

# EMFAC-HK

Using the Program

# Objectives

- Install EMFAC-HK Version 2.1 software
- Step by step tutorial to demonstrate examples of emission data routinely run by EMFAC-HK
- Compare EMFAC-HK 2.1 input/output screens, to EMFAC-HK Version 1.2
- Perform exercises using EMFAC-HK v 2.1

# System Requirements / Installation

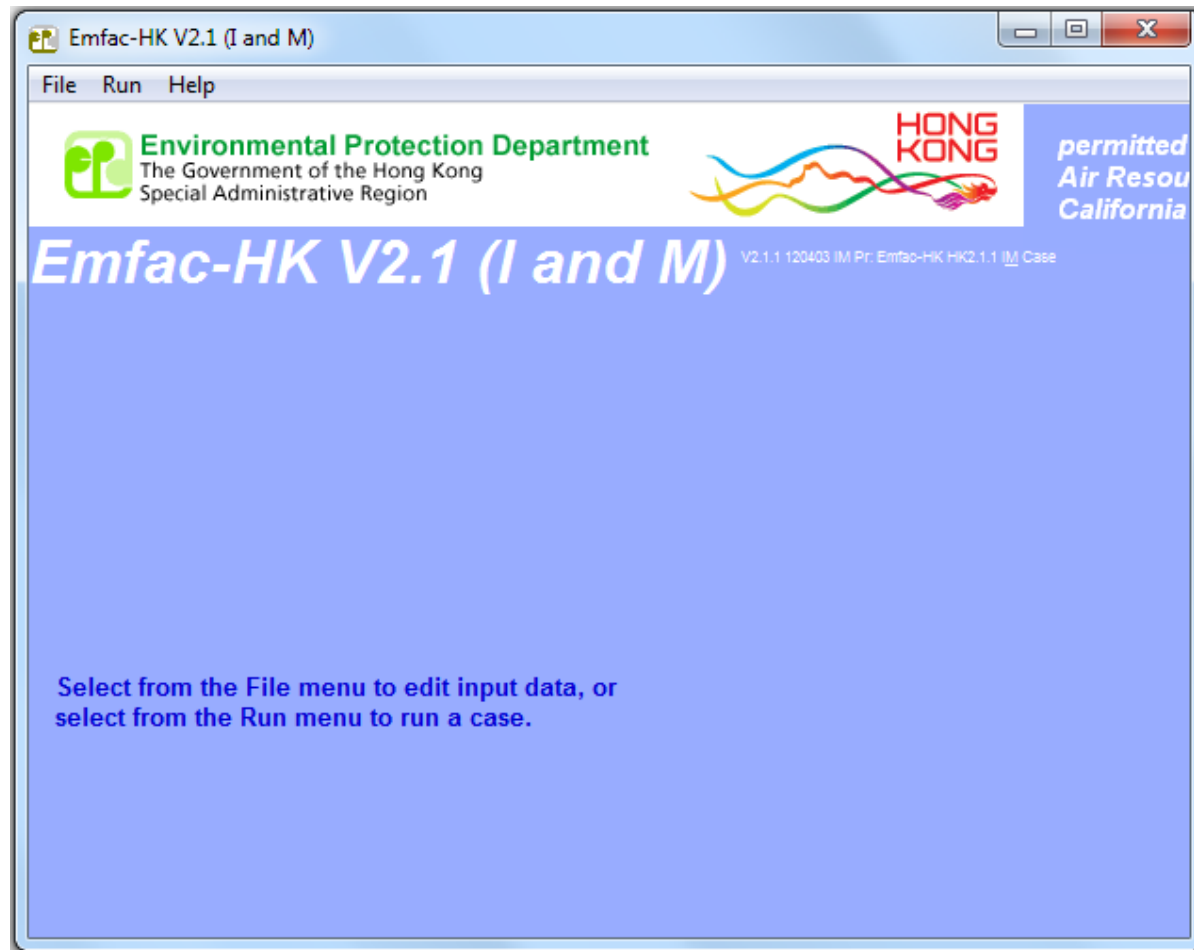
- **Executables -**  
[http://www.epd.gov.hk/epd/english/environmentinhk/air/guide\\_ref/emfac.html](http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/emfac.html)
- **x86 compatible Microsoft 32-bit or 64-bit OS**  
**(preferably Microsoft Windows XP Service Pack 3, Windows Vista, or Windows 7 operating systems)**
- **45 MB of Hard Disk space**
- **Minimum 64 MB RAM (128 MB recommended)**
- **Available Hard Disk Space 350 MB**

# Installation

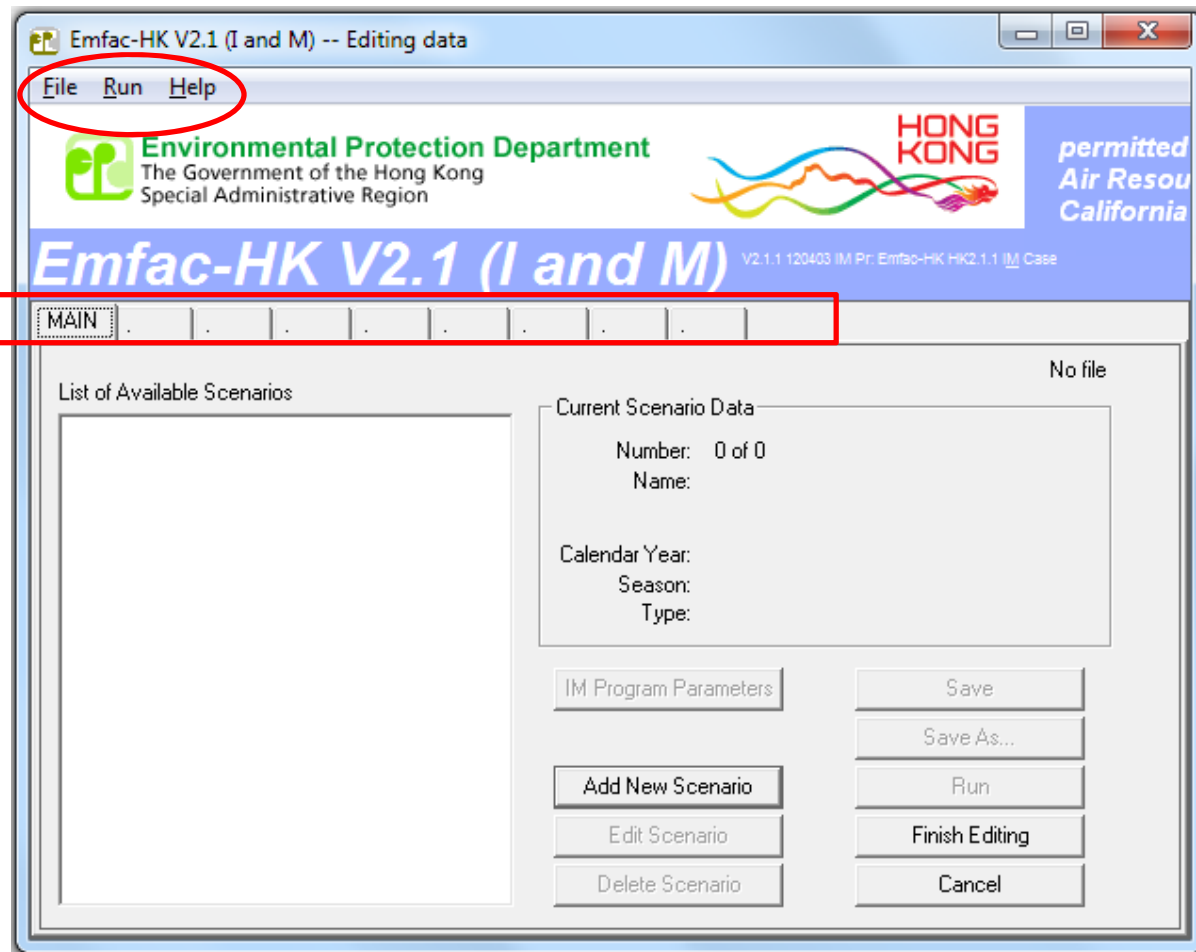
- Program:
  - EmfacHKV21BCInstaller.exe
    - Emfac\_HK\_v2.1 Base Case (BC) Installation Packet
    - Installs EmfacHKV2\_1\_BC.exe and supporting libraries in default, or user-specified directory
  - EmfacHKV21IMInstaller.exe
    - Emfac\_HK\_v2.1 Inspection & Maintenance (I&M) Installation Packet
    - Installs EmfacHKV2\_1\_I&M.exe and supporting libraries in default, or user-specified directory

# Running the Program

## Opening Screen



# Main Screen



Tab must be performed in sequence.

# Adding or Editing Scenarios

The screenshot shows the 'Emfac-HK V2.1 (I and M) -- Editing data' window. The title bar includes the application name and standard window controls. The menu bar contains 'File', 'Run', and 'Help'. The header area features the Environmental Protection Department logo and text: 'Environmental Protection Department', 'The Government of the Hong Kong Special Administrative Region', the 'HONG KONG' logo, and 'permitted Air Resou California'. Below this is a blue banner with 'Emfac-HK V2.1 (I and M)' and version information: 'V2.1.1 120403 IM Pr: Emfac-HK HK2.1.1 IM Case'. The main content area is titled 'Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season'. It contains three steps: 'Step 1 - Geographic Area' with a 'Select an Area Type' label and a text box containing 'SAR'; 'Step 2 - Calendar Years' with a 'Select' button and a 'Select a Calendar Year' label; and 'Step 3 -- Season or Month' with a dropdown menu showing 'Annual'. At the bottom are 'Cancel', 'Next >', and 'Finish' buttons.

Emfac-HK V2.1 (I and M) -- Editing data

File Run Help

Environmental Protection Department  
The Government of the Hong Kong  
Special Administrative Region

HONG KONG

permitted  
Air Resou  
California

**Emfac-HK V2.1 (I and M)** V2.1.1 120403 IM Pr: Emfac-HK HK2.1.1 IM Case

Input 1

Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season

Step 1 - Geographic Area  
Select an Area Type

SAR

Step 2 - Calendar Years

Select

Select a Calendar Year

Step 3 -- Season or Month

Annual

Cancel Next > Finish

# Step 1: Geographic Area

The screenshot shows the 'Emfac-HK V2.1 (I and M) -- Editing data' window. The title bar includes 'File', 'Run', and 'Help' menus. The header area features the Environmental Protection Department logo and the text 'The Government of the Hong Kong Special Administrative Region', along with the 'HONG KONG' logo and 'permitted Air Resou California'. The main window title is 'Emfac-HK V2.1 (I and M)'. Below the header, there is a tab labeled 'Input 1'. The main content area is titled 'Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season'. It is divided into three steps: 'Step 1 - Geographic Area', 'Step 2 - Calendar Years', and 'Step 3 - Season or Month'. In Step 1, 'Area Type: SAR' is displayed, and a dropdown menu is open showing 'SAR' and 'Hong Kong'. In Step 2, there is a 'Select' button and the text 'Select a Calendar Year'. In Step 3, a dropdown menu is open showing 'Annual'. At the bottom, there are 'Cancel', 'Next >', and 'Finish' buttons.

