOA=IT(IX)                                                      AGEN0660
      NEXOB=IND                                                         AGEN0670
      CALL SEARCH(NEXOA,NEXOB,NEXO1,NEXO2,NEXO,ISEA,IEXO)              AGEN0680
      IF(ISEA.EQ.0) GO TO 80                                            AGEN0690
      IF(VEXO(IEXO).EQ.BLANK) VEXO(IEXO)=0.0                            AGEN0700
      VEXO(IEXO)=VEXO(IEXO)+VEXOV*RATIO(3,IX)                          AGEN0710
   80 IA(IT)=1                                                          AGEN0720
   90 RETURN                                                            AGEN0730
      END                                                               AGEN0740
```

```
      SUBROUTINE EQCALC                                                 ECAL0010
C                                                                       ECAL0020
C                                                                       ECAL0030
      DIMENSION ISC(9),IPR(7),STACK(30),OUT(100),IOP(100)               ECAL0040
      COMMON /VAR/ NEWDO1(100),NEWDO2(100),VEWDO(100),NEXO1(600),       ECAL0050
     *             NEXO2(600),VEXO(600),NEXO,NEWDO                    ECAL0060
      COMMON /EBV/ EB(53,8)                                             ECAL0070
      COMMON /EQT/ NEQ(80),NEQ(80)                                      ECAL0080
C                                                                       ECAL0090
C                                                                       ECAL0100
      DATA IBLANK/'    '/,BLANK/'    '/,ICE/'E   '/,ICB/'B   '/,       ECAL0110
     *     ICC/'    '/                                                  ECAL0120
      DATA ISC/'+   ','-   ','*   ','/   ','(   ',')   ','=   ',       ECAL0130
     *         '    ','    '/                                          ECAL0140
      DATA IPR/2,2,3,3,1,7,0/                                           ECAL0150
      DATA KRO/5/,LST/6/                                                ECAL0160
C                                                                       ECAL0170
C                                                                       ECAL0180
  200 FORMAT(1H ,'E003  VALUE OF ',2A4,' IS NOT FOUND, ASSUMED ZERO')   ECAL0190
  201 FORMAT(1H ,'K004  STORED POSITION OF EQ ',I4,2X,80A1/             ECAL0200
     *       1H ,' IS NOT FOUND')                                       ECAL0210
C                                                                       ECAL0220
C                                                                       ECAL0230
      NEWEND 15                                                         ECAL0240
      IEQ=0                                                             ECAL0250
      DO 5 I=1,80                                                       ECAL0260
      DO 5 J=1,53                                                       ECAL0270
      EB(J,I)=BLANK                                                     ECAL0280
    5 CONTINUE                                                          ECAL0290
C                                                                       ECAL0300
C        READ EQUATIONS FROM PERMANENT FILE                             ECAL0310
```

```
C                                                                       ECAL0320
   10 CALL READEQ(IEND)                                                 ECAL0330
      IF(IEND.EQ.1) GO TO 70                                            ECAL0340
      IEQ=IEQ+1                                                         ECAL0350
C                                                                       ECAL0360
C        SET INITIAL VALUE                                              ECAL0370
C                                                                       ECAL0380
      ID=1                                                              ECAL0390
      NU=0                                                              ECAL0400
      IS=0                                                              ECAL0410
      IM=0                                                              ECAL0420
      JM=0                                                              ECAL0430
      NENDOA=IBLANK                                                     ECAL0440
      NENDOB=IBLANK                                                     ECAL0450
      VAL1=BLANK                                                        ECAL0460
      VAL2=BLANK                                                        ECAL0470
      IU1=0                                                             ECAL0480
      IU2=0                                                             ECAL0490
      DO 15 IU=1,100                                                    ECAL0500
      IOP(IU)=0                                                         ECAL0510
   15 CONTINUE                                                          ECAL0520
C                                                                       ECAL0530
C        INVERSE POLAND TRANSFORMATION                                  ECAL0540
C                                                                       ECAL0550
   20 IF(ID.GT.80) GO TO 40                                             ECAL0560
      IF(NEQ(ID).GT.0) GO TO 30                                         ECAL0570
      DO 21 NSC=1,9                                                     ECAL0580
      IF(NEQ(ID).EQ.ISC(NSC)) GO TO 25                                  ECAL0590
   21 CONTINUE                                                          ECAL0600
      IF(NEQ(ID).EQ.ISC(9)) GO TO 22                                    ECAL0610
      IU=ID+1                                                           ECAL0620
      GO TO 20                                                          ECAL0630
C                                                                       ECAL0640
C        EQUATION IS CONTINUED TO NEXT CARD                             ECAL0650
C                                                                       ECAL0660
   22 ID=1                                                              ECAL0670
      CALL READEQ(IEND)                                                 ECAL0680
      GO TO 20                                                          ECAL0690
C                                                                       ECAL0700
C        OPERATOR CASE                                                  ECAL0710
C                                                                       ECAL0720
C          RULE 1: IF THE STACK AREA IS EMPTY, THE OPERATOR IS STORED   ECAL0730
C                  IN THIS AREA WITHOUT RESTRICTIONS.                   ECAL0740
C          RULE 2: THE OPERATOR IS STORED IN THE MOST UPPER POSITION    ECAL0750
C                  OF STACK AREA WITHOUT RESTRICITIONS.                 ECAL0760
C                                                                       ECAL0770
   25 IF(IS.GT.0.AND.NSC.NE.5) GO TO 26                                 ECAL0780
      IS=IS+1                                                           ECAL0790
      STACK(IS)=FLOAT(NSC)                                              ECAL0800
      ID=ID+1                                                           ECAL0810
      GO TO 20                                                          ECAL0820
C                                                                       ECAL0830
C          RULE 3: IF THE PRIORITY OF OPERATOR IS HIGHER THAN THE       ECAL0840
C                  PRIORITY OF OPERATOR STORED IN THE SURFACE OF STACK  ECAL0850
C                  AREA, IT IS STORED IN THE MOST UPPER POSITION OF     ECAL0860
C                  STACK AREA.                                          ECAL0870
C                                                                       ECAL0880
   26 MSC=IFIX(STACK(IS))                                               ECAL0890
      IF(IPR(NSC).GE.IPR(MSC)) GO TO 27                                 ECAL0900
      IS=IS+1                                                           ECAL0910
      STACK(IS)=FLOAT(NSC)                                              ECAL0920
      ID=ID+1                                                           ECAL0930
      GO TO 20                                                          ECAL0940
C                                                                       ECAL0950
C          RULE 4: IF THE PRIORITY OF OPERATOR IS LOWER THAN OR EQUAL   ECAL0960
C                  TO THE PRIORITY OF OPERATOR STORED IN THE SURFACE    ECAL0970
C                  OF STACK AREA, THE LATTER IS TRANSFERRED TO THE      ECAL0980
```

