```
C                    BLANK POSITION                                      KOUT3710
C                                                                        KOUT3720
   31 DO 32 L=1,7                                                        KOUT3730
      MEB(L,I)=BLANK                                                     KOUT3740
   32 CONTINUE                                                           KOUT3750
C                                                                        KOUT3760
C                    PARENTHESIS                                         KOUT3770
C                                                                        KOUT3780
   33 IF(NEB(I).LT.0) GO TO 34                                           KOUT3790
      IB(I)=BLANK                                                        KOUT3800
      JB(I)=BLANK                                                        KOUT3810
      GO TO 35                                                           KOUT3820
   34 IB(I)=BRA                                                          KOUT3830
      JB(I)=KET                                                          KOUT3840
   35 CONTINUE                                                           KOUT3850
C                                                                        KOUT3860
C                    PRINT OUT TABLE                                     KOUT3870
C                                                                        KOUT3880
      IF(M.GT.1) GO TO 37                                                KOUT3890
      IF(J.LE.LINE(ID)) GO TO 36                                         KOUT3900
      KN=K-7                                                             KOUT3910
      WRITE(6,103) (LIN(I),I=1,KN)                                       KOUT3920
      ID=ID-1                                                            KOUT3930
   36 WRITE(6,107) J,(TRAW(I,J),I=1,3),(IB(I),(MEB(L,I),L=1,7),         KOUT3940
     *              JB(I),I=1,K)                                         KOUT3950
      GO TO 40                                                           KOUT3960
C                                                                        KOUT3970
C                                                                        KOUT3980
   37 IF(J.LE.LINE(ID)) GO TO 38                                         KOUT3990
      KN=K-3                                                             KOUT4000
      WRITE(6,106) (LIN(I),I=1,KN)                                       KOUT4010
      ID=ID-1                                                            KOUT4020
   38 WRITE(6,110) (IB(I),(MEB(L,I),L=1,7),JB(I),I=1,K)                  KOUT4030
   40 CONTINUE                                                           KOUT4040
   50 CONTINUE                                                           KOUT4050
      RETURN                                                             KOUT4060
      END                                                                KOUT4070
```

3. To read equations of energy balance again from the permanent file and calculate values of individual columns of the energy balance table in accordance with the equations (subroutine EBCALC).

4. Based on the results of calculations, to output the energy balance table (subroutine EBOUT).

4-6. Energy Balance Table (1969–1978)

As an ultimate result of a series of operations including establishment of configuration of rows and columns of an energy balance table, collection of basic statistics on energy, construction of system of energy balance equations and development of software for preparation of an energy balance table, we present in this section an energy balance table (1969–1978) prepared based on data on Indonesia which were collected on an annual basis. 10^3 TCE (tons coal equivalent) is used in the energy balance table as a unified unit.

ENERGY BALANCES IN INDONESIA CA 1989

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C26	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	0		0	0	NA	54299	54259						
2 IMPORT	0	0				69	0	69	0	0	0	0	0
3 EXPORT	0		0	0		-37239	-37239		-7168	-2153	-303	0	
4 (INTERNATIONAL UPLIFT)									(-295)	(-253)	(0)	(0)	
5 STOCK CHANGE	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
6 PRIMARY ENERGY SUPPLY	0	0	0	0	0	15509	15553	49	-7168	-2153	-308	0	0
7 REFINERY						-15220	-15171	-49	14039	10375	2039	33	1
8 NGL(LNG, LPG)									0				
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY	0		NA						-302	-302			
12 PUMP-UP USE													
13 AUTO GENERATION	0		0						-192	-192			
14 TOWN GAS	:	0	NA						-3	-3			
15 COKE	0	0											
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	0	0	0			-15220	-15171	-49	13597	5526	2035	35	1
18 CRUDE OIL FIELD						0	NA						
19 NATURAL GAS FIELD													
20 REFINERY						0	0		0	0			
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT									0				
23 PUBLIC UTILITY									0	0			
24 TOWN GAS									0	0			
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE	0		NA	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	:	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	0	0	0	0	0	-1239	-1239	0	1033	-55	1	-5	0
31 FINAL CONSUMPTION	0		0	0	0				7445	7356	1753	33	1
32 FINAL ENERGY USE	0		0	0	0				7355	7356	1733	33	1
33 INDUSTRY	0		0	0	0				769	769			
34 AGRICULTURE FORESTRY									67	67			
35 FISHERY									0	0			
36 MINING(EXCL.ENERGY SECT.)	0		0	0					323	323			
37 CONSTRUCTION									0	0			
38 MANUFACTURING	0		0	0	0				571	554			
39 FOODS									153	153			
40 TEXTILE									22	23			
41 RUBBER									35	35			
42 PAPER,PULP									25	25			
43 CHEMICAL(EXCL.FUEL USE)									3	3			
44 CERAMICS,CEMENTS	0		0		NA				152	152			
45 IRON,STEEL									0	0			
46 NON-FERROUS METALS	0			0					0	0			
47 METAL FABRI.,MACHINERY									0	0			
48 SMALL WARES,OTHERS	0		0						200	200			
49 RESIDENT.,COMMER.,(TOTAL)									3506	3506			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	0		0						2227	2227	1752	33	1
53 AIR TRANSPORTATION									133	133	33	33	
54 ROAD TRANSPORTATION									1528	1823	1355		1
55 RAILWAYS	0		0						239	233			
56 INTERNAL NAVIGATION									239	233	0		
57 INTERNATIONAL UPLIFT									298	295	0	0	
58 OTHERS(GOVERN.,FORCES ETC)									355	305	0	0	0
59 RAW MATERIAL USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	0			0					92				
61 TOTAL USE IN CHEMISTRY									0	0			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH., ETC)	25 PETROLEUM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	0	0	0	0	0	0	0			0	0	NA	
3 EXPORT	-303	-305		-206	-206	-3	-1333	0	-4906		-7	-34	
4 (INTERNATIONAL UPLIFT)		(0)		(-35)	(-13)	(-21)	(-263)						
5 STOCK CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	-303	-305	0	-236	-234	-3	-1333	0	-4905	0	-7	-34	0
7 REFINERY	2353	373	2939	1795	1355	455	2811	0	3921	4	33	151	0
8 NGL(LNG, LPG)													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY				-205	-133	-25	-57						
12 PUMP-UP USE													
13 AUTO GENERATION				-192	-192	0	0						
14 TOWN GAS			0	-5	-3	-3	0						
15 COKE													
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	2353	373	2939	1255	933	455	2211	0	3321	4	35	151	0
18 CRUDE OIL FIELD					0	0	0						
19 NATURAL GAS FIELD													
20 REFINERY				0	0	0	0	0	0	0	0	0	0
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT								0					
23 PUBLIC UTILITY				0	0	0	0						
24 TOWN GAS				0	0	0							
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	12	32	555	-191	-129	-63	-509	0	1036	0	0	0	0
31 FINAL CONSUMPTION	1756	100	3524	591	502	335	372	0		4	33	53	0
32 FINAL ENERGY USE	1756	100	3524	591	502	330	572	0					0
33 INDUSTRY				455	192	263	316	0					0
34 AGRICULTURE FORESTRY				63	22	13	7						
35 FISHERY				0	0								
36 MINING(EXCL.ENERGY SECT.)				322	35	93	0						
37 CONSTRUCTION				0	0	0	0						
38 MANUFACTURING				237	134	153	322	0					0
39 FOODS				32	33	15	121						
40 TEXTILE				20	15	4	7						
41 RUBBER				25	8	17	0						
42 PAPER,PULP				15	2	3	15						
43 CHEMICAL(EXCL.FUEL USE)				0	2	0	2						
44 CERAMICS,CEMENTS				33	5	22	114	NA					
45 IRON,STEEL				0	0	0	0						
46 NON-FERROUS METALS				0	NA		0						
47 METAL FABRI.,MACHINERY				0	0	0	0						NA
48 SMALL WARES,OTHERS				152	24	13	33						
49 RESIDENT.,COMMER.,(TOTAL)			3524										
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	1756	100		296	375	111	595						
53 AIR TRANSPORTATION		100		0	0								
54 ROAD TRANSPORTATION	1756			73	73	0	0						
55 RAILWAYS				53	45	2	139						
56 INTERNAL NAVIGATION	0			135	63	52	144						
57 INTERNATIONAL UPLIFT		0		35	11	24	253						
58 OTHERS(GOVERN.,FORCES ETC)	0	0		263	234	5	52						
59 RAW MATERIAL USE IN CHEM.								NA					
60 OTHER NON-ENERGY USE										4	33	53	0
61 TOTAL USE IN CHEMISTRY				0	0	0	0	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY (42-52)	43 PUBLIC UTILITY (43-48)	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL &	49 AUTO-GENERAT. (49-52)	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
	0	3975					0				15451	NA	0	17375				513		0	0			0	0	91522
																										49
	-11		0	0	0								0													-45007
																										(-2723
	0						0			0	NA	NA	0													0
	-11	3975	0	0	0		0			0	15451	0	0	17375 (	13073 (	8151 (	2023)	513		0	0 (	1923 (	1923)	0	0	45556
0	19																									-1120
	0	0	0	0																						0
		0	0		0																					0
		NA													229	223	-34	-144		0	0					-597
		0				19	0	0							-56							56	-56	0	0	-133
							0	0																		11
																										0
																										0
0	16	0	0	-	0	19	0	0		0					222	223	-34	-144		0	0	56	-56	0	0	-1335
		0													0							-				0
0	0	-21													0							-				-21
		0																								0
		0																								0
		0													0	0						0				0
		0				0									0	NA						0				0
								0																		0
															0	NA										0
															0							0				0
0	0	-1935				-5									-47	-49	-217	-359		0	0	0	-133	0	0	-1333
0	0	-1555				-5		0							-47	-43	-217	-359		0	0	0	-133	0	0	-2320
0	-2	-1929	0	0	0	0	0	0		2	0	0	0	0												-2200
	0	50			0	16	0			2	15453	0	0	17375	232	119						56				45559
	0	62			0	14	0			3	15451	0	0	17375	232	119						56				45475
	3	60				0	0			0	5522			10315	27	-23						56				21453
											9415			5697	5	NA						5				17355
	NA																									0
															10	NA						10				326
															0	NA						NA				0
	0	40				0	0			0	1257			1419	25	0						23				3345
															5	NA						5				152
															4	NA						4				31
															2	NA						2				37
															1	NA						1				25
		40													0	NA						NA				43
		0				0				0	1257			1415	2	NA						2				2225
							0								0	NA						NA				0
															0	NA						NA				0
							0								0	NA						NA				0
	NA	0													24	NA						24				224
	NA	0				16				0	5725	NA		6651	117	117						xx				15321
	0				0						56		0		0	0										2343
																										133
	0				0								0													1322
											56				0	NA										333
																										229
																										293
															23	25						NA				333
	0	49			0								0													49
																										92
	0	39			0								0		0	0						0				32

ENERGY BALANCES IN INDONESIA IN 1979

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C28	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SULPHUR WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPHALT)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION	0		0	0	NA	62428	62428																			
2 IMPORT		0				532	0	532	0	0	0	0	0	0	0	0	0	0	0	0			0	0	NA	
3 EXPORT	0		0	0		-65745	-65745		-7805	-2459	-436	-5		-629	-32		-44	-46	0	-1369	0	-5235		-7	-29	
4 (INTERNATIONAL UPLIFT)									(-1503)	(-1503)	(0)	(0)			(0)		(-531)	(-243)	(-377)	(-677)						
5 STOCK CHANGE	0	0	NA	NA	NA	+455	0	-455	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	0	0	0	0	0	15760	16593	77	-7805	-2459	-436	-5	0	-629	-32	0	-44	-46	0	-1569	0	-5235	0	-7	-29	0
7 REFINERY						-15205	-15129	-77	15519	10934	2343	32	0	2333	193	3352	1935	1233	637	2452	0	5352	4	32	151	52
8 NGL(INCL. LPG)									1																	
9 CHEMICAL ENERGY									0																	
10 PETROCHEMICAL LPG																					0					
11 PUBLIC UTILITY	0		NA						-371	-371							-250	-225	-25	-121						
12 PUMP-UP USE																										
13 AUTO GENERATION	0		0						-293	-293							-233	-233	0	0						
14 TOWN GAS	0	0	NA						-8	-8						0	-8	-1	-8	0						
15 COKE	0	0																								
16 BRIQUET	0		0																							
17 TRANSFORMATION(TOTAL)	0	0	0			-15205	-15129	-77	15965	10311	2343	32	0	2333	193	3352	1333	773	-604	3362	0	5352	4	39	151	52
18 CRUDE OIL FIELD						0	NA											0	0	0						
19 NATURAL GAS FIELD																										
20 REFINERY						0	0		0	0							0	0	0	0	0	0	0	0	0	0
21 NGL PLANT																										
22 CHEMICAL ENERGY PLANT									0												0					
23 PUBLIC UTILITY									0	0							0	0	0	0						
24 TOWN GAS									0	0							0	0	0							
25 COKE PLANT																										
26 BRIQUET																										
27 COAL MINE	0		NA	NA																						
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	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
30 STATIS TICAL DIFFERENCE	0	0	0	0	0	-555	-555	0	-105	15	-15	-1	0	-35	-37	472	-157	-46	-123	-254	0	-124	0	0	0	0
31 FINAL CONSUMPTION	0		0	0	0				8037	7870	1593	25	5	1555	143	3523	1172	591	492	1135	0		4	31	71	59
32 FINAL ENERGY USE	0		0	0	0				7371	7870	1593	25	9	1359	143	3523	1172	851	492	1139	0					0
33 INDUSTRY	0		0	0	0				1045	1045							555	293	256	237	0					0
34 AGRICULTURE FORESTRY									67	67							51	22	23	17						
35 FISHERY									0	0							0	0								
36 MINING(EX.ENERGY SEC.)	0		0	0					146	146							144	43	131	1						
37 CONSTRUCTION									0	0							0	0	0	0						
38 MANUFACTURING	0		0	0	0				934	836							453	223	245	273	0					0
39 FOODS									126	126							29	22	9	97						
40 TEXTILE									45	45							34	26	9	11						
41 WOOD									55	55							45	33	27	11						
42 PAPER,PULP									30	30							5	3	5	21						
43 CHEMISTRY(FUEL USE)									1	1							0	0	0	1						
44 CERAMICS,CEMENTS	0		0		NA				164	164							35	5	33	122	NA					
45 IRONSTEEL									0	0							0	0	0	0						
46 NON-FERROUS METALS	0			0					0	0							3	NA		3						NA
47 METAL FABRI.,MACHINERY									0	0							0	0	0	0						
48 SMALL WARES,OTHERS	0		0						412	412							383	351	159	122						
49 RESIDENT.,COMMER.(TOTAL)									3526	3523						3523										
50 RESIDENTIAL																										
51 COMMERCIAL																										
52 TRANSPORTATION(TOTAL)	0		0						3078	3275	1593	25	0	1357	143		321	233	113	721						
53 AIR TRANSPORTATION									159	159	25	25			143		0	0								
54 ROAD TRANSPORTATION	0		0						1961	1961	1567		0	1559			93	93	0	0						
55 RAILWAYS									226	226							54	52	3	121						
56 INTERNAL NAVIGATION									263	263	0			0			121	63	71	142						
57 INTERNATIONAL UPLIFT									450	450	0	0			0		52	14	29	497						
58 OTHERS(GOVERN.,FORCES ETC)									224	224	0	0	0	0	0		393	359	6	33						
59 RAW MATERIAL USE IN CHEM.									0												NA					
60 OTHER NON-ENERGY USE	0			0					156														4	31	71	52
61 TOTAL USE IN CHEMISTRY									1	1							0	0	0	1	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY (42-52)	43 PUBLIC UTILITY (43-45)	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL E	49 AUTO-GENERAT. (49-52)	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		4314									15775	NA	0	15531				537		0	0			0	0	102335
	0																									
	-11		0	0	0		0																			532
													0													-53550
	0						0			0	NA	NA	0													(-4501
																										-455
	-11	4314	0	0	0		0			0	15775	0	0	15531	(12021	(9091	(-3713	537		0	0	(2933	(2933	0	0	65717
0	11																									
	1	-50	0	0																						413
		0	0		0																					-39
																										0
		NA																								
															256	254	-103	-151		0	0					-555
		0				17	0	0							-32							32	-52	0	0	-211
							0	0																		1
										0																0
																										0
0	12	-90	0	0	0	17	0	0		0					335	254	-103	-151		0	0	32	-52	0	0	-533
		-1367													0							0				-1367
0	0	-53													0							0				-53
		0																								0
		0																								0
		0																								0
		0				0									-5	-5						0				-5
								0							0	NA						0				0
															0	NA										0
															0							0				0
0	0	-2431				-3									-52	-52	-269	-337		0	0	0	-211	0	0	-2435
0	0	-3341				-3		0							-53	-52	-269	-337		0	0	0	-211	0	0	-3353
0	0	-1	0	0	0	0	0	0		0	0	0	0	0												-551
	1	132			0	NA	0			0	15775	0	0	15531	277	155						52				43517
	1	91			0	14	0			0	15773	0	0	15531	277	155						52				43553
	0	91				0	0			0	10937			11231	112	35						52				22552
	NA										3557			9327	3	NA						5				19773
																										0
															12	NA						12				155
															0	NA						NA				0
	0	91				0	0			0	3239			1324	63	0						63				3533
															5	NA						6				132
															7	NA						7				51
															5	NA						5				52
		91													1	NA						1				31
		0				0									0	NA						NA				33
							0			0	3239			1326	2	NA						2				2779
															0	NA						NA				0
							0								0	NA						NA				0
	NA	0													0	NA						NA				0
															42	NA						42				654
	1	0				14				0	5515	NA		7331	125	125						NA				17535
	0				0						55		0		0	0										3134
	0				0								0													159
											55				0	NA										1553
																										232
																										263
																										459
															34	34						NA				253
	0	91			0								0													91
																										155
	0	152			0								0		0	0						0				324