Emfac-HK V2.1 (I and M) -- Editing data

File Run Help

Environmental Protection Department  
The Government of the Hong Kong  
Special Administrative Region

HONG KONG

permitted  
Air Resou  
California

**Emfac-HK V2.1 (I and M)** V2.1.1 120403 IM Pr. Emfac-HK HK2.1.1 IM Case

Input 1

Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season

Step 1 - Geographic Area

Area Type: SAR

SAR

Hong Kong

SAR

Step 2 - Calendar Years

Select

Select a Calendar Year

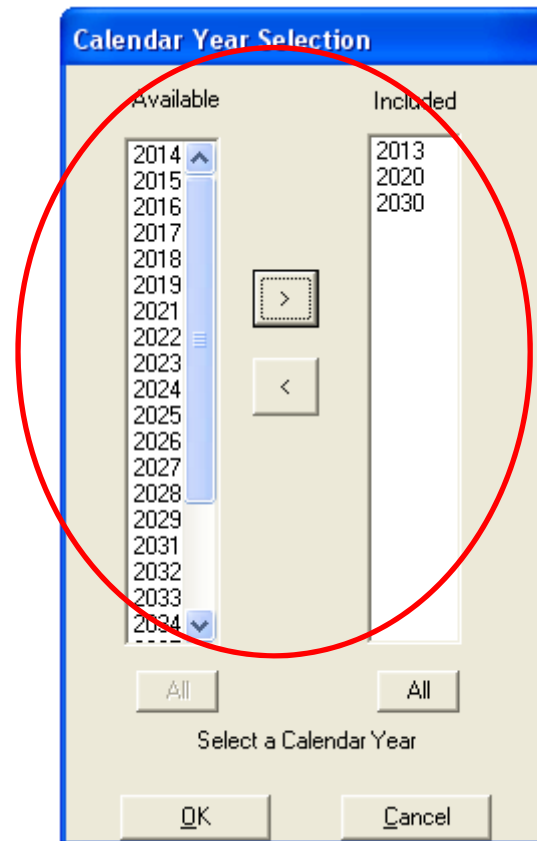
Step 3 - Season or Month

Annual

Cancel Next > Finish



# Step 2: Calendar Year Selection (I&M Version)



# Step 3: Season or Month Selection

## EMFAC-HK v 1.2

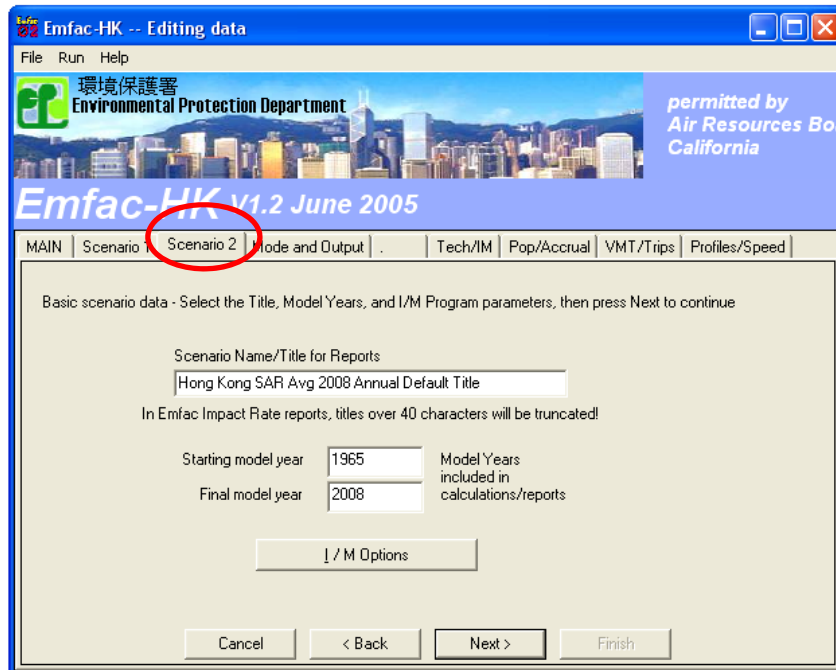
The screenshot shows the 'Emfac-HK v1.2 June 2005' software window. The title bar reads 'Emfac-HK -- Editing data'. The menu bar includes 'File', 'Run', and 'Help'. The header features the Environmental Protection Department logo and text: '環境保護署 Environmental Protection Department' and 'permitted by Air Resources Board California'. The main window title is 'Emfac-HK V1.2 June 2005'. Below the header is a menu bar with 'MAIN', 'Scenario 1', 'Scenario 2', 'Mode and Output', 'Tech/IM', 'Pop/Accrual', 'VMT/Trips', and 'Profiles/Speed'. The main content area displays 'Basic scenario data - Select the Area, Calendar Year, and Season, then press Next to continue'. It shows 'Selected area: Hong Kong SAR, Area Average' with a 'Geographical Area' button. The 'Calendar Year' is set to '2008'. The 'Season or Month' dropdown menu is open, showing options: 'Invalid month', 'January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September', 'October', 'November', 'December', 'N/A', 'N/A', 'Annual', and 'Invalid month' (highlighted at the bottom). 'Cancel' and 'Finish' buttons are at the bottom.

## EMFAC-HK v 2.1

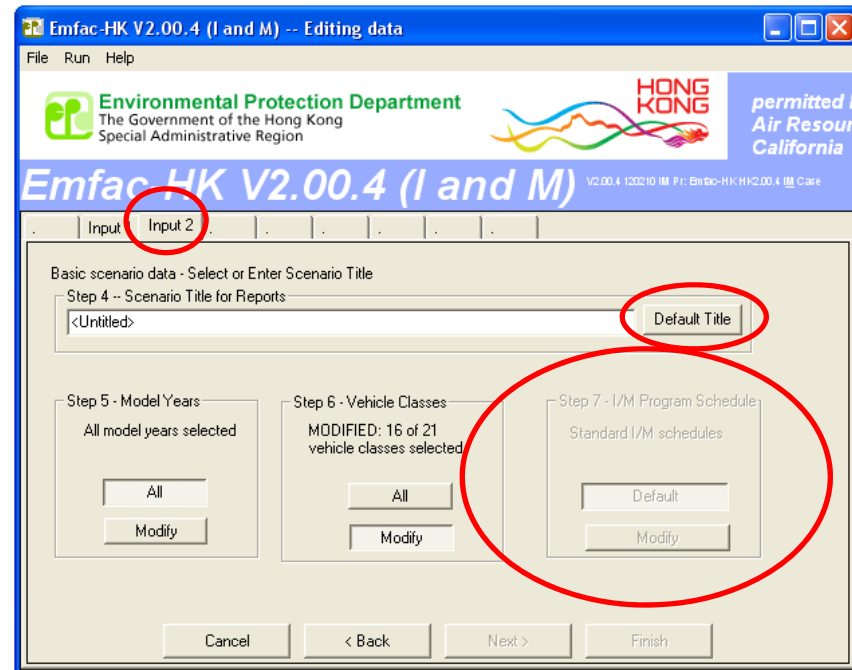
The screenshot shows the 'Emfac-HK V2.00.4 (I and M) -- Editing data' software window. The title bar reads 'Emfac-HK V2.00.4 (I and M) -- Editing data'. The menu bar includes 'File', 'Run', and 'Help'. The header features the Environmental Protection Department logo and text: 'Environmental Protection Department The Government of the Hong Kong Special Administrative Region' and 'permitted by Air Resources Board California'. The main window title is 'Emfac-HK V2.00.4 (I and M)'. Below the header is a menu bar with 'Input 1'. The main content area displays 'Basic scenario data - Select Area, Calculation Method, Calendar Year(s), and Season'. It is divided into three steps: 'Step 1 - Geographic Area' with 'Area Type: SAR' and a dropdown menu showing 'SAR' and 'Hong Kong'; 'Step 2 - Calendar Years' with a 'Select' button and 'Select a Calendar Year' text; and 'Step 3 -- Season or Month' with a dropdown menu showing 'Annual', 'January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September', 'October', 'November', 'December', 'N/A', 'N/A', and 'Annual' (highlighted at the bottom). 'Cancel' and 'Next >' buttons are at the bottom.

# Steps 4-7: Scenario Details Screen

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



I/M Options/Program Schedule  
deactivated in GUI.

# Step 5: Model Year Selection (Available in EMFAC-HK 2.1 Only)

## Before Changes

Model Year Selection

Available	Included
	1965
	1966
	1967
	1968
	1969
	1970
	1971
	1972
	1973
	1974
	1975
	1976
	1977
	1978
	1979
	1980
	1981
	1982
	1983

All All

All model years selected

OK Cancel

## After Changes

Model Year Selection

Available	Included
1965	2000
1966	2001
1967	2002
1968	2003
1969	2004
1970	2005
1971	
1972	
1973	
1974	
1975	
1976	
1977	
1978	
1979	
1980	
1981	
1982	
1983	