```
      ID=ID-8                                                           ECAL1660
      GO TO 20                                                          ECAL1670
C                                                                       ECAL1680
C           RULE 7: THE OPERATORS REMAINING IN THE STACK AREA ARE       ECAL1690
C                   TRANSFERRED TO THE OUT-PUT AREA IN ORDER.           ECAL1700
C                                                                       ECAL1710
   40 IF(IS.LE.0) GO TO 50                                              ECAL1720
      DO 41 I=1,IS                                                      ECAL1730
      NU=NU+1                                                           ECAL1740
      OUT(NU)=STACK(IS-I+1)                                             ECAL1750
      IOP(NU)=-1                                                        ECAL1760
   41 CONTINUE                                                          ECAL1770
C                                                                       ECAL1780
C           CALC. OF EXC**R** OR ENDOGRESSIVE VARIABLES                 ECAL1790
C                                                                       ECAL1800
   50 DO 51 IU=1,NU                                                     ECAL1810
      IF(IOP(IU).EQ.-1) GO TO 52                                        ECAL1820
      IF(IOP(IU).EQ.1) GO TO 51                                         ECAL1830
      VAL1=VAL2                                                         ECAL1840
      VAL2=OUT(IU)                                                      ECAL1850
      IU1=IU2                                                           ECAL1860
      IU2=IU                                                            ECAL1870
   51 CONTINUE                                                          ECAL1880
      VAL=OUT(IU)                                                       ECAL1890
      GO TO 60                                                          ECAL1900
C                                                                       ECAL1910
C                                                                       ECAL1920
   52 MOP=IFIX(OUT(IU))                                                 ECAL1930
      IF(MOP.EQ.1) GO TO 53                                             ECAL1940
      IF(MOP.EQ.2) GO TO 54                                             ECAL1950
      IF(MOP.EQ.3) GO TO 56                                             ECAL1960
C                                                                       ECAL1970
C              / CALCULATION                                            ECAL1980
C                                                                       ECAL1990
      VAL=VAL1/VAL2                                                     ECAL2000
      GO TO 60                                                          ECAL2010
C                                                                       ECAL2020
C              - CALCULATION                                            ECAL2030
C                                                                       ECAL2040
   53 VAL=VAL1-VAL2                                                     ECAL2050
      GO TO 60                                                          ECAL2060
C                                                                       ECAL2070
C              + CALCULATION                                            ECAL2080
C                                                                       ECAL2090
   54 IF(VAL1.EQ.BLANK) GO TO 55                                        ECAL2100
      VAL=VAL1+VAL2                                                     ECAL2110
      GO TO 60                                                          ECAL2120
C                                                                       ECAL2130
C              CHANGE OF SIGN                                           ECAL2140
C                                                                       ECAL2150
   55 VAL=-VAL2                                                         ECAL2160
      GO TO 60                                                          ECAL2170
C                                                                       ECAL2180
C              * CALCULATION                                            ECAL2190
C                                                                       ECAL2200
   56 VAL=VAL1*VAL2                                                     ECAL2210
C                                                                       ECAL2220
C                                                                       ECAL2230
   60 IF(IU.EQ.NU) GO TO 69                                             ECAL2240
      OUT(IU2)=VAL                                                      ECAL2250
      IF(IU1.GT.0) IOP(IU1)=1                                           ECAL2260
      IOP(IU)=1                                                         ECAL2270
      VAL1=BLANK                                                        ECAL2280
      VAL2=BLANK                                                        ECAL2290
      IU1=0                                                             ECAL2300
      IU2=0                                                             ECAL2310
```

