

Appendix C: AIM/Enduse Database System and Implementation

C.1 Description of Input Data

The window as shown in Fig. C.1 appears on clicking at file AIM_Enduse.mdb on Windows explorer. On clicking at "Main" in the list of forms, the form 'Main' as shown in Fig. C.2 can be seen. Input data is entered by clicking on the buttons in the main form.

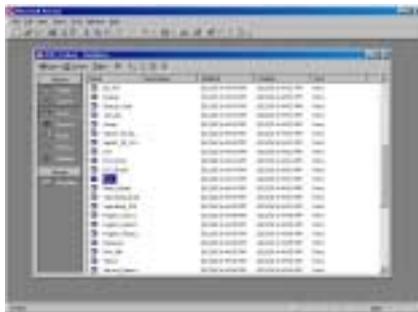


Fig. C.1. After clicking AIM_Enduse.mdb



Fig. C.2. After clicking "Main"

C.1.1 Control parameters

C.1.1.1 Parameters used in computation

The list of parameters used in computation is shown in the following table.

Table C.1. List of items in "Parameters used in Computation"

Items	Format	Contents
Start year of calculation *	Integer	Year from which AIM/Enduse calculates CO ₂ , SO ₂ , NO _x emissions. It corresponds to the base year.
End year of calculation *	Integer	Year to which AIM/Enduse calculates CO ₂ , SO ₂ , NO _x emissions.
Discount rate *	Percent	Rate is used for economic criteria of technology selection based life cycle cost.
Unit of price	Character	Unit is shown in the footer of other forms. Change of unit could not cause the exchange of values.
Unit of energy	Character	
Unit of CO ₂	Character	
Unit of SO ₂	Character	
Unit of NO _x	Character	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.2 Region database

C.1.2.1 Region classification 1

This table specifies the aggregate region classification. Service demand, technologies' share and countermeasure etc. should be listed by this classification.

Table C.2. List of items in "Region Classification 1"

Items	Format	Contents
No.	Integer (Max 32768)	Number of the coarse region classification. It is an independent number and is not used in the calculation.
Region 1 code *	Character (Max 6)	Code of the coarse region classification. Every code must be unique in the list. - "ALL" could not be permitted to use as the code. - "_" could not be permitted to use as a part of the code.
Region 1 name	Character (Max 40)	Name of the coarse region classification.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.3 Sector database

C.1.3.1 Sector classification

This table specifies the sector classification. AIM/Enduse shows emission by each sector based on this classification. Also, countermeasure scenarios can be set for each sector.

Table C.3. List of items in "Sector Classification"

Items	Format	Contents
No.	Integer (Max 32768)	Number of the sector classification. It is an independent number and is not used in the calculation.
Sector code *	Character (Max 6)	Code of the sector classification. Every code must be unique in the list. - "ALL" could not be permitted to use as the code. - "_" could not be permitted to use as a part of the code.
Sector name	Character (Max 40)	Name of the sector classification.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.4 Service database

C.1.4.1 Service classification

This table specifies the service classification.

Table C.4. List of items in "Service Classification"

Items	Format	Contents
No.	Integer (Max 32768)	Number of the energy classification. It is an independent number and is not used in the calculation.

Table C.4. List of items in “Service Classification” (continued)

Items	Format	Contents
Service code *	Character (Max 6)	Code of the service classification. Every code must be unique in the list.
Service name	Character (Max 40)	Name of the service classification.
Service unit	Character (Max 10)	Unit of the service classification.
Sector name *	-	Select the sector that the service belongs in the list.
Allocation index	-	In case of area source, firstly, its emission is calculated by each region classification 1. Then emission is allocated to the region classification 2 in proportion to allocation index. Select the number and the name of the allocation index by which the emission is divided to the classification 2.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.4.2 Service demand

The data for service demand in reference year as well as its projections in future years are entered in this table.