All All

All model years selected

OK Cancel

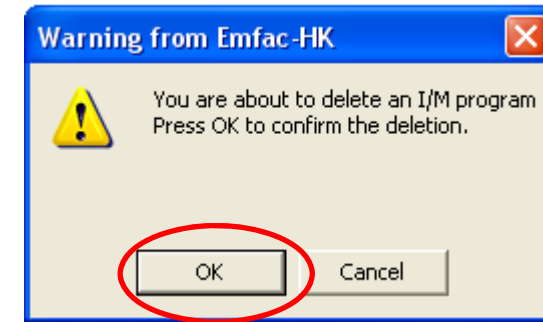
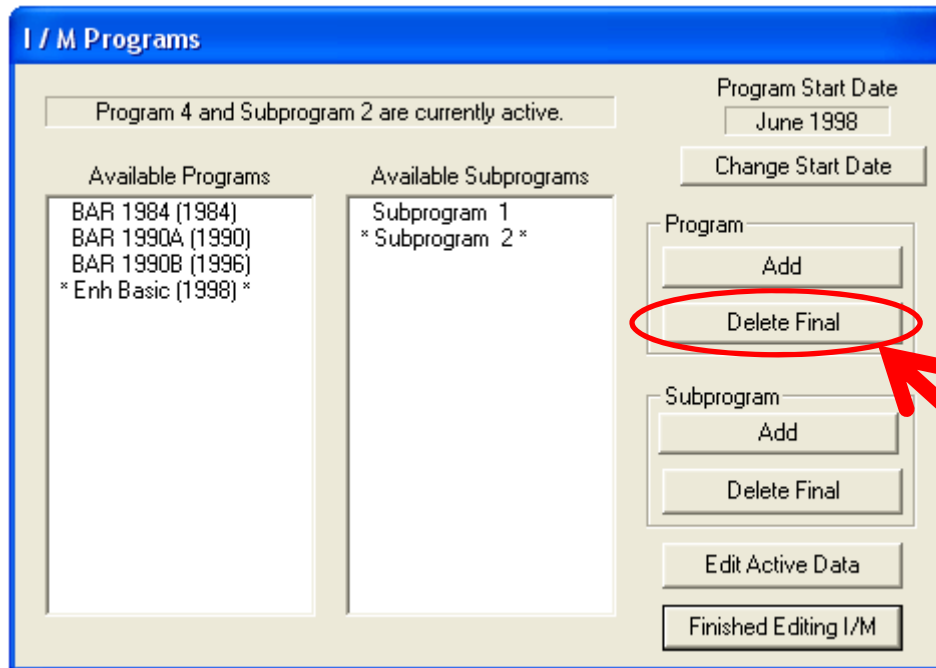
# Step 6: Vehicle Class Selection (Available Only in EMFAC-HK 2.1)

**Vehicle Class Selection**

<input checked="" type="checkbox"/> Private Cars (PC)	<input checked="" type="checkbox"/> Heavy Goods Vehicles<=15t	<input checked="" type="checkbox"/> Franchised Bus (SD)
<input type="checkbox"/> <Placeholder (P1)>	<input checked="" type="checkbox"/> Heavy Goods Vehicles >15t	<input checked="" type="checkbox"/> Franchised Bus (DD)
<input checked="" type="checkbox"/> Taxi	<input type="checkbox"/> <Placeholder (P2)>	<input checked="" type="checkbox"/> Motorcycles (MC)
<input checked="" type="checkbox"/> Light Goods Vehicles<=2.5t	<input type="checkbox"/> <Placeholder (P3)>	<input type="checkbox"/> <Placeholder (P4)>
<input checked="" type="checkbox"/> Lt Goods Vehicles 2.5-3.5t	<input checked="" type="checkbox"/> Public Light Buses	<input type="checkbox"/> <Placeholder (P5)>
<input checked="" type="checkbox"/> Light Goods Vehicles>3.5t	<input checked="" type="checkbox"/> Private Light Bus <=3.5t	
	<input checked="" type="checkbox"/> Private Light Bus >3.5t	
	<input checked="" type="checkbox"/> Non-franchised Bus<=6.4t	
	<input checked="" type="checkbox"/> Non-franchised Bus 6.4-15t	
	<input checked="" type="checkbox"/> Non-franchised Bus >15t	

MODIFIED: 16 of 21 vehicle classes selected

# Step 7: Delete I/M Programs (EMFAC-HK v 1.2 Only)

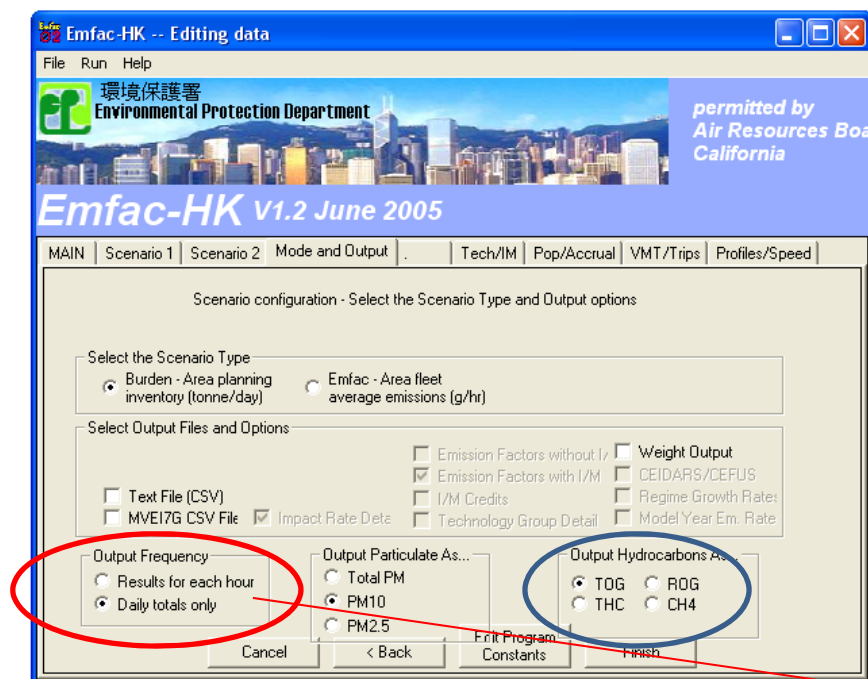


Must be deleted "manually".  
Click "Delete Final" and "OK"  
until all programs are  
removed.

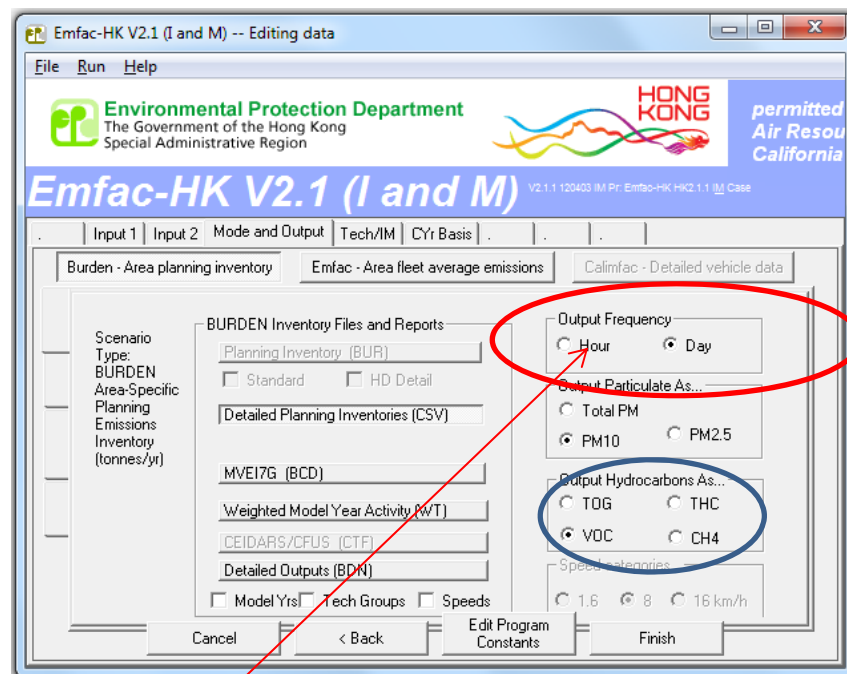


# BURDEN Output Options

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



Hour frequency increases output by factor of 25



# Detailed Planning Inventory (\*.csv)

HK\_2015\_2020\_2030\_Burden.csv - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Add-Ins

Clipboard: Cut, Copy, Paste, Format Painter

Font: Calibri, 10, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

Number: General, Currency, Percentage, Date, Time, Text, Fraction, Scientific

Styles: Normal, Bad, Good, Neutral, Calculation, Check Cell

Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

A15 Run Exh

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Title : Hong Kong SAR Annual 3 Yrs 2015 to 2030 Default Title																			
2	Version : Emfac-HK V2.1 (I and M) V2.1.1 120403 I&M Pr: Emfac-HK HK2.1.1 I&M Case																			
3	Run Date : 2012/04/10 10:41:48																			
4	Scen Year: 2015 -- All model years in the range 1971 to 2015 selected																			
5	Season : Annual																			
6	Area : Hong Kong SAR																			
7	I/M Stat : HK I/M program in effect																			
8	Emissions: Tonnes Per Day																			
9	*****																			
10		PC-NCAT	PC-CAT	PC-DSL	PC-LPG	PC-TOT	TAXI-NCAT	TAXI-CAT	TAXI-DSL	TAXI-LPG	TAXI-TOT	LGV<=2.5t	LGV<=2.5t	LGV<=2.5t	LGV<=2.5t	LGV<=2.5t	LGV2.5-3.5	LGV2.5-3.5	LGV2.5-3.5	LGV2.5-3.5
11	Vehicles	381	460553	1543	0	462476	0	0	6	18237	18243	29	122	1001	0	1152	6	1105	42811	
12	VKT	8300	12734294	44399	0	12786993	0	0	2120	6908678	6910798	1877	8575	77105	0	87558	326	75411	3083650	
13	Trips	571	690829	2314	0	693715	0	0	22	72942	72965	115	487	4004	0	4607	23	4419	171226	
14	VOC Emissions																			
15	Run Exh	0.01735	0.36939	0.00499	0	0.39174	0	0	0.00108	0.45326	0.45433	0.01102	0.01036	0.00481	0	0.02619	0.00106	0.01418	0.13354	
16	Idle Exh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Start Ex	0.00484	0.12363	0	0	0.12846	0	0	0	0.07527	0.07527	0.00154	0.00295	0	0	0.00448	0.00024	0.00396	0	
18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
19	Total Ex	0.02219	0.49301	0.00499	0	0.5202	0	0	0.00108	0.52852	0.5296	0.01256	0.01331	0.00481	0	0.03067	0.0013	0.01814	0.13354	
20																				
21	Diurnal	0.00377	0.27071	0	0	0.27448	0	0	0	0	0	0.00048	0.00033	0	0	0.00081	0.00004	0.00147	0	
22	Hot Soak	0.00266	0.15965	0	0	0.16231	0	0	0	0	0	0.00098	0.00068	0	0	0.00166	0.00008	0.00283	0	
23	Running	0.01219	0.19929	0	0	0.21148	0	0	0	0	0	0.00452	0.00112	0	0	0.00564	0.00037	0.00494	0	
24	Resting	0.00509	0.28072	0	0	0.28581	0	0	0	0	0	0.00060	0.00036	0	0	0.00105	0.00006	0.00184	0	

# MVEI7G CSV file (\*.bcd.csv)

Debug\_HK20Data.bcd.csv - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Acrobat

