

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**MINISTRY OF ENERGY  
THE SOCIALIST REPUBLIC OF VIET NAM**

**THE MASTER PLAN STUDY  
ON  
ELECTRIC POWER DEVELOPMENT  
IN  
THE SOCIALIST REPUBLIC OF VIET NAM**

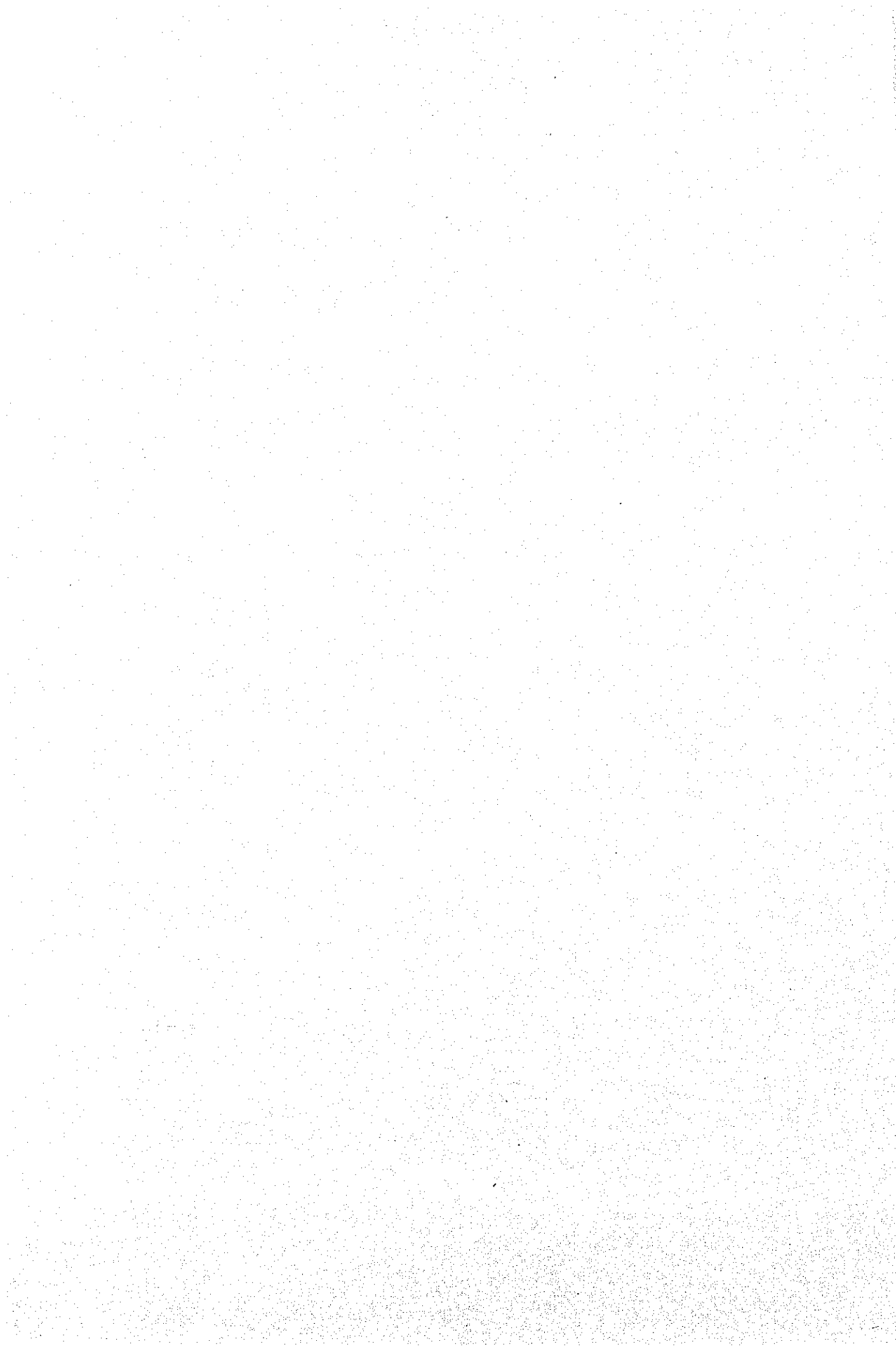
**FINAL REPORT  
APPENDIX Vol. II  
DATA BASE OPERATION MANUAL**



**SEPTEMBER 1995**

**ELECTRIC POWER DEVELOPMENT CO., LTD.  
THE INSTITUTE OF ENERGY ECONOMICS, JAPAN**

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## **CHAPTER 4**

### **DATABASE SYSTEM**

## CHAPTER 4 DATABASE SYSTEM

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## **CHAPTER 4 DATABASE SYSTEM**

### **4.1 Introduction**

#### **4.1.1 Basic Concepts of Database and Management System**

A database in general is a collection of data organized for some objectives, however the database defined here is an electronic file, especially that can be processed by a computer.

Data can be classified in three types. The first type is fixed stable data like location name or personal name. The second is what lasts unchanged for a period like the specifications of facilities. The first type of data are often used as keys for sorting or collating. It is called key code or simply a code. The second type of data is often used as base data so that it is called Master Data or simply a Master. In contrast to them, the third type data is called Transaction Data or simply Data that means business, trade or dealings.

The database in this study is assumed as a collection of data organized in a electronic file and it consists of all or a part of Code, Master and Transaction Data.

#### **4.1.2 New Database for Viet Nam**

After first study, JICA Study Team recognized that two energy databases are necessary for Viet Nam. They are "Power Database" and "Energy and Economic Database."

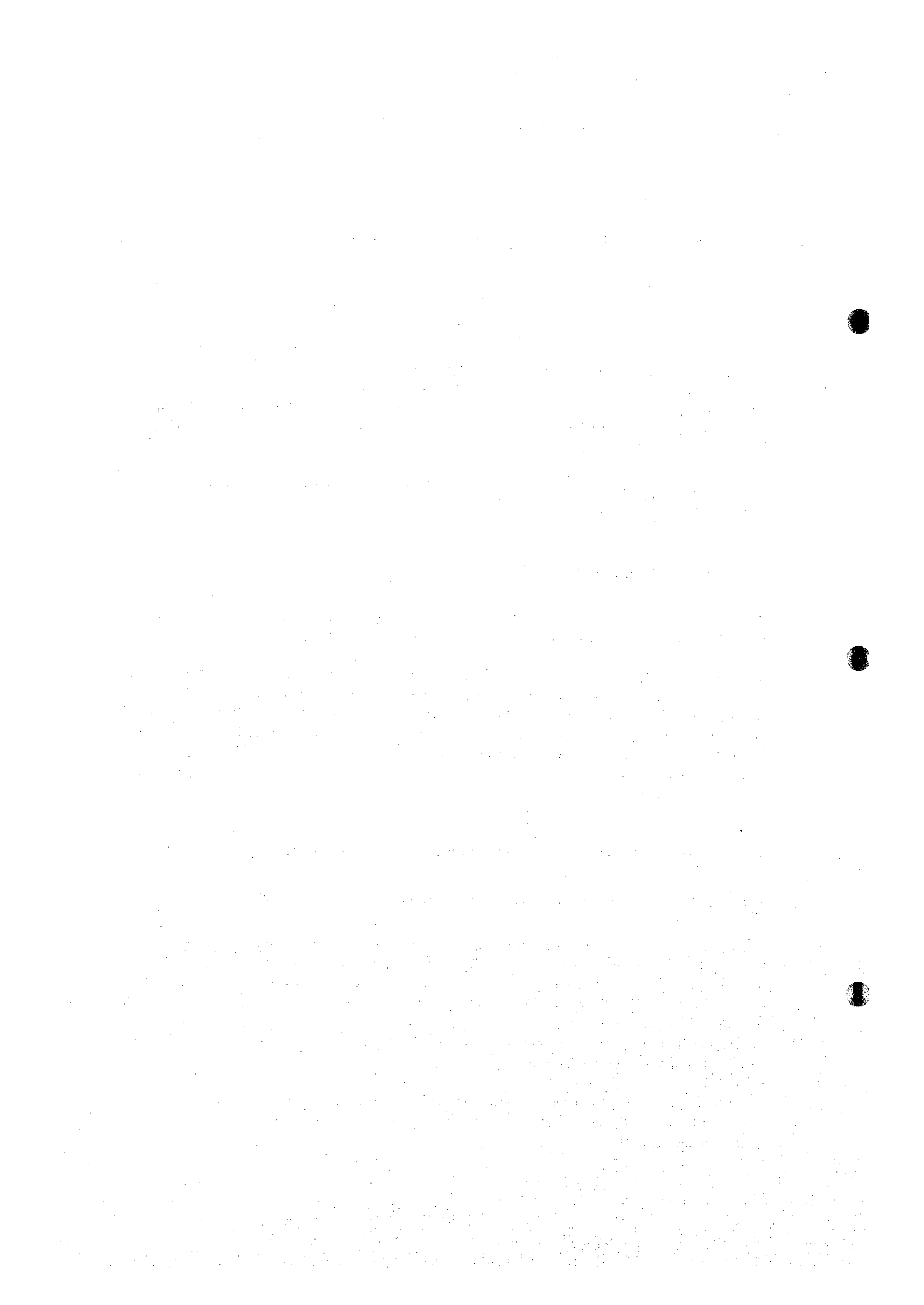
The "electricity database" is designed to reflect exact situations peculiar to Viet Nam, and technically represents a structure of planning-use database. Therefore, with this database, a special emphasis is put on report-style outputting in technical terms. The "energy/economic database" provides external information necessary for forecasting electricity demand and preparing power development plans, and technically represents a structure of general-purpose database. As a result, with this database, technical priorities are given to how to improve data editing and make information retrieval easier.