Table C.5. List of items in “Service Demand”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the coarse region classification in the list.
Service *	-	Select the service classification in the list. Every pair of ‘Region 1’ and ‘Service’ must be unique.
Service demand (year) *	Integer	Enter data sets given by pairs of year and quantity. The total sets are less than four. Temporary value may be entered as the demand of internal service so that the one is decided endogenously in the model.
Service demand (value) *	Single (>0)	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.4.3 Service loss

Data for transmission and distribution loss between the producer and the receiver of energy service is entered in this table. If no data is entered in this table for a service, its transmission and distribution loss is assumed as 0%.

Table C.6. List of items in “Service Loss”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the region classification 1 in the list.
Service *	-	Select the service type in the list.
Service loss rate (year) *	Integer	Enter data sets given by pairs of year and quantity. The total sets are less than four.
Service loss rate (value) *	Single	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.5 Energy database

C.1.5.1 Energy data

Energy data is listed in this table.

Table C.7. List of items in “Energy Data”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the energy classification. It is an independent number and is not used in the calculation.
Energy code *	Character (Max 6)	Code of the energy classification. Every combination of energy code and region 1 be unique in the list.
Energy name	Character (Max 40)	Name of the energy classification.
Energy price *+	Single	Energy price by energy type with the unit shown in the heading row.
CO ₂ emission factor +	Single	CO ₂ emission factor by energy type with the unit shown in the heading row.
SO ₂ emission factor +	Single	SO ₂ emission factor by energy type with the unit shown in the heading row.
NO _x emission factor +	Single	NO _x emission factor by energy type with the unit shown in the heading row.

Item with * : Code or value of the item is indispensable for database system and calculation.

Item with + : If the factor is not constant year by year, check the box and enter the value in “Energy Data by year” table.

Explanation of the command button, “Update energy factor with checking”

If the check box is not checked, the corresponding data is assumed constant for all the years. If this box is checked, the corresponding data in “Energy Data by year” table is referred. After clicking the command button, the starting year’s value is calculated with using the data in “Energy Data by year” table and the data in “Energy Classification” table is updated.

C.1.5.2 Change in energy data

This table shows energy price, CO₂ emission factor, SO₂ emission factor and NO_x emission factor by year. If this data is constant by year, this table is not needed. Data in this table is considered only when corresponding row in table “Energy Classification” is checked.

Table C.8. List of items in “Change in Energy Data”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the energy classification. It is an independent number and is not used in the calculation.
Energy *	-	Select the energy type of which energy price or emission factor changes year by year in the list.
Price or gas *	-	Select energy price or type of emission gas in the list.
Energy factor (year) *	Integer	A set of data is given by a pair of year (year) and price/emission factor (value). The total sets are less than four. The value is entered with the units shown in the footer of the form.
Energy factor (year) *	Single	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.6 Technology database

“Technology” includes two types of devices, one is energy devices and another is removal processes. Energy device refers to the technology which consumes energy and supply service in order to satisfy service demand. Removal process refers to the technology which removes air pollutants emitted by a energy device.

C.1.6.1 Energy device data

Energy device data is listed in this table.

Table C.9. List of items in “Energy Device Data”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the energy device. It is an independent number and is not used in the calculation.
Energy device code *	Character (Max 6)	Code of the energy device. Every code must be unique in the list.
Energy device name	Character (Max 40)	Input the name of the technology. Maximum number of characters is 40.
Life time *	Single (>0)	Life time of the energy device.
Device unit	Character (Max 40)	Unit which service supply and energy consumption of each technology based on.
Specific service output (name) *	-	Select the service the technology supplies in the list.
Specific service output (value) **+	Single (>0)	Service supply of an energy device per year and per device unit is listed.
Fixed cost **+	Single (≥ 0)	Fixed cost of the energy device per device unit. The value is entered with the units shown in the footer of the form.
Operation cost +	Single (≥ 0)	Operation cost of the energy device. The value is entered with the units shown in the footer of the form.
Specific energy consumption (name) *	-	Select the type of energy or material that the energy device consumes in the list.
Specific energy consumption (value) **+	Single	Energy or material consumption of the energy device per unit is listed. Energy consumption is entered with the unit shown in the footer of the form.
Specific energy (non-energy use)	Single	Ratio of energy or material except combustion use. If the rate is equal to 100%, each gas does not be emitted
SO ₂ /NO _x ex. fuel content +	Single	SO ₂ (upper) and NO _x (lower) emission other than fuel content.