```
C                                                                       ECAL0990
C           OUT-PUT AREA.  THE SAME COMPARIZON OF PRIORITY IS           ECAL1000
C           MADE FOR THE NEXT SURFACE OPERATOR OF STACK AREA.           ECAL1010
C                                                                       ECAL1020
   27 IF(NSC.EQ.6.AND.IPR(NSC).EQ.IPR(NSC)) GO TO 28                    ECAL1030
      NU=NU+1                                                           ECAL1040
      OUT(NU)=STACK(IS)                                                 ECAL1050
      IOP(NU)=-1                                                        ECAL1060
      IS=IS-1                                                           ECAL1070
      GO TO 25                                                          ECAL1080
C                                                                       ECAL1090
C           RULE 5: IF THE OPERATOR IS ) AND THE SURFACE OPERATOR OF    ECAL1100
C                   STACK IS ( , BOTH OPERATORS ARE DELETED.            ECAL1110
C                                                                       ECAL1120
   28 IS=IS-1                                                           ECAL1130
      ID=ID-1                                                           ECAL1140
      GO TO 20                                                          ECAL1150
C                                                                       ECAL1160
C        VARIABLE NAME CASE                                             ECAL1170
C                                                                       ECAL1180
C           RULE 6: ALL VARIABLE ARE TRANSFERRED TO THE OUT-PUT AREA    ECAL1190
C                   DIRECTLY.                                           ECAL1200
C                                                                       ECAL1210
   30 IF(MEQ(ID).EQ.ICE.AND.MEQ(ID-1).EQ.ICB.AND.MEQ(ID-2).EQ.ICC)      ECAL1220
     *   GO TO 35                                                       ECAL1230
C                                                                       ECAL1240
C              ENDOGRESSIVE VARIABLE (LEFT SIDE OF = )                  ECAL1250
C                                                                       ECAL1260
      IF(ID.GT.1) GO TO 31                                              ECAL1270
      CALL NVAR(NENDOA,NENDOB,ID)                                       ECAL1280
      GO TO 20                                                          ECAL1290
C                                                                       ECAL1300
C              SET VALUES OF VARIABLE (RIGHT SIDE OF = )                ECAL1310
C               ENDOGRESSIVE VARIABLE                                   ECAL1320
C                                                                       ECAL1330
   31 CALL NVAR(NVARA,NVARB,ID)                                         ECAL1340
      CALL SEARCH(NVARA,NVARB,NENDO1,NENDO2,NENDO,ISEA,IENDO)           ECAL1350
      IF(ISEA.EQ.0) GO TO 32                                            ECAL1360
      NU=NU+1                                                           ECAL1370
      OUT(NU)=VENDO(IENDO)                                              ECAL1380
      GO TO 20                                                          ECAL1390
C                                                                       ECAL1400
C              EXOGRESSIVE VARIABLE                                     ECAL1410
C                                                                       ECAL1420
   32 CALL SEARCH(NVARA,NVARB,NEXO1,NEXO2,ISEA,IEXO)                    ECAL1430
      IF(ISEA.EQ.0) GO TO 33                                            ECAL1440
      NU=NU+1                                                           ECAL1450
      OUT(NU)=VEXO(IEXO)                                                ECAL1460
      GO TO 20                                                          ECAL1470
   33 WRITE(LST,200) NVARA,NVARB                                        ECAL1480
      NU=NU+1                                                           ECAL1490
      OUT(NU)=0.0                                                       ECAL1500
      GO TO 20                                                          ECAL1510
C                                                                       ECAL1520
C              EXC**R** (LEFT SIDE OF = )                               ECAL1530
C                                                                       ECAL1540
   35 IF(ID.GT.1) GO TO 36                                              ECAL1550
      IN=(NEG(ID-3)+48)*10+NEG(ID-4)-48                                 ECAL1560
      JN=(NEG(ID-6)+48)*10+NEG(ID-7)-48                                 ECAL1570
      ID=ID-8                                                           ECAL1580
      GO TO 20                                                          ECAL1590
C                                                                       ECAL1600
C              SET VALUES OF EXC**R** (RIGHT SIDE OF = )                ECAL1610
C                                                                       ECAL1620
   36 IN=(NEG(ID-3)+48)*10+NEG(ID-4)-48                                 ECAL1630
      JN=(NEG(ID-6)+48)*10+NEG(ID-7)-48                                 ECAL1640
      NU=NU+1                                                           ECAL1650
      OUT(NU)=EB(IN,JN)
```