ENERGY BALANCES IN INDONESIA IN 1971

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C26	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	154		154	0	NA	65265	65265						
2 IMPORT	0	0				570	0	570	1329	1329	1	1	0
3 EXPORT	0		0	0		-48013	-48013		-7539	-1245	-55	-2	
4 (INTERNATIONAL UPLIFT)									(-3373)	(-3373)	(0)	(0)	
5 STOCK CHANGE	-43	0	-43	NA	NA	59	0	69	0	0	0	0	0
6 PRIMARY ENERGY SUPPLY	135	0	135	0	0	17325	17247	639	-6215	86	-55	-1	0
7 REFINERY						-17710	-18076	-634	17350	11089	2425	37	22
8 NGL(LNG), LPG									0				
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY	0		NA						-414	-414			
12 PUMP-UP USE													
13 AUTO GENERATION	-55		-55						-378	-378			
14 TOWN GAS	0	0	NA						-13	-13			
15 COKE	0	0											
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-55	0	-55			-17710	-18375	-634	16575	10286	2426	37	22
18 CRUDE OIL FIELD						0	NA						
19 NATURAL GAS FIELD													
20 REFINERY						0	0		0	0			
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT									0				
23 PUBLIC UTILITY									0	0			
24 TOWN GAS									0	0			
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE	-22		-22	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	3	0	0
29 ENERGY SECTOR USE AND LOSSES	-22	0	-22	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	47	0	47	0	0	224	529	-5	-1593	-1763	-336	-12	-2
31 FINAL CONSUMPTION	54		54	0	0				9755	3599	2262	24	15
32 FINAL ENERGY USE	54		54	0	0				8593	8593	2262	24	15
33 INDUSTRY	53		53	0	0				1234	1214			
34 AGRICULTURE, FORESTRY									85	85			
35 FISHERY									0	0			
36 MINING(EXCL.ENERGY SECT.)	0		0	0					154	154			
37 CONSTRUCTION									0	0			
38 MANUFACTURING	53		53	0	0				975	975			
39 FOODS									156	165			
40 TEXTILE									33	83			
41 RUBBER									60	60			
42 PAPER, PULP									42	42			
43 CHEMIST.(EXCL.FUEL USE)									4	4			
44 CERAMICS, CEMENTS	45		45		NA				202	202			
45 IRONSTEEL									0	0			
46 NON-FERROUS METALS	0			0					0	0			
47 METAL PRODUCT, MACHINERY									0	0			
48 SMALL APPLIANCES	4		4						437	437			
49 RESIDENT., COMMERCIAL(TOTAL)									3908	3905			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	45		45						3236	3236	2262	24	15
53 AIR TRANSPORTATION									215	215	24	24	
54 ROAD TRANSPORTATION									2176	2176	2235		15
55 RAILWAYS	45		45						233	233			
56 INTERNAL NAVIGATION									223	223	0		
57 INTERNATIONAL UPLIFT									332	332	0		
58 OTHERS(GOVERN., FORCES ETC)												0	
59 RAW MATERIAL USE IN CHEM.									247	247	0	0	0
60 OTHER NON-ENERGY USE	0			0					0				
61 TOTAL USE IN CHEMISTRY									156				
									4	4			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPHTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPHALT)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	0	0	1352	10	10	0	255			0	0	NA	
3 EXPORT	-57	0		0	0	0	-1185	0	-6184			-102	
4 (INTERNATIONAL UPLIFT)		(0)		(-753)	(-53)	(-731)	(-2521)						
5 STOCK CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	-57	0	1352	10	10	0	-931	0	-6184	0	0	-102	0
7 REFINERY	2355	215	3550	2222	1555	655	3375	0	6023	3	15	335	52
8 NGL(LNG), LPG													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY				-250	-221	-39	-154						
12 PUMP-UP USE													
13 AUTO GENERATION				-372	-375	0	0						
14 TOWN GAS			0	-13	-1	-12	0						
15 COKE													
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	2355	215	3550	1573	355	515	3221	0	6023	3	15	335	52
18 CRUDE OIL FIELD													
19 NATURAL GAS FIELD					0	0	0						
20 REFINERY													
21 NGL PLANT				0	0	0	0	0	0	0	0	0	0
22 CHEMICAL ENERGY PLANT													
23 PUBLIC UTILITY								0					
24 TOWN GAS				0	0	0	0						
25 COKE PLANT				0	0	0							
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	-231	-26	-232	-173	-33	-90	-1059	0	151	0	0	0	0
31 FINAL CONSUMPTION	2219	192	3935	1439	332	526	1332	0		3	15	34	52
32 FINAL ENERGY USE	2219	192	2935	1439	332	526	1332	0					0
33 INDUSTRY				373	375	355	441	0					0
34 AGRICULTURE, FORESTRY				52	33	22	27						
35 FISHERY				0	0								
36 MINING(EXCL.ENERGY SECT.)				154	44	115	0						
37 CONSTRUCTION				0	0	0	0						
38 MANUFACTURING				559	332	259	416	0					0
39 FOODS				42	22	22	118						
40 TEXTILE				64	32	32	19						
41 RUBBER				45	24	24	12						
42 PAPER, PULP				15	6	11	27						
43 CHEMIST.(EXCL.FUEL USE)				0	0	0	4	NA					
44 CERAMICS, CEMENTS				53	8	41	152						
45 IRONSTEEL				0	0	0	0						
46 NON-FERROUS METALS				0	NA		0						
47 METAL PRODUCT, MACHINERY				0	0	0	0						NA
48 SMALL APPLIANCES				335	235	135	81						
49 RESIDENT., COMMERCIAL(TOTAL)			3935										
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	2219	192		432	323	124	547						
53 AIR TRANSPORTATION		192		0	0								
54 ROAD TRANSPORTATION	2219			135	135	0	0						
55 RAILWAYS				54	52	2	138						
56 INTERNAL NAVIGATION				153	115	53	165						
57 INTERNATIONAL UPLIFT	0			75	5	73	252						
58 OTHERS(GOVERN., FORCES ETC)		0											
59 RAW MATERIAL USE IN CHEM.	0	0		233	197	6	44						
60 OTHER NON-ENERGY USE								NA					
61 TOTAL USE IN CHEMISTRY										3	15	34	52
				0	0	0	4	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 ENG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL S	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		4592									15255	NA	0	15321				619		0	0			0	0	138231
	0						0																			1396
	-9		0	0	0								0													-55552
																										(-3271
	0						0			0	NA	NA	0													22
	-5	4592	0	0	0		0			0	15255	0	0	15321	(16771)	(10331)	(4141)	619		0	0	(4441)	(4441)	0	0	54599
0	12																									-1333
	0	-156	0	0																						-156
		0	0		0																					0
		NA													237	287	-314	-173		0	0					-265
															126							324	-324	0	0	-320
		0				13	0	0																		5
							0	0																		0
										0																0
0	12	-156	0	0	0	15	0	0		0					412	257	-314	-173		0	0	324	-324	0	0	-2553
															0							0				
		-1315																								-1315
0	0	-45													0							0				-45
		0																								0
		0																								2
		0													-9	-9						0				-5
		0				0									0	NA						0				0
								0																		0
															0	NA										0
															-13							-15				-41
0	0	-2305				-3									-53	-53	-332	-445		0	0	0	-333	0	5	-2376
0	0	-4259				-3		0							-37	-59	-333	-445		0	0	-13	-333	0	0	-4352
0	-3	-3	0	0	0	-0	0	0		0	0	0	0	0												-737
	2	159			0	15	0			0	15255	0	0	15321	265	219						136				45925
	3	76			3	15	0			0	15255	0	0	15321	325	219						135				45592
	0	79				0	0			0	10011			10435	142	33						125				22337
											9531			9559	9	NA						5				13556
	NA																									0
															32	NA						12				157
															0	NA						NA				0
	0	75				0	0			0	1583			1443	55	0						35				4133
															5	NA						2				113
															9	NA						0				92
															7	NA						7				67
															1	NA						1				62
		75													0	NA						NA				36
		0				0				0	1512			1442	0	NA						2				3253
							0								0	NA						NA				0
															0	NA						NA				0
							0								0	NA						NA				0
	NA	0													55	NA						55				419
	3	0				15				0	3203	NA		3322	141	142						NA				29335
	0				0						41		0		0	0										3359
																										215
	0				0								0													2174
											41				0	NA										315
																										222
																										337
															141	41						NA				252
	0	33			0								0													79
																										154
	0	159			0								0		0	0						0				153

ENERGY BALANCES IN INDONESIA CA 1972

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRA-CITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C05-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLE-UM PRODUCTS C09-C26	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	157		167	0	NA	29270	29270						
2 IMPORT	12	12				162	0	162	1956	1922	0	0	0
3 EXPORT	0		0	0		-55947	-55947		-9791	-791	0	0	
4 (INTERNATIONAL UPLIFT)									(-2201)	(-2203)	(0)	(0)	
5 STOCK CHANGE	17	0	15	2	NA	100	0	100	0	0	0	0	0
6 PRIMARY ENERGY SUPPLY	155	12	132	2	0	20535	20323	262	-7027	1135	0	0	0
7 REFINERY						-20355	-20123	-262	19957	10365	2183	23	43
8 NGL(ENG. LPG)													
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG									0				
11 PUBLIC UTILITY	0		NA										
12 PUMP-UP USE									-355	-355			
13 AUTO GENERATION	-67		-57										
14 TOWN GAS	-12	-12	NA						-431	-431			
15 COKE	0	0							-17	-17			
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-33	-12	-55			-20355	-20123	-252	19154	5553	2153	22	43
18 CRUDE OIL FIELD						0	NA						
19 NATURAL GAS FIELD													
20 REFINERY													
21 NGL PLANT						0	0		0	0			
22 CHEMICAL ENERGY PLANT													
23 PUBLIC UTILITY									0				
24 TOWN GAS									0	0			
25 COKE PLANT									0	0			
26 BRIQUET													
27 COAL MINE	-125		-126	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-125	0	-125	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	93	0	93	0	0	-200	-200	0	-1549	-1152	-60	-2	-1
31 FINAL CONSUMPTION	53		79	2	0				9776	9562	2122	22	33
32 FINAL ENERGY USE	73		79	0	0				9549	9562	2122	22	33
33 INDUSTRY	53		51	0	0				1516	1516			
34 AGRICULTURE FORESTRY									85	85			
35 FISHERY									0	0			
36 MINING(EX.ENERGY SEC.)	0		0	0					157	157			
37 CONSTRUCTION									0	0			
38 MANUFACTURING	55		53	0	0				1272	1272			
39 FOODS									150	133			
40 TEXTILE									159	159			
41 RUBBER									80	83			
42 PAPER,PULP									58	55			
43 CHEMISTRY(FUEL USE)									55	55			
44 CERAMICS,CEMENTS	47		47		NA				333	333			
45 IRONSTEEL									13	13			
46 NON-FERROUS METALS	0			0					0	0			
47 METAL FABRI.,MACHINERY									0	0			
48 SMALL WARES,OTHERS	4		4						352	352			
49 RESIDENT.,COMMER.(TOTAL)													
50 RESIDENTIAL									4255	4249			
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	23		23						3522	3522	2122	22	33
53 AIR TRANSPORTATION									274	274	22	22	
54 ROAD TRANSPORTATION									2539	2533	2151		33
55 RAILWAYS	28		28						193	193			
56 INTERNAL NAVIGATION									293	293	0		
57 INTERNATIONAL UPLIFT									220	220	0	0	
58 OTHERS(GOVERN.,FORCES ETC)									256	256	0	0	0
59 RAW MATERI. USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	2			2					231				
61 TOTAL USE IN CHEMISTRY									95	95			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRI-CANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH.,ETC)	26 PETROLE-UM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	0	15	510	0	0	0	1335			9	0	33	
3 EXPORT	0	0		0	0	0	-791	0	-8900			-95	
4 (INTERNATIONAL UPLIFT)		(0)		(0)	(0)	(0)	(-2203)						
5 STOCK CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	0	15	510	0	0	0	607	0	-8900	9	0	-63	0
7 REFINERY	2113	263	3147	2751	1720	1041	2027	353	8933	7	23	156	54
8 NGL(ENG. LPG)													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY													
12 PUMP-UP USE				-253	-139	-56	-102						
13 AUTO GENERATION													
14 TOWN GAS				-431	-431	0	0						
15 COKE			0	-17	-1	-17	0						
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	2315	265	3167	2553	1339	1570	1525	353	8933	7	23	155	54
18 CRUDE OIL FIELD					0	0	0						
19 NATURAL GAS FIELD													
20 REFINERY													
21 NGL PLANT				0	0	0	0	0	0	0	0	0	0
22 CHEMICAL ENERGY PLANT								0					
23 PUBLIC UTILITY													
24 TOWN GAS				0	0	0	0						
25 COKE PLANT				0	0	0							
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	-51	-11	573	-252	215	-457	-1422	-353	-34	0	0	0	0
31 FINAL CONSUMPTION	2362	252	4249	1633	1305	503	1110	0		15	23	133	54
32 FINAL ENERGY USE	2362	252	4249	1533	1305	503	1110	0					0
33 INDUSTRY				549	433	419	565	0					0
34 AGRICULTURE FORESTRY				52	40	22	23						
35 FISHERY				0	0								
36 MINING(EX.ENERGY SEC.)				153	69	105	4						
37 CONSTRUCTION				0	3	5	0						
38 MANUFACTURING				536	348	292	635	0					0
39 FOODS				55	41	25	114						
40 TEXTILE				117	46	13	41						
41 RUBBER				51	20	21	19						
42 PAPER,PULP				15	3	9	35						
43 CHEMISTRY(FUEL USE)				7	6	1	55	NA					
44 CERAMICS,CEMENTS				77	9	63	255						
45 IRONSTEEL				5	4	1	5						
46 NON-FERROUS METALS				5	NA		6						NA
47 METAL FABRI.,MACHINERY				0	0	0	5						
48 SMALL WARES,OTHERS				254	133	55	75						
49 RESIDENT.,COMMER.(TOTAL)													
50 RESIDENTIAL			4249										
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	2362	252		355	726	62	392						
53 AIR TRANSPORTATION		252		0	0								
54 ROAD TRANSPORTATION	2362			433	433	0	0						
55 RAILWAYS				45	65	1	151						
56 INTERNAL NAVIGATION	0			232	228	63	11						
57 INTERNATIONAL UPLIFT		0		0	0	0	220						
58 OTHERS(GOVERN.,FORCES ETC)	0	0		193	170	23	63						
59 RAW MATERI. USE IN CHEM.								NA					
60 OTHER NON-ENERGY USE										15	23	133	54
61 TOTAL USE IN CHEMISTRY				7	5	1	53	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDENSATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRICULTURAL WASTES	42 TOTAL OF ELECTRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERMAL &	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		5716									20319	NA	0	17172				557		0	0			0	0	123710
	0						0																			
	-6		0	0	0																					2038
													0													-53738
	0						0			0	NA	NA	0													(-2231)
																										117
	-6	5716	0	0	0		0			0	20319	0	0	17172	(14221)	(9221)	(3551)	557		0	0	(5001)	(5001)	0	0	57226
0	19																									
	0	-253	0	0																						-428
		0	0		0																					-253
																										0
		NA																								
															309	309	-151	-159		0	0					-512
															145											
		0				21	0	0														140	-140	0	0	-350
							0	0																		-3
										0																0
																										0
0	30	-253	0	0	0	21	0	0		0					449	309	-151	-159		0	0	140	-140	0	0	-1551
		-1159													0							0				
0	0	-39																								-1159
		0													0							0				-39
		0																								0
		0																								0
		0				0									-9	-9						0				-9
															0	NA						0				0
								0																		0
															0	NA										0
0	0	-3931				-5									-19							-19				-145
															-53	-53	-204	-403		0	0	0	-350	0	0	-3773
0	0	-5109				-5		0							-35	-77	-204	-403		0	0	-19	-350	0	0	-5337
0	0	-18	0	0	0	0	0	0		0	0	0	0	0												-1574
	5	336			0	15	0			0	23319	0	0	17172	353	233						121				48556
	5	157			0	16	0			0	23319	0	0	17172	353	233						121				48155
	0	157				0	0			0	15233			8555	159	38						121				21750
	NA										5970			7405	38	NA						11				15471
																										0
															34	NA						34				171
															0	NA						NA				0
	0	157				0	0			0	1914			1559	95	0						95				5379
															12	NA						12				193
															12	NA						12				171
															3	NA						5				38
															2	NA						2				56
		157																								
															2	NA						2				263
		0				0				0	1914			1559												
															3	NA						3				3376
							0																			
															1	NA						1				16
															0	NA						NA				0
							0																			
															0	NA						NA				0
	NA	0																								
															55	NA						55				422
	6	0				15				0	5917	NA		8187	451	351						NA				22527
	0				0						19		0		0	0										3569
	0				0								0													274
																										2539
											19				0	NA										
																										266
																										293
																										220
															43	43						NA				239
	0	157			0								0													157
																										232
	0	336			0								0		2	0						2				431

ENERGY BALANCES IN INDONESIA   SA 1979

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C28	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH.,ET)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION	143		137	6	NA	97903	97903																			
2 IMPORT	2	2				223	0	223	2555	2539	0	3	0	0	151	600	331	331	0	1567			13	2	14	
3 EXPORT	0		0	0		-14056	-14056		-12310	-70	0	3		3	0		0	0	0	-70	0	-12115			-125	
4 (INTERNATIONAL UPLIFT)									(-2481)	(-2481)	(0)	(0)			(0)		(0)	(0)	(0)	-2431						
5 STOCK CHANGE	32	0	-22	NA	NA	204	0	204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	175	3	159	6	0	24271	23265	425	-9745	2459	3	3	3	0	151	600	331	331	0	1522	0	-12115	13	2	-111	0
7 REFINERY						-24203	-23773	-425	23209	10526	2452	5	73	2333	202	4303	3195	2224	371	754	203	12035	7	24	267	65
8 NGL(LNG, LPG)									0																	
9 CHEMICAL ENERGY									0																	
10 PETROCHEMICAL LPG																										
11 PUBLIC UTILITY	0		NA						-447	-447							-332	-255	-65	-115	0					
12 PUMP-UP USE																										
13 AUTO GENERATION	-65		-65						-576	-576							-575	-575	0	0						
14 TOWN GAS	-3	-3	NA						-21	-21						0	-21	-1	-20	0						
15 COKE	2	0																								
16 BRIQUET	0		0																							
17 TRANSFORMATION(TOTAL)	-63	-3	-65			-24203	-23773	-425	22165	9592	2452	5	73	2333	202	4303	2255	1433	735	-569	203	12330	7	24	267	65
18 CRUDE OIL FIELD						0	NA																			
19 NATURAL GAS FIELD																										
20 REFINERY						0	0		0	0								0	0	0						
21 NGL PLANT																	0	0	0	0	0	0	0	0	0	0
22 CHEMICAL ENERGY PLANT									0																	
23 PUBLIC UTILITY									0	0											0					
24 TOWN GAS									0	0							0	0	0	0						
25 COKE PLANT																	0	0	0							
26 BRIQUET																										
27 COAL MINE	-12		-83	NA																						
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-13	0	-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	-32	0	-31	-1	0	-58	-58	0	-1107	-983	-117	-2	-2	-111	-14	357	-239	-55	-174	-375	-233	85	0	3	0	2
31 FINAL CONSUMPTION	33		32	3	0				11313	11063	2345	4	72	2272	343	4759	2358	1767	612	1252	0		17	35	135	65
32 FINAL ENERGY USE	53		53	3	3				11077	11063	2345	4	73	2272	343	4759	2352	1747	512	1252	0					3
33 INDUSTRY	43		43	0	0				1835	1835							1035	575	559	750	0					3
34 AGRICULTURE FORESTRY									106	106							35	54	26	26						
35 FISHERY									0	0							0	0								
36 MINING(EX.ENERGY SEC.)	0		0	0					197	197							192	55	127	4						
37 CONSTRUCTION									0	0							0	0	0	0						
38 MANUFACTURING	43		43	0	0				1532	1532							812	457	355	720	0					0
39 FOODS									214	214							55	55	33	128						
40 TEXTILE									195	195							162	59	89	47						
41 RUBBER									59	59							73	40	33	21						
42 PAPER,PULP									63	63							22	13	11	45						
43 CHEMICAL(FUEL USE)									103	103							9	9	1	99	NA					
44 CERAMICS,CEMENTS	33		32		NA				386	386							55	12	93	233						
45 IRONSTEEL									15	15							7	5	1	9						
46 NON-FERROUS METALS	0			0					0	0							0	NA		0						
47 METAL FABRI.,MACHINERY									0	0							0	0	0	3						NA
48 OTHERS	5		5						457	457							359	255	104	53						
49 RESIDENT.,COMMER.(TOTAL)									4774	4359						4759										
50 RESIDENTIAL																										
51 COMMERCIAL																										
52 TRANSPORTATION(TOTAL)	37		37						3342	3342	2345	4	55	2373	343		1512	342	35	431						
53 AIR TRANSPORTATION									352	352	4	4			343		0	0								
54 ROAD TRANSPORTATION									2628	2623	2342		55	2373			555	555	0	0						
55 RAILWAYS	33		33						232	232							62	55	2	133						
56 INTERNAL NAVIGATION									332	332	0			0			373	255	13	12						
57 INTERNATIONAL UPLIFT									243	243	0	0			0		6	9	0	243						
58 OTHERS(GOVERN.,FORCES ET)									522	622	200	5	1	239	0		255	223	28	31						
59 RAW MATERIAL USE IN CHEM.									0																	
60 OTHER NON-ENERGY USE	3			3					235												NA					
61 TOTAL USE IN CHEMISTRY									135	103							9	3	1	93	0		17	35	135	65

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL E	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		7055									23554	NA	0	20133				690		0	0			0	0	143973
	0						0																			2786
	-1		0	0	0								0													-35357
																										(-2491)
	0						0			0	NA	NA	0													235
	-1	7055	0	0	0		0			0	23554	0	0	20130	(13593	(16333	(4473)	690		0	0	(6223	(6223	0	0	65631
0	15																									-991
	0	-273	0	0																						-273
		0	0		0																					0
		NA													356	356	-179	-193		0	0					-716
															176							176	-176	0	0	-463
		0				22	0	0																		-2
							0	0																		0
										0																0
0	15	-273	0	0	0	22	0	0		0					533	356	-170	-193		0	0	176	-176	0	0	-2491
															0											
		-1491																								-1491
0	0	-54													0							0				-55
		0																								0
		0																								0
		0													-10	-10						0				-10
		0				0									0	NA						0				0
								0																		0
															0	NA										0
															-13							-13				-26
0	0	-5335				-6									-35	-55	-277	-497		0	0	0	-463	0	0	-5926
0	0	-6550				-6		0							-103	-56	-277	-497		0	0	-13	-462	0	0	-6718
0	0	143	0	0	0	0	0	0		0	0	0	0	0												-1054
	14	336			0	15	0			0	23554	0	0	20130	429	267						151				55359
	14	157			0	15	0			0	23554	0	0	20135	429	267						151				54553
	0	157				0	0			0	12275			13335	227	55						153				25455
											10765			9327	15	NA						15				20257
	NA																									0
															13	NA						13				235
															0	NA						NA				0
	0	157				0	0			0	3527			1421	123	0						122				4939
															15	NA						15				229
															17	NA						17				211
															11	NA						11				310
															3	NA						2				63
		157													2	NA						2				272
		0				0				0	3527			1423	3	NA						3				3474
							0								2	NA						2				17
															0	NA						NA				0
							0								0	NA						NA				0
	NA	0													74	NA						74				537
	14	0				14				0	10673	NA		9322	155	155						NA				24550
	0				0						5		0		0	0										3335
																										352
	0				0								0													2528
											5				0	NA										275
																										332
																										243
															35	35						NA				653
	0	157			0								0													157
																										238
	0	336			0								0		2	0						2				445