Item with * : Code or value of the item is indispensable for database system and calculation.

Item with + : If the value is not constant, click the box and enter time-series value in “Improvement of Energy Device” table.

Explanation of the command button, “Update energy factor with checking”

If the check box is not checked, the corresponding data is assumed constant for all the years. If this box is checked, the corresponding data in “Improvement of Energy Device” table is referred. After clicking the command button, the starting year’s value is calculated with using the data in “Improvement of Energy Device” table and the data in “Energy Device Classification” table is updated.

C.1.6.2 Change in energy device data

Change in energy device data is listed in this table. Data in this table is considered only when corresponding row in “Energy Device Classification” table is checked.

Table C.10. List of items in “Change in Energy Device”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Energy device *	-	Select the energy device in the list.
Improved item *	-	Select the item whose quantity is improved. Every pair of ‘Energy Device’ and ‘Improved Item’ must be unique.
Improvement (year) *	Integer	Input data sets given by pairs of year and quantity. The total sets are less than four. The value is entered with the units shown in the footer of the form.
Improvement (value) *	Single	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.6.3 Removal process

This table specifies the classification of air pollution removal processes.

Table C.11. List of items in “Removal Process”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the removal process classification. It is an independent number and is not used in calculation.
Removal process code *	Character (Max 6)	Code of the removal process classification. Every code must be unique in the list.
Removal process name *	Character (Max 40)	Name of the removal process.
Stage of control *	-	Select at which stage the control is done. Pre-combustion: coal screening, coal washing etc. In Situ Combustion: lime stone injection into furnace etc. Post-combustion: flue gas desulfurization, selective catalytic reduction etc.
SO ₂ / NO _x *	-	Select which SO ₂ or NO _x removal process mitigates.
Fixed cost	Single	Fixed cost of the removal process per energy consumption of energy device with the unit shown in the heading row.
Operation cost	Single	Operation cost of the removal process per year and per energy consumption of energy device with the unit shown in the heading row.
Energy consumption	Single	Energy consumption of the removal process per energy consumption of energy device with the unit shown in the heading row.
Removal rate	Percentage	Removal rate to mitigate for air pollution emission by control.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.7 Combination database

In combination database, users must set two types of combination (see Fig. 1.2 in Part IV). One is the combination concerning removal process. Firstly, users set the combination of removal processes by

selecting each process at pre-combustion, in-site and post-combustion in “Combination of Removal Process” table. Next, users set the combination of energy devices and removal processes in “Combination of Energy Devices and Removal Processes”.

Another is the combination concerning energy devices. In case that a device consumes output from others as input (see Fig. 1.3 in Part IV), users set the linkage between input and output in “Combination of Input and Output of Energy Devices”.

C.1.7.1 Combination of removal processes

Combination of removal processes is assembled in this table. In case that removal processes are not introduced, this table can be ignored.

Table C.12. List of items in “Combination of Removal Processes”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the combination of removal process. It is an independent number and is not used in the calculation.
Combination of removal processes Code *	Character (Max 6)	Code of the combination of removal process. Every code must be unique. “NON” cannot be used as a code.
Name	Character (Max 40)	Name of the combination of the removal process.
Removal process *	-	Select the removal process at each stage.
Removal rate	-	Removal rate of the combination is calculated automatically after clicking “UPDATE”.
Fixed cost	-	Fixed cost of the combination is calculated automatically after clicking “UPDATE”.
Operation cost	-	Operation cost of the combination is calculated automatically after clicking “UPDATE”.
Energy consumption	-	Energy consumption of the combination is calculated automatically after clicking “UPDATE”.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.7.2 Combination of energy device and removal processes

Combination of energy device and removal processes is assembled in this table.

Table C.13. List of items in “Combination of Energy Device and Removal Processes”

Items	Format	Contents
Energy device *	-	Select the energy device from the upper box.
No.	Integer (Max 32768)	Number of the combination of energy device and removal process. It is an independent number and is not used in the calculation.
Code	-	Code of the combination of energy device and removal process is determined automatically after selecting removal process.
Combination of energy device and removal processes	Character (Max 40)	Name of the combination of energy device and removal process.
Combination of removal processes *	-	Select the combination of the removal process.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.7.3 Relationship between internal energy/service

Relationship between internal energy/service is assembled in this table.