### **4.2 Requisites for Electric Power Database and Database Management System**

#### **4.2.1 Requisites for Electric Power Demand and Supply Planning**

What is necessary for a database of electric power demand forecasting and supply planning is not to bring all kind of things together but to condense the data related to the current problem, arrange them, simulate, calculate and study for better idea. Some case-study may use specific data specially created for the study. Therefore the system should have easy data input method. The database management system should furnish such functions as input and report data to or from spread sheet like Microsoft Excel, because simulations using the spread sheets may be necessary to meet the change of assumption in the planning.

If database usage is limited to electric power demand forecasting and supply planning, spread sheet system as Lotus 1-2-3 can be used as database management system, because the planning requires limited number of data.





#### **4.2.2 Requisites for Electric Power Statistics**

Data collected from unsettled data source and processed differently each time can not make any reliable statistics. Continuity and consistency are important for electric power statistics as well as any other statistics. It is important that the data are collected periodically and processed in the same way, and that basic reports should be issued periodically.

Therefore data once input into database have to be kept unchanged unless there occurs special reasons. Data security should be considered seriously.

Database systems on market are sufficient for these requisites, and spread sheet system as Lotus 1-2-3 or Microsoft Excel has simple database functions. However the data capacity of the spread sheets are limited up to 8,192 or 16,384 that will make problems.

#### **4.2.3 Requisites for Operations of Computer System**

A database management system is necessary to have security functions for system operation, and it will be necessary network functions for the future expansion.

The database management system should provide the Database Administrator with some important database security functions as follows.

##### **(1) Protection from Illegal Access to Database**

A database management system is necessary to have equipped with effective protection system to avoid access to database by non-authorized persons or outsiders. The protection systems are;

Registration and check of User-ID and Accessible User-Level code.

Registration and check of Accessible User-Level by User Group.

Registration and check of Password for all database users.

##### **(2) Protection from Accident**

Fire accident, a natural disaster like flood or power failure while updating may destroy database. So that database should be copied periodically to keep safe them from such trouble.

##### **(3) Protection from Data Outflow**

A database can be copied illegally and carried out of office. For such data outflow accident, encrypting database will be effective.

#### **(4) Protection from System Subversive**

Database can be changed incorrectly or destroyed by mistake. Sometimes database may be exposed to the menace of computer virus. To protect incorrect change or destruction, access control to the office or file back up operations are very effective. To counter the virus, a virus checker is useful. Computer control software like Microsoft Windows often provide a virus checker, however stand alone virus buster is valuable to purchase.

A Networking is to connect computers by communication lines. The computers consist of a server, or file server, and clients. The server keeps only database files and each client has database management systems. Network system have to be equipped with at least three important functions as follows.

#### **(1) Integrated Security Control Files**

System security control files may be dispersed if database management systems are dispersed among clients. Therefore database management system should have such function as integrate security control files to a server.

#### **(2) Exclusivity Control**

Multiple clients in a network can access a database constructed on a file server just in the same time. Then a client may try to open a database already in use by other client. Exclusivity control works for such conflict. There are four control level as follows.

- Level 1: No overlapped access is permitted.
- Level 2: Only open operation is permitted. However nobody is permitted to update data.
- Level 3: All user except specified user can update any data.
- Level 4: All users are permitted to use all functions.

#### **(3) Record Locking**

If the database system employ Level 3 or Level 4 control, and if two users tried to update the same record of the same database, then it occurs sometimes that one side is effective and the other side as not. To avoid such conflicts, database management system permits only one user to access a record at a moment, and lock other all accesses.

There are four levels of record locks as follows.

- Level 1: Lock by record
- Level 2: Lock by record block
- Level 3: Lock by a table or data sheet
- Level 4: Lock by a file

Database management systems on market meet for these requisites very well. On the other hand database functions of spread sheet systems can never answer to these requirement so that they can not be used as official database.

#### **4.2.4 Database Management System**

There are many kinds of relational database management systems. Among them, Approach of Lotus, Inc., Paradox of Boland, Inc. and FoxPro and, its improved successor, Access of Microsoft, Inc. are used by many users over the world. Then JICA team evaluated them and selected the system for our object. However FoxPro was not included in this evaluation because Microsoft is expected to replace FoxPro by Access and reduce their maintenance service and technical support for the FoxPro in the near future.

##### **(1) Approach**

###### **(a) Design Concept**

Approach seems to be designed for database beginners. It has simple macros manipulated by mouse.

###### **(b) File Control**

Approach has two files for data storage. One type of files is named, for instance, xxxx.DB that is Table containing data, and the other is named xxxx.VEW in which Report parameters, Form parameters and Macros are kept. User have to manipulate two files in database creation or in file saving.

###### **(c) Database Creation**

The operation is very simple because Approach offers to its user some Smart Icons and pull-down menu for mouse operation. Even a beginner can create database easily if the structures are not so complicated.

##### **(2) Paradox**

###### **(a) Design Concept**

Paradox seems to be developed for professional programmers who can use a number of commands and expanded functions. Therefore there remains many procedures that are very similar to MS-DOS programming.

**(b) File Control**

Paradox has at least five files. They are xxxx.DB for TABLEs, xxxx.RSL for Reports, xxxx.FSL for Form, xxxx.QBE for Query and xxxx.SSL for Macros. User has to handle those five files in database creation or file saving operation. Such complicated file control is not good for QA/QC of database.

**(c) Database Creation**

The operation depends mainly on mouse manipulation. Paradox has many ornamental functions as five ruled line options, 11 cell decoration options and 24 screen options, so that the database creation may be difficult for beginners. Furthermore some operations as Copy or Paste is different from Windows regular operation, and user has to write macros for input-data validity checking that can be executed automatically in the Microsoft Access.

**(3) Access**

**(a) Design Concept**

Access is designed for both database beginners and professional programmers. For beginners it presents many kind of visual designing assistance. For intermediate database user it offers many kinds of easy macros. And for professional programmers it offers Access Basic language that can manipulate all process necessary for far advanced database operation. Furthermore Microsoft will offer Visual Basic for Applications (VBA) for more advanced. Access users in the near future.

**(b) File Control**

Access has only one file for total database. The file xxxx.MDB keeps all six Objects as Table, Form, Report, Query, Macro and Module. The file often becomes very large because it keeps all functions of the database. But file control is so simple and easy that database security can be well kept. This is very important for database QA/QC.

**(c) Database Creation**

Access offers many visual and easy tools for database creation. For instance a programming tool named 'WIZARD' assists users powerfully for designing Tables, Forms, Reports or Macros.

### **4.3 Conceptual Design of Improved Database System**

Microsoft Access is, as described before, the newest and the excellent database software, because it is developed after preceded database systems as Approach, Paradox or Foxpro, etc.. Microsoft Access has such features as easy input and easy improvement systems for users. Furthermore Microsoft Access has Access Basic programming language which will be compatible with VBA. Consequently Microsoft Access is the most appreciated and recommended for Viet Nam power planning database system.

#### **4.3.1 Official Database and Local Database**

There are two types of database. One is Official Database controlled by an institutional organization and the other is Local Database created and managed by database users. The users can extract the necessary data from the Official Database, and put them into his own Local Database to get more useful information. The Official Database can avoid useless disputes and misunderstandings of people by offering data of the same standard to all users, and by preparing the right information to all persons concerned.

JICA Study Team developed and presented an Electric Power Database and an Energy and Economy Database as an Official Database model.

#### **4.3.2 Role of Microsoft Access and Microsoft Excel**

Database management system updates original data when the data of related table or dynaset are changed. Therefore any data processing or calculations on opening database should be avoided for database security. Recently spread sheets are often used for analysis because it is easier to use them than to use the same functions of database management system. So that Microsoft Excel or Lotus 1-2-3 is used for data processing as calculations, SORTing etc. Using such spread sheet system makes systems design easy and data processing efficient. Viet Nam Power Energy Database are employing Microsoft Access for data storage and Microsoft Excel for data analysis based on the idea of role sharing.