ENERGY BALANCES IN INDONESIA IN 1976

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRA-CITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLE-UM PRODUCTS C09-C25	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	143		140	9	NA	100553	100553						
2 IMPORT	1	1				195	0	195	2869	2769	0	0	0
3 EXPORT	0		0	0		-75933	-75533		-3972	-522	-522	0	
4 (INTERNATIONAL UPLIFT)									(-459)	(-459)	(-23)	(-23)	
5 STOCK CHANGE	-7	0	-7	NA	NA	-1550	-1593	37	0	0	0	0	0
6 PRIMARY ENERGY SUPPLY	142	1	133	9	0	23283	23345	232	-1133	2246	-522	0	0
7 REFINERY						-24037	-23355	-232	23555	12275	2453	27	33
8 NGL(CONS, LPG)									4				
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY	0		NA						-452	-452			
12 PUMP-UP USE													
13 AUTO GENERATION	-57		-57						-363	-363			
14 TOWN GAS	-1	-1	NA						-23	-23			
15 COKE	0	5											
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-53	-1	-57			-24037	-23355	-232	23042	11927	2453	27	33
18 CRUDE OIL FIELD						-505	-505						
19 NATURAL GAS FIELD													
20 REFINERY						0	0		0	0			
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT									0				
23 PUBLIC UTILITY									0	0			
24 TOWN GAS									0	0			
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE	-13		-13	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-13	0	-13	0	0	-505	-505	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	2	0	5	-1	0	1332	1332	0	-2642	-1229	124	-2	7
31 FINAL CONSUMPTION	92		75	7	0				13267	12944	2553	25	33
32 FINAL ENERGY USE	75		75	0	0				12975	12944	2553	25	35
33 INDUSTRY	43		43	0	0				1772	1772			
34 AGRICULTURE FORESTRY									149	149			
35 FISHERY									0	5			
36 MINING(EX.ENERGY SEC.)	0		0	0					255	255			
37 CONSTRUCTION									7	7			
38 MANUFACTURING	43		43	0	0				1352	1352			
39 FOODS									235	235			
40 TEXTILE									232	232			
41 RUBBER									93	93			
42 PAPER,PULP									52	82			
43 CHEMISTRY(EX.FUEL USE)									124	124			
44 CERAMICS,CEMENTS	37		37		NA				442	442			
45 IRON,STEEL									44	44			
46 NON-FERROUS METALS	0			0					0	0			
47 METAL FABRI.,MACHINERY									3	3			
48 SMALL WARES,OTHERS	5		5						4	4			
49 RESIDENT.,COMMER.(TOTAL)									5539	5499			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	32		32						5091	5091	2355	33	55
53 AIR TRANSPORTATION									322	322	13	13	
54 ROAD TRANSPORTATION									3769	3769	2245		55
55 RAILWAYS	32		32						155	155			
56 INTERNAL NAVIGATION									377	377	1		
57 INTERNATIONAL UPLIFT									459	459	2	2	
58 OTHERS(GOVERN.,FORCES ETC)									592	592	235	2	0
59 RAW MATERI. USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	7			7					291				
61 TOTAL USE IN CHEMISTRY									126	124			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRI-CANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH.,ETC)	26 PETROLE-UM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	0	212	1156	452	453	0	543			15	4	53	
3 EXPORT	-522	0		0	0	0	0	0	-9324			-142	
4 (INTERNATIONAL UPLIFT)		(-1141)		(-351)	(-13)	(-371)	(-3051)						
5 STOCK CHANGE	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	-522	212	1156	452	453	0	543	0	-9324	15	4	-91	0
7 REFINERY	2352	235	4335	3357	2595	971	1319	345	9371	6	30	233	43
8 NGL(CONS, LPG)													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY				-357	-255	-71	-55						
12 PUMP-UP USE													
13 AUTO GENERATION				-353	-352	0	0						
14 TOWN GAS			0	-23	-1	-22	0						
15 COKE													
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	2352	235	4335	2115	2237	272	1723	345	9371	6	30	233	43
18 CRUDE OIL FIELD													
19 NATURAL GAS FIELD					0	0	0						
20 REFINERY				0	0	0	0	0	0	0	0	0	0
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT								0					
23 PUBLIC UTILITY				0	0	0	0						
24 TOWN GAS				0	0	0							
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	833	-45	2	-537	-331	-135	-1207	-345	-557	0	0	0	0
31 FINAL CONSUMPTION	2325	451	5459	2935	2303	632	1353	0		22	34	193	43
32 FINAL ENERGY USE	2525	451	5477	2935	2303	632	1355	0					0
33 INDUSTRY				517	253	554	156	0					0
34 AGRICULTURE FORESTRY				114	31	33	35						
35 FISHERY				0	0								
36 MINING(EX.ENERGY SEC.)				155	33	123	53						
37 CONSTRUCTION				7	0	7	0						
38 MANUFACTURING				600	209	391	752	0					0
39 FOODS				35	42	47	142						
40 TEXTILE				233	33	155	59						
41 RUBBER				75	63	27	21						
42 PAPER,PULP				24	11	13	33						
43 CHEMISTRY(EX.FUEL USE)				19	15	4	155						
44 CERAMICS,CEMENTS				113	15	121	329	NA					
45 IRON,STEEL				33	5	27	11						
46 NON-FERROUS METALS				0	NA		0						
47 METAL FABRI.,MACHINERY				2	0	2	0						NA
48 SMALL WARES,OTHERS				4	0	4	0						
49 RESIDENT.,COMMER.(TOTAL)			5459										
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	2251	433		1359	1143	116	443						
53 AIR TRANSPORTATION		305		0	0								
54 ROAD TRANSPORTATION	2251			1433	1357	14	0						
55 RAILWAYS				55	54	1	100						
56 INTERNAL NAVIGATION	1			353	203	63	33						
57 INTERNATIONAL UPLIFT		114		35	1	37	305						
58 OTHERS(GOVERN.,FORCES ETC)	233	32		235	197	32	55						
59 RAW MATERI. USE IN CHEM.								NA					
60 OTHER NON-ENERGY USE										22	34	193	43
61 TOTAL USE IN CHEMISTRY				19	15	4	155	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDENSATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL 5	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		7276																								
	0										25193	NA	0	19293				902								
	-5		0	0	0		0													0	0			0	0	153233
	0												0													3335
							0																			-35905
										0	NA	NA	0													(-4591)
	-5	7276	0	0	0																					-1559
							0			0	25192	0	0	19293 (	15941 (	12551 (	4521	902								
0	22																			0	0 (	4191 (	4191	0	0	59355
	4	-259	0	0																						
		0	0		0																					+202
		NA																								-255
																										0
															493	493	-173	-225		0	0					
		0																								-553
						22	0	0							197											
							0	0														117	-117	0	0	-392
										0																-2
0	35	-259	0	0	0	22	0	0		0																0
															531	493	-173	-225		0	0	117	-117	0	0	-1532
0	0	-1227													0											
		-223																				0				-506
		0													0											-1551
		0																				0				-220
		0																								0
		0																								0
						0									-12	-12										
								0							0	NA						0				-12
																										0
															0	NA										0
0	0	-4542				-6									-15											0
															-100	-100	-254	-573				-15				-25
0	0	-5565																		0	0	0	-304	0	0	-4553
						-6		0																		
															-127	-111	-254	-578								
0	0	0	0	0	0	0	0	0												0	0	-95	-352	0	0	-7233
										0	0	0	0	0												
	22	353			0	15	0																			-1322
										0	25973	0	0	19292	393	252										
	32	191			0	15	0															132				55693
										0	25855	0	0	19292	393	292										
	0	390				0	0															102				58135
										0	12239			5435	133	22										
	NA										17283			7222	23	NA						122				24378
																						27				13225
															23	NA										3
	0	390				0	0			0	2175				0	NA						22				215
														1557	53	0						NA				7
															12	NA						53				5435
															22	NA						12				242
															11	NA						22				313
		157													3	NA						11				912
		23				0									4	NA						3				65
										0	2175			1657	5	NA						4				245
							0								2	NA						5				4355
	NA	0					0								0	NA						2				45
															0	NA						NA				0
															0	NA						NA				2
	32	1																				NA				5
						15				0	12233	NA		9302	176	175										
																						NA				28322
	0				0																					
											11		0		0	0										
	0				0																					5535
													0													322
											61				0	NA										3763
																										225
																										327
																										459
	0	167			0										23	23										
																						NA				683
													0													
																										167
	0	336			0																					
																										293
													0		4	0										
																						4				583

ENERGY BALANCES IN INDONESIA OF 1975

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRA-CITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLE-UM PRODUCTS C09-C26	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRI-CANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH.,ET)	26 PETROLE-UM COKE
1 DOMESTIC PRODUCTION	152		133	5	NA	55562	55562																			
2 IMPORT	5	5				122	0	122	2795	2226	0	0	0	0	457	1273	945	945	0	35			14	7	42	
3 EXPORT	0		0	0		-22759	-22759		-8563	-727	-727	0		-727	0		0	0	0	0	-727	-7367			-35	
4 (INTERNATIONAL UPLIFTS)									(-4373)	(-4373)	(-33)	(-33)			(-1353)		(-453)	(-33)	(-333)	(-2363)						
5 STOCK CHANGE	-2	0	-2	NA	NA	-355	-355	-5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA
6 PRIMARY ENERGY SUPPLY	154	5	133	5	0	22568	22452	116	-6567	1995	-727	0	0	-727	457	1273	945	945	0	35	-727	-7367	14	7	13	0
7 REFINERY						-21713	-21595	-116	23352	12393	2501	33	123	2567	100	4350	4037	3009	1023	1555	320	7333	7	25	113	55
8 NGL(LNG, LPG)									3																	
9 CHEMICAL ENERGY									0												0					
10 PETROCHEMICAL LPG																										
11 PUBLIC UTILITY	0		NA						-533	-803							-453	-335	-55	-365						
12 PUMP-UP USE																										
13 AUTO GENERATION	-77		-77						-665	-665							-665	-665	0	0						
14 TOWN GAS	-5	-5	NA						-21	-21						0	-21	-1	-19	0						
15 COKE	-6	-6																								
16 BRIQUET	0		0																							
17 TRANSFORMATION(TOTAL)	-33	-5	-77			-21713	-21596	-116	20052	11519	2531	33	123	2567	100	4350	3109	2157	942	1259	320	7333	7	22	113	55
18 CRUDE OIL FIELD						-535	-535											0	0	0						
19 NATURAL GAS FIELD																										
20 REFINERY						0	0		0	0							0	0	0	0	0	0	0	0	0	0
21 NGL PLANT																										
22 CHEMICAL ENERGY PLANT									0												0					
23 PUBLIC UTILITY									0	0							0	0	0	0						
24 TOWN GAS									0	0							0	0	0							
25 COKE PLANT																										
26 BRIQUET																										
27 COAL MINE	-7		-7	NA																						
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-7	0	-7	0	0	-535	-535	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATIS TICAL DIFFERENCE	-5	0	-6	-1	0	-359	-350	0	947	1072	442	-7	5	144	-25	534	-233	-193	-39	-55	-93	-33	0	0	0	0
31 FINAL CONSUMPTION	55		92	7	0				14985	14559	2915	25	125	2353	542	5222	3771	2915	553	1239	0		21	35	133	55
32 FINAL ENERGY USE	52		52	0	0				14737	14589	2915	25	125	2353	542	5222	3771	2318	653	1239	0					0
33 INDUSTRY	45		45	0	0				1952	1852							1135	445	655	823	0					0
34 AGRICULTURE FORESTRY									153	153							123	91	29	33						
35 FISHERY									0	0							0	0								
36 MINING(EX.ENERGY SEC.)	0		0	0					190	190							179	77	132	1						
37 CONSTRUCTION									8	8							3	0	3	0						
38 MANUFACTURING	45		45	0	0				1621	1521							832	277	555	193	0					0
39 FOODS									285	285							143	51	92	145						
40 TEXTILE									392	392							315	111	207	73						
41 RUBBER									93	93							97	44	43	12						
42 PAPER,PULP									69	69							27	13	17	41						
43 CHEMISTRY(FUEL USE)									177	177							29	21	8	149	NA					
44 CERAMICS,CEMENTS	43		43		NA				524	524							372	24	145	351						
45 IRONSTEEL									65	65							45	15	31	19						
46 NON-FERROUS METALS	0			0					0	0							0	NA		0						NA
47 METAL FABRI.,MACHINERY									3	3							3	0	3	0						
48 SMALL WARES,OTHERS	5		5						5	5							5	0	5	0						
49 RESIDENT.,COMMER.(TOTAL)									6210	6222						5222										
50 RESIDENTIAL																										
51 COMMERCIAL																										
52 TRANSPORTATION(TOTAL)	47		47						5532	5532	2603	15	125	2457	515		2311	2223	163	345						
53 AIR TRANSPORTATION									336	386	15	15			379		0	0								
54 ROAD TRANSPORTATION									4477	4477	2533		125	2457			1536	1377	15	0						
55 RAILWAYS	47		47						163	163							55	54	2	133						
56 INTERNAL NAVIGATION									379	319	0			0			377	293	87	2						
57 INTERNATIONAL UPLIFT									417	417	3	3			135		45	2	35	236						
58 OTHERSECTORS,,FORCES ET									673	673	314	3	0	355	27		251	245	15	72						
59 RAW MATERIAL USE IN CHEM.									0												NA					
60 OTHER NON-ENERGY USE	7			7					244														21	35	132	55
61 TOTAL USE IN CHEMISTRY									177	177							23	21	9	149	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL E	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		5017									19330	NA	0	15595				371		0	0			0	0	142657
	0						0																			2929
	-5		0	0	0								0													-91602
																										(-4171)
	0						0			0	NA	NA	0													-359
	-5	5017	0	0	0		0			0	19330	0	0	15536 (	22013 (	16593) (	2593)	371		0	0 (	5221 (	5221)	0	0	53619
0	50																									-355
	3	-196	0	0																						-193
		0	0		0																					0
		NA													455	455	-221	-244		0	0					-1265
															145							145	-145	0	0	-376
		0				20	0	0																		-5
							0	0																		0
										0																0
0	54	-136	0	0	0	20	0	0		0					511	455	-221	-245		0	0	145	-145	0	0	-2167
															0							0				-535
		-2155																								-2155
0	0	-242													0							0				-242
		0																								0
		0																								0
		0													-13	-13						0				-13
		0				0									0	NA						0				0
								0																		0
															0	NA										0
															-22							-22				-25
0	0	-4532				-6									-131	-107	-558	-527		0	0	0	-376	0	0	-4956
0	0	-3240				-6		0							-142	-120	-593	-627		0	0	-22	-375	0	0	-3561
0	0	0	0	0	0	0	0	0		0	0	0	0	0												531
	45	544			0	13	0			0	19333	0	0	15595	659	344						125				54122
	43	295			0	13	0			0	19333	0	0	15595	459	344						125				53522
	0	254				0	0			0	7122			5930	233	105						125				16556
											5351			5134	26	NA						25				15114
	NA																									0
															21	NA						21				201
															0	NA						NA				5
	0	234				0	0			0	1111			1716	17	0						17				5525
															14	NA						14				322
															31	NA						31				423
															12	NA						12				112
															3	NA						3				72
		245													5	NA						5				631
		45				0				0	1111			1716	7	NA						7				4134
							0								4	NA						4				72
															0	NA						NA				0
							0								0	NA						NA				3
	NA	0													0	NA						NA				13
	43	1				13				0	12054	NA		11725	204	204						NA				33435
	0				0						44		0		0	0										5522
																										394
	0				0								0													4477
											44				0	NA										254
																										319
																										417
															32	32						NA				735
	0	249			0								0													249
																										251
	0	497			0								0		5	0						6				679

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRA-CITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C28	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	173		151	22	NA	110264	115234						
2 IMPORT	1	1				8569	1555	59	6559	6517	351	0	0
3 EXPORT	-3		0	-3		-90076	-90076		-8165	-73	0	0	
4 (INTERNATIONAL UPLIFT)									(-4373 (	-4373 (	-21 (	-21	
5 STOCK CHANGE	-4	0	-3	-1	NA	-233	-314	24	-522	-150	53	5	1
6 PRIMARY ENERGY SUPPLY	152	1	149	13	0	21529	21447	83	-2333	6387	411	5	1
7 REFINERY													
8 NGL(INCL. LPG)						-22023	-21933	-33	21333	13337	2332	24	134
9 CHEMICAL ENERGY									13				
10 PETROCHEMICAL LPG									0				
11 PUBLIC UTILITY	0		NA						-1171	-1131			
12 PUMP-UP USE													
13 AUTO GENERATION	-11		-11						-859	-889			
14 TOWN GAS	-1	-1	NA						-21	-21			
15 COKE	0	0											
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-12	-1	-11			-22023	-21933	-33	19327	11235	2332	24	134
18 CRUDE OIL FIELD						-566	-566						
19 NATURAL GAS FIELD													
20 REFINERY													
21 NGL PLANT						0	0		0	0			
22 CHEMICAL ENERGY PLANT									0				
23 PUBLIC UTILITY									0				
24 TOWN GAS									0	0			
25 COKE PLANT									0	0			
26 BRIQUET													
27 COAL MINE	-3		-3	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-3	0	-3	0	0	-566	-566	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	-1	0	-1	0	0	1135	1135	0	-1150	-1233	1	-5	1
31 FINAL CONSUMPTION	35		76	12	0				15556	15115	3145	25	137
32 FINAL ENERGY USE	76		76	0	0				16153	15110	3145	25	137
33 INDUSTRY	34		34	0	0				2693	2593			
34 AGRICULTURE FORESTRY									319	319			
35 FISHERY									0	0			
36 MINING(EX.ENERGY SEC.)	0		0	0					155	155			
37 CONSTRUCTION									67	67			
38 MANUFACTURING	34		34	0	0				2157	2157			
39 FOODS									401	401			
40 TEXTILE									653	653			
41 RUBBER									155	155			
42 PAPER,PULP									74	74			
43 CHEMISTRY(FUEL USE)									185	185			
44 CERAMICS,CEMENTS	23		23		NA				733	733			
45 IRONSTEEL									116	115			
46 NON-FERROUS METALS	0			0					37	37			
47 METAL FABRI.,MACHINERY									35	15			
48 SMALL WARES,OTHERS	5		5						24	24			
49 RESIDENT.,COMMER.(TOTAL)									6335	6325			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	63		63						5941	5941	2345	15	135
53 AIR TRANSPORTATION									615	615	13	13	
54 ROAD TRANSPORTATION									4447	4447	2325		135
55 RAILWAYS	63		63						172	172			
56 INTERNAL NAVIGATION									471	471	0		
57 INTERNATIONAL UPLIFT									437	437	2	2	
58 OTHERS(GOVERN.,FORCES ET)									941	941	334	13	1
59 RAW MATERL. USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	12			12					155				
61 TOTAL USE IN CHEMISTRY									155	155			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRI-CANTS	24 SOLVENTS	25 OTHERS (GREASES, ASPH.,ETC)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	351	550	3305	2732	2503	133	0			5	3	61	
3 EXPORT	0	0		0	0	0	-39	-25	-7934			-53	
4 (INTERNATIONAL UPLIFT)		(-1611		(-921 (	-161 (	-759 (	-2021						
5 STOCK CHANGE	66	-5	33	-99	-92	2	-134						
6 PRIMARY ENERGY SUPPLY	455	543	3336	2512	2436	201	-214	-227	-154	0	-2	81	NA
7 REFINERY								-312	-8359	9	1	2	0
8 NGL(INCL. LPG)	2534	72	6053	3254	2728	1055	2543	237	8268	3	31	122	43
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY				-723	-576	-65	-433	0					
12 PUMP-UP USE													
13 AUTO GENERATION				-835	-239	0	0						
14 TOWN GAS			0	-21	-2	-19	0						
15 COKE													
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	2534	72	6059	2335	1153	573	2215	237	8361	3	31	122	43
18 CRUDE OIL FIELD													
19 NATURAL GAS FIELD													
20 REFINERY					0	0	0						
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT				0	0	0	0	0	0	0	0	0	0
23 PUBLIC UTILITY													
24 TOWN GAS								0					
25 COKE PLANT				0	0	0	0						
26 BRIQUET				0	0	0							
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0						
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	5	-69	-337	-232	-313	-176	-554	0	0	0	0	0	0
31 FINAL CONSUMPTION	2554	557	5525	4455	2455	1503	1417	25	63	0	0	0	0
32 FINAL ENERGY USE	2534	557	6326	4455	3555	1503	1417	0		12	32	123	63
33 INDUSTRY				1535	359	153	1069	0					0
34 AGRICULTURE FORESTRY				233	251	37	31	0					
35 FISHERY				0	0								0
36 MINING(EX.ENERGY SEC.)				331	34	17	55						
37 CONSTRUCTION				54	55	9	2						
38 MANUFACTURING				1235	633	732	921						
39 FOODS				203	111	97	137	0					0
40 TEXTILE				332	153	222	81						
41 RUBBER				52	55	37	13						
42 PAPER,PULP				33	32	22	63						
43 CHEMISTRY(FUEL USE)				45	29	15	133						
44 CERAMICS,CEMENTS				340	55	226	332	NA					
45 IRONSTEEL				23	31	51	24						
46 NON-FERROUS METALS				11	11		25						
47 METAL FABRI.,MACHINERY				16	13	3	0						
48 SMALL WARES,OTHERS				19	15	5	6						NA
49 RESIDENT.,COMMER.(TOTAL)													
50 RESIDENTIAL			6326										
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	2593	533		2223	2043	150	339						
53 AIR TRANSPORTATION		337		4	4								
54 ROAD TRANSPORTATION	2593			1522	1533	12	0						
55 RAILWAYS				51	57	4	110						
56 INTERNAL NAVIGATION	0			444	253	53	23						
57 INTERNATIONAL UPLIFT		141		72	16	73	202						
58 OTHERS(GOVERN.,FORCES ET)	234	23		563	523	20	63						
59 RAW MATERL. USE IN CHEM.													
60 OTHER NON-ENERGY USE								NA					
61 TOTAL USE IN CHEMISTRY				44	23	16	133	0		12	32	139	63

