Exercises

Exercise Setup

- Folders for each Exercise
- Save input/output to folders for each Exercise
- Exercises require MS Office 2007 (Excel).

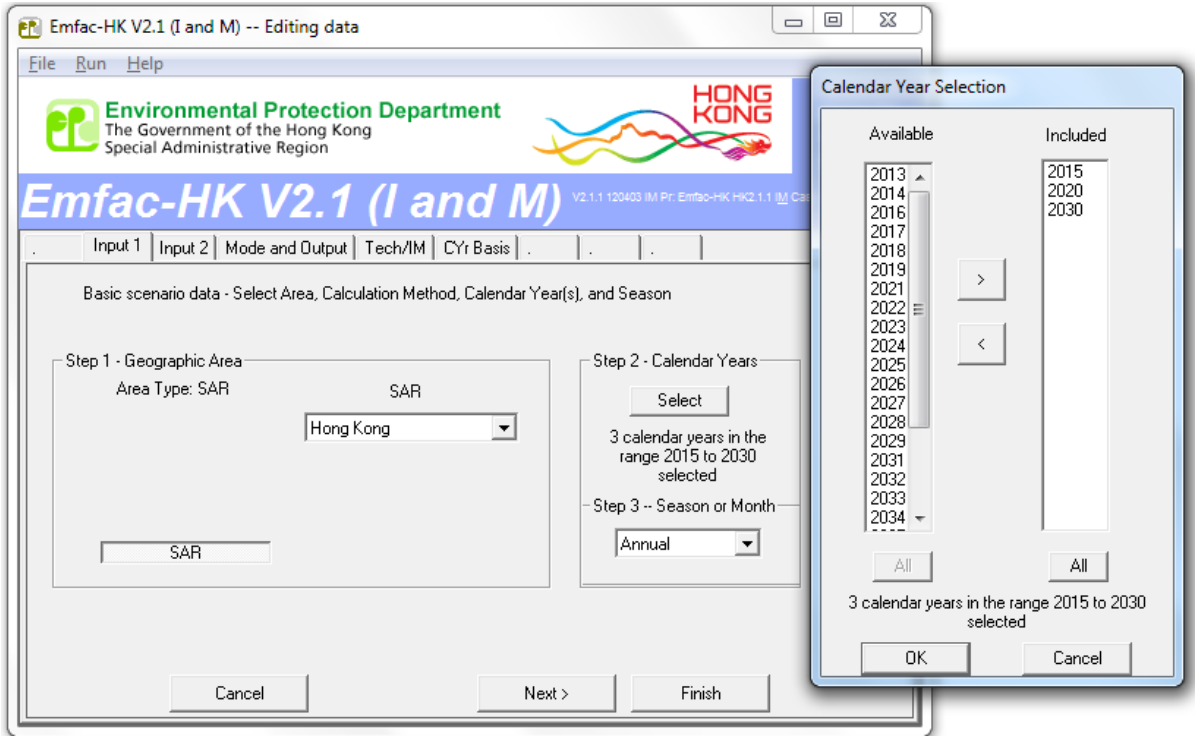
Exercise #1: Daily Emissions Inventory

- Problem: This exercise will generate an average daily emissions inventory for Hong Kong for calendar years 2015, 2020 and 2030. Assume model defaults, except as noted below. I/M programs begin in 2013; therefore, this calculation should use EMFAC-HK V2.1 (I and M).
- Purpose: familiarization with emission inventories; using BURDEN output formats
- Scenario input data:
  - Geographic Area: Hong Kong SAR
  - Calendar Years: 2015, 2020, 2030
  - Season: Annual
  - Scenario Type: BURDEN
  - Output File types: Detailed Planning Inventory (CSV), MVEI7G (BCD)
  - Output Frequency: daily
  - Pollutants: PM10, VOC