#### **4.3.3 Consideration on Database Operation**

The Quality assurance of database should be considered not only in design phase but also in the operational stage. Official database will be opened and used by many users, so that security is a key factor for facilitation of database applications. Usually Official database is divided into two parts. One is a strictly controlled part and the other is a part opened widely to users. As for Viet Nam Power Energy Database, Code Table, Master Table and Statistics Table are designed separated from Data Table. Especially Code and Master is necessary to be updated strictly by only Database Administrator. In order to limit updating to the responsible staff alone, security functions given to a database can be in use.

## **4.4 Design of Improved Database**

### **4.4.1 Terminology**

In this report key words or reserved words used in Microsoft Access are capitalized all, and for other reserved words, only first letters are capitalized. For example, table is written as TABLE and field are as Field. In information processing fields, a group of data identified by some codes are called a record and a set of records is called a file, but in database system a collection of records is called a TABLE and a set of TABLEs is called a File. In Microsoft Access a collection of TABLEs is called specially an OBJECT not a File, and a set of OBJECTs is called a File. The reason database system including Microsoft Access uses special terms as described above is that the system stores and manages not only a collection of data but also process for the data itself. For example MACROs and programs written in Microsoft Access Basic language are stored and managed in the same database as well as other data. A Program has different structure. It is stored in a storage in a form of data strings and the strings have no key codes to identify each string as record.

As database contains many kinds of data structures in it, including TABLEs, MACROs and MODULEs, so each structure is called an OBJECT, an abstract word. Terms written commonly in the user's manuals published by Microsoft or other publishers are not described in this report.

### **4.4.2 TABLE Design**

#### **(1) Code Table**

Data are controlled by codes in database system as well as any other information processing. It is very important to apply standard code to all data because data are identified and arranged by codes. Therefore codes are controlled by only Database Administrator. No other person is permitted to add or change the code. The objective of the Code Table is to open the code to the users and let users use the standard code in all data processing. Therefore user can only read out the Code Table. However write-in is limited to Database Administrator.

#### **(2) Data Table**

Data Table stores time variable data as annual data or planning data. Therefore most of data are stored in the Data Table. The data-input operations and Table updating operations are controlled by Database Administrator. Only standard codes registered in the Code Table are used in the operations so as Database Administrator can assure the quality of the Database. Data Table is designed taking QA/QC in consideration. For example, error free code input in data input operation phase can be designed by means of introducing Code Table into pull down menu. Check for the must data is also inevitable. Regulations necessary to keep secrecy of data may restrict the users from accessing some Data Table. The level of secrecy that corresponds to level of users is decided by the Top Management in charge of Power Database System, and executed by Database Administrator. Such restricted operation system is considered at system design phase.

**(3) Master Table**

Master Table stores the fixed data that does not change for some extent of time. For instance, actual power demand and supply data, location of a facility, completion date, specifications of the facility are typical master items. Therefore, once fixed, Master Table is not changed or deleted usually unless any error is detected in the Table. A part of Master Table may contain records that may be updated due to change in original planning data. The updating is controlled by Database Administrator. Regulations necessary to keep secrecy of data may restrict the users from accessing some Master Table. The level of secrecy that corresponds to level of users is decided by the Top Management in charge of Power Database System, and executed by Database Administrator. Such restricted operation system is considered at system design phase.

**(4) Statistics Table**

Statistics Table stores, for instance actual electric power data, Local Population Statistics, National Economics Statistics, Industrial Statistics, etc. Once stored the data is not updated unless any error is detected.

Regulations necessary to keep secrecy of data may restrict the users from accessing some Statistics Table. The necessity of secrecy is decided by the Top Management in charge of Power Database System, and executed by Database Administrator by means of, for example, pass-word.

**4.4.3 Data Exchange between Access and Excel**

**(1) Import/Export**

Basic way to exchange data between Microsoft Access and Excel is to use Import/Export functions equipped in the Access system.

**(2) Visual Basic for Applications in Microsoft Excel**

More effective way of data exchange is to make some programs by using Visual Basic for Applications (VBA) furnished to Microsoft Excel version 5.0 or later. Although this way can realize very good efficiency in system operation, the programming in VBA requires quite high programming technique and experiences.

# DATABASE OPERATION MANUAL

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## 1. The Electric Power Database System

### 1.1 Starting the System

Start Access in Program Manager menu. Click "File" and select "Open Database". Find electric.mdb, the file of the electric database system, select it and click "OK," then the main menu of the database will appear. The main menu is shown in Figure 1.1.

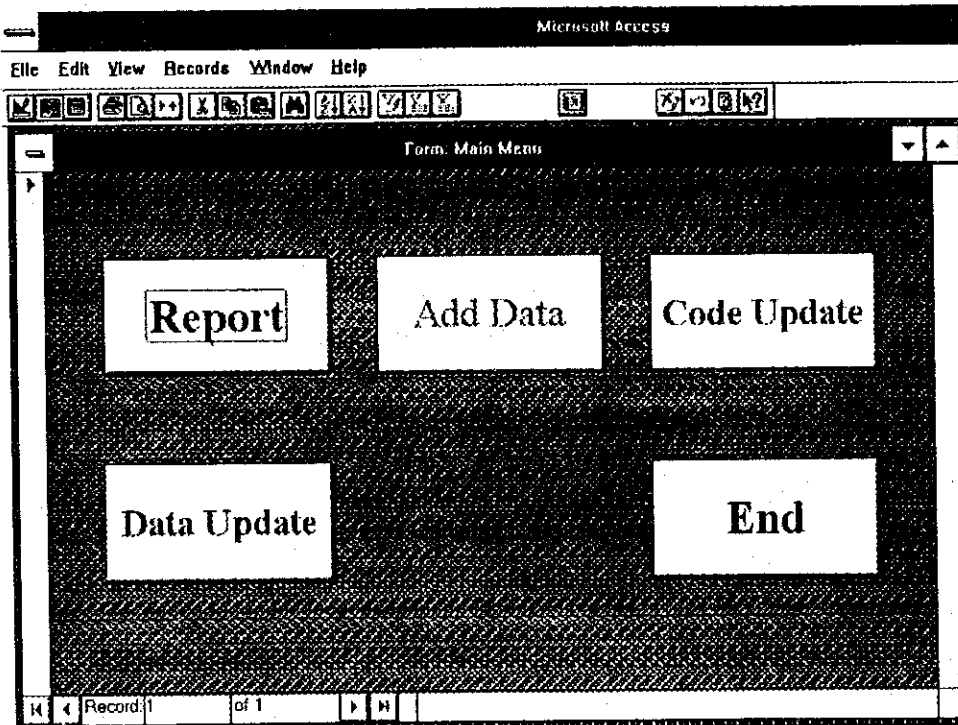


Figure 1.1 Main menu of electric database

Main menu has five command buttons to start each object. The main task of the main menu is in controlling the sub-objects.

#### **Report button:**

This enables you to open a window that shows 15 reports' names. You can select, show and print necessary reports listed in the window.

#### **Data Update button:**

This enables you to open a window that shows 14 names of data tables. You can select a table to be updated, then replace any data in the table.

**Add Data button:**

This enables you to open a window that shows 14 names of data tables. You can select a table to add some data, then insert any data in the table.

**Code Update button:**

This enables you to open a window that shows 12 names of code tables including four sub-code tables. You can select a table to be updated, add and/or replace any code in the table.

**End button:**

Click this button to close the current window and return to the Access database window.

## 1.2 Creating Reports

Clicking "Report" button in main menu will open a window of a list of 15 reports (Figure 1.2). You can make a report by selecting a name from the window. You can also print the reports from your printer by selecting print command in "File" menu.