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL CONDEN-SATES	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C43-C52	43 PUBLIC UTILITY C44-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERMAL	49 AUTO-GENERAT. C50-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		15513																								
	33						0				21344	NA	3	17256				317		3	3			3	0	193330
	-677		-229	-1233	0																					5956
													C													-33C551
	0																									C -5731
							0			3	NA	NA	3													2336
	-455	13513	-229	-1233	0		0			3	21344	3	3	17244 (	23543 (	22353 (	14153	817		3	3 (	11233 (	11253	3	0	26759
3	53																									
	475	-5515	225	1535																						-562
		3	3		3																					-2733
		NA																								C
															593	593	-352	-229		3	3					-1565
															315											
		C				23	3	3														315	-315	3	3	-282
							0	C																		-4
																										3
																										C
3	523	-5315	223	1559	3	25	0	3							507	591	-352	-229		C	C	315	-315	3	3	-5332
		-4351													3											
3	C	-234																				3				-623
		3													3											-4351
		C																				3				-234
		3																								3
		3				3									-17	-17										3
															3	NA						3				-17
								3																		C
															3	NA										C
															-22											0
3	0	-2351				-7									-144	-144	-1557	-533		3	3	-22	-312	0	0	-25 / -9242
3	0	-33135				-7		5							-132	-139	-1557	-533		3	3	-22	-312	0	3	-13534
3	3	C	C	-355	3	0	0	3			3	:	3	C												-4359
	55	9417			0	12	0			:	21555	3	C	17255	725	632						355				50224
	54	734			3	12	3				21544	3	C	17254	725	632						234				59335
	3	733				3	3				5375			4335	635	145						254				13544
	NA										3727			2552	76	NA						74				5535
																										3
															27	NA						27				327
	3	733				0	0			:	1757			1457	23	NA						23				135
															176	C						176				5255
															33	NA						23				533
															52	NA						52				597
															17	NA						37				327
		577													5	NA						5				301
		55				3				:	1237			1457	13	NA						13				933
							0								19	NA						13				4482
															12	NA						13				145
							0								3	NA						3				21
	NA	C													4	NA						4				23
															5	NA						5				45
	54	2				32				3	14743	NA		13225	251	251						NA				37515
	3				3						35		2		3	0										5728
	3				3								3													630
											35				5	NA										5375
																										222
																										632
																										575
															37	37						NA				333
	3	577			6								3													577
																										252
	3	1355			0								3		13	0						13				1550

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C28	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	222		133	35	NA	123270	123270						
2 IMPORT	0	0				5955	5935	33	3928	3876	79	4	0
3 EXPORT	-7		-7	0		-57251	-57251		-11569	-933	0	0	
4 INTERNATIONAL UPLIFT									(-5783)	(-5761)	(-23)	-23	
5 STOCK CHANGE	-14	0	-3	-11	NA	2015	1991	24	305	-106	-65	-2	0
6 PRIMARY ENERGY SUPPLY	201	0	173	28	0	34535	33346	54	-7616	2833	32	2	0
7 REFINERY						-30337	-30333	-54	29765	15949	3501	21	337
8 NGL(LNG, LPG)									475				
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY	0		NA						-1419	-1419			
12 PUMP-UP USE													
13 AUTO GENERATION	-77		-77						-1352	-1352			
14 TOWN GAS	0	0	NA						-23	-23			
15 COKE	0	0											
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-77	0	-77			-30397	-30233	-54	27727	16656	3531	21	337
18 CRUDE OIL FIELD						-424	-424						
19 NATURAL GAS FIELD													
20 REFINERY													
21 NGL PLANT						0	0		0	0			
22 CHEMICAL ENERGY PLANT													
23 PUBLIC UTILITY									0				
24 TOWN GAS									0	0			
25 COKE PLANT									0	0			
26 BRIQUET													
27 COAL MINE	-5		-5	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-5	0	-5	0	0	-424	-424	0	0	0	0	0	0
30 STATIS. DIFFERENCE	-3	0	0	-3	0	-3159	-3159	0	-1335	-181	-25	1	-
31 FINAL CONSUMPTION	111		31	20	0				19335	13502	3555	23	337
32 FINAL ENERGY USE	51		31	0	0				19555	13502	3525	23	337
33 INDUSTRY	51		51	0	0				3259	3259			
34 AGRICULTURE FORESTRY									326	326			
35 FISHERY									0	0			
36 MINING(EXC.ENERGY SEC.)	0		0	0					231	281			
37 CONSTRUCTION									89	89			
38 MANUFACTURING	51		51	0	0				2554	2556			
39 FOODS									471	471			
40 TEXTILE									533	533			
41 RUBBER									113	113			
42 PAPER,PULP									95	95			
43 CHEMISTRY(FUEL USE)									223	223			
44 CERAMICS,CEMENTS	45		45		NA				916	916			
45 IRON,STEEL									137	137			
46 NON-FERROUS METALS	0								18	12			
47 METAL FABRI.,MACHINERY				0					15	13			
48 SMALL INDUS.,OTHERS	5		5						35	35			
49 RESIDENT.,COMMER.,PUBLIC									7660	3577			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	43		43						6712	6712	3132	15	335
53 AIR TRANSPORTATION									430	433	13	15	
54 ROAD TRANSPORTATION									5076	5075	3121		335
55 RAILWAYS	43		43						845	245			
56 INTERNAL NAVIGATION									632	692	1		
57 INTERNATIONAL UPLIFT									578	578	2	2	
58 OTHERS(GOVERN.,FORCES E)									954	554	309	3	2
59 RAW MATERIAL USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	23			23					243				
61 TOTAL USE IN CHEMISTRY									223	223			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOB.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (PARAFF., ASPHALT)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	75	533	3023	2147	1931	265	0			7	2	22	
3 EXPORT	0	0		0	0	0	-933	-930	-9656			-43	
4 INTERNATIONAL UPLIFT		(-1563)		(-333)	(-153)	(-583)	-3333						
5 STOCK CHANGE	-65	-29	-355	23	-65	69	147	135	290	0	-22	-5	NA
6 PRIMARY ENERGY SUPPLY	23	531	325	2159	1355	316	-737	-794	-9176	5	-9	-13	0
7 REFINERY	3243	12	5225	5662	4263	1175	3769	1010	9474	5	63	152	52
8 NGL(LNG, LPG)													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY				-550	-351	-59	-459						
12 PUMP-UP USE													
13 AUTO GENERATION				-1352	-1352	0	0						
14 TOWN GAS			0	-21	-5	-15	-2						
15 COKE													
16 BRIQUET													
17 TRANSFORMATION(TOTAL)	3342	12	5235	3417	2315	1101	3235	1010	5474	5	63	152	52
18 CRUDE OIL FIELD													
19 NATURAL GAS FIELD													
20 REFINERY					0	0	0						
21 NGL PLANT													
22 CHEMICAL ENERGY PLANT				0	0	0	0	0	0	0	0	0	0
23 PUBLIC UTILITY								0					
24 TOWN GAS				0	0	0	0						
25 COKE PLANT				0	0	0							
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	-	0
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATIS. DIFFERENCE	-25	-1	517	-452	-216	-137	-332	-216	-253	0	0	-	0
31 FINAL CONSUMPTION	3345	513	3577	5135	3356	1273	1572	0		12	31	166	52
32 FINAL ENERGY USE	3345	513	3577	5135	3355	1273	1572	0					0
33 INDUSTRY				2115	1252	1055	1142	0					0
34 AGRICULTURE FORESTRY				333	255	35	25						
35 FISHERY				0	0								
36 MINING(EXC.ENERGY SEC.)				212	55	117	57						
37 CONSTRUCTION				34	70	16	5						
38 MANUFACTURING				1522	521	931	1041	0					0
39 FOODS				257	135	122	212						
40 TEXTILE				453	237	253	51						
41 RUBBER				97	52	35	13						
42 PAPER,PULP				45	13	23	51						
43 CHEMISTRY(FUEL USE)				53	65	13	159	NA					
44 CERAMICS,CEMENTS				444	63	377	471						
45 IRON,STEEL				133	43	55	31						
46 NON-FERROUS METALS				13	12		3						0
47 METAL FABRI.,MACHINERY				13	15	3	0						
48 SMALL INDUS.,OTHERS				23	17	11	5						
49 RESIDENT.,COMMER.,PUBLIC			3577										
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	3265	553		2456	2256	372	452						
53 AIR TRANSPORTATION		415		3	3								
54 ROAD TRANSPORTATION	3265			1135	1372	24	0						
55 RAILWAYS				56	53	3	92						
56 INTERNAL NAVIGATION	1			415	262	26	63						
57 INTERNATIONAL UPLIFT		136		33	15	63	333						
58 OTHERS(GOVERN.,FORCES E)	299	46		551	518	45	53						
59 RAW MATERIAL USE IN CHEM.													
60 OTHER NON-ENERGY USE								NA		12	31	166	52
61 TOTAL USE IN CHEMISTRY				53	45	12	359	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY (42+52)	43 PUBLIC UTILITY (43-48)	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL &	49 AUTO-GENERAT. (49+52)	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
	3	11526					0				20363	NA	3	17539				500		3	3			3	3	351715
	0		0	0	0								0													2239
																										-33231
	-1						0			3	NA	NA	3													-4373
																										-315
	-1	11526	3	0	0		0			3	20363	3	3	17333	25323	15723	11133	333		3	3	5503	5503	3	3	70965
0	41																									
	19	-1337	3	0																						-331
		0	0		0																					-1315
																										0
		NA													511	511	-237	-224		3	3					-1451
															259											
		3				20	0	3														257	-255	3	0	-531
							0	3																		-2
																										0
																										3
0	50	-1337	3	3	3	23	0	3		3					733	511	-237	-224		3	3	255	-255	3	3	-3553
															3											
		-2624																								-543
3	3	-235																								-2624
		0													0							3				-235
		0																								0
		9																								3
															-14	-26										
		3				0									3	NA										-14
																										3
								3																		0
															3	NA										3
															-22							-22				-22
0	0	-5742				-3									-133	-313	-335	-575		3	3	3	-591	3	3	-3555
3	3	-5534				-8		3							-152	-332	-365	-576		3	3	-27	-591	3	3	-15411
3	3	3	3	3	0	0	0	0		3	3	3	3	3												-26
	59	593			3	12	0			3	20363	3	3	17332	523	315						265				56935
	59	322			3	12	0			3	20343	3	3	17336	523	313						243				55423
	3	321				0	0			3	5325			5412	359	125						249				15192
											4533			3332	13	NA						73				3331
	NA																									0
															24	NA						24				175
															15	NA						15				32
	0	321				3	3			3	1125			1535	145	3						14				5515
															32	NA						32				433
															45	NA						45				527
															15	NA						15				321
															3	NA						3				77
		233													5	NA						5				453
		55				3				3	1159			1539	15	NA						15				4155
							0								9	NA						9				325
															3	NA						3				43
							0								4	NA						4				23
	NA	0													4	NA						4				33
	59	2				12				3	14533	NA		12535	224	224						NA				34243
	3				3						35		0		0	3										6317
	0				0								3													415
											35				3	NA										4443
																										267
																										473
																										428
															35	35						NA				579
	3	283			3								0													233
																										233
	3	541			3								3		3	3										233

ENERGY BALANCES IN INDONESIA CA 1975

	1 TOTAL OF COAL C01-C05	2 COKING COAL	3 STEAM COAL	4 ANTHRACITE	5 LIGNITE	6 TOTAL OF CRUDE OIL C06-C08	7 ORIGINAL CRUDE OIL	8 REDUCED CRUDE OIL	9 PETROLEUM PRODUCTS C09-C28	10 DOMESTIC FUEL OIL C10-C20	11 GASOLINE C11-C14	12 AVIATION	13 SUPER
1 DOMESTIC PRODUCTION	253		197	61	NA	119579	119578						
2 IMPORT	0	0				6224	6224	0	3559	3577	3	0	0
3 EXPORT	-33		-3	-27		-92559	-92565		-9575	-411	0	0	
4 (INTERNATIONAL UPLIFT)									(-609)	(-609)	(-31)	-11	
5 STOCK CHANGE	-42	0	-24	-19	NA	-552	-553	1	55	32	-122	1	-6
6 PRIMARY ENERGY SUPPLY	155	0	119	16	0	32652	32658	3	-5849	3195	-119	1	-6
7 REFINERY						-32025	-32024	-1	31671	21157	3743	25	136
8 NGL(LNG, LPG)									574				
9 CHEMICAL ENERGY									0				
10 PETROCHEMICAL LPG													
11 PUBLIC UTILITY	0		NA										
12 PUMP-UP USE									-1199	-1199			
13 AUTO GENERATION	-75		-75										
14 TOWN GAS	0	0	NA						-1291	-1291			
15 COKE	0	0							-25	-25			
16 BRIQUET	0		0										
17 TRANSFORMATION(TOTAL)	-75	0	-75			-32025	-32024	-1	29231	15073	3743	25	136
18 CRUDE OIL FIELD						-252	-252						
19 NATURAL GAS FIELD													
20 REFINERY						0	0		-1	0			
21 NGL PLANT									0				
22 CHEMICAL ENERGY PLANT									0	0			
23 PUBLIC UTILITY									0	0			
24 TOWN GAS													
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE	-2		-2	NA									
28 FLARE AND LOSSES	0	0	NA	NA	NA	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	-2	0	-5	0	0	-252	-252	0	-1	0	0	0	0
30 STATISTICAL DIFFERENCE	0	0	-7	13	0	-435	-435	0	-2144	-550	334	-2	11
31 FINAL CONSUMPTION	155		73	27	0				21235	20722	3925	25	141
32 FINAL ENERGY USE	75		73	0	0				20532	20722	3922	25	141
33 INDUSTRY	53		50	0	0				3333	3333			
34 AGRICULTURE FORESTRY									377	377			
35 FISHERY									0	0			
36 MINING(EXC.ENERGY SEC.)	0		0	0					237	237			
37 CONSTRUCTION									94	94			
38 MANUFACTURING	53		50	0	0				3122	3122			
39 FOODS									593	593			
40 TEXTILE									612	612			
41 RUBBER									121	121			
42 PAPER,PULP									137	137			
43 CHEMISTRY(FUEL USE)									293	293			
44 CERAMICS,CEMENTS	44		44		NA				1074	1074			
45 IRONSTEEL									233	233			
46 NON-FERROUS METALS	0			0					8	9			
47 METAL FABRI.,MACHINERY									27	27			
48 SMALL WARES,OTHERS	5		6						30	30			
49 RESIDENT.,COMMER.(TOTAL)									5555	8475			
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	22		23						7443	7443	3546	16	162
53 AIR TRANSPORTATION									493	493	33	12	
54 ROAD TRANSPORTATION	23		23						5211	5211	3533		140
55 RAILWAYS									152	152			
56 INTERNAL NAVIGATION									452	452	0		
57 INTERNATIONAL UPLIFT									659	659	1	1	
58 OTHERS(GOVERN.,FORCES ETC)									933	933	255	11	1
59 RAW MATERIAL USE IN CHEM.									0				
60 OTHER NON-ENERGY USE	22			22					435				
61 TOTAL USE IN CHEMISTRY									293	293			

	14 PREMIUM	15 JET FUEL	16 KEROSENE	17 DIESEL C17-C19	18 AUTOMOT.	19 INDUSTR.	20 HEAVY FUEL OIL	21 NAPTHA	22 LOW SUL. WAXY RESIDUE	23 LUBRICANTS	24 SOLVENTS	25 OTHERS (GREASE, ASPH.,ETC)	26 PETROLEUM COKE
1 DOMESTIC PRODUCTION													
2 IMPORT	3	652	893	2024	2024	0	0			9	2	65	
3 EXPORT	0	0		0	0	0	-611	-289	-8175			-13	
4 (INTERNATIONAL UPLIFT)		(-2031)		(-651)	(-129)	(-561)	-3371						
5 STOCK CHANGE	-119	16	-35	615	377	33	-191	60	-6	-13	5	13	NA
6 PRIMARY ENERGY SUPPLY	-116	653	813	2439	2433	33	-593	-249	-8179	-9	2	24	0
7 REFINERY	3593	25	6135	6421	4583	1538	4962	1105	8915	35	34	275	53
8 NGL(LNG, LPG)													
9 CHEMICAL ENERGY													
10 PETROCHEMICAL LPG								0					
11 PUBLIC UTILITY													
12 PUMP-UP USE													
13 AUTO GENERATION				-1151	-1112	-49	-633						
14 TOWN GAS													
15 COKE				-1291	-1291	0	0						
16 BRIQUET			0	-25	-7	-13	0						
17 TRANSFORMATION(TOTAL)	3533	25	6535	3545	2473	1471	4225	1106	8915	35	34	275	53
18 CRUDE OIL FIELD													
19 NATURAL GAS FIELD													
20 REFINERY					0	0	0						
21 NGL PLANT				0	0	0	0	0	0	0	0	0	0
22 CHEMICAL ENERGY PLANT								0					
23 PUBLIC UTILITY				0	0	0	0						
24 TOWN GAS				0	0	0							
25 COKE PLANT													
26 BRIQUET													
27 COAL MINE													
28 FLARE AND LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
29 ENERGY SECTOR USE LOSSES	0	0	0	0	0	0	0	0	0	0	0	0	0
30 STATISTICAL DIFFERENCE	255	33	1525	-545	-533	-109	-1378	-357	-735	0	0	0	0
31 FINAL CONSUMPTION	2752	731	6475	5737	6335	1401	1851	0		27	43	233	53
32 FINAL ENERGY USE	2752	731	2475	5737	6335	1402	1851	0					
33 INDUSTRY				2471	1291	1150	1350	0					0
34 AGRICULTURE FORESTRY				359	322	47	5						
35 FISHERY				0	0								
36 MINING(EXC.ENERGY SEC.)				173	45	75	66						
37 CONSTRUCTION				93	56	10	1						
38 MANUFACTURING				1835	790	1045	1235	0					
39 FOODS				227	173	158	253						0
40 TEXTILE				535	258	278	76						
41 RUBBER				132	72	35	14						
42 PAPER,PULP				75	33	43	81						
43 CHEMISTRY(FUEL USE)				35	72	23	195	NA					
44 CERAMICS,CEMENTS				537	92	417	565						
45 IRONSTEEL				125	53	75	108						
46 NON-FERROUS METALS				7	7		1						
47 METAL FABRI.,MACHINERY				25	22	3	2						
48 SMALL WARES,OTHERS				28	12	16	2						NA
49 RESIDENT.,COMMER.(TOTAL)			3475										
50 RESIDENTIAL													
51 COMMERCIAL													
52 TRANSPORTATION(TOTAL)	3455	677		2657	2520	157	435						
53 AIR TRANSPORTATION		674		3	3								
54 ROAD TRANSPORTATION	3455			2032	2265	13	0						
55 RAILWAYS				21	78	3	31						
56 INTERNAL NAVIGATION	0			454	359	55	28						
57 INTERNATIONAL UPLIFT				65	12	55	237						
58 OTHERS(GOVERN.,FORCES ETC)	222	233		519	525	54	55						
59 RAW MATERIAL USE IN CHEM.		56											
60 OTHER NON-ENERGY USE								NA		27	43	332	53
61 TOTAL USE IN CHEMISTRY				95	72	23	395	0					