From Access From Web From Text From Other Sources Existing Connections Refresh All Properties Edit Links Connections Sort & Filter Filter Clear Reapply Advanced Text to Columns Remove Duplicates Data Validation Consolidate What-If Analysis Group Ungroup Subtotal Show Detail Hide Detail Outline

F3 6751

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	CALYR	START MYR	END MYR	REGION	SAR	STARTS	POPULATION	VKT/1000	VEH TYPE	VEH TECH	POLLUTANT	PROCESS	EMISSIONS	BASIS
2	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO	Run Exh	5.2646	Day
3	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	NOx	Run Exh	0.2657	Day
4	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	SOx	Run Exh	0	Day
5	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	PM	Run Exh	0.0021	Day
6	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	Pb	Run Exh	0.0001	Day
7	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	ROG	Run Exh	0.3957	Day
8	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO2	Run Exh	33.1422	Day
9	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO	Idle Exh	0	Day
10	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	NOx	Idle Exh	0	Day
11	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	SOx	Idle Exh	0	Day
12	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	PM	Idle Exh	0	Day
13	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	Pb	Idle Exh	0	Day
14	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	ROG	Idle Exh	0	Day
15	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO2	Idle Exh	0	Day
16	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO	Start Ex	0.2129	Day
17	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	NOx	Start Ex	0.0107	Day
18	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	SOx	Start Ex	0	Day
19	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	PM	Start Ex	0.0001	Day
20	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	Pb	Start Ex	0	Day
21	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	ROG	Start Ex	0.0348	Day
22	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO2	Start Ex	1.357	Day
23	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO	Total Ex	5.4775	Day
24	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	NOx	Total Ex	0.2764	Day
25	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	SOx	Total Ex	0	Day
26	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	PM	Total Ex	0.0022	Day
27	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	Pb	Total Ex	0.0001	Day
28	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	ROG	Total Ex	0.4305	Day
29	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO2	Total Ex	34.4992	Day
30	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	CO	Hot Soak	0	Day
31	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	NOx	Hot Soak	0	Day
32	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	SOx	Hot Soak	0	Day
33	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	PM	Hot Soak	0	Day
34	2008	1965	2008	SAR Average	Hong Kong SAR Average	6751	4471	104	PC	NCAT	Pb	Hot Soak	0	Day

# Weighted Model Year Activity Output (\*.WT)

UltraEdit - [C:\Documents and Settings\Arney\My Documents\My Projects\VERGEMFAC\HongKong\Task 6 - Testing\EPD Comments\20110216\Debug\_HK20Data.wt]

File Edit Search Insert Project View Format Column Macro Scripting Advanced Window Help