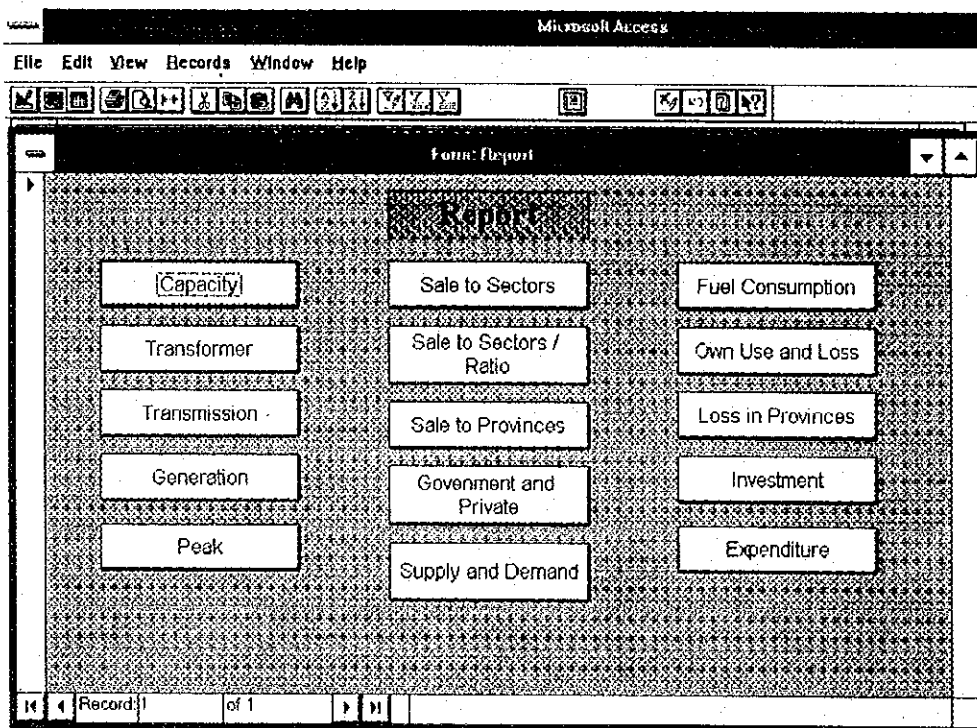


Figure 1.2 Menu window for Report

The 15 reports are as follows. (All reports are classified primarily by company name.)

- (1) Capacity: Installed capacity by type of generation
- (2) Transformer: Substation capacity by type of transformation
- (3) Transmission: Route length of transmission lines by voltage
- (4) Generation: Generated power by type of generation
- (5) Peak: Peak load by month
- (6) Sale to Sectors: Power consumption by demand sector
- (7) Sale to Sectors/Ratio: Power consumption share by demand sector
- (8) Sale to Provinces: Power consumption by Province
- (9) Government and Private: Power consumption in government and private sectors by province
- (10) Supply and Demand: Electric power output by type of generation, power consumption per sector, station use and transmission loss.
- (11) Fuel Consumption: Fuel consumption for power generation by fuel type
- (12) Own Use and Loss: Station-use rate of power by type of generation and average transmission loss factor by province
- (13) Loss in Provinces: Transmission loss factors by province
- (14) Investment: Investment for generation and transmission
- (15) Expenditure: Expenditure by accounting item

### 1.3 Updating Data

Clicking “Data Update” button in main menu will open a window of a list of 14 tables that can be updated (Figure 1.3). You can replace records in a table by selecting the table from the window.

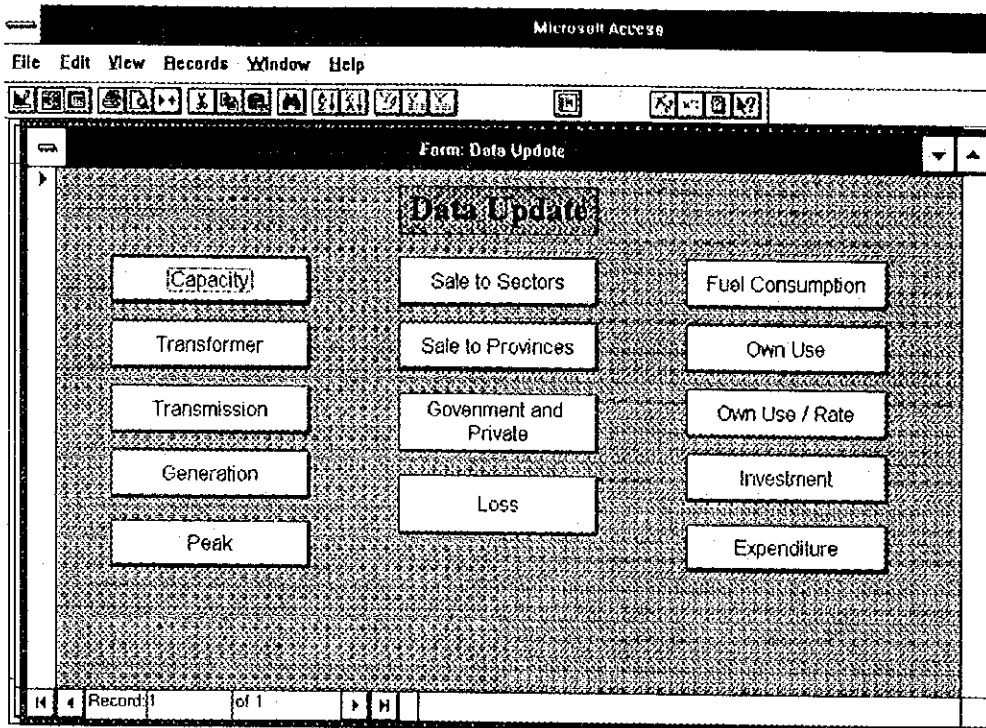


Figure 1.3 Menu window for Updating data

The 14 tables are as follows. (All reports are classified primarily by company name.)

- |                             |   |
|-----------------------------|---|
| (1) Capacity:               | Installed capacity by type of generation                        |
| (2) Transformer:            | Substation capacity by type of transformation                   |
| (3) Transmission:           | Route length of transmission lines by voltage                   |
| (4) Generation:             | Generated power by type of generation                           |
| (5) Peak:                   | Peak load by month  |
| (6) Sale to Sectors:        | Power consumption by demand sector                              |
| (7) Sale to Provinces:      | Power consumption by Province                                   |
| (8) Government and Private: | Power consumption in government and private sectors by Province |
| (9) Loss:                   | Transmission loss rate by Province                              |
| (10) Fuel Consumption:      | Fuel consumption for power generation by fuel type              |
| (11) Own Use:               | Station-use power by type of generation                         |

- (12) Own Use Rate: Station-use rate of power by type of generation
- (13) Investment: Investment for generation and transmission
- (14) Expenditure: Expenditure by accounting item

#### 1.4 Adding Data

Clicking “Add Data” button in main menu will open a window of a list of tables that can be added data (Figure 1.4-1). You can insert new records in a table by selecting the table from the list in window.

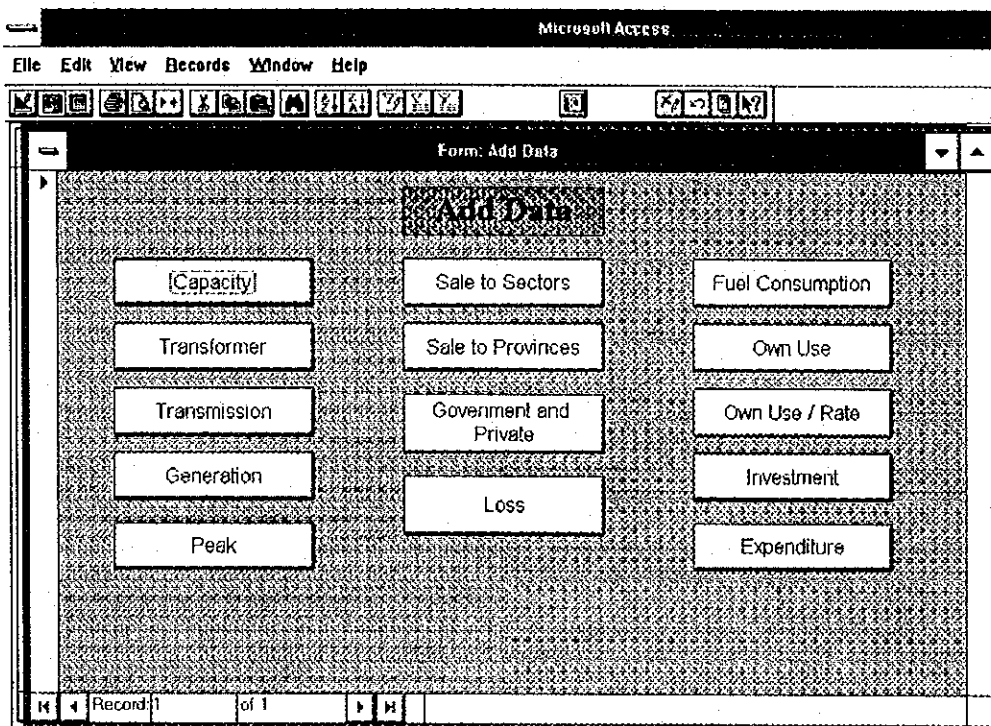


Figure 1.4-1 Menu Window for Adding data

Tables of which names are shown on the top of buttons are the same with that of “Updating Data”. This “Add Data” menu provides you easier way of updating data if the operation is limited to adding data, or inserting new records to the table. An example of working window is shown as follows. (Figure 1.4-2)

Microsoft Access

File Edit View Records Window Help

Capacity

		Capacity		1992	1993	1994	1995
Company	Plant Type						
1	PC1	1	Thermal (Coal)	0.00			
1	PC1	3	Hydro	1086.60			
1	PC1	4	Diesel	8.20			
1	PC1	5	Gas Turbine (Oil)	0.00			
1	PC1	6	Gas Turbine (Gas)	34.00			
2	PC2	2	Thermal (Oil)	295.00			
2	PC2	3	Hydro	563.70			
2	PC2	4	Diesel	221.70			
2	PC2	5	Gas Turbine (Oil)	174.00			
3	PC3	3	Hydro				
3	PC3	4	Diesel	167.20			
3	PC3	5	Gas Turbine (Oil)				
*	0	All PC	Total	0.00	0.00	0.00	0.00

Record: 1 of 12

Record: 1 of 1

Figure 1.4-2 An example of working window for adding data operation

## 1.5 Updating Codes

Clicking “Code Update” button in main menu will open a window of a list of code tables that can be updated (Figure 1.5). You can update any code in the table by selecting the table from the list in window.