27 REFINERY GAS	28 LPG	29 NATURAL GAS	30 NGL (CONDEN-SATES)	31 LNG	32 METHANOL	33 TOWN GAS	34 COKE	35 COKE OVEN GAS	36 BLAST FURNACE GAS	37 BRIQUET	38 WOOD	39 CHARCOAL	40 FUEL ETHANOL FROM BIOMASS	41 AGRI-CULTURAL WASTES	42 TOTAL OF ELEC-TRICITY C42-C52	43 PUBLIC UTILITY C43-C48	44 THERMAL GENERAT.	45 HYDRO-GENERAT.	46 PUMP-UP USE	47 NUCLEAR GENERAT.	48 GEOTHERM-AL E	49 AUTO-GENERAT. C49-C52	50 THERMAL GENERAT.	51 HYDRO-GENERAT.	52 OTHER GENERAT.	53 TOTAL
		30327									22944	NA	0	16545				1050		0	0			131	0	190596
	6						0																			9593
	-557		-1935	-7519	0								0													-111629
																										(-5393)
	0						0			0	NA	NA	0													-528
	-652	30327	-1935	-7519	0		0			0	22544	0	0	15515	(44973)	(28593)	(17991)	1350		0	0	(15423)	(13573)	131	0	89621
1	58																									-356
	574	-11555	1933	7553																						-1724
		0	0		0																					0
		NA																								
															534	654	-337	-297		0	0					-2115
		0				20	0	0							433							433	-333	-51	0	-1116
							0	0																		-4
										0																0
																										0
1	732	-11555	1933	7553	0	20	0	0		0					1117	554	-337	-297		0	0	433	-333	-51	0	-5311
		-8255													0							0				-252
-1	0	-245																								-8255
		0													0							0				-245
		0																								0
		0																								0
		0				0									-19	-19						0				-19
															0	NA						0				0
								0																		0
															0	NA										0
															-21							-21				-29
6	0	-7716				-7									-354	-154	-1412	-763		0	0	0	-334	-133	0	-2375
-1	0	-15214				-7		0							-395	-173	-1412	-763		0	0	-21	-356	-130	0	-15595
0	0	0	0	-34	0	0	0	0		0	0	0	0	0												-2520
	33	2225			0	14	0			0	22344	0	0	15565	923	511						412				53595
	83	1141			0	14	0			0	22344	0	0	15565	923	511						412				52449
	0	1133				0	0			0	3551			2637	574	162						412				33332
	NA										1554			3202	93	NA						52				3334
																										0
															77	NA						77				316
															23	NA						23				117
	0	1339				0	0			0	1327			1435	221	0						221				7554
															45	NA						45				633
															72	NA						72				535
															29	NA						29				141
		1384													3	NA						5				165
															20	NA						20				1334
		55				0				0	1557			1435	26	NA						26				4521
							0								14	NA						14				247
															2	NA						2				10
							0								6	NA						5				33
	NA	0													3	NA						3				37
	33	2				14				0	19257	NA		13311	322	302						NA				42240
	0				0						35		0		0	0										7533
																										692
	0				0								0													5711
											35				0	NA										215
																										612
																										639
															47	47						NA				1520
	0	1384			0								0													1386
																										453
	0	2167			0								0		20	0						20				2477

4-7. Future Improvements of Energy Balance Table

In respect to configuration of rows, it will be inevitable to change the configuration when there is a drastic change of industrial structure in the future. While no problem was caused in making calculation in respect to coke this time because there is no Iron-Steel plants in Indonesia at present and the Iron and Steel industry does not from a key industry, it is worthy to point out a problem for the time being. That is, when iron-steel plants are constructed and consumption of coking coal starts in the future, it will be necessary to fractionize the energy conversion group subdividing the present coke manufacturing sector into three rows of gas coke manufacturing, iron-steel coke manufacturing and specialized coke manufacturing, to which a row of blast furnace gas manufacturing is to be newly added. As the sector is not detailed in that manner, a column of blast furnace gas is established as an item of energy source in the present energy balance table, but, as a result, it is not possible to express supply and demand balance of blast furnace gas.

The aforementioned problem of blast furnace gas also forms one of problems related to configuration of columns. One of the most critical problems in respect to configuration of columns is that it becomes impossible to obtain lengthwise and crosswise balances at a look due to breaksdown list by type of power generation source inserted in the parts of electric power utilities and independent power generation. If priority should be given to lengthwise and crosswise balances, processing used for preparing OECD's energy balance table would be better. In other words, it is recommended to take the following method; to input supplied quantities of primary energy supply to hydroelectric power generation, nuclear power generation and other types of power generation into the rows of public utilities, electric power generation and private power generation as they are, delete the column of thermal power generation, establish columns of public utilities electric power and private electric power generation on the right of columns of power generation aforementioned and state total quantities of electric power generation and consumption in each column. As to items of energy, insertion of new columns is considered necessary in the future as it is expected that a variety of new types of energy will be introduced. In this light, columns of fuel methanol and fuel ethanol have been already established. Judging from a fact that Indonesia is a tropical country blessed with sunshine throughout a year, a column of solar energy will be required in the near future.

As to basic statistics on energy, a system to aggregate micro data has been finally established in this project, and systematization should be started as the next step. It is desirable to establish a system of basic statistics on energy referring to configuration of the present energy balance table as a foundation. In particular, it is critically necessary to collect and classify statistics on electric power including auto generation and on firewood and agricultural wastes which represent principal energy in Indonesia.

As to thermal quantity scale factor, a system to conduct regular measurements combustion heat of individual types of energy to find average values of combustion heat is not yet established. It is required to prepare a standard method to make experiments and a method to calculate average values and continue to renew thermal quantity scale factor.

When configuration of columns and rows are to be changed or basic statistics on energy are to be changed, it is also necessary to change system of equations of energy balance table. Under present conditions, it seems that there is no special problem in respect to system of equation itself.

Regarding softwear for preparation of energy balance table, it seems there is no serious problem. If it was troublesome to modify and newly compile program whenever configuration of energy balance table is to be changed, such a trouble could be eliminated by transforming numbers and titles of rows and columns into data. A problem which is considered more serious is that, a present, we have to aggregate micro data whenever we need new basic statistics on energy for preparing energy balance table. It is extremely troublesome to operate the aggregation system of the energy supply-demand data bank every time an energy balance is prepared. To eliminate such a trouble and facilitate decision-making function of the Ministry of Mining and Energy as to energy policies, it is considered desirable to prepare another energy data bank having functions of input, reference and output, in which basic statistics on energy which have been already aggregated based on micro data are stored and which is used when an energy balance table is to be prepared or when an energy supply-demand forecast is to be made.

5. Energy Supply-Demand Forecast

5-1. Establishment of Energy Supply-Demand Forecast Method

To construct an energy supply-demand forecast method for the Republic of Indonesia, we conducted operations in accordance with steps outlined below.

To start with, it was agreed basically during the first-stage joint work that a method used by the Institute of Energy Economics for preparing Japan's medium- and long-term energy supply-demand forecast model would be adopted as a method to be used for our preparing Indonesia's medium- and long-term energy supply-demand forecast model as part of this project.

Secondly, to our counterpart in Indonesia, we explained Japan's medium- and long-term energy supply-demand forecast model from various aspects including its outline, methods and variables, equations and systems introduced in the model.

Unfortunately, during this stage, no significant progress was made in the field of data collection of macro-economics and it was not possible to construct a macro-economic forecast model. Accordingly, all the macro-economic variable were processed as exogenous variables. Also, because Indonesia's energy balance table was available only for 1978, a tentative measure was taken. That is, data shown in an energy balance table contained in "Workshop on Energy Data of Developing Countries" prepared and published by OECD were newly aggregated into 17 energy resources and 16 energy supply and consumption sectors which was used in our operations.

Furthermore, Indonesia's medium- and long-term energy supply-demand forecast tentative model was constructed by estimating about 10 constitutive equations in respect to the final consumption sector in addition to definitive equations. The number of equations used for constructing the model totaled 102.

Finally, a tentative forecast was made on Indonesia's energy supply-demand for a period up to 1985. A primary purpose of our joint work in the first stage was not to produce plausible figures by making a forecast but to master methods and processes of forecast. In this light, it is considered that we achieved satisfactory results by and large.

Then, during the second-stage joint work, we conducted operations based on results gained through the first-stage joint work. In other words, we were primarily engaged in enlarging and filling up such results.

First of all, we conducted collection and classification of macro-economic data, which could not be carried out during the first-stage joint work, and constructed a simple macro-economic forecast model consisting of 26 equations drawn up from the collected data.

Secondly, data shown in Indonesia's energy balance table prepared by a softwear team were newly aggregated into 25 energy resources and 18 energy supply and consumption sectors to prepare a simplified balance table, which was used to construct an energy model consisting of 175 equations. After these operations, the macro-economic model and the energy model were linked, based on which Indonesia's medium- and long-term energy supply-demand forecast model (number of equations; 201) was constructed. Finally, a final test was conducted on a seven-year period from 1972 to 1978. Also made was a forecast on a twelve-year-period from 1979 to 1990. Under a close cooperation with the software team, processes of the test and the forecast were made into the form of programming.

A primary purpose of the second-stage joint work was to solidify a fundamental framework of Indonesia's medium- and long-term energy supply-demand forecast model. It is considered that we could achieve the purpose to some extent.

5-2. Concept of Energy Supply-Demand Forecast Model

To prepare a medium- and long-term energy supply-demand forecast model of Indonesia, we adopted in our joint work a method used by the Institute of Energy Economics. Concretely speaking, econometric methods were used for macro-economic model and the energy final consumption sector. Relative equations in which technical properties among individual energy resources (rate of loss, energy sector own use etc.) were taken into a consideration were prepared as to the energy transformation sector. In respect to the primary energy supply sector, almost all the energy supply sources (hydro generation, crude oil production, etc.) were processed as policy variables (=exogenous variables).

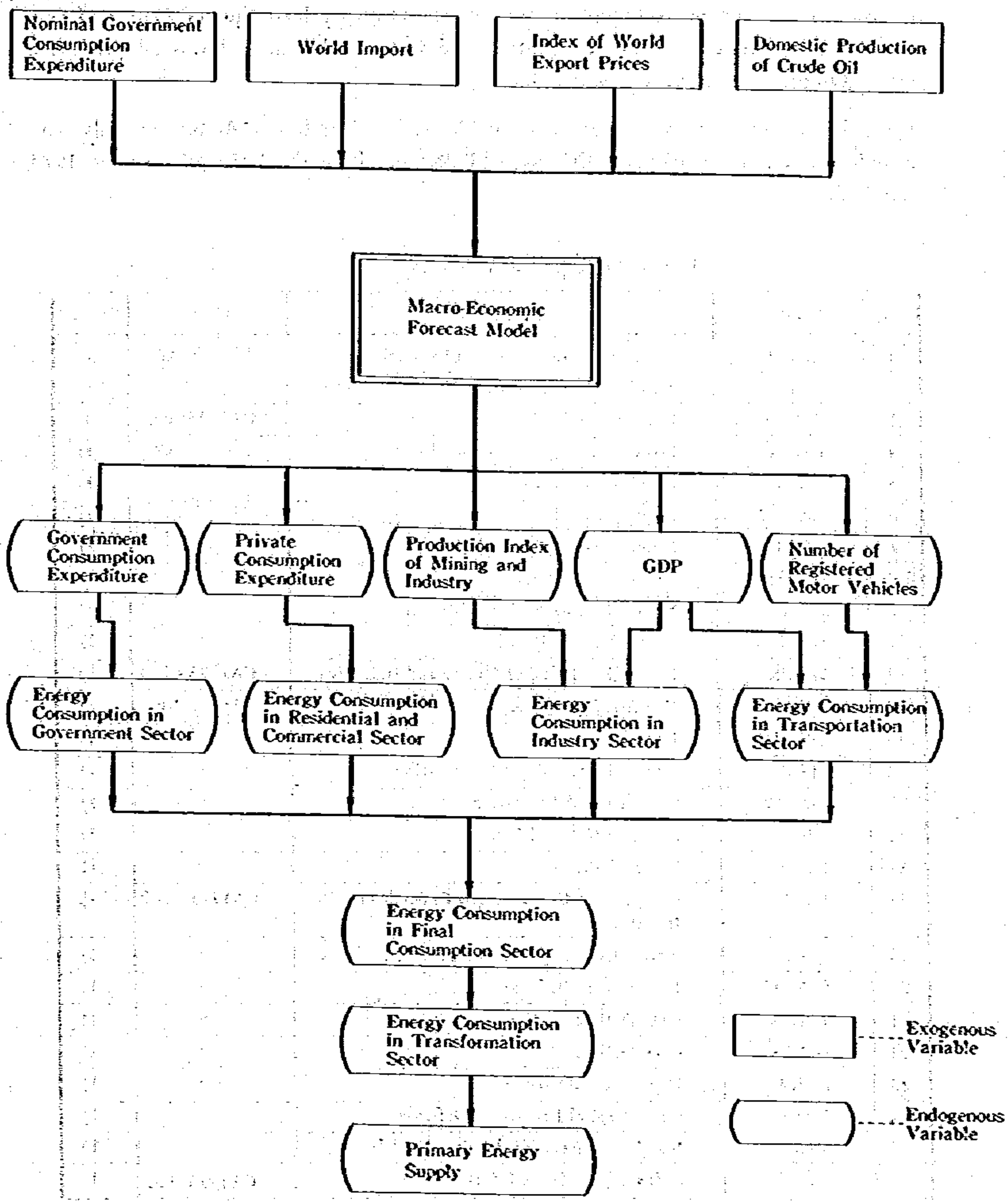
Flow of preparing the model is as follows; based on the macro-economic model, figures of GDP, private consumption expenditure, government consumption expenditure, number of registered motor vehicles, etc. were deduced first. Using the resultant figures as explanatory variables, energy consumption of the final consumption sector (industry residential and commercial, transportation and government sectors) were obtained and, as the final step, balances were struck in the primary energy supply sector (production, import and export, etc.).

Flow chart shown the next page is schematization of the aforementioned processes.

5-3. Preparation of Energy Supply-Demand Forecast Model

Macro-economic model we jointly prepared this time consists of 26 equations. 17 of them are constitutive equations and 9 definitive equations. Endogenous variables are numbered 26 and exogenous variables 6. Major endogenous variables include gross domestic product, private consumption expenditure, government consumption expenditure and production index of mining and industry. Principal exogenous variables include government consump-

Fig. 5-2-1 Flow Chart for Outline of Indonesia's Medium- and Long-Term Energy Supply-Demand Forecast



tion expenditure (in current prices), crude oil product and world import. Of them, an exogenous variable (policy variable) which takes the most important position in our model is nominal government consumption expenditure. Ordinary least squares were used as a method to estimate constitutive equation and Gauss-Seidel method was adopted as a method to solve simultaneous equations.

Symbol, name, unit and source of each variable are listed up below. Arabic numerals "73" included in variable marks (ex. CG73&, CPI73&) stand for the 1973 price or the 1973 standard.

List of Endogenous Variables

No.	Symbol	Name of Variables	Unit	Source
1	CG73&	Government Consumption Expenditure	1 billion RP	1)
2	CP&	Nominal Private Consumption Expenditure	"	1)
3	CPI73&	Consumer Price Index	CA1973=100	2)
4	CP73&	Private Consumption Expenditure	1 billion RP	1)
5	EXP&	Nominal Export, etc.	"	1)
6	EXP73&	Export, etc.	"	1)
7	GDP&	Nominal Gross Domestic Product	"	1)
8	GDP73&	Gross Domestic Product	"	1)
9	GNP&	Nominal Gross National Product	"	1)
10	GNP73&	Gross National Product	"	1)
11	IIP73&	Production Index of Mining and Industry	CA1973=100	1)
12	IMP&	Nominal Inport, etc.	1 billion RP	1)
13	IMP73&	Import, etc.	"	1)
14	ITP&	Nominal Gross Capital Formation	"	1)
15	ITP73&	Gross Capital Formation	"	1)
16	NI&	Nominal National Income	"	1)
17	NI73&	National Income	"	1)
18	PCG&	Government Consumption Expenditure Deflator	CA1973=100	1)
19	PCP&	Private Consumption Expenditure Deflator	"	1)
20	PEXP&	Export, etc. Deflator	"	1)
21	PGDP&	GDP Deflator	"	1)
22	PGNP&	GNP Deflator	"	1)
23	PIMP&	Import, etc. Deflator	"	1)
24	PITP&	Gross Capital Formation Deflator	"	1)
25	TR&	Number of Registered Motor Vehicles		1)
26	WPI73&	Index of Wholesale Prices	CA1973=100	1)

Source: 1) Data offered from Indonesian counterparts
2) *International Financial Statistics*, IMF.

List of Exogenous Variables

No.	Symbol	Name of Variables	Unit	Source
1	CG&	Nominal Government Consumption Expenditure	1 billion RP	1)
2	PAGRGPE73&	Agricultural Export Deflator	CA1973 = 100	1)
3	PCROIL&	Crude Oil Export Prices	Dollar/Barrel	1)
4	PETROP&	Crude Oil Product	1000 Barrel	1)
5	PWE75&	Index of World Export Prices	CA1975 = 100	2)
6	WIM75&	World Import	1 billion RP	2)

Source: 1) Data offered from Indonesian counterparts
2) *International Financial Statistics*, IMF.

Newly aggregating data presented in Indonesia's energy balance table which was prepared by the softwear team, we prepared a "simplified energy balance table of Indonesia" consisting of 25 energy resources and 18 energy supply and consumption sectors, which is presented below.

Table 5-3-1 Configuration of Columns of Simplified Energy Balance Table

Column	Title	Column	Title
C01	Solid Fuels	C11	Gas
C02	Grude	C11A	Natural Gas
C03	Petroleum Products Total	C11B	LNG
C04	Gasoline	C11C	Town Gas
C05	Jet Fuel	C11D	Others
C06	Kerosene	C12	Nuclear Power
C07	Diesel Oil	C13	Hydro & Geothermal
C07A	Automotive Diesel Oil	C14	Electricity
C07B	Industrial Diesel Oil	C15	Commercial Energy Total
C08	Heavy Fuel Oil	C16	Non-Commercial Energy
C09	Naphthas + Condensates (NGL)		(Wood + Agricultural Wastes)
C10	Other Petroleum Products	C17	Total (C15 + C16)
C10A	LPG		
C10B	Others		

Table 5-3-2 Configuration of Rows of Simplified Energy Balance Table

Row	Title	Row	Title
R01	Indigenous Production	R10A	Energy Sector Own Use
R02	Import	R10B	Loss etc.
R03	Export	R11	Total Final Consumption
R04	Marine Bunker	R12	Industry Sector
R05	Stock Change	R13	Transportation Sector
R06	Total Energy Requirements	R14	Residential & Commercial Sector
R07	Electric Generation	R15	Government Sector
R08	Town Gas Producer	R16	Non-Energy Consumption
R09A	Refineries		
R09B	NGL Plant		

Secondly, processing the data shown in the simplified energy balance table we prepared an energy and supply-demand model. Constitutive equations of the model are numbered 11 and definitive equations 163. There are 174 endogenous variables and 115 exogenous variables. The number of constitutive equations resulted in limited due to sharp fluctuations in individual variables which made it difficult to obtain significant estimated equations as many as planned. On the other hand, numbers of definitive equations and exogenous variables increased.