```
      GO TO 50                                                          KCAL2320
C                                                                       KCAL2330
C     STORE CALC. RESULTS                                               KCAL2340
C                                                                       KCAL2350
   65 IF(IM.EQ.0.OR.JM.EQ.0) GO TO 66                                   KCAL2360
      KM(IM,JM)=VAL                                                     KCAL2370
      GO TO 10                                                          KCAL2380
C                                                                       KCAL2390
C                                                                       KCAL2400
   66 IF(NENDOA.EQ.IBLANK) GO TO 67                                     KCAL2410
      CALL SEARCH(NENDOA,NENDOB,NENDO1,NENDO2,NENDO,ISEA,IENDO)         KCAL2420
      IF(ISEA.EQ.0) GO TO 67                                            KCAL2430
      VENDO(IENDO)=VAL                                                  KCAL2440
      GO TO 10                                                          KCAL2450
C                                                                       KCAL2460
C                                                                       KCAL2470
   67 WRITE(LST,201) IEQ,(MEQ(ID),ID=1,80)                              KCAL2480
      GO TO 10                                                          KCAL2490
C                                                                       KCAL2500
C                                                                       KCAL2510
   70 RETURN                                                            KCAL2520
      END                                                               KCAL2530
```

```
      SUBROUTINE KBOUT                                                  KOUT0010
C                                                                       KOUT0020
C                                                                       KOUT0030
      INTEGER BLANK,NRA                                                 KOUT0040
      DIMENSION IKN(2,20),JEB(12),MEN(7,12),NEB(12),IN(12),JB(12),      KOUT0050
     *          LIT(10),JCOL(12),LINE(20),NA(3,80),NP(2,144),IN(93,61), KOUT0060
     *          NP1(2,72),NP2(2,72)                                     KOUT0070
      REAL*8 TRAW(3,61),TCOL(4,53),LIN(20),R1(3,19),R2(3,19),R3(3,19),  KOUT0080
     *       R4(3,4),C1(4,19),C2(4,19),C3(4,15)                       KOUT0090
C                                                                       KOUT0100
C                                                                       KOUT0110
      EQUIVALENCE (TRAW(1,1),R1(1,1)), (TRAW(1,20),R2(1,1)),           KOUT0120
     *            (TRAW(1,39),R3(1,1)), (TRAW(1,58),R4(1,1))           KOUT0130
      EQUIVALENCE (TCOL(1,1),C1(1,1)), (TCOL(1,20),C2(1,1)),           KOUT0140
     *            (TCOL(1,39),C3(1,1))                                 KOUT0150
      EQUIVALENCE (NP(1,1),NP1(1,1)),  (NP(1,73),NP2(1,1))             KOUT0160
C                                                                       KOUT0170
C                                                                       KOUT0180
      COMMON /EBV/ EN(53,61)                                            KOUT0190
      COMMON/OPT/ PREQ, IY, IO, IPMA, IPOU, IPAUT                       KOUT0200
C                                                                       KOUT0210
C     TITLE OF ROW                                                      KOUT0220
C                                                                       KOUT0230
      DATA R1 /'DOMESTIC','  PRODUCT','ION     ',                     KOUT0240
     *         'IMPORT  ','        ','        ',                      KOUT0250
     *         'EXPORT  ','        ','        ',                      KOUT0260
     *         '(INTERNA','TIONAL U','PLIFT)  ',                      KOUT0270
     *         'STOCK CH','ANGE    ','        ',                      KOUT0280
     *         'PRIMARY ','ENERGY S','UPPLY   ',                      KOUT0290
     *         'REFINERY','        ','        ',                      KOUT0300
     *         'NGL(INCL','UDES LIG','HT)     ',                     KOUT0310
     *         'PETROCHE','MICAL FE','EDSTOCKS',                      KOUT0320
     *         'REFINERY','FUELS   ','        ',                      KOUT0330
     *         'ELECTRIC','ITY     ','        ',                      KOUT0340
     *         'TOWN GAS','        ','        ',                      KOUT0350
     *         'COKE    ','        ','        ',                      KOUT0360
     *         'BRIQUET ','        ','        ',                      KOUT0370
     *         'TRANSFOR','MATION(T','OTAL    ',                     KOUT0380
     *         'CRUDE OI','L FIELD ','        ',                      KOUT0390
     *         'NATURAL ','GAS FIEL','D       ',                     KOUT0400
     *  DATA R2 /'REFINERY','        ','        ',                    KOUT0410
     *         'NGL PLAN','T       ','        ',                     KOUT0420
     *         'CHEMICAL','  ENERTY ','PLANT   ',                     KOUT0430
     *         'PUBLIC U','TILITY  ','        ',                      KOUT0440
     *         'TOWN GAS','        ','        ',                      KOUT0450
     *         'COKE PLA','NT      ','        ',                      KOUT0460
     *         'BRIQUET ','        ','        ',                      KOUT0470
     *         'COAL MIN','E       ','        ',                      KOUT0480
     *         'PLANT AN','D LOSSES','        ',                      KOUT0490
     *         'ENERGY S','ECT. USE',',LOSSES ',                      KOUT0500
     *         'STATISTI','CAL DIFE','RENCE   ',                      KOUT0510
     *         'FINAL CO','NSUMPTIO','N       ',                      KOUT0520
     *         'FINAL EN','ERGY USE','        ',                      KOUT0530
     *         'INDUSTRY','        ','        ',                      KOUT0540
     *         ' AGRICUL','TURE, FO','RESTRY  ',                      KOUT0550
     *         ' FISHERY','        ','        ',                      KOUT0560