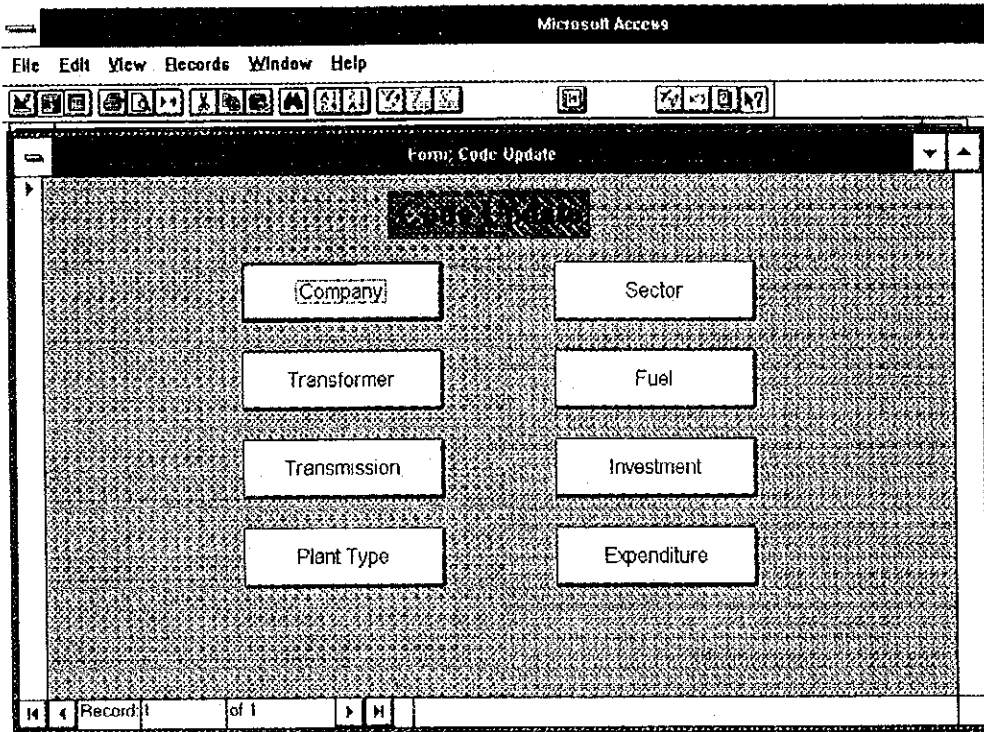


Figure 1.5 Menu window for updating codes

Actually there are 12 codes in this system, although eight codes are on the menu window. This is because some codes have their “sub-codes” designed for the convenience of programming.

- |                   |   |
|-------------------|---|
| (1) Company:      | Code of power generation company  |
| (2) Transformer:  | Code for substation facilities by type of transformation<br>This code has a sub-code for data aggregation |
| (3) Transmission: | Code for transmission facilities  |
| (4) Plant Type:   | Code for type of generation<br>This code has two sub-codes, “Plant Type 2” and “Plant Type 3”             |
| (5) Sector:       | Code for demand sector  |
| (6) Fuel:         | Type code of fuel for power generation  |

- (7) Investment: Code for investment account items  
This code has a sub-code "Investment 2" to classify generation  
from transmission
- (8) Expenditure: Accounting code for expenditure items



## 2. The Energy and Economy Database System

### 2.1 Starting the Energy Database System

Start Access in Program Manager menu. Click "File" and select "Open Database." Find energy.mdb, the file of the energy database system, select it and click "OK," then the main menu of the database will appear. The main menu is shown in Figure 2.1.

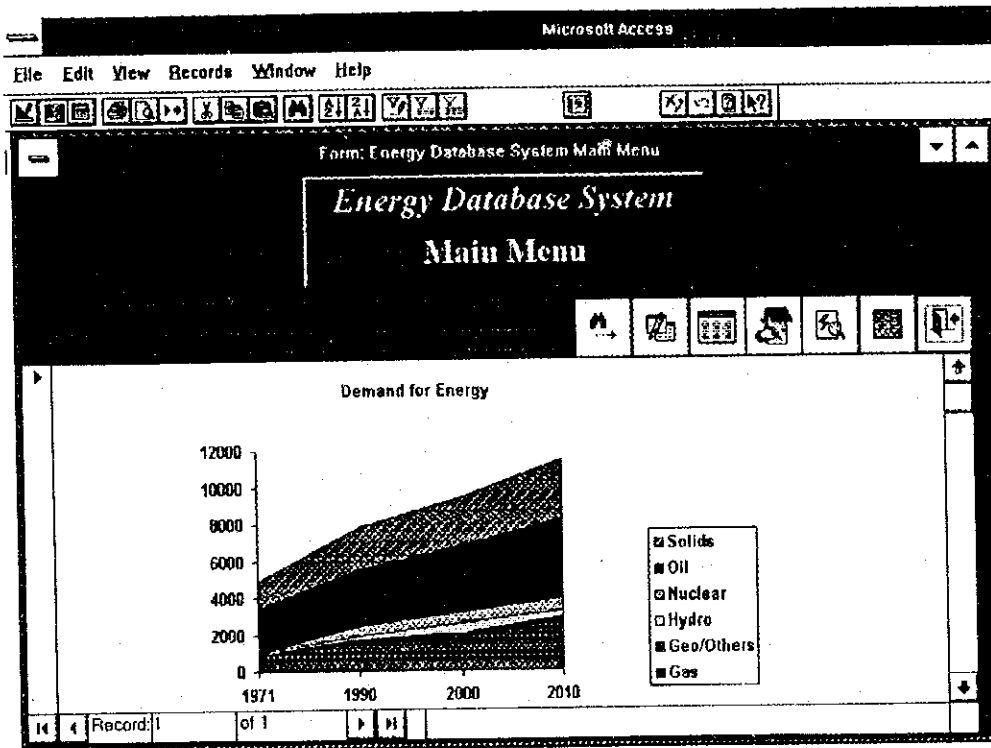


Figure 2.1 Energy database main menu

The main menu has seven command buttons, each of which triggers a different object. The main task of the main menu is to control the sub-objects.



#### **IEA data view button:**

This enables you to view, print and export some of the IEA energy data. Clicking this button opens a view window for the energy data.



#### **IEA data edit button:**

This enables you to view and update some of the IEA energy data. Clicking this button opens an edit window for the energy data.



***IEV data view button:***

This enables you to view, print and export some of the energy balance data of Vietnam. Clicking this button opens a view window for Vietnamese energy data.



***IEV data edit button:***

This enables you to view and update some of the data of Vietnam. Clicking this button opens an edit window for Vietnamese energy data.



***Economy data view button:***

This enables you to view, print and export some of the economy data. Clicking this button opens a view window for the economy data.



***Economy data edit button:***

This enables you to view and update some of the economy data. Clicking this button opens an edit window for the economy data.



***Close Window button:***

Click this button to close the current window and return to the Access database window.

## 2.2 Retrieving and Editing Energy Balance Data

### 2.2.1 IEA Energy Data View Window

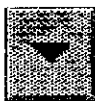
Figure 2.2.1-1 shows a view window of the energy data. In this object you can search for the energy balance data by country name. It also assists you when you print data in a report format. If you need this data in Microsoft Excel format, it provides data format for the Microsoft Excel spreadsheet.

The screenshot shows a software window titled "Energy Database System Energy Balance Table" for the country "china". The window contains a table with the following data:

Country	china		1971	1972	1973	1974	1975
Product	Flow						
Coal and coal products	Indigenous production		192080	200900	204330	202370	2361
Coal and coal products	Imports		0	0	0	0	
Coal and coal products	Exports		-1672	-1624	-1688	-1704	-17
Coal and coal products	Stock change		0	0	0	0	
Coal and coal products	Total primary energy supply		190409	199276	202642	200667	2344
Coal and coal products	Statistical difference		1395	1525	1654	1677	14
Coal and coal products	Public service electricity		-30457	-30985	-31518	-31210	-360
Coal and coal products	Public combined heat & power		0	0	0	0	
Coal and coal products	Manufactured gases		0	0	0	0	
Coal and coal products	Oil refineries		0	0	0	0	
Coal and coal products	Coal transformation		-6026	-6300	-6574	-6574	-68
Coal and coal products	Own use by energy sectors		0	0	0	0	
Coal and coal products	Distribution losses		-8452	-8840	-8990	-8904	-103
Coal and coal products	Total final consumption		146869	154676	157213	155656	1828
Coal and coal products	Total industry sector		0	0	0	0	
Coal and coal products	Iron & steel		0	0	0	0	

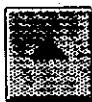
At the bottom of the window, it indicates "Record: 1 of 224".