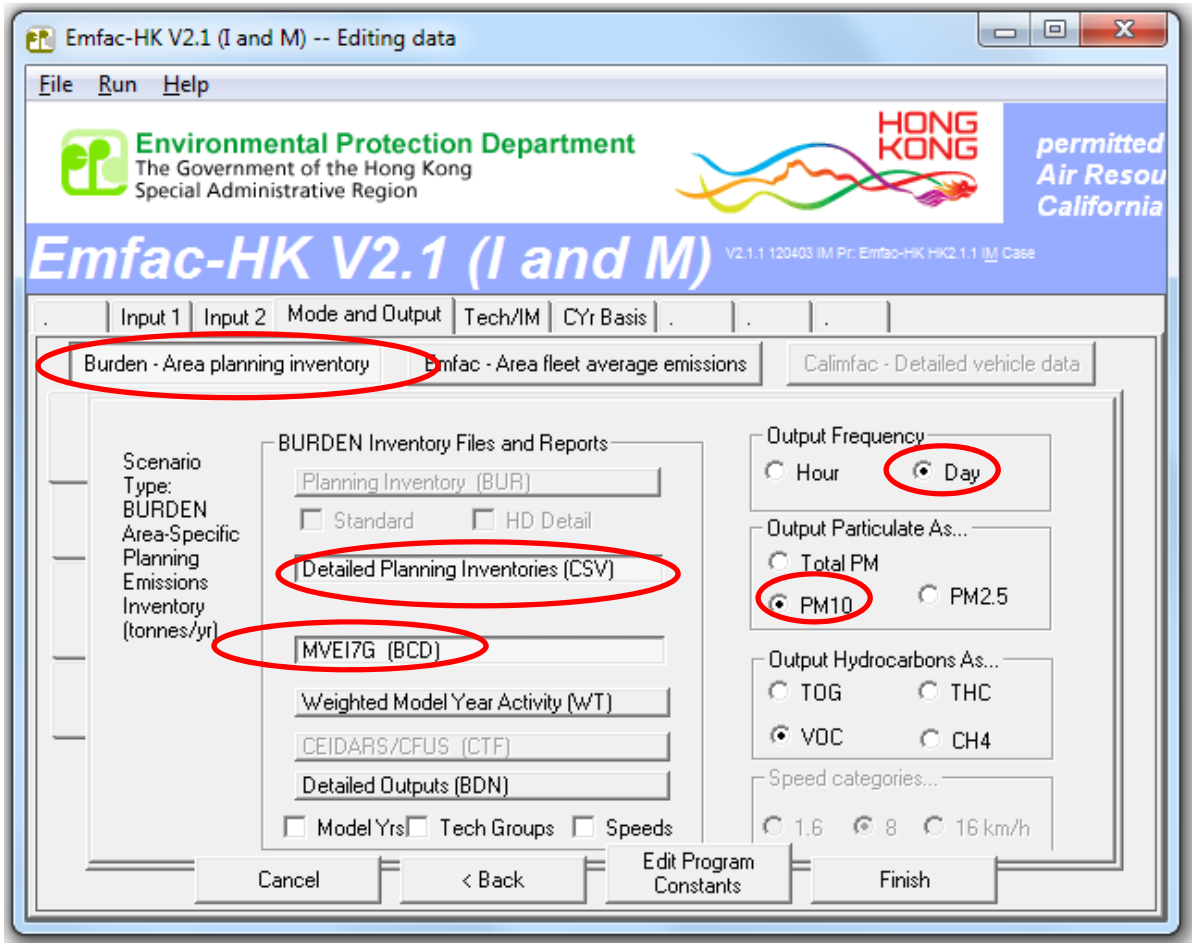
Exercise #1: Notes

- Requires only 1 scenario to include all three calendar years (2015, 2020, 2030)
- Save Input File As: HK_2015_2020_2030_Burden.inp