     *         ' MINING(','EX.ENERG','Y SECT.)',                      KOUT0570
     *         ' CONSTRU','CTION   ','        ',                      KOUT0580
     *         ' MANUFAC','TURING  ','        ',                      KOUT0590
     *  DATA R3 /'  FOODS ','        ','        ',                    KOUT0600
     *         '  TEXTIL','E       ','        ',                     KOUT0610
     *         '  NUMBER','        ','        ',                     KOUT0620
     *         '  PAPER,','PULP    ','        ',                     KOUT0630
     *         '  CHEMIS','TRY(FUEL','  USE)  ',                     KOUT0640
     *         '  CERAMI','CS, CEME','NTS    ',                     KOUT0650
     *         '  IRON ','STEEL   ','        ',                     KOUT0660
     *         '  NON-FE','ROUS ME','TAL)    ',                     KOUT0670
     *         '  MACHIN','ERY, MET','AL FAB,',                      KOUT0680
     *         '  SMALL ','WARES, O','THERS  ',                      KOUT0690
     *         'RESIDENT','...COMMER','(TOTAL)',                      KOUT0700
     *         ' RESIDEN','TIAL    ','        ',                     KOUT0710
     *         ' COMMERC','IAL     ','        ',                     KOUT0720
     *         'TRANSPOR','TATION(T','OTAL)   ',                      KOUT0730
     *         ' AIR TRA','NSPORTAT','ION     ',                     KOUT0740
     *         ' ROAD TR','ANSPORTA','TION    ',                     KOUT0750
     *         ' RAILWAY','S       ','        ',                     KOUT0760
     *         ' INTERNA','L NAVIGA','TION    ',                     KOUT0770
     *         ' INTERNA','TIONAL U','PLIFT   ',                      KOUT0780
     *  DATA R4 /'OTHERS(G','OVERN.,P','RIVATE &)',                   KOUT0790
     *         'RAW MATE','RI. USE ','IN CHEM.',                      KOUT0800
     *         'OTHER NO','N-ENERGY','  USE   ',                      KOUT0810
     *         'TOTAL US','E IN CHE','MISTRY  '/                      KOUT0820
C                                                                       KOUT0830
C     TITLE OF COLUMN                                                   KOUT0840
C                                                                       KOUT0850
      DATA C1 /'TOTAL OF','COAL    ','        ','C01=C05 ',           KOUT0860
     *         '        ','COAKING ','COAL    ','        ',           KOUT0870
     *         '        ','STEAM   ','COAL    ','        ',           KOUT0880
     *         '        ','ANTHRA- ',' CITE   ','        ',           KOUT0890
     *         '        ','LIGNITE ','        ','        ',           KOUT0900
     *         'TOTAL OF','CRUDE   ','OIL     ','C06=C08 ',           KOUT0910
     *         '        ','ORIGINAL','CRUDE   ','OIL     ',           KOUT0920
     *         '        ','REDUCED ','CRUDE   ','OIL     ',           KOUT0930
     *         'PETROLEU','M       ','PRODUCTS','C09=C20 ',           KOUT0940
     *         '        ','DOMESTIC','FUEL OIL','C10=C20 ',           KOUT0950
     *         '        ','        ','GASOLINE','C11=C14 ',           KOUT0960
     *         '        ','        ','        ','AVIATION',           KOUT0970
     *         '        ','        ','        ','SUPER   ',           KOUT0980
     *         '        ','        ','        ','PREMIUM ',           KOUT0990
     *         '        ','        ','JET FUEL','        ',           KOUT1000
     *         '        ','        ','KEROSENE','        ',           KOUT1010
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*                                                 'DIESEL      'C17=C10     '
*                                                              'AUTOMOT.    '
*                                                              'INDUSTR.    '/
 DATA C2 /'                                       'HEAVY       'FUEL OIL    '
*                                  'NAPTHA       '            '            '
*                                  'LOW SUL.     'WAXY        'RESIDUE     '
*                                  'LUBRI-       ' CANTS      '            '
*                                  'SOLVENTS     '            '            '
*                                  'OTHERS       '(GREASE,    'ASPH.,&)    '
*                                  'PETROLE-     ' UM         'COKE        '
*                                  'REFINARY     'GAS         '            '
*                                  'LPG          '            '            '
*                      'NATURAL    'GAS          '            '            '
*                      'NGL        'CONDEN-      ' SATES)     '            '
*                      'LNG        '             '            '            '
*                      'METHANOL   '             '            '            '
*                      'TOWN GAS   '             '            '            '
*                      'COKE       '             '            '            '
*                      'COKE       'OVEN         'GAS         '            '
*                      'BLAST      'FURNACE      'GAS         '            '
*                      'BRIQUET    '             '            '            '
*                      'WOOD       '             '            '            '/
 DATA C3 /'CHARCOAL   '                                                    '
*         'FUEL       'ETHANOL    'FROM        'BIOMASS     '
*         'AGRI-      'CULTURAL   'WASTES      '            '
*         'TOTAL OF   'ELEC-      ' TRICITY    'C42=C52     '
*                     'PUBLIC     'UTILITY     'C43=C48     '
*                                 'THERMAL     'GENERAT.    '
*                                 'HYDRO-      'GENERAT.    '
*                                 'PUMP-UP     'USE         '
*                                 'NUCLEAR     'GENERAT.    '
*                                 'GEOTHERM'   '-AL &       '
*                     'AUTO-      'GENERAT.    'C44=C52     '
*                                 'THERMAL     'GENERAT.    '
*                                 'HYDRO-      'GENERAT.    '
*                                 'OTHER       'GENERAT.    '/
*        'TOTAL      '                                      '/