C:\Documents and Settings\Arney\N

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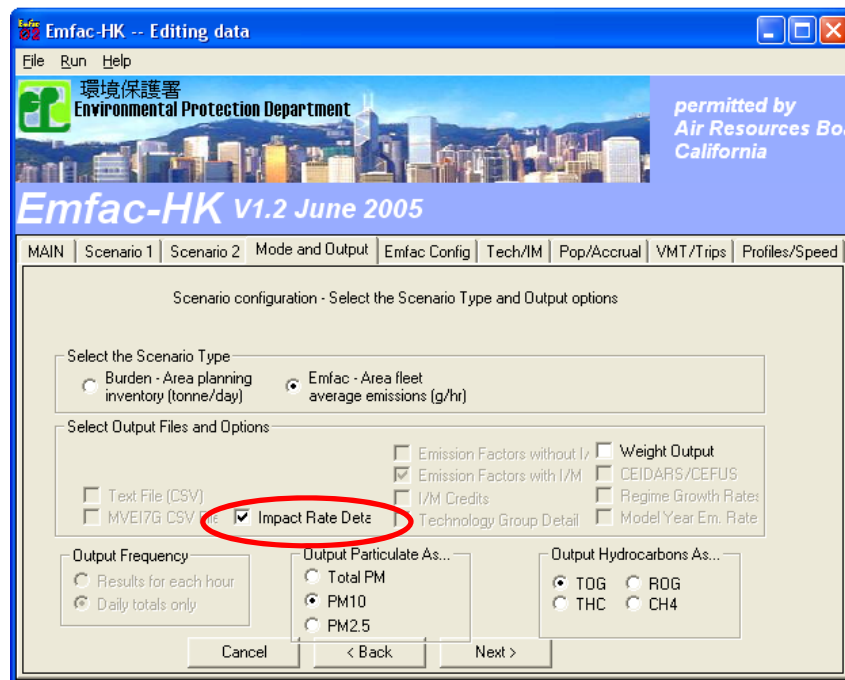
1
2 Calendar Year: 2008
3 Model Years: 1965 to 2008
4 Title: Hong Kong SAR Annual CYr 2008 Default Title
5 Area: Hong Kong
6 SubArea: Average
7 Program: Emfac-HK working draft V1.99.6.2 110210 Sp: InProgress; GUI (HK Units); 330 TG; HK2.0 Data; HK TG Desc;
8 Run Date: 2011/02/17 13:08:17
9
10 SCEN VEH VEH POP VKT/1000 TRIPS ACCRUAL ODOMETER
11 YEAR CLS TBCH MYR (number) (km/day) (per day) (km/yr/veh) (km/veh)
12
13 2008 1 NCAT 1965 21. 0.28 32. 4810. 241367.
14 2008 1 NCAT 1966 3. 0.04 5. 4824. 236557.
15 2008 1 NCAT 1967 6. 0.08 9. 4839. 231733.
16 2008 1 NCAT 1968 4. 0.05 6. 4853. 226894.
17 2008 1 NCAT 1969 11. 0.15 17. 4868. 222041.
18 2008 1 NCAT 1970 26. 0.35 39. 4884. 217173.
19 2008 1 NCAT 1971 16. 0.21 24. 4900. 212289.
20 2008 1 NCAT 1972 25. 0.34 38. 4916. 207389.
21 2008 1 NCAT 1973 47. 0.64 71. 4933. 202473.
22 2008 1 NCAT 1974 35. 0.47 53. 4951. 197540.
23 2008 1 NCAT 1975 23. 0.31 35. 4969. 192589.
24 2008 1 NCAT 1976 23. 0.31 35. 4988. 187620.
25 2008 1 NCAT 1977 41. 0.56 62. 5007. 182632.
26 2008 1 NCAT 1978 44. 0.61 66. 5028. 177625.
27 2008 1 NCAT 1979 43. 0.59 65. 5048. 172597.
28 2008 1 NCAT 1980 84. 1.17 127. 5070. 167549.
29 2008 1 NCAT 1981 85. 1.19 128. 5093. 162479.
30 2008 1 NCAT 1982 87. 1.22 131. 5116. 157386.
31 2008 1 NCAT 1983 32. 0.45 48. 5141. 152270.
32 2008 1 NCAT 1984 42. 0.59 63. 5166. 147129.
33 2008 1 NCAT 1985 104. 1.48 157. 5193. 141963.
34 2008 1 NCAT 1986 175. 2.50 264. 5221. 136770.
35 2008 1 NCAT 1987 209. 3.01 316. 5251. 131549.
36 2008 1 NCAT 1988 352. 5.09 532. 5282. 126298.
37 2008 1 NCAT 1989 552. 8.04 834. 5315. 121016.
38 2008 1 NCAT 1990 860. 12.61 1299. 5350. 115701.
39 2008 1 NCAT 1991 1492. 22.02 2253. 5387. 110351.
40 2008 1 NCAT 1992 2. 0.03 3. 5427. 104964.
41 2008 1 NCAT 1993 7. 0.10 11. 5469. 99537.
42 2008 1 NCAT 1994 15. 0.23 23. 5515. 94068.
43 2008 1 NCAT 1995 5. 0.08 8. 5564. 88553.
44 2008 1 NCAT 1996 0. 0.00 0. 0. 0.
45 2008 1 NCAT 1997 0. 0.00 0. 0. 0.

```

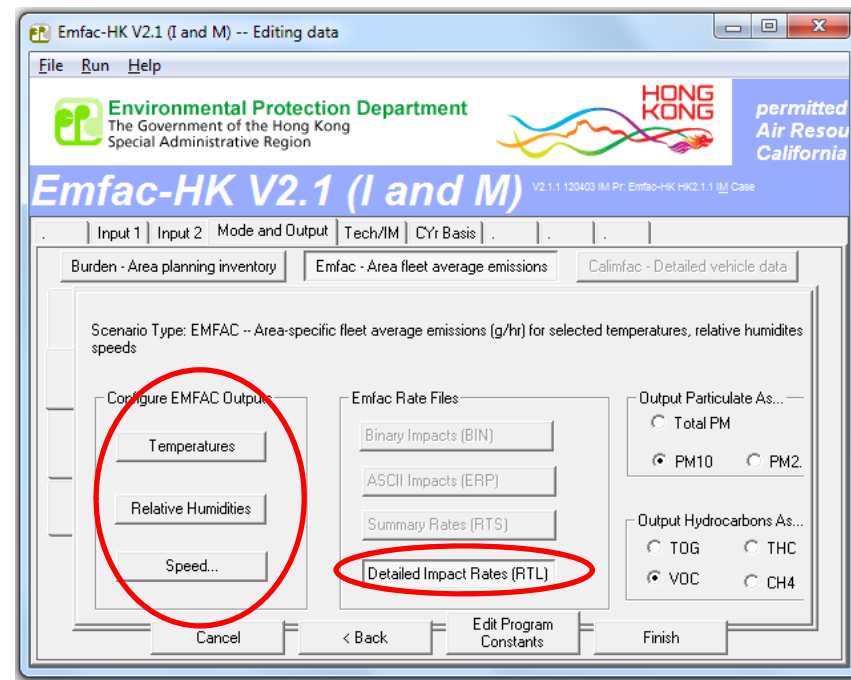


# EMFAC Mode Options

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1

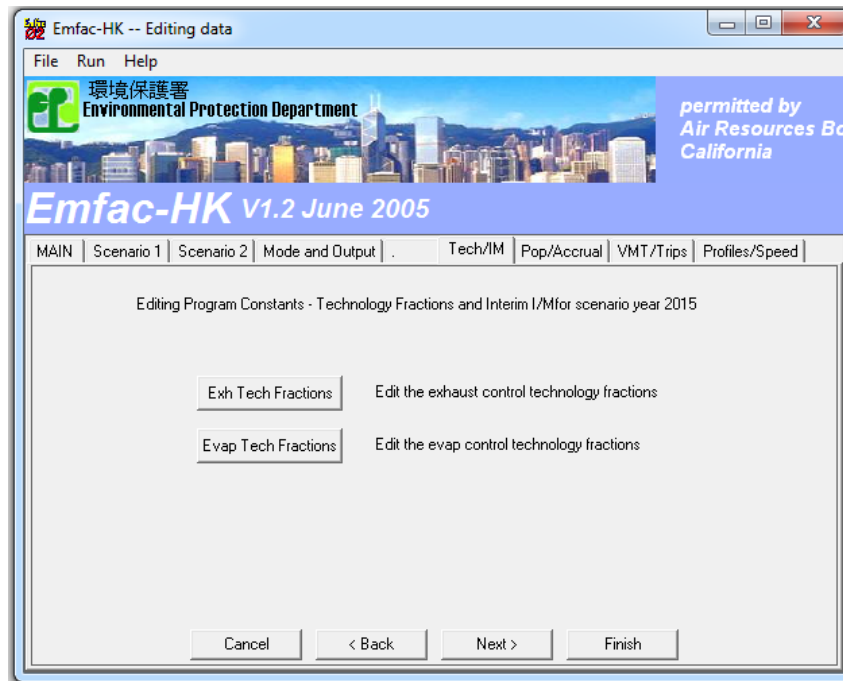


# EMFAC Output Options

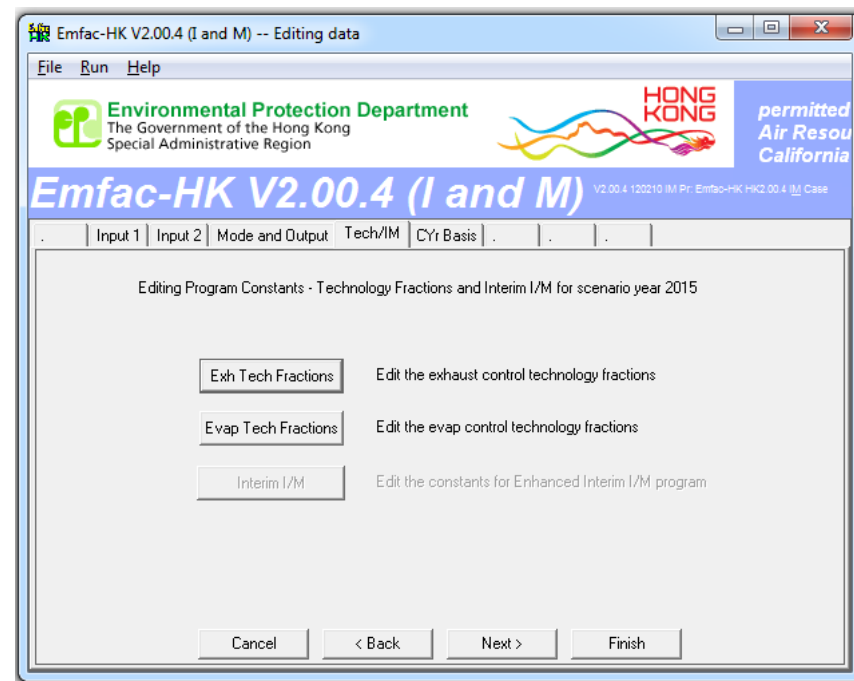
- Impact Rate Detail (RTL). This file as the name implies generates detailed information for each vehicle class and technology group combination. This file has an “RTL” extension but is in a CSV format. Hence, any spreadsheet program can read this file. It is recommended that new users output this file to get a feel for the type of information generated in EMFAC mode.

# Editing Fundamental Data

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



# Changing Activity Data

- edit fundamental activity data such as population, accrual rates, trips and vehicle kilometers traveled.
- dialogs are sequenced noting the inter-dependencies among the data



# Editing Exhaust Technology Fractions

## EMFAC-HK v 1.2

Exhaust Tech Fractions by Model Year and Technology Group

Exhaust Tech Fractions by Model Year and Technology Group

Vehicle Class: 01: PC+LGV-petrol

Model Year: 2015    #Tech Indices: 2

EXHAUST Tech Fractions	
Index	%
24	99.6455
28	0.3545
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	

Total (%) 100.0  
OK

Apply    Cancel    Done

## EMFAC-HK v 2.1

Exhaust Technology Fractions

Edit Exhaust Technology Fractions by: 01: Private Cars (PC)

Vehicle Class

Model Year: 1995

EXHAUST Technology Groups Total: 100.0001% OK

# of Tech Groups: 4

Group	%	Description - model years, vehicle classes, fuel, catalyst, fuel delivery, years and
1	0.0502	pre-Euro PC and LGV<= 3.5t petrol
8	37.3971	ULP PC and LGV<=2.5t petrol
9	0.4419	Euro I LGV<= 3.5t petrol
10	62.1109	PC Euro I petrol
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		

Return    Copy values to other years and

Apply    Cancel    Done    Apply to Others

# Editing Evap Technology Fractions

## EMFAC-HK v 1.2

Evap Tech Fractions by Model Year and Technology Group