Table C.14. List of items in “Relationship between Internal Energy/Service”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the combination of input and output of energy devices. It is an independent number and is not used in the calculation.
Internal energy *	-	Internal energy is selected to combine with internal service.
Internal service*	-	Internal service is selected to combine with internal service.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.8 Stock database

C.1.8.1 Stock in start year

This table specifies the stock of each combination of device and removal process in start year of calculation.

Table C.15. List of items in “Area Stock”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the dataset. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the coarse region classification.
Energy device *	-	Select the energy device.
Combination of removal process *	-	Select the combination of removal process.
Stock	Single	Stock quantity in the start year of calculation.
Specific service output (name)	-	Service name is shown automatically after selecting an energy device.
Specific service output (value) ⁺	Single	Average service supply of the stocked devices in starting year.
Fixed cost / operation cost	Single	Average cost of the stock devices in the starting year.
Specific energy consumption (name)	Single	Energy name is shown automatically after selecting an energy device.
Specific energy consumption (value) ⁺	Single	Average energy consumption of the stocked devices in starting year.
Specific energy consumption (non ene.) ⁺	Single	Value is shown as same as the one in energy device table after clicking the Update button.
Removal rate ⁺ (DeSlr/DeNtr)	Percent	“DeSlr” and “DeNtr” refer to average desulfurization rate and average denitration rate of the stocked removal process respectively.
Emission except fuel content (SO ₂ /NO _x ex. fl.) ⁺	Single	“SO ₂ ex. fl.” and “NO _x ex. fl.” refer to the average SO ₂ and NO _x emission except fuel content from the stocked devices in starting year, respectively.

Item with * : Code or value of the item is indispensable for database system and calculation.

Item with + : If the option button is false, the value is calculated automatically with using the value of energy device table after clicking Update button.

C.1.9 Share database

C.1.9.1 Maximum share of energy device

Maximum share of energy device in satisfying a service is entered in this table. This table is necessary only for the devices whose share is bound by upper limit. No such limit is assumed for devices whose data is not entered in this table.

Table C.16. List of items in “Maximum Share of Energy Device”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the coarse region classification.
Service *	-	Select the service classification in the list.
Energy device *	-	Select the energy device in the list.
Maximum share * (year)	Integer	Enter data sets given by pairs of year and quantity. The
Maximum share * (value)	Single (%)	total sets are less than four.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.10 Performance database

C.1.10.1 Operating rate

Operating rate of a device is entered in this table. If this value is not entered by the user, default value of operating rate is assumed as 100% in the model.

Table C.17. List of items in “Operating Rate”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the region classification 1 in the list.
Energy device *	-	Select the energy device in the list.
Operation rate * (year)	Integer	Enter data sets given by pairs of year and quantity. The
Operation rate * (value)	Single	total sets are less than four.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11 Countermeasure database

AIM/Enduse can estimate CO₂, SO₂, NO_x emissions with countermeasures. Following countermeasures can be set in the model: (i) Countermeasure at use stage; (ii) Tax for energy consumption and CO₂, SO₂, NO_x emission; (iii) Regulation for energy consumption and CO₂, SO₂, NO_x emission; (iv) Subsidy for recruited technology and exchange etc.

C.1.11.1 Improvement at use stage

Change in life style and method of use and maintenance of devices can result in conservation of energy at use stage. This table shows improvement at use stage of energy device.

Table C.18. List of items in “Improvement at Use Stage”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Code *	-	Code of the countermeasure at used stage.
Content of countermeasure	Character (Max 60)	Content of the countermeasure at used stage.
Energy device *	-	Select the energy device in the list.
Reduction rate *	Single	Rate of reduction of service supply or energy use.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.2 Action of improvement at use stage

Action rate of improvement at use stage in the region is listed in the table.