C     TABLE LINE DATA

 DATA LIN /'        '        '        '        '        '
*          '        '        '        '        '        '
*          '        '        '        '        '        '
*          '        '        '        '        '        '/
 DATA LINE/5,6,16,17,28,29,30,31,32,48,51,57,58,59,60,61,0,0,0,0,0/

C     SPECIAL POSITION INDICATOR
C          PARENTHESES

 DATA IOKB/'(',NOA/67/,NOP/130/
 DATA IEB / 9, 4,   10, 4,   11, 4,   12, 4,   15, 4,   17, 4,
*          18,4,   19, 4,   20, 4,   33, 4,   42, 6,   43, 6,
*          44, 6,   44, 6,   50, 6,    0, 0,    0, 0,    0, 0,
*           0, 0,    0, 0/

C          DATA AVAILABILITY

 DATA NA /' 3, 4,    3,11,    3,14,    3,23,    3,24,    3,27,
*          3,28,    4, 5,    4,27,    4,28,    5, 1,    5, 5,
*          5,28,    5,44,    7,18,   21,43,   21,59,   25, 2,
*         26, 5,   26,46,   28,49,   29,11,   38, 1,   38, 5,
*         38,44,   38,49,   38,55,   39, 1,   39, 5,   39,49,
*         41, 1,   41,24,   41,44,   41,49,   43,24,   43,26,
*         43,34,   43,36,   43,37,   43,39,   43,40,   43,41,
*         43,42,   43,43,   43,44,   43,45,   43,46,   43,47,
*         43,48,   43,55,   49,34,   49,37,   49,39,   49,40,
*         49,41,   49,42,   49,43,   49,44,   49,45,   49,46,
*         49,47,   49,48,   49,49,   49,50,   18,46,   28,39,
*         28,48,    0, 0,    0, 0,    0, 0,    0, 0,    0, 0,
*          0, 0,    0, 0,    0, 0,    0, 0,    0, 0,    0, 0,
*          0, 0,    0, 0/

C          BLANK POSITION OF ORIGINAL UNIT TABLE

 DATA NP1 /42, 6,   42,11,   42,13,   42,17,   42,18,   42,20,
*          42,23,   42,24,   42,26,   42,27,   42,28,   42,29,
*          42,31,   42,32,   42,33,   42,34,   42,36,   42,37,
*          42,38,   42,39,   42,40,   42,41,   42,42,   42,43,
*          42,44,   42,45,   42,46,   42,47,   42,48,   42,49,
*          42,52,   42,55,   42,58,   42,61,   43, 6,   44, 6,
*          44,24,   44,27,   49, 6,   49,13,   49,17,   49,18,
*          49,20,   49,23,   49,24,   49,27,   49,28,   49,29,
*          49,31,   49,32,   49,33,   49,34,   49,36,   49,37,
*          49,38,   49,39,   49,40,   49,41,   49,42,   49,43,
*          49,44,   49,45,   49,46,   49,47,   49,48,   49,49,
*          49,58,   49,61,   50, 6,   50,13,   50,17,   50,28/
 DATA NP2 /50,29,   53, 1,   53, 2,   53, 3,   53, 4,   53, 5,
*          53, 6,   53, 7,   53, 8,   53, 9,   53,11,   53,13,
*          53,14,   53,15,   53,16,   53,17,   53,18,   53,19,
*          53,20,   53,21,   53,22,   53,23,   53,24,   53,25,
*          53,26,   53,27,   53,28,   53,29,   53,30,   53,31,
*          53,32,   53,33,   53,34,   53,35,   53,36,   53,37,
*          53,38,   53,39,   53,40,   53,41,   53,42,   53,43,
*          53,44,   53,45,   53,46,   53,47,   53,48,   53,49,
*          53,52,   53,53,   53,54,   53,55,   53,56,   53,57,
*          53,58,   53,59,   53,60,   53,61,    0, 0,    0, 0,
*           0, 0,    0, 0,    0, 0,    0, 0,    0, 0,    0, 0,
*           0, 0,    0, 0,    0, 0,    0, 0,    0, 0,    0, 0/