Evap Tech Fractions by Model Year and Technology Group

Vehicle Class: 01: PC+LGV-petrol

Model Year	#Tech Indices	EVAP Tech Fractions	
		Index	%
2015	1	10	100.0
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	
		1	

Total (%) 100.0  
OK

Apply Cancel Done

## EMFAC-HK v 2.1

Evap Technology Fractions

Edit Evap Technology Fractions by: 01: Private Cars (PC)

Vehicle Class

Model Year: 1995

EVAP Technology Groups Total: 100.0000% OK

# of Tech Groups: 1

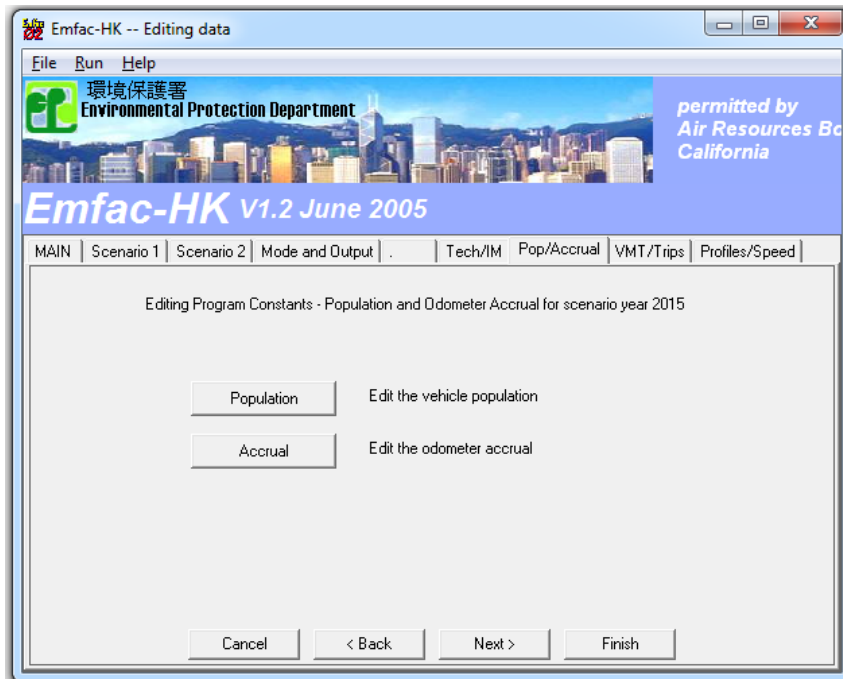
Group	%	Description - model years, vehicle classes, fuel, catalyst, fuel delivery, years and
8	100.0	1979-1985, LDA, gas, Cat, TBI, 1979-85,
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		
1		

Return Copy values to other years and

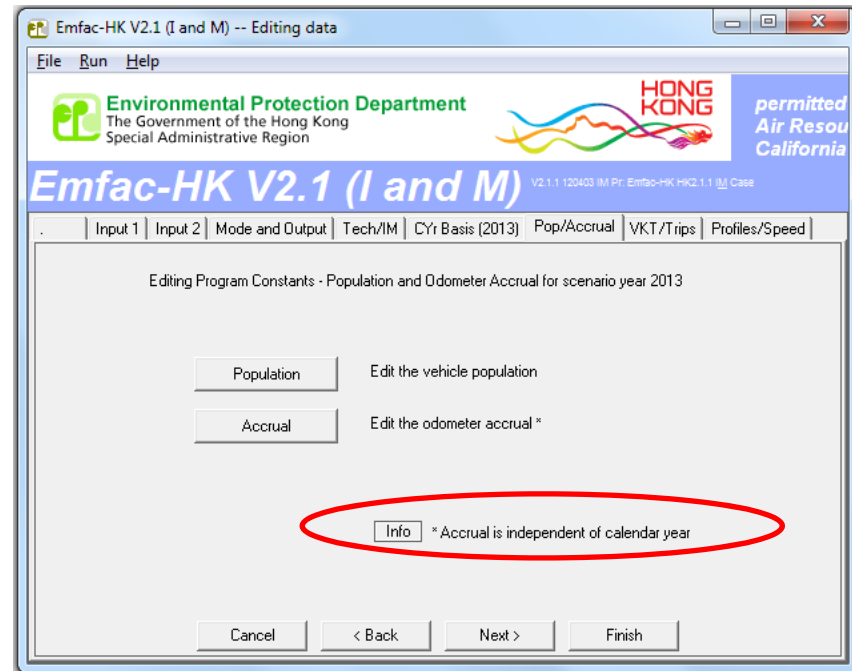
Apply Cancel Done Apply to Others

# Population and Accrual Edits

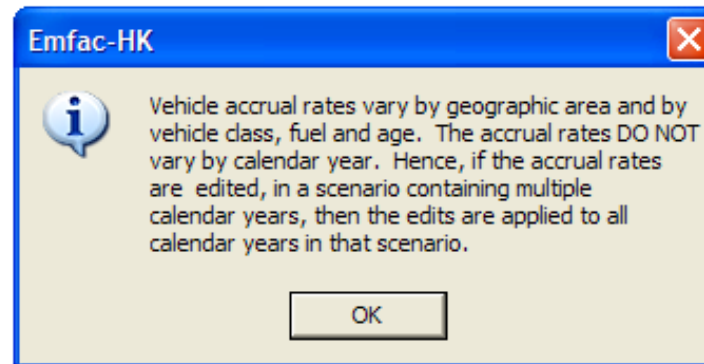
## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



# Info on Accrual Rates (EMFAC-HK v 2.1)



# Editing Total Population

## EMFAC-HK v 1.2

Editing Population data for scenario 1: Hong Kong SAR Avg 2015 Annual Default Title

Total Population for area  
Hong Kong

Editing Mode  
Editing Population (licensed vehicles)

Total Population | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Age

Revised Total Population

Previous Total Population

Apply Cancel Done

## EMFAC-HK v 2.1

Editing Population data for scenario 1: Hong Kong SAR Annual 3 CYrs 2013 to 2030 Default Title

Total Population for area

Editing Mode  
Editing Population (registered vehicles with adjustments)

Total Population | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Age

Revised Total Population

Previous Total Population

Apply Cancel Done

# Editing Population by Vehicle Class and Fuel Type

## EMFAC-HK v 1.2

Editing Population data for scenario 1: Hong Kong SAR Avg 2015 Annual Default Title

Total Population for area  
Hong Kong

Editing Mode  
Editing Population (licensed vehicles)

Total Population | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Age

		Fuel (1=Gas/2=Diesel/3=Electric)		
		1	2	3
1 - PC+LGV-petrol	1	338618.0	0.0	0.0
2 - Not Applicable	2	0.0	0.0	0.0
3 - PC+LGV<2.5t-diesel	3	0.0	5351.0	0.0
4 - LGV2.5-3.5t-diesel	4	0.0	34075.0	0.0
5 - Public Light Buses	5	2827.4	1525.6	0.0
6 - Light Goods Vehicles>3.5t	6	0.0	27281.0	0.0
7 - Heavy Goods Vehicles<15t	7	0.0	9714.0	0.0
8 - Heavy Goods Vehicles>15t	8	0.0	32012.0	0.0
9 - Not Applicable	9	0.0	0.0	0.0
10 - Franchised Buses (DD)	10	0.0	5702.0	0.0
11 - Motorcycles	11	30084.0	0.0	0.0
12 - Not Applicable	12	0.0	0.0	0.0
13 - Not Applicable	13	0.0	0.0	0.0

Apply Cancel Done

## EMFAC-HK v 2.1

Editing Population data for scenario 1: Hong Kong SAR Annual 3 CYrs 2013 to 2030 Default Title

Total Population for area  
Hong Kong SAR

Editing Mode  
Editing Population (registered vehicles with adjustments)

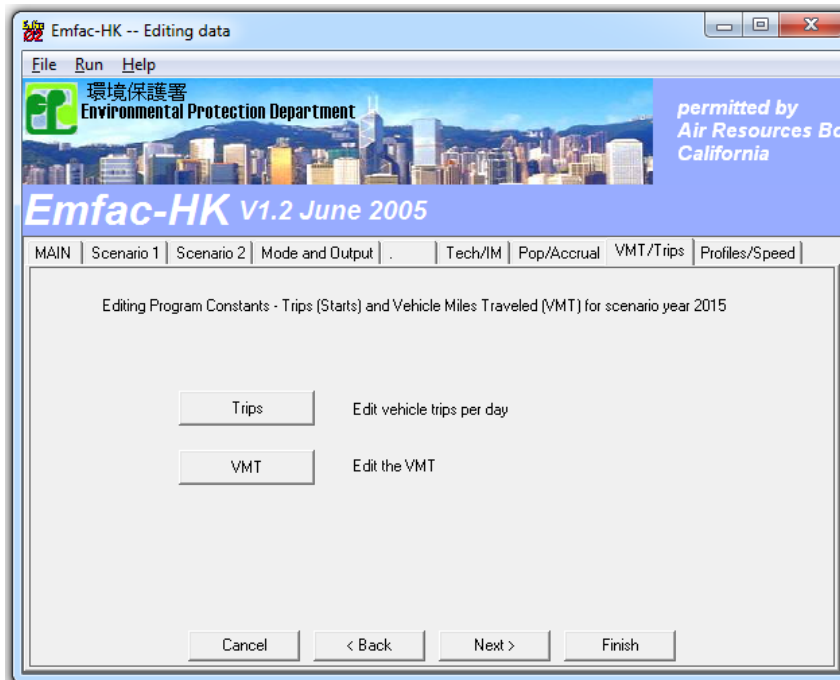
Total Population | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Age

		Fuel (1=Petrol/2=Diesel/3=LPG)		
		1	2	3
01 - Private Cars (PC)	1	443125.6	1448.9	0.0
02 - <Placeholder (P1)>	2	0.0	0.0	0.0
03 - Taxi	3	0.0	3.5	18239.5
04 - Light Goods Vehicles<=2.5t	4	161.7	978.6	0.0
05 - Lt Goods Vehicles 2.5-3.5t	5	1172.2	42313.4	0.0
06 - Light Goods Vehicles>3.5t	6	0.0	25811.2	0.0
07 - Heavy Goods Vehicles<=15t	7	0.0	10766.9	0.0
08 - Heavy Goods Vehicles >15t	8	0.0	30523.0	0.0
09 - <Placeholder (P2)>	9	0.0	0.0	0.0
10 - <Placeholder (P3)>	10	0.0	0.0	0.0
11 - Public Light Buses	11	0.0	1182.5	3165.5
12 - Private Light Bus <=3.5t	12	2163.6	299.4	0.0
13 - Private Light Bus >3.5t	13	11.4	1067.7	961.9
14 - Non-franchised Bus<=6.4t	14	0.0	3215.0	0.0
15 - Non-franchised Bus 6.4-15t	15	0.0	2305.0	0.0
16 - Non-franchised Bus >15t	16	0.0	2344.0	0.0
17 - Franchised Bus (SD)	17	0.0	381.0	0.0
18 - Franchised Bus (DD)	18	0.0	5349.0	0.0
19 - Motorcycles (MC)	19	41652.9	0.0	0.0
20 - <Placeholder (P4)>	20	0.0	0.0	0.0
21 - <Placeholder (P5)>	21	0.0	0.0	0.0

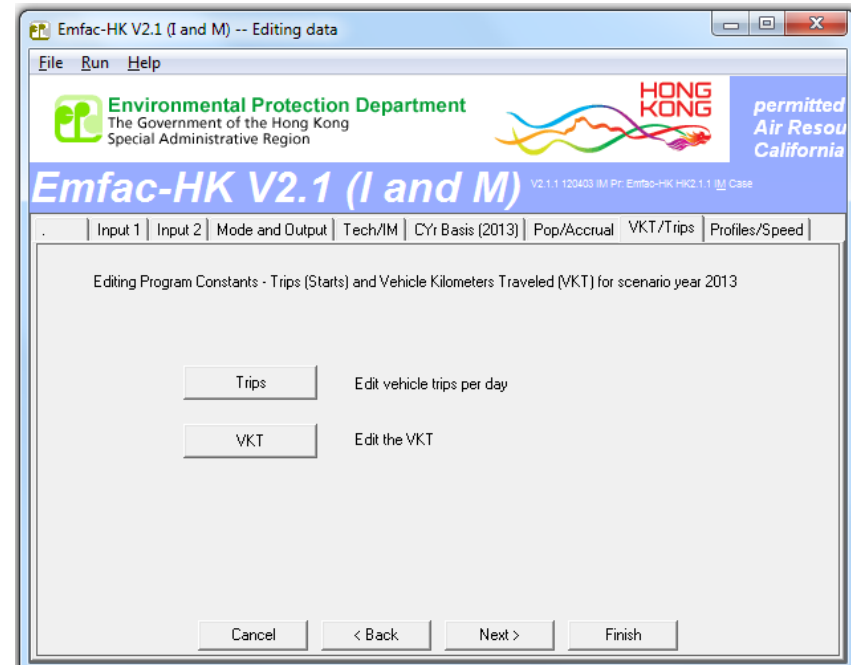
Apply Cancel Done