Table C.19. List of items in “Action of Improvement at Use Stage”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Region 1 *	-	Select the coarse region classification in the list.
Improvement at use stage *	-	Select the countermeasure menu in the list.
action rate (year) *	Integer	Enter data sets given by pairs of year and quantity.
action rate (value) *	Percent	The total sets are less than four.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.3 Tax/regulation classification

User can set the countermeasure as tax or restriction (constraint) by emission type and/or energy.

Table C.20. List of items in “Tax/Regulation Classification”

Items	Format	Contents
No.	Integer (Max 32768)	Number of the data sets. It is an independent number and is not used in the calculation.
Group code *	Character (Max 6)	Code of the group.
Countermeasure type *	-	Select the countermeasure type in the following choices. <ul style="list-style-type: none"> - Energy Tax: Tax is imposed on energy use - CO₂ Tax: Tax is imposed on CO₂ emission - SO₂ Tax: Tax is imposed on SO₂ emission - NO_x Tax: Tax is imposed on NO_x emission - Energy constraint: Energy use is restricted - CO₂ constraint: CO₂ emission is restricted. - SO₂ constraint: SO₂ emission is restricted. - NO_x constraint: NO_x emission is restricted.
Group name *	Character (Max 40)	Name of group.

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.4 Group for tax/regulation

The tax and constraints defined in previous section can be applied to selected sectors in this table.

Explanation of the command button, “Same group”

If a group is selected in a cell of a column and this button is clicked, all the cells of that column are changed to the same group

Table C.21. List of items in “Group for Tax/Regulation”

Items	Format	Contents
No.	-	These data are shown automatically.
Region 1 *	-	
Sector *	-	
Group for energy	-	Select group on measure.
Group for CO ₂	-	
Group for SO ₂	-	
Group for NO _x	-	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.5 Tax / regulation

Tax rate or regulation for each group is listed in this table. If the tax rate or regulation is not entered for a group, tax rate is assumed zero or regulation is assumed infinite.

Table C.22. List of items in “Tax / Regulation”

Items	Format	Contents
(check box)	-	If you do not check, the rate is ignored.
Group *	-	Select the group in the list quoted from “Group on Measure Classification” table.
Type	-	Countermeasure type is shown after selecting group.
Energy *	-	If the countermeasure is energy tax or energy constraint, select the energy classification.
Tax rate/regulation (year) *	Integer	Input data sets given by pairs of year and quantity. The total number of sets is less than four. The unit is shown in the type field.
Tax rate/regulation (value)*	Percent	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.6 Subsidy (recruitment & operation)

The subsidy rate for recruitment (fixed cost) or operation (operational cost) can be entered in this table.

Table C.23. List of items in “Subsidy (Recruitment & Operation)”

Items	Format	Contents
(check box)	-	If you do not check, the rate is ignored.
No.	Integer (Max 32768)	The number of the data sets. It is an independent number and is not used in the calculation.
Energy device *	-	Select the energy device in the list.
Combination of removal processes *	-	Select the combination of removal processes.

For recruitment / operation -		Select 'for recruited' for subsidy at recruited stage, and 'for operation' for subsidy at operation for technology.
Subsidy rate (year) *	Integer	Input data sets given by pairs of year and quantity. The total sets are less than four.
Subsidy rate (value) *	Percent	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.1.11.7 Subsidy (removal process)

The subsidy rate at recruited or exchange stage for removal process is listed in this table.

Table C.24. List of items in "Subsidy (Removal Process)"

Items	Format	Contents
No.	Integer (Max 32768)	The number of the data sets. It is an independent number and is not used in the calculation.
Removal process*	-	Select the energy device in the list.
Combination of removal process 1*	-	Select the combination of removal processes that may be exchanged to new one.
Combination of removal process 2*	-	Select the combination of removal processes that may be exchanged from old one.
Subsidy rate (year) *	Integer	Input data sets given by pairs of year and quantity. The total sets are less than four.
Subsidy rate (value) *	Percent	

Item with * : Code or value of the item is indispensable for database system and calculation.

C.2 Implementation

C.2.1 How to export input files for AIM/Enduse

AIM/Enduse database system can supply the input data for the GAMS program.