Figure 2.2.1-1 Energy data view window



**Next button:**

This enables you to retrieve energy data from the energy balance database. Clicking this button selects the next country.



**Previous button:**

This enables you to retrieve energy data from the IEA energy database. Clicking this button selects the previous country.



**Printer button:**

This enables you to print the data you have retrieved. Clicking this button sends the report image to your printer. Figure 2.6-1 shows you a report of energy balance table.



**Export button:**

This enables you to export the data to Microsoft Excel spreadsheet. By clicking this button the system will copy the data you want to export to an Excel file. The system will ask you to provide a filename. If the filename already exists, the system will ask you whether you want to replace the file. If you click "No" the system will ask you to provide a different filename. Figure 2.2.1-2 shows you an energy balance table that has been sent to MS Excel.



**Close Window button:**

Click this button to close the view window for IEA energy data and return to the system main menu.

	C	D	E	F	G	H	I	J
1	Product	Flow	1972	1973	1974	1975	1976	1977
2	Coal and coal products	Indigenous production	10903	11062	10869	10205	9909	
3		Imports	48992	54958	55097	52748	61058	6
4		Exports	-1445	-1370	-1124	-1499	-1582	-
5		Stock change	1105	419	-506	415	187	
6		Total primary energy supply	59555	65069	64336	61870	69572	7
7		Statistical difference	-80	-745	-1097	-247	-203	
8		Public service electricity	-8026	-10803	-11675	-13663	-15063	-1
9		Autoproducers of electricity	-2491	-2665	-2745	-2874	-3198	-
10		District heating plants	0	0	0	0	0	
11		Manufactured gases	-1253	-1611	-1533	-1431	-1458	-
12		Coal transformation	-9116	-9720	-8644	-7755	-9842	-1
13		Own use by energy sectors	-1905	-1849	-1845	-1803	-2355	-
14		Total final consumption	36682	37673	36795	34095	37450	3

Figure 2.2.1-2 Example of an exported Excel file

## 2.2.2 IEA Energy Data Edit Window

Figure 2.2.2 shows an edit windows for the energy data. Using this object you can update some of the data from the database.

File Edit View Records Window Help

Energy Balance table edit form

*Energy Database System*

**Energy Balance Table Edit Form**

china

Product	Flow	1980	1981	1982	1983	i
Coal and coal products	Indigenous production	306876	304604	326502	350120	
Coal and coal products	Imports	975	946	1073	1049	
Coal and coal products	Exports	-3281	-3357	-3477	-3452	
Coal and coal products	Stock change	4989	3983	-1409	-6352	
Coal and coal products	Total primary energy supply	306557	306175	322689	341364	
Coal and coal products	Statistical difference	2790	1772	1702	1765	
Coal and coal products	Public service electricity	-57900	-58121	-61463	-65492	
Coal and coal products	Public combined heat & power	0	0	0	0	
Coal and coal products	Manufactured gases	-642	-669	-684	-727	
Coal and coal products	Oil refineries	-36	-43	-148	-41	
Coal and coal products	Coal transformation	-6188	-4589	-4770	-4823	
Coal and coal products	Own use by energy sectors	-555	-498	-474	-565	
Coal and coal products	Distribution losses	-13504	-13027	-13754	-14697	
Coal and coal products	Total final consumption	230522	231000	243099	256783	
Coal and coal products	Total industry sector	148845	143790	151837	161248	
Coal and coal products	Iron & steel	49835	45055	46223	48754	
Coal and coal products	Chemical and non-ferrous metal	28517	28272	28776	21413	

Record: 11 of 224

Figure 2.2.2 Energy data edit window



**Next button:**

Click this button to select the next country's energy balance data.



**Previous button:**

Click this button to select the previous country's energy balance data.



**Close window button:**

Click this button to close the current window and return to IEA "Energy Database" main menu.

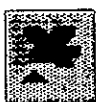
## 2.3 Retrieving and Edting Data of IEV

### 2.3.1 IEV energy Data View Window

Figure 2.3.1 shows a view window for the IEV energy data. This object allows you to view and output to a file or to your printer, Vietnamese energy balance data.

product	flow	1980	1981	1982	1983	1984
PRODUCTION		0.00	2,589.00	2,878.00	2,705.00	2,712.00
Coal	Losses produc	0.00	0.00	0.00	0.00	0.00
Coal	Net production	0.00	2,589.00	2,878.00	2,705.00	2,712.00
Coal	IMPORT	0.00	3.00	0.00	0.00	0.00
Coal	EXPORT	0.00	-467.00	-337.00	-201.00	-235.00
Coal	PRIMARY ENE	0.00	2,125.00	2,542.00	2,504.00	2,478.00
Coal	OIL REFINING	0.00	0.00	0.00	0.00	0.00
Coal	POWER GENE	0.00	0.00	0.00	0.00	0.00
Coal	Input	0.00	-692.00	-720.00	-795.00	-888.00
Coal	Output	0.00	124.00	131.00	132.00	174.00
Coal	TRANSM. & D	0.00	0.00	0.00	0.00	0.00
Coal	ENERGY SEC	0.00	0.00	0.00	0.00	0.00
Coal	NET SUPPLY	0.00	1,433.00	1,822.00	1,709.00	1,590.00
Coal	NET DOMEST	0.00	1,433.00	1,822.00	1,709.00	1,590.00
Coal	Industry	0.00	1,192.00	1,454.00	1,320.00	1,244.00
Coal	Agriculture	0.00	10.00	15.00	15.00	13.00

Figure 2.3.1 IEV energy data view window



**Export button:**

Click this button to output the data to a Microsoft Excel file.



**Printer button:**

Click this button to send the information to your printer. Figure 2.6-2 shows the report of IEV energy balance data.



**Close window button:**

Click this button to close the current window and return to the Energy Database System main menu.

### 2.3.2 IEV Energy Data Edit Window

Figure 2.3.2 shows an edit window for the IEV energy data. This object allows you to modify data of the Vietnamese energy balance.

Year	Coal	PRODUCTION OF PRIMARY ENERGY
1960	0.00	2,565.00
1961	2,589.00	2,562.00
1962	2,878.00	2,599.00
1963	2,705.00	2,745.00
1964	2,712.00	2,505.00
1965	2,797.00	0.00
1966	3,061.00	
1967	3,166.00	
1968	3,026.00	

Figure 2.3.2 IEV energy data edit form



**Next button:**

Click this button to view the next page of the Form.



**Previous button:**

Click this button to view the previous page of the Form.



**Close window button:**

Click this button to close the current window and return to the previous window.

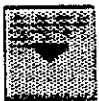
## 2.4 Retrieving and Editing Economic Statistics Data

### 2.4.1 Economy Data View Window

Figure 2.4.1 shows a view window for economy data. Using this object you can view economic data of selected countries and you can output necessary data to a Microsoft Excel file or to your printer as a set of report.

Item	1971	1972	1973	1974
Population	11128000	11408000	11690000	1197
GNP per capita (US\$, curr. pt.)	410	450	550	
GDP (billion 1987 US dollars)	10500727760.4695	11483777547.7377	12824469791.967	13878151034.
Gross National Product (local,curr. pr.)	13185998848	14494998528	18915999744	2289199
Gross Domestic Product (local,curr. pr.)	13531000832	14853001216	19555999744	2387600
Gross National Product (local,const. p.)	25631248384	28130242560	31067430912	3341654
GDP at market prices (local,const. pr.)	26457632768	26934524928	32312532992	3496738
GDP at factor cost (local,const. pr.)	23971045376	26074271744	29017464832	3103029
GDP Deflator (1987=100,Inde:	51.1421508789063	51.3331451416016	60.521408081055	68.280776977
Conversion Factor (Ann. av., local per U	3.05230045318604	2.81960010528564	2.4433002471924	2.4070997238
*	0	0	0	

Figure 2.4.1 Economy Data view window



**Next button:**

Click this button to select the next country's economy data.



**Previous button:**

Click this button to select the previous country's economy data.



**Export button:**

Click this button to save the report output as a Microsoft Excel format file.





**Printer button:**

Click this button to send the report to your printer. See Figure 2.6-3.



**Close window button:**

Click this button to close the current window and return to the previous window.

## 2.4.2 Economy Data Edit Window

Figure 2.4.2 shows an edit window for economy data. Using this object you can view and update some of the economy data of selected countries.