# Editing Trip and VMT/VKT Profiles

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



# Editing Total VMT/VKT

## EMFAC-HK v 1.2

Editing VMT data for scenario 1: Hong Kong SAR Avg 2015 Annual Default Title

Total VMT for area  
Hong Kong

Editing Mode  
Editing VMT (vehicle miles traveled per weekday)

Total VMT | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Hour

Revised Total VMT

Previous Total VMT

Apply Cancel Done

## EMFAC-HK v 2.1

Editing VKT data for scenario 1: Hong Kong SAR Annual 3 Cys 2013 to 2030 Default Title

Total VKT for area

Editing Mode  
Editing VKT (vehicle km traveled per weekday)

Total VKT | By Vehicle Class | By Vehicle and Fuel | By Vehicle/Fuel/Hour

Revised Total VKT

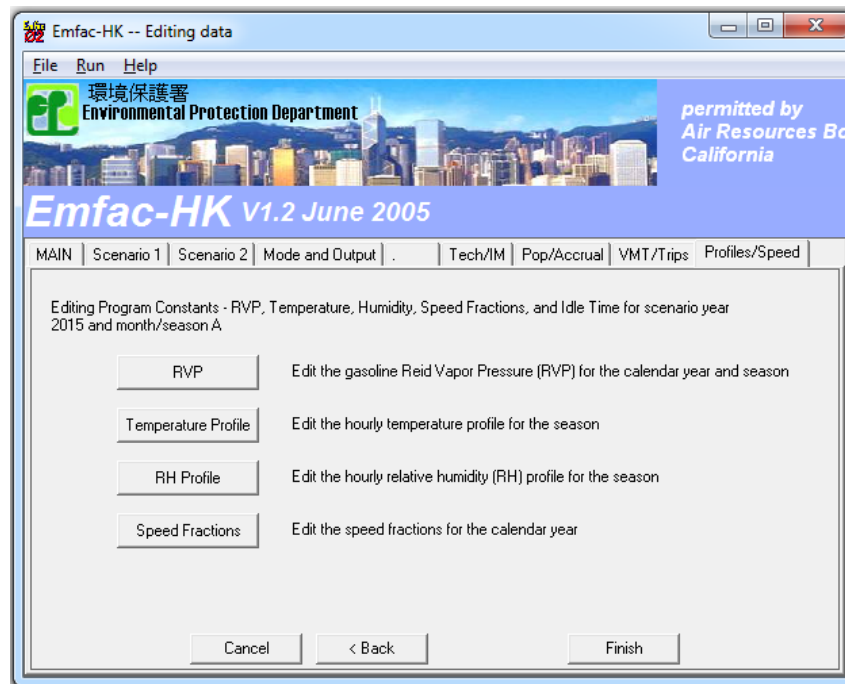
Previous Total VKT

Apply Cancel Done

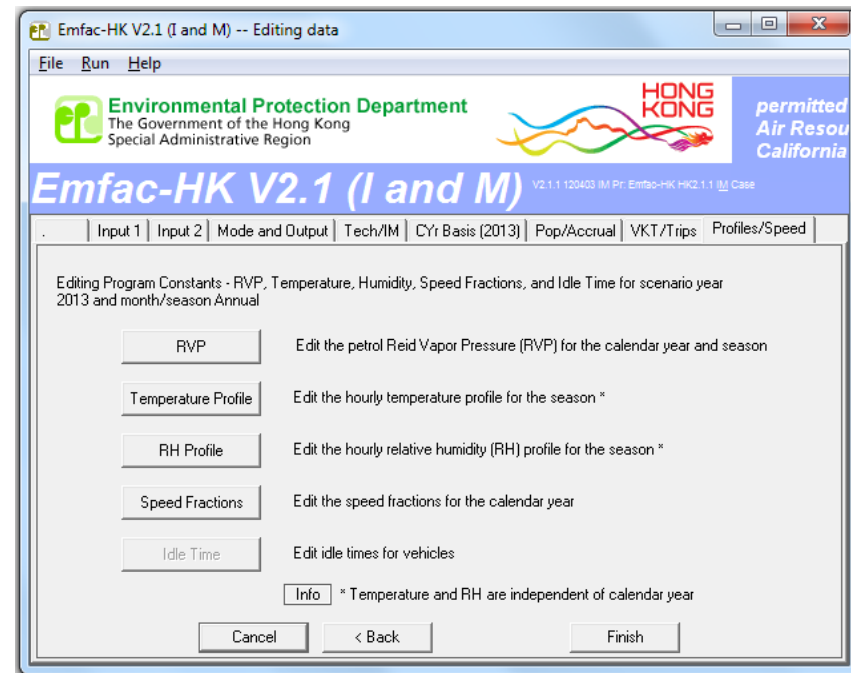


# Editing Profiles/Speed

## EMFAC-HK v 1.2



## EMFAC-HK v 2.1



# Editing Speed Profiles

## EMFAC-HK 1.2 (Taxi)

**Speed Fractions by Scenario Year, Hour, and Vehicle Class**

Speed Fractions by Scenario Year and Vehicle Group  
 Area: Hong Kong SAR  
 VMT-Weighted Average of 1 Sub-areas  
 Scenario Year: 2008  
 Hong Kong

Speed Fractions by Bin (MPH)

Bin	%	Bin	%	Bin	%
05	1.9842	35	9.6805	65	0.6719
10	14.7939	40	8.8786	70	0.00
15	15.052	45	5.9257	75	0.00
20	14.3956	50	1.7884	80	0.00
25	12.6011	55	3.3126	85	0.00
30	10.2438	60	0.6719	90	0.00

Hour: 8  
 Vehicle Class: 03: Taxi

Total 100.00 % OK

Apply Changes to This Hour / Vehicle Class  
 Apply This Profile to Other Hours and Vehicle Classes

Apply Cancel Done Apply to Others

## EMFAC-HK 2.1

**Speed Fractions by Scenario Year and Vehicle Class**

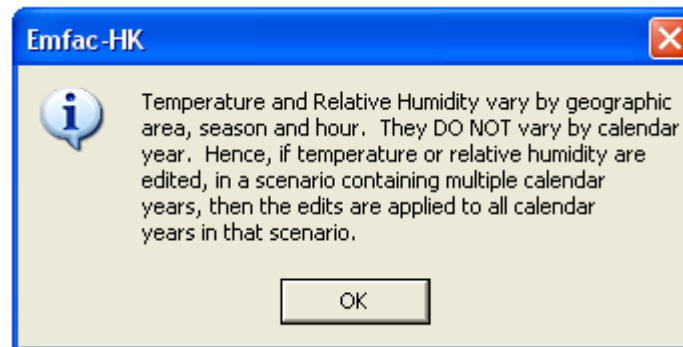
Area: Hong Kong SAR Scenario Year: 2013 Copy with Headings Paste Data Only  
 Hong Kong SAR

VKT-Weighted Average Basis: 1.6 KPH 8 KPH 16 KPH Vehicle Class: 01: Private Cars (PC)

Speed Bin (8,16,24,...) (1:18)	Hour (1 to 24)							
	1	2	3	4	5	6	7	8
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0541	0.0541	0.0541	0.0541	0.0541	0.0541	0.0541	0.0589
5	0.0980	0.0980	0.0980	0.0980	0.0980	0.0980	0.0980	0.1053
6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
7	0.1993	0.1993	0.1993	0.1993	0.1993	0.1993	0.1993	0.2072
8	0.0603	0.0603	0.0603	0.0603	0.0603	0.0603	0.0603	0.0748
9	0.2731	0.2731	0.2731	0.2731	0.2731	0.2731	0.2731	0.2670
10	0.1817	0.1817	0.1817	0.1817	0.1817	0.1817	0.1817	0.1692
11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	0.1203	0.1203	0.1203	0.1203	0.1203	0.1203	0.1203	0.1026
14	0.0132	0.0132	0.0132	0.0132	0.0132	0.0132	0.0132	0.0150
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total 100.00 % OK Apply Cancel Done Apply to Others

# Info Message for 'Profiles/Speed' Option (EMFAC-HK 2.1 Only)




# Editing Temperature Profile

## EMFAC-HK v 1.2

Diurnal Temperature Profile

Area: Hong Kong SAR  
Month: Annual  
VMT-Weighted Average of 1 Sub-areas



Hong Kong

Temperatures (F)

Hour											
0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100
72.0	71.7	71.4	71.2	70.9	70.8	71.0	72.2	73.6	74.9	75.9	76.7
1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
77.1	77.2	77.0	76.6	75.7	74.6	73.6	73.1	72.8	72.5	72.4	72.2


Modify Values for Range of Hours  
[ ] to [ ] Constant Value for Range

Apply Cancel Done

## EMFAC-HK v 2.1

Diurnal Temperature Profile

Area: Hong Kong SAR  
Month: Annual  
VKT-Weighted Average of 1 Sub-areas



Hong Kong SAR

Copy with Headings Paste Data Only

Temperatures (C)

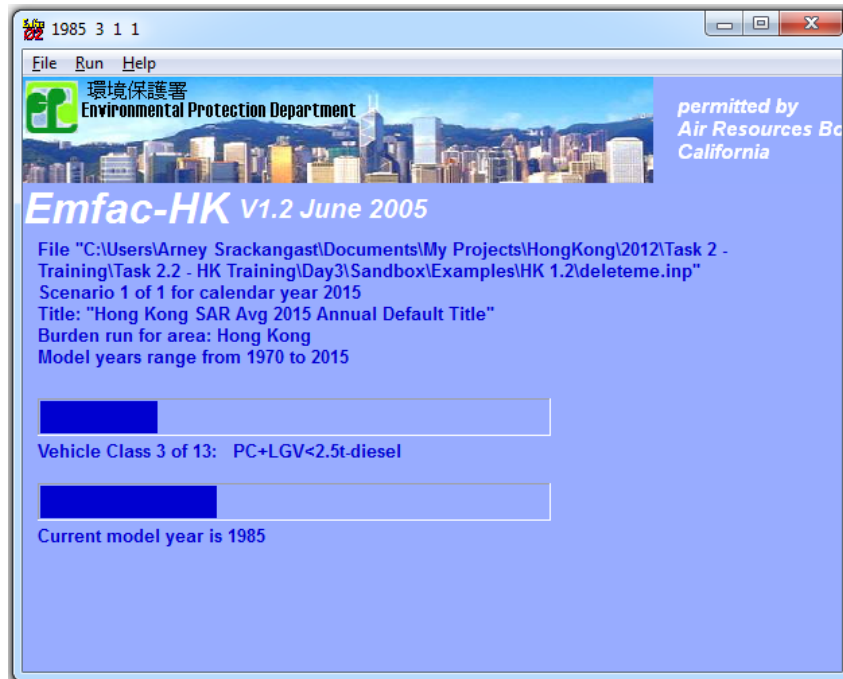
Hour											
0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100
21.8	21.7	21.6	21.4	21.3	21.2	21.1	21.2	21.9	22.8	23.5	24.2
1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
24.6	24.9	25.0	24.9	24.6	24.0	23.3	22.8	22.5	22.3	22.1	22.0

Modify Values for Range of Hours  
[ ] to [ ] Constant Value for Range

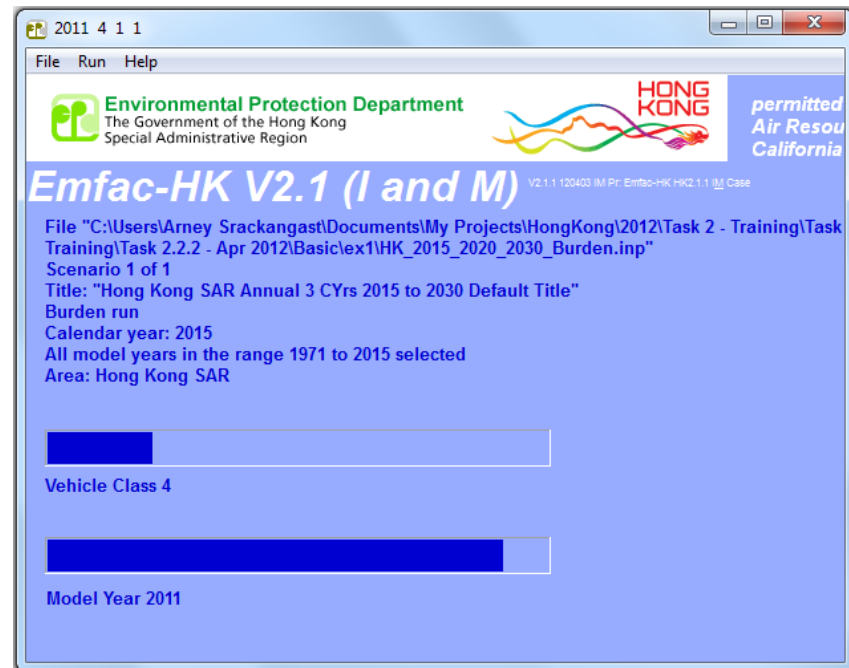
Apply Cancel Done

# Final Run or Progress Screen

## EMFAC-HK v 1.2

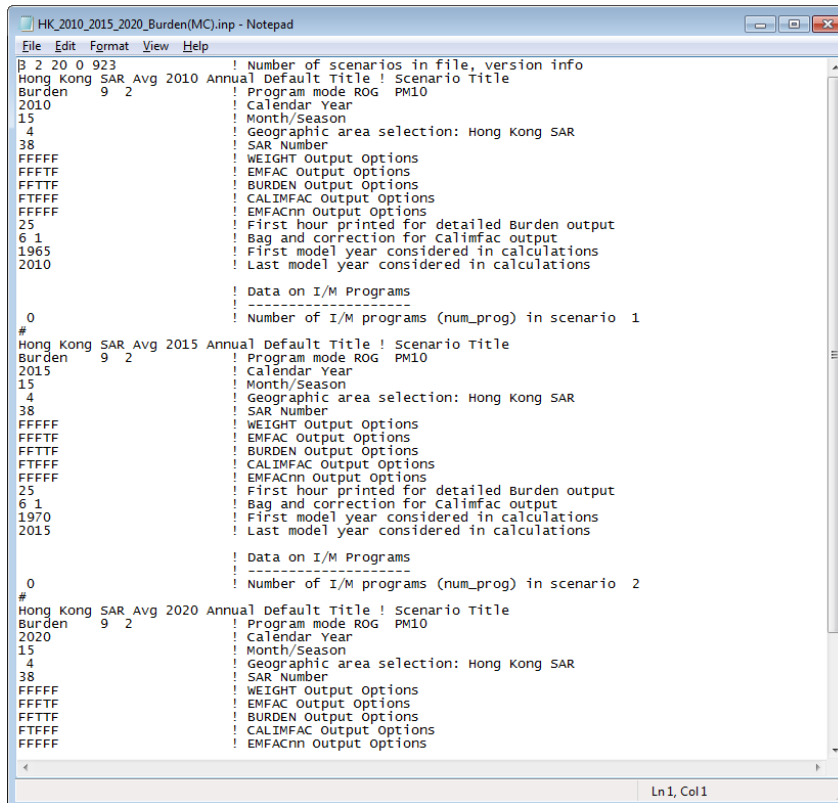


## EMFAC-HK v 2.1



# Comparison of Input Files

## EMFAC-HK v 1.2

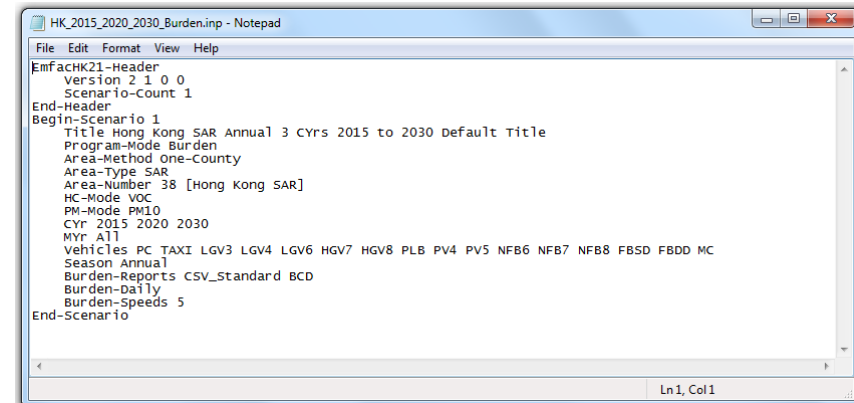