- The files in "data" directory and the ones in "src" directory are set in same directory as shown in Fig. C.3. User should confirm the following program sources in "src" directory.
 - AIM_CMB.gms
 - _interp.gms
 - _printout.gms
 - _errorout.gms
- Input directory and file name of GAMS input file at the side of "Export data to GAMS" command button on main screen as shown in Fig. C.4. In this example, "AIM_Exe" files in "data" directory are used.
- If user clicks on "Export data to GAMS", the interface makes input files for AIM-CMB.gms. After export of GAMS input files, the message as shown in Fig. C.5 appears. The new files, AIM_Exe_1.gms, AIM_Exe_2.gms, AIM_Exe.set and AIM_Exe.err, are made in "data" directory as shown in Fig. C.6.



Fig. C.3. How to export input files for AIM/Enduse GAMS version (1)

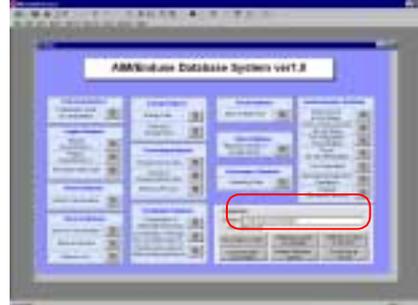


Fig. C.4. How to export input files for AIM/Enduse GAMS version (2)

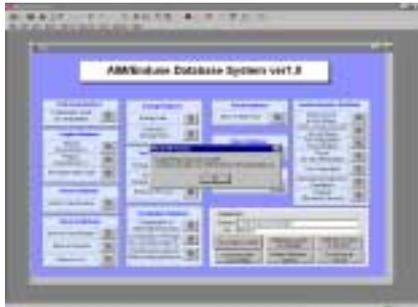


Fig. C.5. How to export input files for AIM/Enduse GAMS version (3)



Fig. C.6. How to export input files for AIM/Enduse GAMS version (4)

C.2.2 How to implement AIM/Enduse GAMS version

GAMS (<http://www.gams.com/>) must be installed on user's PC for implementation of AIM/Enduse GAMS version.

C.2.2.1 GAMSIDE

GAMSIDE is a graphical interface to create, debug, edit and run GAMS files. If GAMSIDE is installed on user's PC, user should click on "AIM/Enduse GAMS on GAMSIDE" command button on main form. At first time user must create GAMS project file in 'src' directory as shown in Fig. C.7. After creating the file in 'src', user must open 'AIM_CMB.gms' file and run it. If the model runs normally, user can see the screen as shown in Fig. C.9. As for how to use GAMSIDE, see the following file: GAMSIDE manual : <http://www.gams.com/mccarl/useide.pdf>

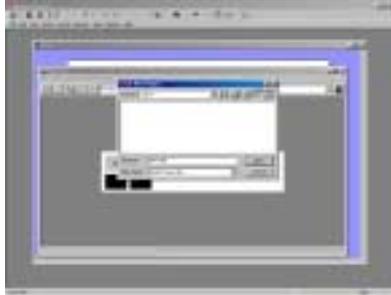


Fig. C.7. How to implement AIM/Enduse GAMS version (1)



Fig. C.8. How to implement AIM/Enduse GAMS version (2)

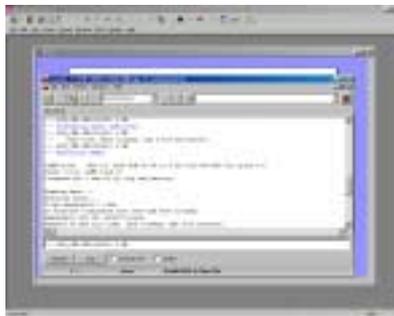


Fig. C.9. How to implement AIM/Enduse GAMS version (3)

C.2.2.2 MS-DOS

If user clicks on "AIM/Enduse GAMS on MS-DOS" command button, MS-DOS prompt appears as shown in Fig. C.10. If GAMS is installed on user's PC, user must input "gams AIM-CMB lp=cplex" in MS-DOS with the input data exported from the database system. GAMS would work as shown in Fig. C.11.