File Edit View Records Window Help

Economy data edit form

Energy Database System

Economy Data Edit Form

Thailand

	1980	1981	1982	1983	1984	1985	1986
	46700000	47727008	48740000	49739008	50720000	51683008	52664000
	670	750	780	810	840	800	800
	32232383282.88	34251822978.1	35631963923.85	38181953861.68	40924518643.38	42298180640.29	4443661
	6.53099926E+11	7.4819987E+11	8.07099892E+11	9.03399932E+11	9.61999995E+11	9.96799873E+11	1.07293
	6.58500026E+11	7.6019991E+11	8.19999998E+11	9.10099874E+11	9.73399917E+11	1.01440002E+12	1.09537
	8.23564042E+11	8.6634719E+11	9.00929618E+11	9.78295718E+11	1.04252906E+12	1.07049799E+12	1.12005
	8.29113827E+11	8.8105989E+11	9.16561265E+11	9.82154674E+11	1.05270169E+12	1.08803641E+12	1.14304
	7.40838539E+11	7.9092226E+11	8.27337212E+11	8.78172373E+11	9.37506636E+11	9.75386837E+11	1.01916
	79.42214965820	86.2824401855	89.46482849121	92.66360473633	92.46682739258	93.23217773438	95.8292
	20.47599792480	21.8200073242	23	23	23.63900756836	27.15899658203	26.2989
*	0	0	0	0	0	0	0

Record: 1 of 10

Figure 2.4.2 Economy data edit window



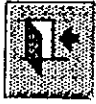
**Next button:**

Click this button to select the next country's economy data.



**Previous button:**

Click this button to select the previous country's economy data.



**Close window button:**

Click this button to close the current window and return to the previous window.

## 2.5 Importing Spreadsheet Data

Sometimes you need to append data to the current database. For example, you need another country's energy balance data that is not included in the database. To solve this problem you can use "Import" function to append data to your database. Microsoft Access allows you to import data from spreadsheet files created by Lotus 1-2-3, Microsoft Excel and others. You can specify a portion of a spreadsheet or an entire spreadsheet to import.

Access database stores its data in tables. The energy database has five tables, country, Energy Balance, Vietnam energy balance, Statistical Data on Economy and Demand table. You can append a range of spreadsheet cells or an entire spreadsheet directly to an existing table. To append data, you must supply the column names from the spreadsheet that match with the field names in the table. You create matching column names by entering them in the first row of your spreadsheet.

Figure 2.5-1 shows the format of a spreadsheet data to be appended to IEA energy balance table.

Figure 2.5-2 shows the format of spreadsheet data to be appended to IEV energy balance table.

Figure 2.5-3 shows the format of spreadsheet data to be appended to an economy data table. When you append data to an existing table, the data types in the spreadsheet and in the table must match.

To import a spreadsheet to the database, do the following:

- (1) Open the Energy Database system, if you already have it open, switch to the Database window.
- (2) Choose the Import command from the File menu. Access opens the Import dialog box.
- (3) Select the type of spreadsheet you want to import (Lotus or Excel) in the data source list, and click OK. Access opens a Select file dialog box.
- (4) Select the name of the spreadsheet file that you want and click the import button. Access opens the Import Spreadsheet Options dialog box.
- (5) Click the "First Row Contains Field Names" check box. In the table "Options" group box, you can choose to append data to an existing table. If you do not want to import the entire spreadsheet, specify the range of cells in the Spreadsheet Range box. Click "OK" to start the import process.

File Edit View Insert Format Tools Data Window Help							
100%							
Arial 8							
A22		21					
	C	D	E	F	G	H	I
1	Product	Flow	1971	1972	1973	1974	1975
2	Coal and coal products	Indigenous production	192080	200900	204330	202370	236180
3	Coal and coal products	Imports	0	0	0	0	0
4	Coal and coal products	Exports	-1672	-1624	-1688	-1704	-1761
5	Coal and coal products	Stock change	0	0	0	0	0
6	Coal and coal products	Total primary energy supply	190409	199276	202642	200667	234419
7	Coal and coal products	Statistical difference	1395	1525	1654	1677	1476
8	Coal and coal products	Public service electricity	-30457	-30985	-31518	-31210	-36035
9	Coal and coal products	Public combined heat & power	0	0	0	0	0
10	Coal and coal products	Manufactured gases	0	0	0	0	0
11	Coal and coal products	Oil refineries	0	0	0	0	0
12	Coal and coal products	Coal transformation	-6026	-6300	-6574	-6574	-6848
13	Coal and coal products	Own use by energy sectors	0	0	0	0	0
14	Coal and coal products	Distribution losses	-8452	-8840	-8990	-8904	-10392
15	Coal and coal products	Total final consumption	146869	154676	157213	155656	182620
16	Coal and coal products	Total industry sector	0	0	0	0	0
17	Coal and coal products	Iron & steel	0	0	0	0	0
18	Coal and coal products	Chemical incl petrochemical	0	0	0	0	0
19	Coal and coal products	Non-ferrous metals	0	0	0	0	0
20	Coal and coal products	Non-metallic minerals	0	0	0	0	0
21	Coal and coal products	Machinery	0	0	0	0	0
Energy Balance							

Figure 2.5-1 Spreadsheet for the IEA energy balance data

	B	C	D	E	F	G	H	I
1	country	product codes	flow codes	1980	1981	1982	1983	1984
2	Vietnam	PRODUCTION OF PRIMARY ENERGY	Coal	0	2589	2878	2705	2712
3	Vietnam	-Losses production & flared	Coal	0	0	0	0	0
4	Vietnam	-Net production	Coal	0	2589	2878	2705	2712
5	Vietnam	IMPORT	Coal	0	3	0	0	0
6	Vietnam	EXPORT	Coal	0	-467	-337	-201	-235
7	Vietnam	PRIMARY ENERGY REQUIREMENT	Coal	0	2125	2542	2504	2478
8	Vietnam	OIL REFINING	Coal	0	0	0	0	0
9	Vietnam	POWER GENERATION	Coal	0	0	0	0	0
10	Vietnam	-Input	Coal	0	-892	-720	-795	-888
11	Vietnam	-Output	Coal	0	124	131	132	174
12	Vietnam	TRANSM. & DISTRIB. LOSSES	Coal	0	0	0	0	0
13	Vietnam	ENERGY SECTOR OWN USE	Coal	0	0	0	0	0
14	Vietnam	NET SUPPLY	Coal	0	1433	1822	1709	1590
15	Vietnam	NET DOMESTIC CONSUMPTION	Coal	0	1433	1822	1709	1590
16	Vietnam	-Industry	Coal	0	1192	1454	1320	1244
17	Vietnam	-Agriculture	Coal	0	10	15	15	13
18	Vietnam	Transport	Coal	0	44	92	98	71

Figure 2.5-2 Spreadsheet for the energy data of Vietnam

	B	C	D	E	F	G	H
1	Country	World bank data	1971	1972	1973	1974	1975
2	China	Population	841104896	862030080	881939968	900349952	916395008
3	China	GNP per capita (US\$, curr. pr.)	130	130	150	160	160
4	China	GDP (billion 1987 US dollars)	9.684E+10	1.002E+11	1.086E+11	1.097E+11	1.188E+11
5	China	Gross National Product (local,curr. pr.)	2.475E+11	2.545E+11	2.671E+11	2.796E+11	2.981E+11
6	China	Gross Domestic Product (local,curr. pr.)	2.475E+11	2.545E+11	2.761E+11	2.796E+11	2.981E+11
7	China	Gross National Product (local,const. pr.)	3.604E+11	3.73E+11	4.04E+11	4.083E+11	4.421E+11
8	China	GDP at market prices (local,const. pr.)	3.604E+11	3.73E+11	4.04E+11	4.083E+11	4.421E+11
9	China	GDP at factor cost (local,const. pr.)	0	0	0	0	0
10	China	GDP Deflator (1987=100,index)	68.665359	68.234741	68.336563	68.48764	67.423492
11	China	Conversion Factor (Ann. av., local per US\$)	2.4617996	2.2451	1.9693999	1.9611998	1.8596003
12	France	Population	51251008	51701008	52118000	52460000	52899008
13	France	GNP per capita (US\$, curr. pr.)	3160	3470	4210	5060	5970
14	France	GDP (billion 1987 US dollars)	6.19E+11	6.421E+11	6.72E+11	6.884E+11	6.826E+11
15	France	Gross National Product (local,curr. pr.)	8.871E+11	9.901E+11	1.132E+12	1.307E+12	1.47E+12
16	France	Gross Domestic Product (local,curr. pr.)	8.842E+11	9.879E+11	1.13E+12	1.303E+12	1.468E+12
17	France	Gross National Product (local,const. pr.)	3.733E+12	3.868E+12	4.048E+12	4.151E+12	4.111E+12
18	France	GDP at market prices (local,const. pr.)	3.721E+12	3.859E+12	4.039E+12	4.138E+12	4.104E+12
19	France	GDP at factor cost (local,const. pr.)	3.248E+12	3.361E+12	3.524E+12	3.642E+12	3.615E+12
20	France	GDP Deflator (1987=100,index)	23.763504	25.598709	27.973251	31.487976	35.76413
21	France	Conversion Factor (Ann. av., local per US\$)	5.5426302	5.0496702	4.4577703	4.8140687	4.2862396

Figure 2.5-3 Spreadsheet for the economy data

## Structure of database

A database consists of five functions as follows.