C
  DATA BLANK/'   '/,BRA/'('/,KET/')'/,MINUS/'-'/,
*      ICHN/'N'/,ICHAA/'A'/,BLNK/' '/
  DATA LIT /'0','1','2','3','4',
*         '5','6','7','8','9'/
100 FORMAT('1H1///1H ,5X,'ENERGY BALANCES IN INDONESIA',
*      5X,A2,2X,I4,2X,A1///)
101 FORMAT(1H ,30X,10(5X,I2,3X)/)
102 FORMAT(1H ,32X,10(A6,2X))
103 FORMAT(1H ,16A8,A2)
104 FORMAT(1H1//////1H ,12(5X,I2,3X))
105 FORMAT(1H ,2X,12(A8,2X))
106 FORMAT(1H ,15A8)
107 FORMAT(1H ,I2,1X,3A8,3X,10(A2,6A1))
108 FORMAT(1H ,12(A2,6A1))

C          SET INDICATORS OF SPECIAL POSITIONS

      NCOL=93
      NROW=61
      DO 1 I=1,NROW
      DO 1 J=1,NCOL
      IN(J,I)=0
    1 CONTINUE
      DO 2 K=1,IOKB
      I=IEB(1,K)
      J=IEB(2,K)
      IN(I,J)=1
    2 CONTINUE