Major endogenous variables include energy consumption by type of energy source in industry, transportation, residential and commercial, and government sectors. Principal exogenous variables include primary energy supply such as production, import and export by type of energy resource and yield of individual petroleum products.

Listed below are all the equations in the energy supply-demand forecast model. Abbreviations stand for as follows; R*R – decision coefficient, ADJ [R*R] – decision coefficient with free factors adjusted, D.W. – Durbine Watson ratio, S – standard error. Figures shown in parentheses under coefficients, which represent explanatory variables, of individual equations are t-value. Descriptions, such as INDONESIA01, which follow numeral number of equations represent names of the equations. OLS is to indicate that constitutive equations were estimated using ordinary least squares.

(1) Macro Economic Sector

[illegible]

(2) Final Energy Consumption Sector

[illegible]

[illegible]

(3) Energy Industries' Own-Use Sector

[illegible]

(4) Energy Transformation Sector

[illegible]

(5) Primary Energy Sector

[illegible]

5-4 Software for Energy Supply-Demand Forecast Model

Software for the forecasting model consists of the following three components.

- Checking of time-series data
- Regression Analysis
- Forecasting model

5-4-1 Verification of the Time-Series Data

The input format of the time-series data, as shown on page 122, consists of a variable name, time-series data, and a period. The following restrictions are imposed on construction of the time-series data.

(1) The variable name consists of 12 alphanumeric or special characters at most, with the exception of +, –, /, ., ,, =, *, :, (, and).

(2) The period of the data is 5 years minimum and 30 years maximum.

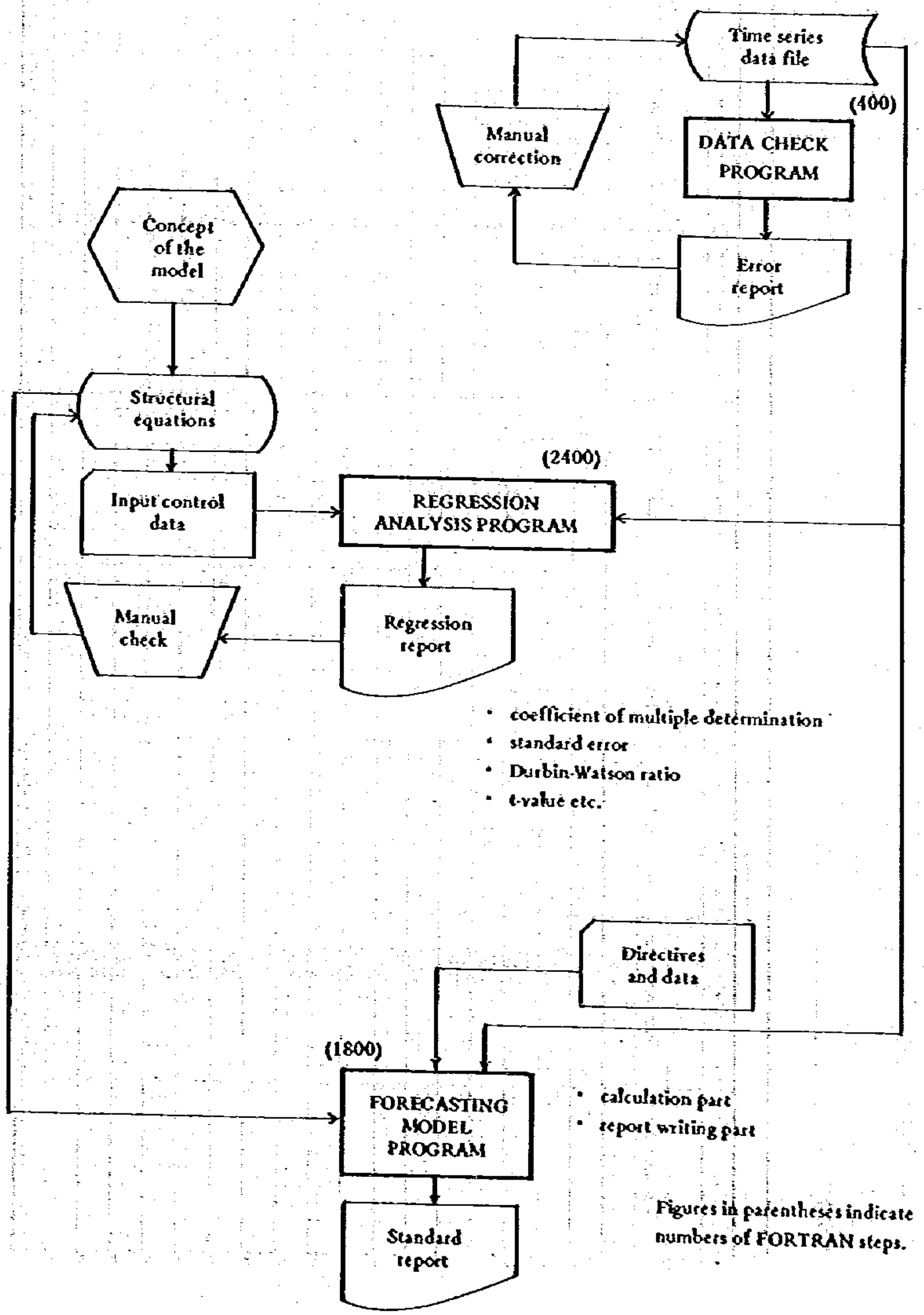
The data check program monitors the following points and prints out a warning message if an error is detected.

(1) Whether the above-mentioned restrictions are observed.

(2) Whether the same names are used for different variables.

(3) Whether the number for data indicated in input data coincides with an actual number for data written in the data columns.

Fig. 5-4-1 Software for the Forecasting Model



客先名 Time Series Data Format

作業名 ______

作成者名 ______

日付 / / ページ /

Number of data

	1–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80
1								
2	Variable Name	Starting Year	Data Field 1	Data Field 2	Data Field 3	Data Field 4	Data Field 5	Data Field 6
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

5-4-2 Regression Analysis

For the construction of a forecasting model, a statistical equation called a structural equation is used to describe cause and effect relationships among the variables. This program performs estimations on parameters employing the least square method, based on the information of the time-series data and independent variables which are maintained in a disk file, dependent variables, estimated period, etc.

This program consists of the following program components: interpretation of equations entered into input data, estimation of parameters using the least square method, and edition and printing of the results of the estimation. Regarding the program of the least square method, the following four subroutines among IBM's SSP (Scientific Subroutine Package) are being used.

- CORRE
- ORDER
- MINV
- MULTR

For the interpretation of equations on input data, the inverse Poland method which is used in the energy data base system was employed after being improved to handle functions. The details of the improved inverse Poland method will be discussed later.

As for the program of edition and printing of estimation results, shown in the sample list, observed and estimated values of dependent variables, estimated parameters of the structural equation, t-value, multiple correlation coefficient, the serial correlation (Durbin-Watson ratio), etc. are output. They are considered as indices for evaluating results of the estimation.

The regression analysis program has the following eight unique built-in FUNCTIONs for transgeneration of the original series which is very often used for estimation of equations in an econometrics model.

Table 5-4-1 Built-in FUNCTIONs

FUNCTION Name	Usage	Definition
1. LOG	LOG (X)	$\log_e X$
2. LOG10	LOG10 (X)	$\log_{10} X$
3. LAG1	LAG1 (X)	X_{-1}
4. LAG2	LAG2 (X)	X_{-2}
5. LAG3	LAG3 (X)	X_{-3}
6. DOT	DOT (X)	$\frac{X - X_{-1}}{X_{-1}} * 100$
7. DEL	DEL (X)	$X - X_{-1}$
8. CON	CON (2.0)	Constant (CON (2.0) indicates a 2.0)

An example of the directive data for this program is shown below.

	Period (Col. 1–Col. 10)	Equation Field (Col. 11–Col. 80)
1	1970–1978	Y=X, Z:
2	1971–1978	Y=LAG1(X), Z*W:
3	1970–1978	LOG(Y)=(X/V), LOG(W):
4	1971–1978	Y=DOT(X):

1) $Y = a_1 X + b_1 Z + c_1$

2) $Y = a_2 X_{-1} + b_2 (Z*W) + c_2$

3) $\log_e Y = a_3 \log_e X/V + b_3 \log_e W + c_3$

4) $Y = a_4 \dfrac{X - X_{-1}}{X_{-1}} * 100 + b_4$

a_n, b_n, and c_n are the parameters to be estimated.

In the above example, a comma (,) separates independent variables and a colon (:) indicates the end of an equation.

(1) Calculation procedure

The overall flow of the process of calculation, including interpretation of an equation, can be described as follows, taking the following equation as an example.

$$Y = a * (X_{-1} + Z_{-1}) + b * V * W + c$$

where a, b, and c are parameters to be estimated.

To describe variable Y, two independent variable units were established: the sum of the previous period's X and Z, and the product of the current period's V and W. The input into the program is shown below.

Y = LAG1 (X + Z), V*W:

Dividing the above equation into dependent and independent variable units produces the following three groups.

客先名 Regression Analysis

作業名 Input Control Data

作成者名 ________

日付 / / ページ /

Continuation

Period

Equation Field (Col.11-Col. 80)

Columns: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Rows: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

- Y
- LAG1 (X + Z)
- V*W

Since Y consists of a single variable, its corresponding time-series data is taken out of the time-series file and then stored into the working space, DLSM (COMMON/ DLSM/).

The LAG1 (X + Z) is divided into the following calculation steps using the improved inverse Poland method.

- ZZ01 = X + Z
- ZZ02 = LAG1 (ZZ01)

Time-series data of X and Z are extracted from the time-series file, and the sum of the two is written in a temporary file. At this time, a new variable name, ZZ 01, is created within the program and is attached to the time-series data of X + Z.

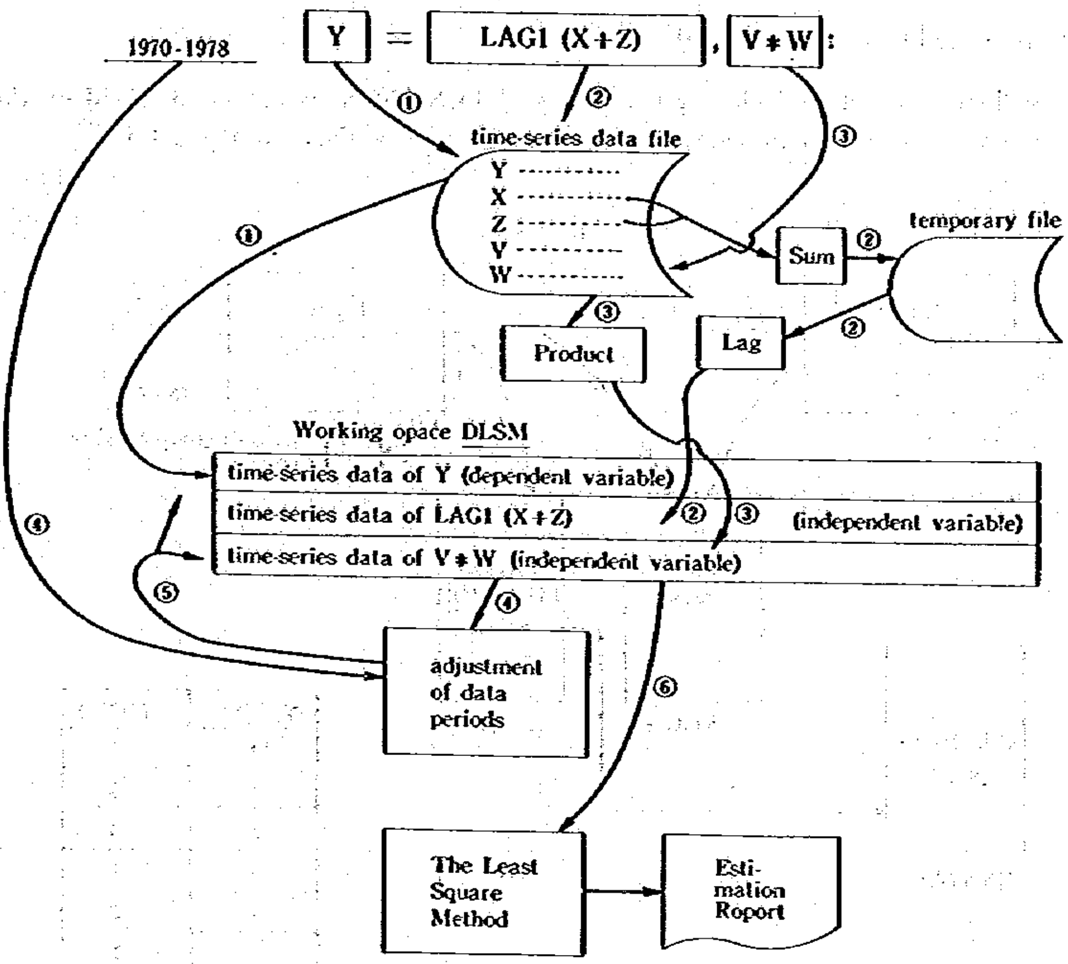
By removing the time-series data of ZZ 01 from the temporary file and attaching a time lag of one period, new time-series data, ZZ 02, is created. This is also transferred to the working space, DLSM.

Similarly, V * W will have the following calculation step as a result of applying the improved inverse Pbland method.

- ZZ01 = V*W

The data for V and W are extracted from the time-series file, and new time-series data, ZZ 01, is created by taking a product of the two. This ZZ 01 is also transferred to DLSM.

Meanwhile, since the time-series data for V, W, X, Y, and Z all have their own observation periods and data periods used in directive data of the regression analysis, they are adjusted appropriately. The parameters are then estimated, employing the least square method based on the working space, DLSM, as input data.



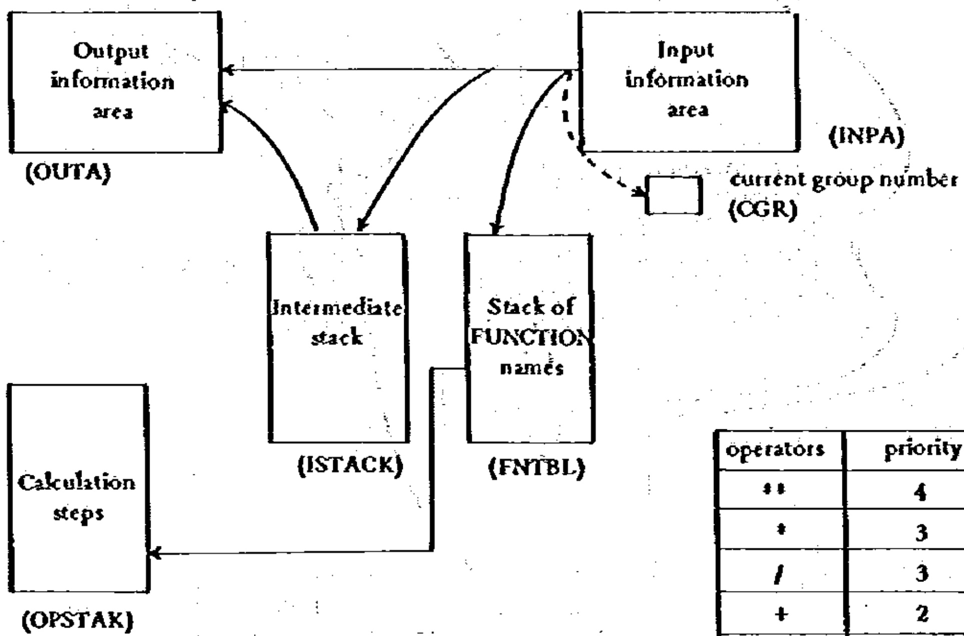
1970-1978
Y
=
LAG1 (X+Z)
, V*W :
①
②
③
time-series data file
Y
X
Z
V
W
①
Sum
②
temporary file
③
Product
Lag
②
Working opace DLSM
time-series data of Y (dependent variable)
time-series data of LAG1 (X+Z)
②
③
(independent variable)
time-series data of V*W (independent variable)
④
⑤
④
adjustment of data periods
⑥
The Least Square Method
Esti-mation Roport

Fig. 5-4-2

(2) Improved Inverse Poland Method

An arithmetic equation including the names of FUNCTIONs is processed, based on the input and output information areas, stack, etc., organized as shown in Fig. 5-4-3.

Fig. 5-4-3

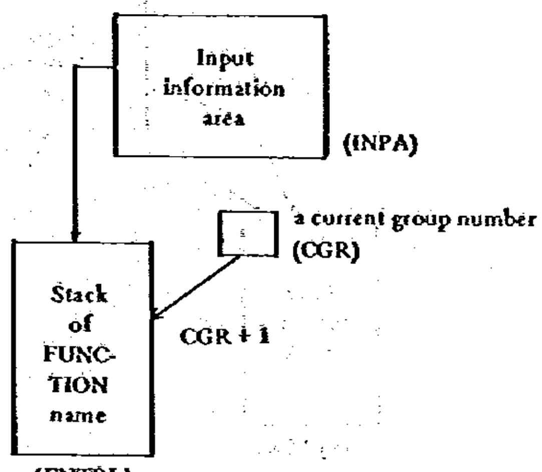


operators	priority
**	4
*	3
/	3
+	2
–	2
)	1
(	1

Case of a FUNCTION name

In order to indicate to which group a FUNCTION belongs, CGR + 1 is stored in the FNTBL together with the name of the FUNCTION. The initial value of the current group number (CGR) is 0.

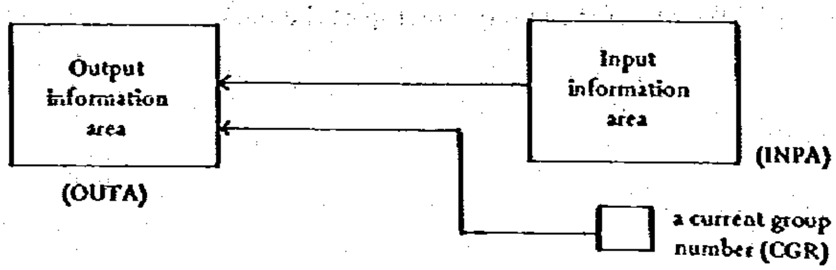
Fig. 5-4-5



Case of a variable name

In order to indicate to which group the variable belongs, the CGR is transferred to the OUTA together with the variable name.

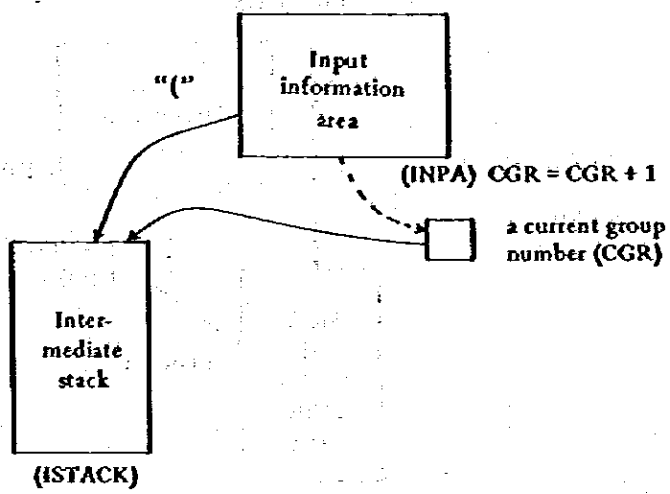
Fig. 5-4-6



Case of an operator

If the operator is " (", the CGR is incremented by 1 (CGR = CGR + 1), and the operator and CGR are transferred to the ISTACK.