- (1) Data storing
- (2) Data input and verification
- (3) Data processing and extraction
- (4) Data display and updating
- (5) Data rearrangement and printing

The Access database management system assigns these five functions to four blocks named "objects". They are,

- (1) "Table" Data storing
- (2) "Query" Data processing and extraction
- (3) "Form" Data input and verification, display and updating
- (4) "Report" Data rearrangement and printing.

From number (2) to (4) of four blocks of Access can be changed or modified as your options. How to change or modify the options will be lectured in the Access database seminar course held in July and/or August in 1995.

The structure of "Electric Power Database" and "Energy and Economy Database" is listed after this page.

**Structure of "Table" (1)**

**Electric Power Database**

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Plant Type Code	Number (Long)	4
1976	Number (Long)	4
1977	Number (Long)	4
1978	Number (Long)	4
1979	Number (Long)	4
1980	Number (Long)	4
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Number (Long)	4
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Company Name	Text	255
Company Name in Vietnamese	Text	255

Columns

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Code	Number (Long)	4
1976	Text	255
1977	Text	255
1978	Text	255
1979	Number (Long)	4
1980	Number (Long)	4
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255



**Columns**

Name	Type	Size
DB-ID	Text	255
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255
Unit	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Long)	4
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Double)	8
1989	Number (Long)	4
1990	Number (Double)	8
1991	Number (Double)	8
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Plant Type Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Long)	4
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Number (Double)	8
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
DB-ID	Text	255
SN Code	Number (Long)	4
Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255

**Columns**

Name	Type	Size
DB-ID	Text	255
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255

Columns

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Code	Text	255
Province	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Long)	4
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Long)	4
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

Columns

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Plant Type Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255



**Columns**

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Month	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Long)	4
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255
Code 2	Number (Long)	4
Name 2	Text	255
Code 3	Number (Long)	4
Name 3	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Name in Vietnamese	Text	255

**Columns**

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Code	Text	255
Province	Text	255
1986 T	Number (Double)	8
1986 G	Number (Double)	8
1986 P	Number (Double)	8
1987 T	Number (Double)	8
1987 G	Number (Double)	8
1987 P	Number (Double)	8
1988 T	Number (Double)	8
1988 G	Number (Double)	8
1988 P	Number (Double)	8
1989 T	Number (Double)	8
1989 G	Number (Double)	8
1989 P	Number (Double)	8
1990 T	Number (Double)	8
1990 G	Number (Double)	8
1990 P	Number (Long)	4
1991 T	Number (Double)	8
1991 G	Number (Long)	4
1991 P	Number (Double)	8
1992 G	Text	255
1992 P	Text	255
1993 G	Text	255
1993 P	Text	255
1994 G	Text	255
1994 P	Text	255
1995 G	Text	255
1995 P	Text	255
1996 G	Text	255
1997 P	Text	255
1998 G	Text	255
1998 P	Text	255
1999 G	Text	255
1999 P	Text	255
2000 G	Text	255
2000 P	Text	255

Columns

Name	Type	Size
DB-ID	Text	255
Company Code	Number (Long)	4
Code	Text	255
Province	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Long)	4
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Long)	4
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Long)	4
1993	Number (Double)	8
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

Columns

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Sector Code	Number (Long)	4
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Long)	4
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Long)	4
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

Columns

<u>Name</u>	<u>Type</u>	<u>Size</u>
DB-ID	Number (Long)	4
Sector Code	Number (Long)	4
Sector Name	Text	255
Sector Name in Vietnamese	Text	255

**Columns**

Name	Type	Size
DB_ID	Text	255
Company Code	Number (Long)	4
Transformer Code	Number (Long)	4
1976	Text	255
1977	Text	255
1978	Text	255
1979	Text	255
1980	Text	255
1981	Text	255
1982	Text	255
1983	Text	255
1984	Text	255
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Number (Long)	4
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

**Columns**

Name	Type	Size
DB_ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Super Code	Number (Long)	4

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255



**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Code	Number (Long)	4
1976	Text	255
1977	Text	255
1978	Text	255
1979	Text	255
1980	Text	255
1981	Text	255
1982	Text	255
1983	Number (Long)	4
1984	Number (Long)	4
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Text	255
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
DB_ID	Number (Long)	4
Code	Number (Long)	4
Name	Text	255
Total Code	Number (Long)	4

**Columns**

Name	Type	Size
FirstOfDB-ID	Number (Long)	4
Sale by all PCs_Company Code	Text	255
Company Name	Text	255
Sale by all PCs_Sector Code	Number (Long)	4
Sector Name	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Columns**

Name	Type	Size
FirstOfDB-ID	Number (Long)	4
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Sale to Sectors_Company Code	Number (Long)	4
Company Name	Text	255
Sale to Sectors_Sector Code	Number (Long)	4
Sector Name	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

**Columns**

Name	Type	Size
FirstOfDB-ID	Number (Long)	4
Company Code	Text	255
Company Name	Text	255
Sector Code	Number (Long)	4
Sector Name	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255
2001	Text	255
2002	Text	255
2003	Text	255
2004	Text	255
2005	Text	255
2006	Text	255
2007	Text	255
2008	Text	255
2009	Text	255
2010	Text	255

**Columns**

Name	Type	Size
DB-ID	Number (Long)	4
Company Code	Number (Long)	4
Company Name	Text	255
Code	Number (Long)	4
Name	Text	255
1976	Number (Double)	8
1977	Number (Double)	8
1978	Number (Double)	8
1979	Number (Double)	8
1980	Number (Double)	8
1981	Number (Double)	8
1982	Number (Double)	8
1983	Number (Double)	8
1984	Number (Double)	8
1985	Number (Double)	8
1986	Number (Double)	8
1987	Number (Double)	8
1988	Number (Double)	8
1989	Number (Double)	8
1990	Number (Double)	8
1991	Number (Double)	8
1992	Number (Double)	8
1993	Text	255
1994	Text	255
1995	Text	255
1996	Text	255
1997	Text	255
1998	Text	255
1999	Text	255
2000	Text	255

**Structure of "Table" (2)**

**Energy and Economy Database**

**Columns**

Name	Type	Size
country	Text	255
Year	Text	255

**Columns**

Name	Type	Size
Record ID	Number (Long)	4
Item	Text	255
1971	Number (Long)	4
1990	Number (Long)	4
2000	Number (Long)	4
2010	Number (Long)	4



**Columns**

Name	Type	Size
Record ID	Number (Long)	4
Country	Text	255
Product	Text	255
Flow	Text	255
1971	Number (Long)	4
1972	Number (Long)	4
1973	Number (Long)	4
1974	Number (Long)	4
1975	Number (Long)	4
1976	Number (Long)	4
1977	Number (Long)	4
1978	Number (Long)	4
1979	Number (Long)	4
1980	Number (Long)	4
1981	Number (Long)	4
1982	Number (Long)	4
1983	Number (Long)	4
1984	Number (Long)	4
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Text	255
1993	Text	255
1994	Text	255

**Columns**

Name	Type	Size
country	Text	255
Year	Text	255

**Columns**

Name	Type	Size
record id	Number (Long)	4
country	Text	255
product	Text	255
flow	Text	255
1980	Number (Long)	4
1981	Number (Long)	4
1982	Number (Long)	4
1983	Number (Long)	4
1984	Number (Long)	4
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Number (Long)	4
1993	Number (Long)	4
1994	Number (Long)	4

Columns

Name	Type	Size
Record ID	Number (Long)	4
Country	Text	255
Item	Text	255
1971	Number (Long)	4
1972	Number (Long)	4
1973	Number (Long)	4
1974	Number (Long)	4
1975	Number (Long)	4
1976	Number (Long)	4
1977	Number (Long)	4
1978	Number (Long)	4
1979	Number (Long)	4
1980	Number (Long)	4
1981	Number (Long)	4
1982	Number (Long)	4
1983	Number (Long)	4
1984	Number (Long)	4
1985	Number (Long)	4
1986	Number (Long)	4
1987	Number (Long)	4
1988	Number (Long)	4
1989	Number (Long)	4
1990	Number (Long)	4
1991	Number (Long)	4
1992	Number (Long)	4
1993	Number (Long)	4
1994	Number (Long)	4