```
HK_2010_2015_2020_Burden(MC).inp - Notepad
File Edit Format View Help
B 2 20 0 923 ! Number of scenarios in file, version info
Hong Kong SAR Avg 2010 Annual Default Title ! scenario Title
Burden 9 2 ! Program mode ROG PM10
2010 ! Calendar Year
15 ! Month/Season
4 ! Geographic area selection: Hong Kong SAR
38 ! SAR Number
FFFFF ! WEIGHT Output Options
FFFTF ! EMFAC Output Options
FFFTF ! BURDEN Output Options
FTFFF ! CALIMFAC Output Options
FFFFF ! EMFACnn Output Options
25 ! First hour printed for detailed Burden output
6 1 ! Bag and correction for Calimfac output
1965 ! First model year considered in calculations
2010 ! Last model year considered in calculations

! Data on I/M Programs
-----
0 ! Number of I/M programs (num_prog) in scenario 1
#
Hong Kong SAR Avg 2015 Annual Default Title ! Scenario Title
Burden 9 2 ! Program mode ROG PM10
2015 ! Calendar Year
15 ! Month/Season
4 ! Geographic area selection: Hong Kong SAR
38 ! SAR Number
FFFFF ! WEIGHT Output Options
FFFTF ! EMFAC Output Options
FFFTF ! BURDEN Output Options
FTFFF ! CALIMFAC Output Options
FFFFF ! EMFACnn Output Options
25 ! First hour printed for detailed Burden output
6 1 ! Bag and correction for Calimfac output
1970 ! First model year considered in calculations
2015 ! Last model year considered in calculations

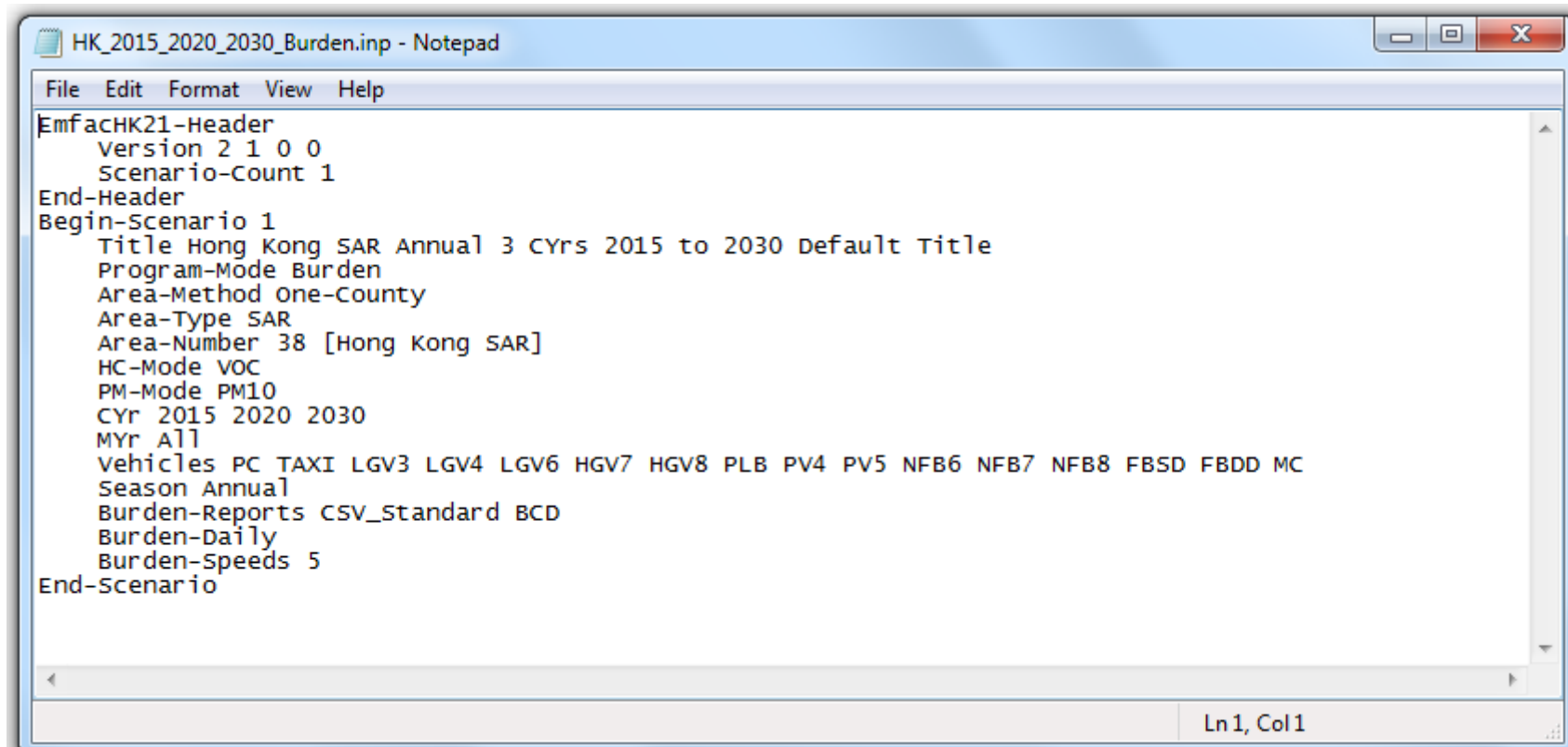
! Data on I/M Programs
-----
0 ! Number of I/M programs (num_prog) in scenario 2
#
Hong Kong SAR Avg 2020 Annual Default Title ! Scenario Title
Burden 9 2 ! Program mode ROG PM10
2020 ! Calendar Year
15 ! Month/Season
4 ! Geographic area selection: Hong Kong SAR
38 ! SAR Number
FFFFF ! WEIGHT Output Options
FFFTF ! EMFAC Output Options
FFFTF ! BURDEN Output Options
FTFFF ! CALIMFAC Output Options
FFFFF ! EMFACnn Output Options
Ln1, Col1
```

## EMFAC-HK v 2.1



```
HK_2015_2020_2030_Burden.inp - Notepad
File Edit Format View Help
EmfacHK21-Header
Version 2 1 0 0
Scenario-Count 1
End-Header
Begin-Scenario 1
Title Hong Kong SAR Annual 3 CYrs 2015 to 2030 Default Title
Program-Mode Burden
Area-Method One-County
Area-Type SAR
Area-Number 38 [Hong Kong SAR]
HC-Mode VOC
PM-Mode PM10
CYr 2015 2020 2030
MYR All
Vehicles PC TAXI LGV3 LGV4 LGV6 HGV7 HGV8 PLB PV4 PV5 NFB6 NFB7 NFB8 FBSD FBDD MC
Season Annual
Burden-Reports CSV_Standard BCD
Burden-Daily
Burden-Speeds 5
End-Scenario
Ln1, Col1
```

# EMFAC-HK 2.1 Input File



The image shows a Notepad window titled "HK\_2015\_2020\_2030\_Burden.inp - Notepad". The window contains the following text:

```
EmfACHK21-Header
  Version 2 1 0 0
  Scenario-Count 1
End-Header
Begin-Scenario 1
  Title Hong Kong SAR Annual 3 CYrs 2015 to 2030 Default Title
  Program-Mode Burden
  Area-Method One-County
  Area-Type SAR
  Area-Number 38 [Hong Kong SAR]
  HC-Mode VOC
  PM-Mode PM10
  CYr 2015 2020 2030
  MYr All
  Vehicles PC TAXI LGV3 LGV4 LGV6 HGV7 HGV8 PLB PV4 PV5 NFB6 NFB7 NFB8 FBSD FBDD MC
  Season Annual
  Burden-Reports CSV_Standard BCD
  Burden-Daily
  Burden-Speeds 5
End-Scenario
```

The status bar at the bottom right of the window indicates "Ln1, Col1".