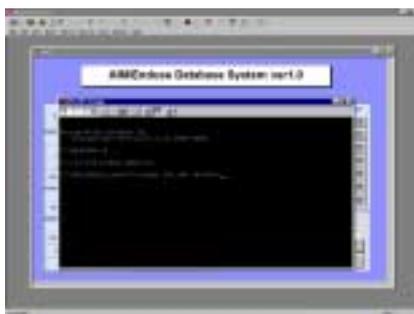


Fig. C.10. How to implement AIM-Local GAMS version (4)



Fig. C.11. How to implement AIM/Enduse GAMS version (5)

C.2.3 How to import output file of AIM/Enduse GAMS version

After implementation of simulation with AIM/Enduse GAMS version, the database system can import the output file of AIM/Enduse GAMS version. If user clicks on “Converting data from GAMS”, the database system starts to import data from output file of AIM/Enduse GAMS version. After importing, the message as shown in Fig. C.12 appears.



Fig. C.12. How to import output file of AIM/Enduse GAMS version

C.2.4 How to display simulation results

AIM/Enduse database system displays simulation results with pivot table after importing data from output file of AIM/Enduse GAMS version. If user clicks on “Display simulation result”, the form as shown in Fig. C.13 appears. After simulating with AIM/Enduse GAMS version, user must refresh data. For this the user must select ‘Table’ worksheet and click right button on mouse. Then select “Refresh Data” on the list as shown in Fig. C.14.

Pivot table and chart allows the user to create dynamic summary data. For example, if user clicks the filter on the upper side of the form as shown in Fig. C.15, it shows the list. If user selects ‘EMS’, it shows emission results. Pivot table shows the result freely and easily with selecting the combination of items on the list of the filter (Table C.25).

Table C.25. Filter of pivot table

Filter	Choice	Content
Kind	EMS	Emission quantity (I,M,L,P,Y)
	ENG	Energy consumption (I,K,L,P, Y)
	SRV	Service supply (I,J,L,P,Y)
	STK	Stock quantity (I,L,P,Y)
	CST	Item = RCA, RCI, MDA, MDI
	RCT	Recruited amount (I,L,P,Y)
	DEV	Operating quantity (I,L,P,Y)
	Item Kind = EMS(M)	CO ₂
	SO ₂	SO ₂ emission
	NO _x	NO _x emission
Kind = ENG(K)	(Energy Type)	The energy code in “Energy Classification”
Kind = SRV(J)	(Service Type)	The energy code in “Service Classification”
Kind = STK	-	-
Kind=CST	RCA	Total annualized investment cost(I,L,P,Y)
	RCI	Total initial investment cost(I,L,P,Y)
	MDA	Total annualized cost of exchanging removal process (I,L,P,Y)->(I,L,P1, Y)

Table C.25. Filter of pivot table (continued)

Filter	Choice	Content
Item Kind = CST	MDI	Total initial cost of exchanging removal process (I,L,P,Y)->(I,L,P1,Y)
	MNT	Total operating cost including energy cost, material cost, maintenance cost etc.(I,L,P)
	TXE	Energy tax payment (I,L,P)
	TXM	Emission tax payment (I,L,P)
	LPS_Area	LPS
Region (I)	Area	Area source
	(Region 1)	The code you input in "Region Classification 1"
LPS (I)	(LPS)	The code you input in "LPS"
Sector (I)	(Sector type)	The code you input in "Sector Classification"
Energy_device (L)	(Energy device)	The code you input in "Energy Device Classification"
Removal (P)	(Removal process)	The code you input in "Removal Process"



Fig. C.13. How to display simulation result (1)



Fig. C.14. How to display simulation result (2)

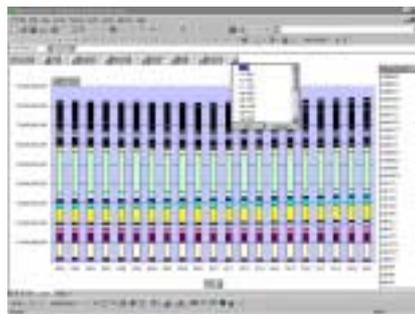


Fig. C.15. How to display simulation result (3)