Fig. 5-4-7

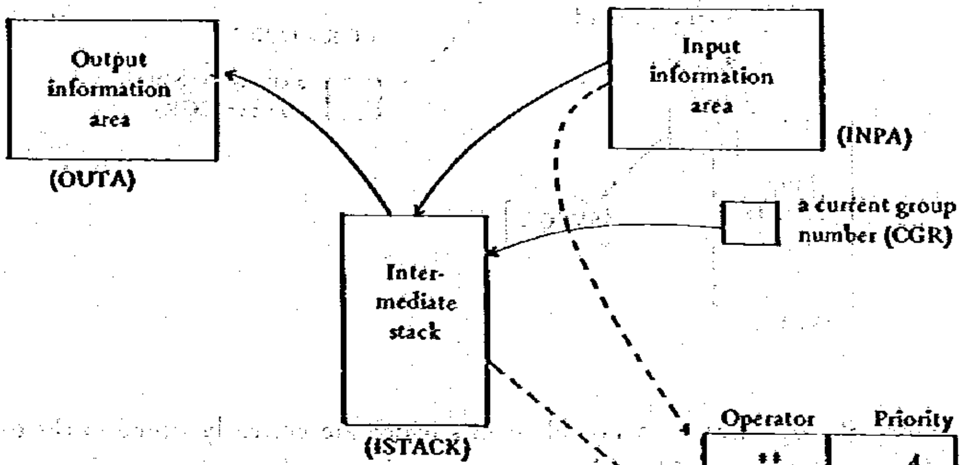


When the operator is not " (", the operator and CGR are transferred to the ISTACK if the stack is empty. If the stack is not empty, the operator's priority is compared with that of the operator in the stack.

p1 : Priority of the operator currently being processed.

p2 : Priority of the operator on top of the stack.

Fig. 5-4-8



Operator	Priority
**	4
*	3
/	3
+	2
−	2
)	1
(	1

P1 ≦ P2: (1) The operator which is on top of the ISTACK is transferred to the OUTA. Thus, the ISTACK will have a new operator on top.

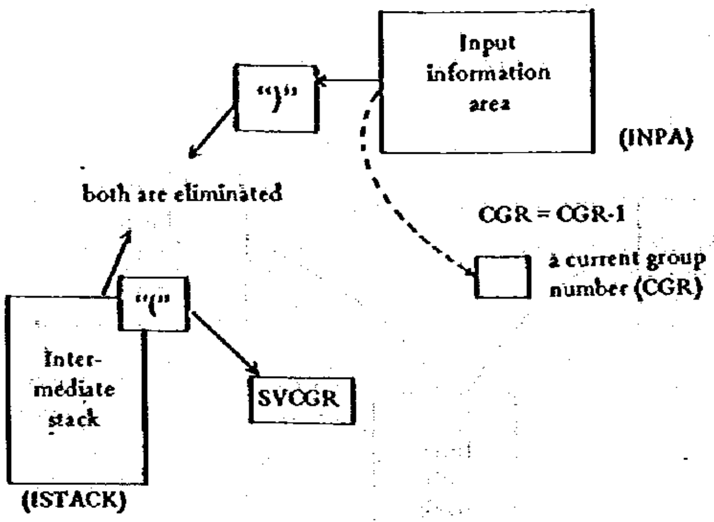
(2) The same process of comparison is repeated.

P1 > P2: (1) The operator currently being processed is placed in the ISTACK together with the CGR.

If the operator is ") ", its priority is compared with that of the operator on the top of the ISTACK, and it is transferred from the ISTACK to the OUTA. However, if the operator of the top of the ISTACK is " (", the following procedures are taken.

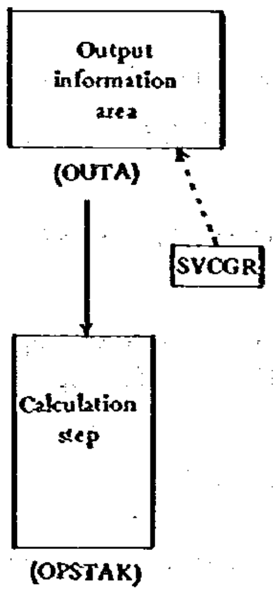
- The group number (SVCGR) of the " (" of the ISTACK is removed.
- The CGR is decremented by 1: CGR = CGR−1
- Both the " (" on the ISTACK and the " (" currently being processed are eliminated.

Fig. 5-4-9



– Among the operators and variable names which are currently stored in the output information area (OUTA), calculation steps of those whose group numbers coincide with the SVCGR are created first, and stored in the OPSTAK.

– Among the names of FUNCTIONs stored in the FNTBL, if there is a FUNCTION name whose group number coincides with the SVCGR, the FUNCTION name is transferred to the OPSTACK as a parameter of the variables on the left side of



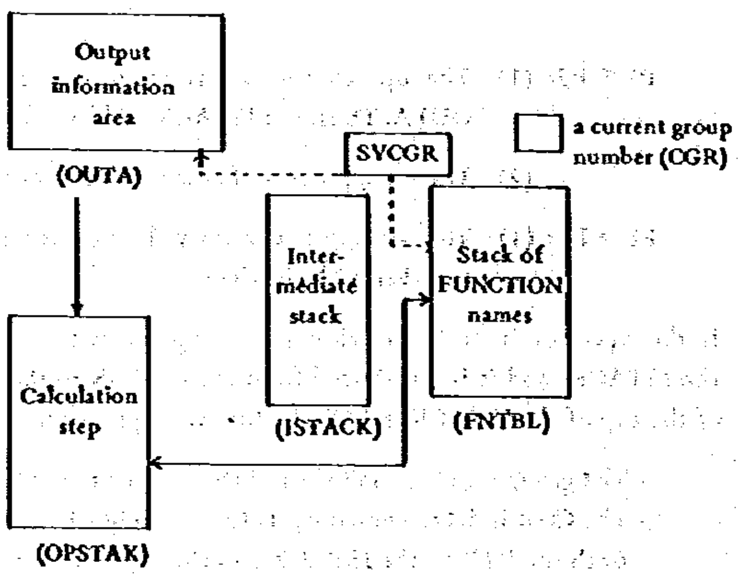


Fig. 5-4-10

Fig. 5-4-11

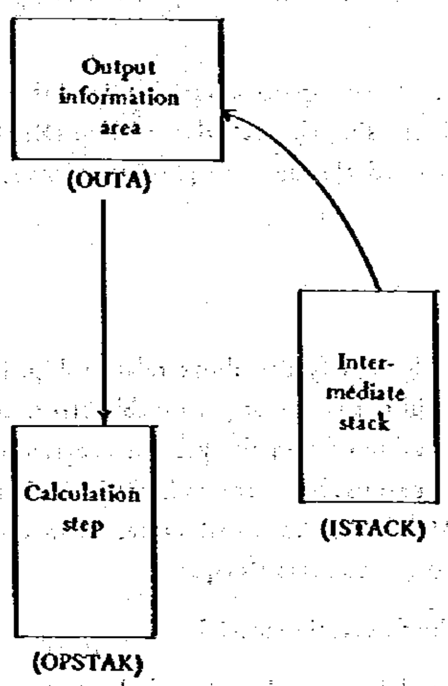
the last calculation equation created in the previous step. The FUNCTION name which is transferred is deleted from the FNTBL. The variable used in the formulation stage of the calculation steps using OUTA and FNTBL is marked (in order to avoid using them in the coming calculation steps). However, since the left side of the last calculation equation in the calculation step which is formulated at this stage may possibly be used later on, it remains unmarked in the OUTA. However, the group number of the variable is replaced by CGR.

Case where the INPA becomes empty

The ISTACK is checked for the presence of an operator. If it is present, all of the remaining operators are transferred to the OUTA.

A calculation step is then formulated from the unmarked operators and variables in the OUTA and stored in OPSTAK.

Fig. 5-4-12



5-4-3 Forecast Model

The forecasting model program employs the Gauss Seidel iteration method for calculating convergence of a model consisting of structural and definition equations.

This program offers the following built-in types so that the calculations will meet variations in model verification and forecast using the model.

– Partial test:

This calculation type is used to check mutual relationships between the parameters and variables in the structural equations. Actual values are used for all calculations.

– Total test:

This calculation type is used to check the degree of errors in comparison with actual values when focussing only on a given period in time-series calculations. Thus, actual values are used only for lagged variables in order to avoid any influence by a previous period's error on calculations for the current period. Calculated values are used for the other variables.

– Forecasting calculation:

Calculated values are used for all variables.

(1) Convergence calculation using the Gauss Seidel iteration Method

The convergence calculation using the Gauss Seidel iteration method is performed for the endogenous variables of the calculation types, excluding the partial test, as shown in the program list.

It determines whether an endogenous variable is within the permissible error range (ε; FPS in the program list) using the calculated value (X: DATA (2, NP, I) in the program list) and the value obtained through the previous convergence calculations (X: HAT(I) in the program list).

$$\left| \frac{X - \bar{X}}{\bar{X}} \right| < \varepsilon$$

If all endogenous variables satisfy the above relationship, it is understood that the solution of the equation is within the range of permissible error, and calculation for a next period can be performed. The value of ε in the present program is set at 0.001%. Tests conducted for the case of 0.01% permissible error indicated no significant difference as far as this model is concerned. Moreover, the initial value, X, in each period's calculation employs the solution, X, of the previous period's equation.

(2) Programming of the forecasting model

Variables used in the model are numbered, and observation values are read into the working array, DATA, whose entries correspond to the variables' numbering from the time-series data file.

Meanwhile, the structural equations of the model are also numbered, and the parameters obtained from the regression analysis are read into the working space, PRM, whose entries correspond to the parameters' numbering. A program which suits the structural equations is then constructed using DATA and PRM, and calculation results are stored in DATA.

```
      C
      C
      C
      C    FIXED POINT CHECK
      C
             IF( ITYPE.EQ.1 ) GO TO 100
             ICOUNT=ICOUNT+1
             IF( ICOUNT.GT.LIMIT ) S T O P
             NON=0
      C
             DO 7 I=1,NCTR
             IF( NOV(4,I).EQ.1 ) GO TO 7
      C   ENDOGENOUS
      C   VARIABLE
             IF( HAT(I).EQ.0. ) GO TO 7
             DIF=(DATA(2,NP,I)-HAT(I))/HAT(I)
             DIF=DABS(DIF)
             IF( DIF.LT.EPS ) GO TO 7
      C
             NON=NON+1
             IF( ICOUNT.EQ.LIMIT ) WRITE(6,8)  (NOV(J,I),J=1,3),DATA(1,NP,I),
            -                                    DATA(2,NP,I),HAT(I),DIF
           8 FORMAT(1X,32HITERATION COUNT EXCEEDED   NAME=,3A4,5X,4F12.4)
           7 CONTINUE
      C
             IF( NON.EQ.0 ) GO TO 100
             DO 9 I=1,NCTR
             IF( NOV(4,I).EQ.1 ) GO TO 9
             HAT(I)=DATA(2,NP,I)
           9 CONTINUE
      C   CALCULATION AGAIN
             GO TO 50
      C


     OSIV/F4 FORTRAN IV (GE)  V04L09      MODEL    DATE 80.03.12  TIME 17.54.27

      C
         100 CONTINUE
      C - - - - - - - - - - - - - - - - - - - -
             RETURN
             END
```

MACRO ECONOMIC SECTOR

VARIABLE NAME LIST

I. Endogenous variable

NO.	NAME
1	CG73&
2	CP&
3	CPI73&
4	CP73&
5	EXP&
6	EXP73&
7	GDP&
8	GDP73&
9	GNP&
10	GNP73&
11	IIP73&
12	IMP&
13	IMP73&
14	ITP&
15	ITP73&
16	NI&
17	NI73&
18	PCG&
19	PCP&
20	PEXP&
21	PGDP&
22	PGNP&
23	PIMP&
24	PITP&
25	WPI73&

II. Exogenous variable

NO.	NAME
26	CG&
27	PAGRGPE73&
28	PCROIL&
29	PETROP&
30	PWE75&
31	WIM75&

MACRO ECONOMIC SECTOR

EQUATION LIST

I. Structual equation

Ident.	Equations
1	EXP73&=WIM75&:
2	PIMP&=PWE75&:
3	NI73&=LAG1(GDP73&):
4	WPI73&=PIMP&,NI&:
5	CPI73&=NI&,PIMP&:
6	PCP&=NI&,PIMP&:
7	PCG&=CPI73&:
8	PITP&=PIMP&,NI&:
9	PEXP&=PCROIL&,PAGRGPE73&:
10	NI&=LAG1(NI&),LAG1(GDP73&):
11	CP73&=NI73&,LAG1(CP73&):
12	ITP73&=CP73&,CG73&:
13	IMP73&=GDP73&:
14	IIP73&=ITP73&,PETROP&:
15	GNP73&=GDP73&:
16	GNP&=GDP&:

II. Definition equation

Equations

CG73&=CG&/(PCG&/100.)
GDP73&=CP73&+CG73&+ITP73&+EXP73&-IMP73&
CP&=CP73&*(PCP&/100.)
ITP&=ITP73&*(PITP&/100.)
EXP&=EXP73&*(PEXP&/100.)
IMP&=IMP73&*(PIMP&/100.)
GDP&=CP&+CG&+ITP&+EXP&-IMP&
PGDP&=100.*GDP&/GDP73&
PGNP&=100.*GNP&/GNP73&

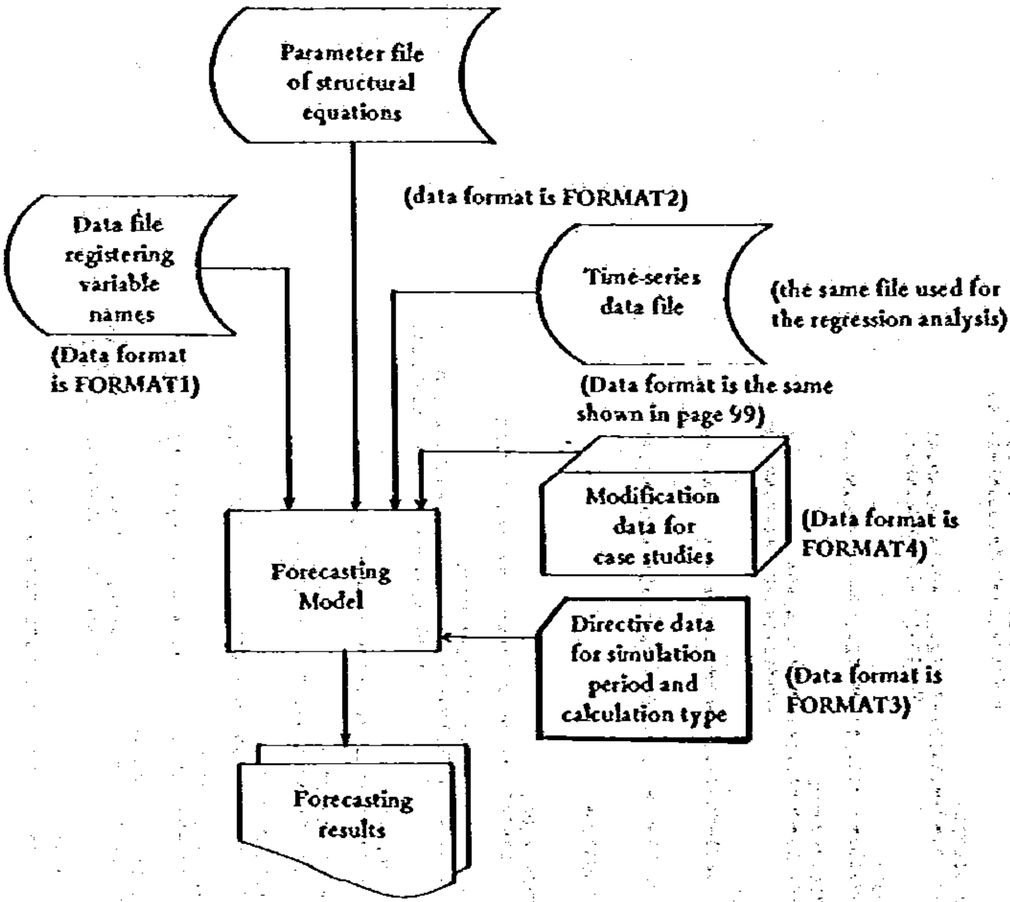
```
             C
000026              DO 4 I=1,NCTR
000027              IF( NOV(4,I).EQ.1 ) GO TO 4
             C
             C   ENDOGENOUS VARIABLE
000028              HAT(I)=DATA(KK,NP-1,I)
000029              DATA(2,NP,I)=DATA(KK,NP-1,I)
000030            4 CONTINUE
             C
             C   ICOUNT: ITERATION COUNTER
000031              ICOUNT=0
000032           50 CONTINUE
             C
             C
             C    ************
             C    * MACRO    *
             C    * ECONOMIC *
             C    * SECTOR   *
             C    ************
             C
             C
             C   STRUCTUAL EQUATIONS
             C
             C
             C   EXP73&=WIM73&:
000033              DATA(2,NP,6)=PRM(1,1)+PRM(2,1)*DATA(KK,NP,31)
             C
             C   PIMP&=PWE73&:
000034              DATA(2,NP,23)=PRM(1,2)+PRM(2,2)*DATA(KK,NP,30)
             C
             C   NI73&=LAG1(GDP73&):
000035              DATA(2,NP,17)=PRM(1,3)+PRM(2,3)*DATA(JJ,NP-1,8)
             C
             C   WPI73&=PIMP&,NI&:
000036              DATA(2,NP,25)=PRM(1,4)+PRM(2,4)*DATA(KK,NP,23)
                 *                           +PRM(3,4)*DATA(KK,NP,16)
             C
             C   CPI73&=NI&,PIMP&:
000037              DATA(2,NP, 3)=PRM(1,5)+PRM(2,5)*DATA(KK,NP,16)
                 *                           +PRM(3,5)*DATA(KK,NP,23)
             C
             C   PCP&=NI&,PIMP&:
000038              DATA(2,NP,19)=PRM(1,6)+PRM(2,6)*DATA(KK,NP,16)
                 *                           +PRM(3,6)*DATA(KK,NP,23)
             C
             C   PCG&=CPI73&:
000039              DATA(2,NP,18)=PRM(1,7)+PRM(2,7)*DATA(KK,NP, 3)
             C
             C   PITP&=PIMP&,NI&:
000040              DATA(2,NP,24)=PRM(1,8)+PRM(2,8)*DATA(KK,NP,23)
                 *                           +PRM(3,8)*DATA(KK,NP,16)
             C
             C   PEXP&=PCROIL&,PAGRGPE73&:
000041              DATA(2,NP,20)=PRM(1,9)+PRM(2,9)*DATA(KK,NP,28)
                 *                           +PRM(3,9)*DATA(KK,NP,27)
             C
             C   NI&=LAG1(NI&),LAG1(GDP73&):
000042              DATA(2,NP,16)=PRM(1,10)+PRM(2,10)*DATA(JJ,NP-1,16)
```

```
                                    +PRM(3,10)*DATA(JJ,NP-1, 8)
          C
          C  CP736=NI736,LAG1(CP736):
 000043         DATA(2,NP, 4)=PRM(1,11)+PRM(2,11)*DATA(KK,NP,17)
               *                    +PRM(3,11)*DATA(JJ,NP-1, 4)
          C
          C  ITP736=CP736,CG736:
 000044         DATA(2,NP,15)=PRM(1,12)+PRM(2,12)*DATA(KK,NP,4)
               *                    +PRM(3,12)*DATA(KK,NP,1)
          C
          C  IMP736=GDP736:
 000045         DATA(2,NP,13)=PRM(1,13)+PRM(2,13)*DATA(KK,NP,8)
          C
          C  IIP736=ITP736,PETROP6:
 000046         DATA(2,NP,11)=PRM(1,14)+PRM(2,14)*DATA(KK,NP,15)
               *                    +PRM(3,14)*DATA(KK,NP,29)
          C
          C  GNP736=GDP736:
 000047         DATA(2,NP,10)=PRM(1,15)+PRM(2,15)*DATA(KK,NP,8)
          C
          C  GNP6=GDP6:
 000048         DATA(2,NP, 9)=PRM(1,16)+PRM(2,16)*DATA(KK,NP,7)
          C
          C
          C  DEFINITION EQUATIONS
          C
          C
          C  CG736=CG6/(PCG6/100.)
 000049         DATA(2,NP, 1)=DATA(KK,NP,26)/(DATA(KK,NP,18)/100.)
          C
          C  GDP736=CP736+CG736+ITP736+EXP736-IMP736
 000050         DATA(2,NP, 8)=DATA(KK,NP,4)+DATA(KK,NP,1)+DATA(KK,NP,15)
               *                    +DATA(KK,NP,6)-DATA(KK,NP,13)
          C
          C  CP6=CP736*(PCP6/100.)
 000051         DATA(2,NP,2)=DATA(KK,NP,4)*(DATA(KK,NP,19)/100.)
          C
          C  ITP6=ITP736*(PITP6/100.)
 000052         DATA(2,NP,14)=DATA(KK,NP,15)*(DATA(KK,NP,24)/100.)
          C
          C  EXP6=EXP736*(PEXP6/100.)
 000053         DATA(2,NP,5)=DATA(KK,NP,6)*(DATA(KK,NP,20)/100.)
          C
          C  IMP6=IMP736*(PIMP6/100.)
 000054         DATA(2,NP,12)=DATA(KK,NP,13)*(DATA(KK,NP,23)/100.)
          C
          C  GDP6=CP6+CG6+ITP6+EXP6-IMP6
 000055         DATA(2,NP,7)=DATA(KK,NP,2)+DATA(KK,NP,26)+DATA(KK,NP,14)
               *                    +DATA(KK,NP, 5)-DATA(KK,NP,12)
          C
          C  PGDP6=100.*GDP6/GDP736
 000056         DATA(2,NP,21)=100.*DATA(KK,NP,7)/DATA(KK,NP,8)
          C
          C  PGNP6=100.*GNP6/GNP736
 000057         DATA(2,NP,22)=100.*DATA(KK,NP,9)/DATA(KK,NP,10)
          C
          C
          C  *****************
```

(3) Various functions used for case studies

In forecast calculations, several cases of simulation are often conducted with different policy variables. The forecasting model program provides a facility which changes data so that several cases of simulation can be conducted continuously by changing the parameters of the structural equations and values of the time-series data.