      DO 4 K=1,NOA
      I=NA(1,K)
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      J=NA(2,K)                                                         KOUT2370
      IF(IN(I,J).EQ.1) GO TO 3                                          KOUT2380
      IN(I,J)=2                                                         KOUT2390
      GO TO 4                                                           KOUT2400
    3 IN(I,J)=4                                                         KOUT2410
    4 CONTINUE                                                          KOUT2420
C                                                                       KOUT2430
      DO 8 K=1,NOP                                                      KOUT2440
      I=NP(1,K)                                                         KOUT2450
      J=NP(2,K)                                                         KOUT2460
      IF(IN(I,J).EQ.1) GO TO 5                                          KOUT2470
      IF(IN(I,J).EQ.2) GO TO 6                                          KOUT2480
      IF(IN(I,J).EQ.4) GO TO 7                                          KOUT2490
      IN(I,J)=3                                                         KOUT2500
      GO TO 8                                                           KOUT2510
    5 IN(I,J)=5                                                         KOUT2520
      GO TO 8                                                           KOUT2530
    6 IN(I,J)=6                                                         KOUT2540
      GO TO 8                                                           KOUT2550
    7 IN(I,J)=7                                                         KOUT2560
    8 CONTINUE                                                          KOUT2570
C                                                                       KOUT2580
C         WRITE TITLE                                                   KOUT2590
C                                                                       KOUT2600
      NO=BLANK                                                          KOUT2610
      IF(IQ.NE.0) NO=LIT(IQ+1)                                          KOUT2620
      WRITE(6,100) FREQ,IY,NO                                           KOUT2630
C                                                                       KOUT2640
C         PRINT OUT ENERGY BALANCES TABLE                               KOUT2650
C                                                                       KOUT2660
      LC=0                                                              KOUT2670
      NC=(NCOL-13)/12                                                   KOUT2680
      DO 50 M=1,NC                                                      KOUT2690
      IF(M.GT.1) GO TO 10                                               KOUT2700
      KC=LC+1                                                           KOUT2710
      LC=LC+10                                                          KOUT2720
      K=10                                                              KOUT2730
      GO TO 11                                                          KOUT2740
   10 KC=LC+1                                                           KOUT2750
      LC=LC+12                                                          KOUT2760
      K=12                                                              KOUT2770
   11 IF(LC.LE.NCOL) GO TO 15                                           KOUT2780
      K=12-LC+NCOL                                                      KOUT2790
      LC=NCOL                                                           KOUT2800
C                                                                       KOUT2810
C         PRINT OUT COLUMN TITLE                                        KOUT2820
C                                                                       KOUT2830
   15 DO 16 I=1,K                                                       KOUT2840
      JCOL(I)=KC+I-1                                                    KOUT2850
   16 CONTINUE                                                          KOUT2860
      IF(M.GT.1)GO TO 18                                                KOUT2870
      WRITE(6,101) (JCOL(I),I=1,K)                                      KOUT2880
      DO 17 J=1,4                                                       KOUT2890
      WRITE(6,102) (TCOL(J,I),I=KC,LC)                                  KOUT2900
   17 CONTINUE                                                          KOUT2910
      KN=K-7                                                            KOUT2920
      WRITE(6,103) (LIN(I),I=1,KN)                                      KOUT2930
      GO TO 20                                                          KOUT2940
C                                                                       KOUT2950
   18 WRITE(6,104) (JCOL(I),I=1,K)                                      KOUT2960
      DO 19 J=1,4                                                       KOUT2970
      WRITE(6,105) (TCOL(J,I),I=KC,LC)                                  KOUT2980
   19 CONTINUE                                                          KOUT2990
      KN=K-3                                                            KOUT3000
      WRITE(6,106) (LIN(I),I=1,KN)                                      KOUT3010
                                                                        KOUT3020
                                                                        KOUT3030
                                                                        KOUT3040
                                                                        KOUT3050
C         PRINT OUT VALUES OF ENERGY BALANCES                           KOUT3060
C                                                                       KOUT3070
   20 IQ=1                                                              KOUT3080
      DO 40 J=1,NRAW                                                    KOUT3090
      DO 35 I=1,K                                                       KOUT3100
      JEB(I)=1                                                          KOUT3110
      MEB(I)=1                                                          KOUT3120
      NI=IN(KC+I-1,J)                                                   KOUT3130
      IF(NI.EQ.1.OR.NI.EQ.4.OR.NI.EQ.5.OR.NI.EQ.7) MEB(I)=-1            KOUT3140
      IF(IPOU.EQ.1.AND.(NI.EQ.3.OR.NI.EQ.5.OR.NI.EQ.6.OR.NI.EQ.7))      KOUT3150
     *   GO TO 31                                                       KOUT3160
C                                                                       KOUT3170
C                 ROUNDING OF VALUES                                    KOUT3180
C                                                                       KOUT3190
      EBV=EB(KC+I-1,J)                                                  KOUT3200
      KK=KC+I-1                                                         KOUT3210
      IF(EBV.EQ.RGNK) GO TO 31                                          KOUT3220
      IF(EBV.GE.0.0) GO TO 21                                           KOUT3230
      IVAL=EBV-0.5                                                      KOUT3240
      GO TO 22                                                          KOUT3250
   21 IVAL=EBV+0.5                                                      KOUT3260
   22 N=0                                                               KOUT3270
      IF(IVAL.LT.0) JEB(I)=-1                                           KOUT3280
      IVAL=IABS(IVAL)                                                   KOUT3290
      IF(IVAL.EQ.0.AND.(NI.EQ.2.OR.NI.EQ.4.OR.NI.EQ.6.OR.NI.EQ.7))      KOUT3300
     *   GO TO 30                                                       KOUT3310
C                                                                       KOUT3320
C                 TRANSFORMATION FROM INTEGER TYPE TO LITERAL TYPE      KOUT3330
C                                                                       KOUT3340
   25 N=N+1                                                             KOUT3350
      JVAL=(IVAL/10)*10                                                 KOUT3360
      JT=IVAL-JVAL                                                      KOUT3370
      IF(JT.EQ.0.AND.IVAL.LT.10) GO TO 26                               KOUT3380
      MEB(8-N,I)=LIT(JT+1)                                              KOUT3390
      IVAL=JVAL/10                                                      KOUT3400
      GO TO 25                                                          KOUT3410
   26 IF(N.GT.1) GO TO 27                                               KOUT3420
      MEB(8-N,I)=LIT(JT+1)                                              KOUT3430
      N=N+1                                                             KOUT3440
C                                                                       KOUT3450
C                 NEGATIVE VALUE CASE                                   KOUT3460
C                                                                       KOUT3470
   27 IF(JEB(I).GT.0) GO TO 28                                          KOUT3480
      MEB(8-N,I)=MINUS                                                  KOUT3490
      N=N+1                                                             KOUT3500
C                                                                       KOUT3510
C                 POSITIVE VALUE CASE                                   KOUT3520
C                                                                       KOUT3530
   28 IF(N.GE.8) GO TO 33                                               KOUT3540
      LL=8-N                                                            KOUT3550
      DO 29 L=1,LL                                                      KOUT3560
      MEB(L,I)=BLANK                                                    KOUT3570
   29 CONTINUE                                                          KOUT3580
      GO TO 33                                                          KOUT3590
C                                                                       KOUT3600
C                 NON-AVAILABILITY OF DATA                              KOUT3610
C                                                                       KOUT3620
   30 MEB(1,I)=BLANK                                                    KOUT3630
      MEB(2,I)=BLANK                                                    KOUT3640
      MEB(3,I)=BLANK                                                    KOUT3650
      MEB(4,I)=BLANK                                                    KOUT3660
      MEB(5,I)=BLANK                                                    KOUT3670
      MEB(6,I)=BLANK                                                    KOUT3680
      MEB(7,I)=BLANK                                                    KOUT3690
      GO TO 33                                                          KOUT3700
C
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