Fig. 5-4-13.

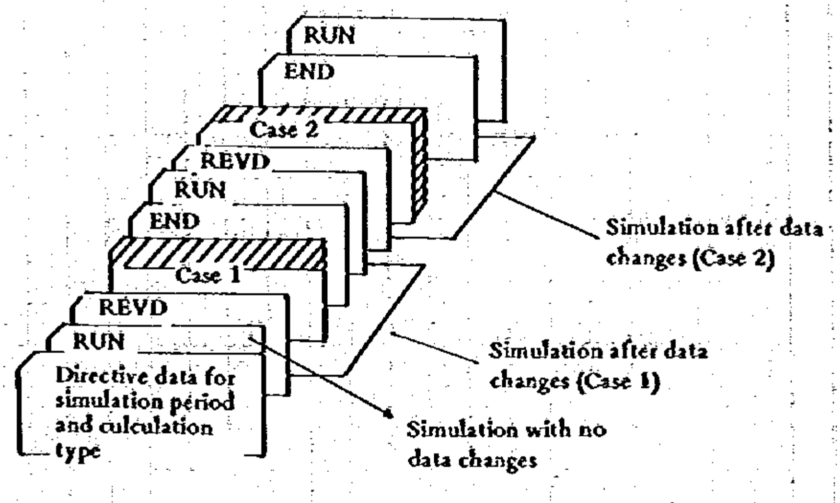


The program provides a modification function for each of the three files shown in Fig. 5-4-13, and each is distinguished by the following directive data.

- REVN: changes in variable names
- REVP: changes in parameters
- REVD: changes in time-series data
- END: indicates the end of the directive data

When a RUN card is encountered after these data changes, simulation begins.

Fig. 5-4-14



After completion of the calculations for all periods, the contents of DATA is edited and output as a report on the forecasting model. There are two types of reports: a comparable table of actual and calculated values, and a table showing calculated values and each period's growth rate. The former is used for the partial and total tests, and the latter for forecasting calculations.

客先名 ______________________

作業名 FORMAT1

作成者名 ______________________

日付 / / ページ /

Variable type 0: Endogenous 1: Exogenous

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Variable Name Field

1
2
3 ✓
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

客先名 ______________________

作業名 FORMAT2

作成者名 ______________________

日付 / / ページ /

Identification

Number of data

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

Data Field

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

客先名 ____________________

作業名 FORMAT3 Directive data

作成者名 ____________________

日付 / / ページ /

Calculation type

1 = Partial test
2 = Total test
3 = Forecasting

Simulation period

start

end

Rows: 1–20

Columns: 1–80

客先名 ______________________

作業名 FORMAT4-(I)

作成者名 ______________________

日付 / / ページ /

Line	Columns 1–80
1	REVN
2	New Variable Name
3	Variable type
4	Old Variable Name ↓ Variable name
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	END
16	
17	
18	
19	
20	

客先名 ____________

作業名 FORMAT4-(2)

作成者名 ____________

日付 / / ページ /

Line	Columns 1–80
1	REVP
2	↑
3	Data format is same as FORMAT2.
4	
5	
6	↓
7	END
8	
9	REVD
10	↑
11	Data format is same as FORMAT3.
12	
13	
14	↓
15	END
16	RUN Run name (Used to print a result)
17	1 = Report type1 2 = Report type2 3 = Report type1&2
18	
19	
20	

5-5. Lists of Calculation Results

Listed below are forecast values of macro-economic exogenous and endogenous variables over the 12-year period from 1979 to 1990.

(1) Exogenous Variables

FY	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%
78	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
79	[illegible]	40.4	[illegible]	5.0	[illegible]	130.0	[illegible]	3.2	[illegible]	12.0	[illegible]	5.0
80	[illegible]	20.0	[illegible]	5.0	[illegible]	10.0	[illegible]	-3.3	[illegible]	12.0	[illegible]	5.0
81	[illegible]	24.0	[illegible]	5.0	[illegible]	10.0	[illegible]	0.6	[illegible]	12.0	[illegible]	5.0
82	[illegible]	24.0	[illegible]	5.0	[illegible]	10.0	[illegible]	0.9	[illegible]	12.0	[illegible]	5.0
83	[illegible]	24.0	[illegible]	5.0	[illegible]	10.0	[illegible]	[illegible]	[illegible]	12.0	[illegible]	5.0
84	[illegible]	20.0	[illegible]	4.0	[illegible]	10.0	[illegible]	0.9	[illegible]	10.0	[illegible]	5.0
85	[illegible]	20.0	[illegible]	4.0	[illegible]	10.0	[illegible]	0.9	[illegible]	10.0	[illegible]	5.0
86	[illegible]	20.0	[illegible]	[illegible]	[illegible]	10.0	[illegible]	[illegible]	[illegible]	10.0	[illegible]	5.0
87	[illegible]	20.0	[illegible]	6.0	[illegible]	10.0	[illegible]	[illegible]	[illegible]	10.0	[illegible]	5.0
88	[illegible]	20.0	[illegible]	3.0	[illegible]	10.0	[illegible]	[illegible]	[illegible]	10.0	[illegible]	5.0
89	[illegible]	17.0	[illegible]	3.0	[illegible]	10.0	[illegible]	[illegible]	[illegible]	8.0	[illegible]	5.0
90	[illegible]	17.0	[illegible]	3.0	[illegible]	10.0	[illegible]	[illegible]	[illegible]	8.0	[illegible]	5.0

(2) Endogenous Variables

FY	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%
78	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
81	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
85	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
89	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FY	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%
78	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
81	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
85	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
89	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FY	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%
78	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
81	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
85	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
89	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FY	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%	[illegible]	%
78	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
81	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
85	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
89	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Presented below is an energy balance table statement prepared on forecast values of 1980, 1983, 1988 and 1990.

FAC 80)	EBC01	EBC02	EBC03	EBC04	EBC05	EBC06	EBC07	EBC07A	EBC07B	EBC08	EBC09	EBC10
E01	719.	818690.										
E02	0.	4224.	5974.	871.	1134.	3876.	4514.	3858.	125.	0.	0.	81.
E03	-30.	-78187.	-55378.	0.						-5247.	-2757.	-14240.
E04			-613.	0.	-270.		-89.	-15.	-65.	-349.		
E05	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E06	688.	33922.	-4892.	871.	864.	3616.	3934.	3873.	69.	-3581.	-2757.	-14157.
E07	-382.		-3524.				-2749.	-2780.	-49.	-775.		
E08	0.		-45.				-45.	-25.	-29.	0.		
E09A		-33470.	33242.	4807.	51.	4532.	6155.	4659.	3515.	4444.	937.	13154.
E09B			2650.								2058.	659.
E10A	-8.	-252.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E10B	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E11	297.		26231.	4978.	915.	18828.	7335.	5828.	1547.	2688.	0.	595.
E12	227.		4568.	0.		0.	2968.	1704.	1254.	1547.	0.	37.
E13	41.		9358.	4578.	842.		3528.	3349.	181.	450.		
E14	0.		18438.			18828.	0.	0.	0.	0.		82.
E15			1268.	349.	72.		847.	775.	72.	61.		
E16	39.		475.								0.	495.

FAC 80)	EBC10A	EBC10B	EBC11	EBC11A	EBC11B	EBC11C	EBC11D	EBC12	EBC13	EBC14	EBC15	EBC16	EBC17
E01			33766.	33766.				0.	1817.		155189.	42551.	197652.
E02	4.	77.									14220.		14220.
E03	-611.	-10425.	-13891.		-13891.						-129221.		-129221.
E04											-678.		-678.
E05	0.	0.									0.		0.
E06	-519.	-10548.	26975.	33766.	-13891.			0.	1817.	4415.	56457.	42551.	92760.
E07								0.	-567.	1325.	-4371.		-4358.
E08			-45.	-54.		9.					-99.		-99.
E09A	61.	11141.									-428.		-428.
E09B	659.		-4472.	-18417.	13925.						-1842.		-1842.
E10A	0.	0.	-5015.	-5395.	0.	0.					-5355.	0.	-5355.
E10B	0.	0.	-2755.	-2714.	-34.	-7.		0.	-1597.	-159.	-7954.	0.	-7754.
E11	188.	435.	2489.	2686.		2.				1126.	30343.	42558.	72891.
E12	37.		1375.	1375.		0.				742.	6717.	3420.	10534.
E13										0.	9839.	36.	9875.
E14	82.		5.	2.		2.				316.	16319.	38876.	19728.
E15										63.	1343.		9343.
E16		495.	1337.	1337.							1834.		1834.

FAC 83)	EBC01	EBC02	EBC03	EBC04	EBC05	EBC06	EBC07	EBC07A	EBC07B	EBC08	EBC09	EBC10
E01	1864.	831839.										
E02	0.	12449.	82797.	1383.	1569.	5039.	4897.	4761.	133.	41.	549.	81.
E03	-39.	-97361.	-76924.	0.						-2926.	-85.	-14913.
E04			-835.	0.	-410.		-85.	-15.	-70.	-349.		
E05	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E06	1834.	44587.	-4202.	1383.	1159.	5459.	4812.	4749.	83.	-2366.	415.	-14732.
E07	-1321.		-4215.				-3265.	-3216.	-49.	-959.		
E08	0.		-45.				-45.	-25.	-29.	0.		
E09A		-44435.	44189.	5312.	87.	8659.	8213.	6281.	2609.	5612.	1295.	14721.
E09B			2759.								2658.	754.
E10A	-8.	-252.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E10B	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E11	595.		38274.	4474.	1228.	13747.	9715.	7713.	2003.	2575.	3428.	739.
E12	453.		6145.	0.		0.	4349.	2618.	1723.	2053.	0.	51.
E13	22.		12158.	4374.	1126.		4264.	4224.	180.	450.		
E14	0.		13834.			13747.	0.	0.	0.	0.		87.
E15			1443.	349.	188.		1071.	1071.	150.	72.		
E16	39.		4220.								3620.	639.

FAC 83)	EBC10A	EBC10B	EBC11	EBC11A	EBC11B	EBC11C	EBC11D	EBC12	EBC13	EBC14	EBC15	EBC16	EBC17
E01			58775.	58775.				0.	1589.		186437.	51027.	237443.
E02	0.	77.									25445.		25445.
E03	-476.	-14117.	-25656.		-25656.						-142171.		-142171.
E04											-835.		-835.
E05	0.	0.									0.		0.
E06	-472.	-14547.	24119.	58775.	-25656.			0.	1789.	4591.	69353.	51027.	120365.
E07								0.	-555.	1027.	-5489.		-5488.
E08			-45.	-55.		10.					-79.		-78.
E09A	89.	14113.									-567.		-567.
E09B	259.		-5932.	-31822.	25810.						-3182.		-3182.
E10A	0.	0.	-7618.	-7618.	0.	0.					-7076.	0.	-7076.
E10B	0.	0.	-2755.	-2711.	-31.	-7.		0.	-1424.	-274.	-8927.	0.	-8927.
E11	130.	559.	3571.	3549.		1.				1553.	43926.	51027.	94953.
E12	57.		1027.	1027.		0.				1066.	9731.	2063.	11854.
E13										0.	12174.	36.	12212.
E14	87.		5.	3.		3.				459.	14239.	45928.	63167.
E15										87.	1739.		1739.
E16		639.	1739.	1739.							5597.		5597.

FAC 88)	EBC01	EBC02	EBC03	EBC04	EBC05	EBC06	EBC07	EBC07A	EBC07B	EBC08	EBC09	EBC10
E01	2779.	136489.										
E02	0.	12449.	24979.	8162.	2455.	9163.	8519.	7855.	453.	0.	569.	81.
E03	-39.	-93198.	-28676.	0.						-1589.	-389.	-18127.
E04			-3699.	0.	-665.		-65.	-15.	-70.	-349.		
E05	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E06	2747.	55452.	4193.	8162.	1779.	9163.	8433.	7850.	583.	-1920.	119.	-18046.
E07	-2254.		-8157.				-1352.	-1303.	-47.	-1895.		
E08	0.		-45.				-45.	-25.	-29.	0.		
E09A		-55680.	54874.	6616.	83.	10786.	10239.	7728.	2502.	7339.	1564.	18337.
E09B			2758.								2058.	753.
E10A	-8.	-252.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E10B	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E11	487.		55434.	19778.	1873.	24154.	14266.	11250.	3618.	3697.	3425.	1847.
E12	453.		14872.	0.		0.	4951.	4272.	2477.	3569.	0.	81.
E13	4.		68117.	16478.	9716.		5473.	5293.	189.	450.		
E14	0.		26519.			24154.	0.	0.	0.	0.		119.
E15			2378.	350.	157.		1842.	1655.	157.	97.		
E16	-39.		4139.								3420.	819.

FAC 88)	EBC10A	EBC10B	EBC11	EBC11A	EBC11B	EBC11C	EBC11D	EBC12	EBC13	EBC14	EBC15	EBC16	EBC17
E01			62123.	62123.				0.	3991.		295413.	72174.	272657.
E02	4.	77.									37327.		37327.
E03	-432.	-17435.	-32666.		-32666.						-145783.		-145780.
E04											-1879.		-1879.
E05	0.	0.									0.		0.
E06	-628.	-17418.	29457.	42123.	-32666.			0.	3991.	9531.	94241.	72174.	166418.
E07								0.	-1119.	2859.	-5543.		-5543.
E08			-45.	-56.		11.					-99.		-99.
E09A	180.	10237.									-766.		-764.
E09B	259.		-4489.	-39349.	32769.						-3939.		-3939.
E10A	0.	0.	-9318.	-9318.	0.	0.					-9578.	0.	-9578.
E10B	0.	0.	-2755.	-2710.	-34.	-7.		0.	-2072.	-929.	-8184.	0.	-8184.
E11	222.	819.	5447.	5645.		4.				2430.	64261.	22074.	136375.
E12	81.		2811.	2811.		0.				1784.	15149.	957.	16397.
E13										0.	18121.	36.	18157.
E14	119.		7.	4.		4.				569.	21187.	71181.	92368.
E15										137.	2533.		2533.
E16		819.	2751.	2751.							7220.		7220.

FAC 90)	EBC01	EBC02	EBC03	EBC04	EBC05	EBC06	EBC07	EBC07A	EBC07B	EBC08	EBC09	EBC10
E01	3419.	038340.										
E02	0.	12448.	33254.	6241.	2093.	12028.	11204.	10030.	1170.	0.	568.	81.
E03	-39.	-91596.	-11454.	0.						-1474.	-381.	-17781.
E04			-1239.	0.	-855.		-85.	-15.	-70.	-349.		
E05	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E06	3269.	55652.	13469.	6241.	2838.	12620.	11615.	10615.	1180.	-1934.	119.	-17713.
E07	-3372.		-8887.				-3884.	-4035.	-49.	-1895.		
E08	0.		-45.				-45.	-25.	-29.	0.		
E09A		-55839.	54811.	6118.	83.	10785.	10230.	7728.	2502.	7339.	1561.	18337.
E09B			2750.								2424.	759.
E10A	-8.	-252.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E10B	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E11	487.		43977.	92654.	2181.	23615.	14418.	12089.	3533.	4180.	3420.	1187.
E12	453.		11850.	0.		0.	8219.	5043.	3170.	3542.	0.	97.
E13	4.		21857.	92558.	4550.		4451.	5871.	160.	450.		
E14	0.		23781.			23615.	0.	0.	0.	0.		187.
E15			2730.	399.	183.		2144.	1963.	183.	169.		
E16	39.		4544.								3426.	924.

FAC 90)	EBC10A	EBC10B	EBC11	EBC11A	EBC11B	EBC11C	EBC11D	EBC12	EBC13	EBC14	EBC15	EBC16	EBC17
E01			43415.	43415.				0.	4430.		269143.	83419.	292762.
E02	4.	77.									45292.		45292.
E03	-559.	-17372.	-32444.		-32444.						-144743.		-144743.
E04											-1230.		-1230.
E05	0.	0.									0.		0.
E06	-526.	-17313.	30749.	43415.	-32444.			0.	4430.	11192.	107567.	83419.	192924.
E07								0.	-1139.	3559.	-10735.		-10735.
E08			-45.	-54.		11.					-92.		-91.
E09A	189.	10237.									-744.		-754.
E09B	250.		-4489.	-35349.	32788.						-3939.		-3939.
E10A	0.	0.	-9512.	-9512.	0.	0.					-9772.	0.	-9772.
E10B	0.	0.	-7755.	-7714.	-34.	-7.		0.	-2959.	-544.	-8257.	0.	-8257.
E11	264.	924.	8748.	8744.		4.				2854.	24184.	83419.	157455.
E12	97.		3453.	3453.		0.				2846.	17779.	743.	16512.
E13										0.	21861.	34.	21897.
E14	187.		0.	4.		4.				489.	24429.	82611.	107119.
E15										159.	2897.		2897.
E16		924.	3288.	3288.							7869.		7859.

5-6. Future improvements of Energy Supply-Demand Forecast Model

The most critical problem related to the macro-economic model of Indonesia is a lack of a variety of data. In the concrete terms, items of income account consisted of only national income, which was used in a number of equations as an explanatory variable. To prepare a proper model, however, national income should be subdivided into several items such as wage, personal disposable income and income of private corporation and it is desirable to improve the aforementioned point as a future subject. Also, if possible, it would be desirable to introduce other variables such as unemployment rate, operating rate, labor productivity and interest rate in the model. The second problem is that a period of data sampling was as short as 8 years from 1971 to 1978. To make a forecast based on constitutive equations estimated from data of an eight-year sampling is problematic in various aspects and, as a result, questions will be raised as to reliability of such a forecast. Accordingly, it is desirable to facilitate collection, classification and filling up of macro-economic data concerning the 1970 and preceding period as soon as possible. Thirdly, enlargement of variables which connect macro-economics with energy supply-demand can be pointed out as a future subject. For examples, as to figures to represent the number of registered motor vehicles, the model prepared this time had an aggregate figure only due to limited data availability. It is required in the future to break down the figure by type of vehicle such as passenger cars, buses and trucks and by type of fuel energy such as gasoline-powered cars and diesel-powered cars. Also required it introduction of variables concerning other items such as aviation transport volume, marine transport volume, railroad transport volume and number of domestic electric generators.

The first problem related to the energy supply-demand model of Indonesia is collection, classification and filling up of data concerning the 1970 and preceding period, which was also pointed out related to the macro-economic model. The second problem involves an energy balance table. That is, while a simplified energy balance table tentatively prepared was used this time due to various limitations including time, it is required in the future to prepare an original energy balance table containing detailed statements by type of energy resource and by energy supply and consumption sectors and enlarge the model based on the table. Thirdly, although price factors were seldom adopted as an explanatory variable for estimating equations of energy consumption presented in the final consumption sector of the model prepared this time because we could not obtain factors having significance, it is necessary in the future to try to introduce price effects by originating some appropriate methods. The forth problem is also related to estimated equations of energy consumption presented in the final consumption sector. In other words, as a matter of convenience, regarding items about which we could not obtain significant data, elasticity (ex. elasticity to GDP, elasticity to government consumption expenditure) were widely used as explanatory variables, which is considered problematic in various aspects. Accordingly, it is required to replace them with other explanatory variables which are more appropriate.

As mentioned above, the medium- and long-term energy supply-demand forecast model that we prepared as part of this project has various problems caused by time limitation and limited data availability. Therefore, we expect that concerned staff of Indonesia will carry out, based on the model prepared this time, energitic activities to enlarge and fill up the model in the future.

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