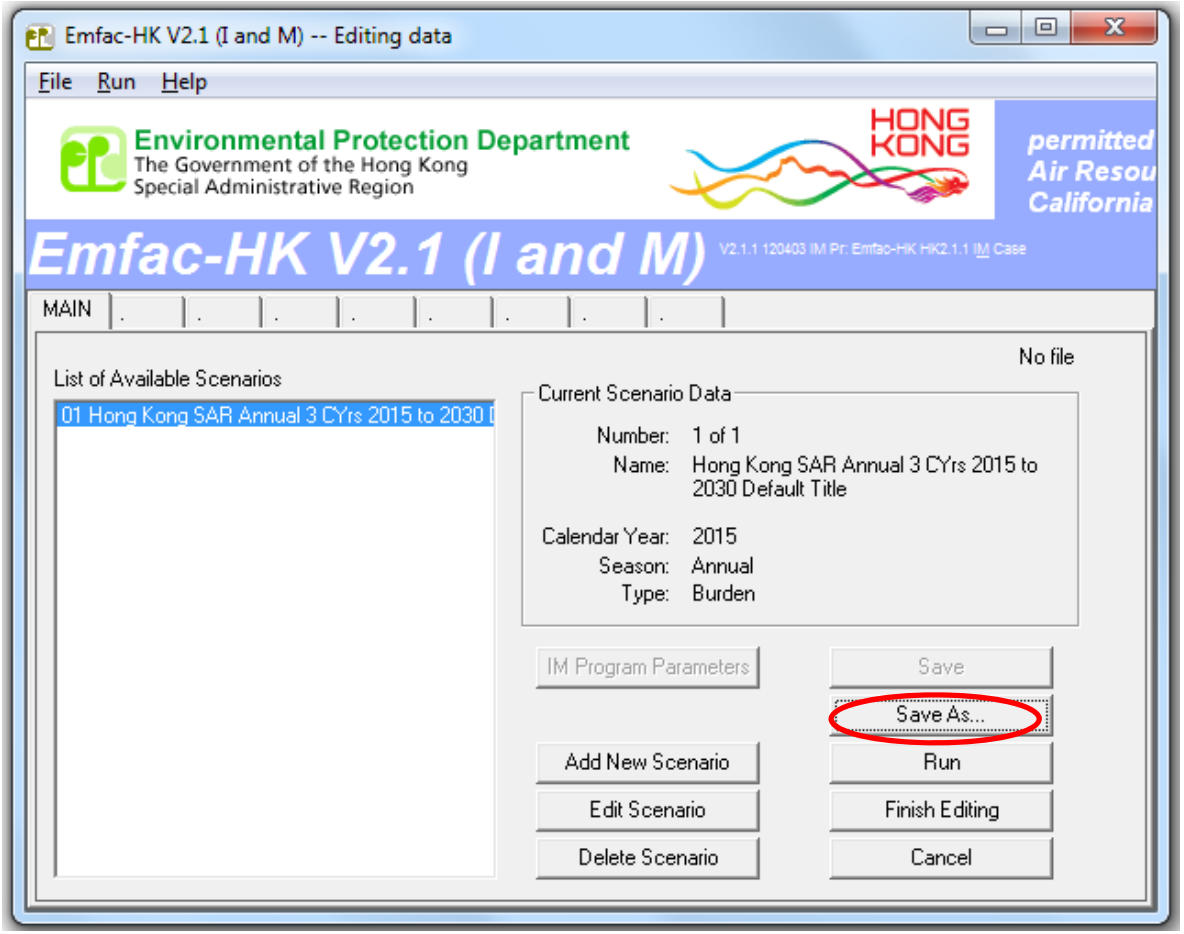
Exercise #1: Input 1 Tab



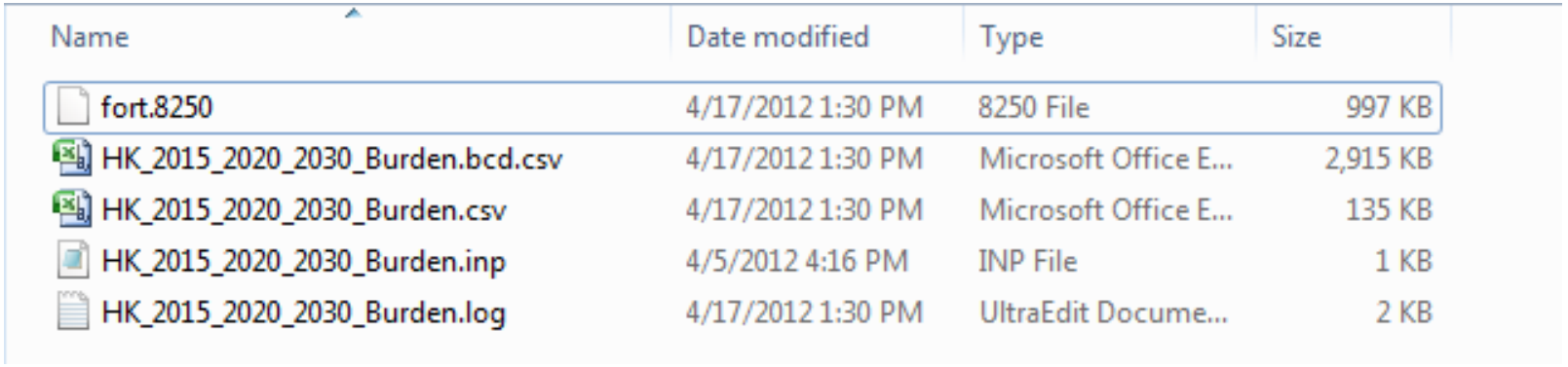
Exercise #1: Mode and Output Tab



Exercise #1: Main Screen After All Edits Applied

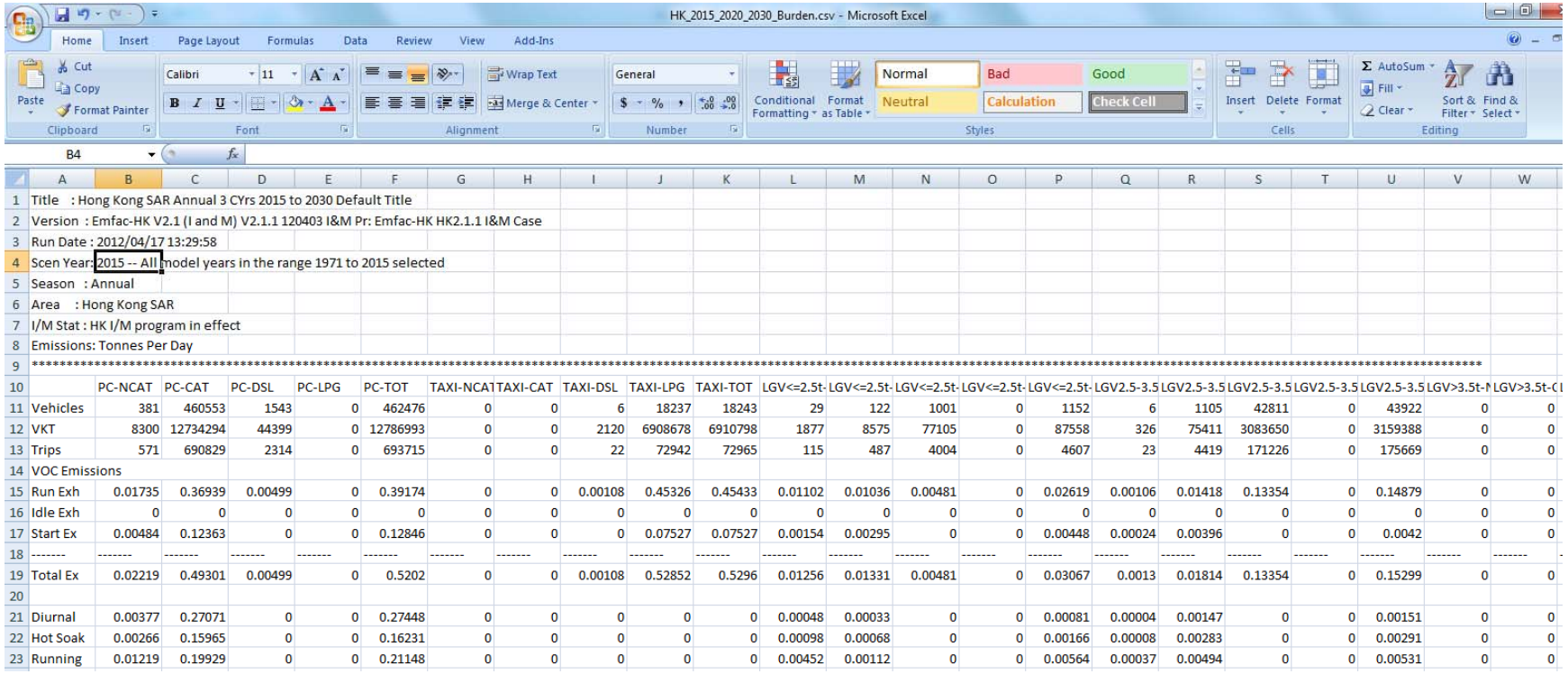


Exercise #1: Output Generated



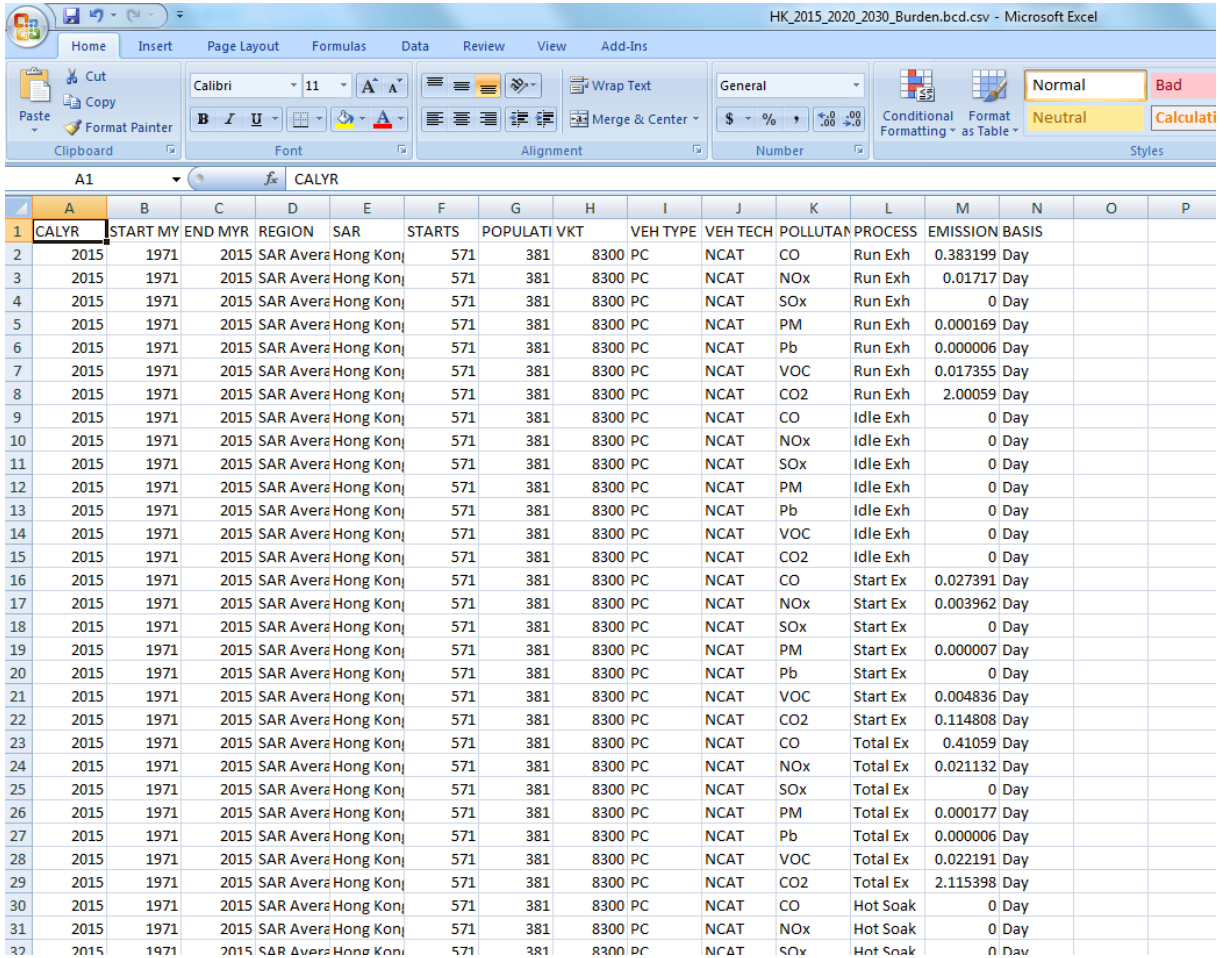
Name	Date modified	Type	Size
fort.8250	4/17/2012 1:30 PM	8250 File	997 KB
HK_2015_2020_2030_Burden.bcd.csv	4/17/2012 1:30 PM	Microsoft Office E...	2,915 KB
HK_2015_2020_2030_Burden.csv	4/17/2012 1:30 PM	Microsoft Office E...	135 KB
HK_2015_2020_2030_Burden.inp	4/5/2012 4:16 PM	INP File	1 KB
HK_2015_2020_2030_Burden.log	4/17/2012 1:30 PM	UltraEdit Docume...	2 KB

Exercise #1: Format of the BURDEN Text File with *.CSV extension



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	Title : Hong Kong SAR Annual 3 CYrs 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 : 2012/04/17 13:29:58																						
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	LGV2.5-3.5	LGV>3.5t-N	LGV>3.5t-C
11	Vehicles	381	460553	1543	0	462476	0	0	6	18237	18243	29	122	1001	0	1152	6	1105	42811	0	43922	0	0
12	VKT	8300	12734294	44399	0	12786993	0	0	2120	6908678	6910798	1877	8575	77105	0	87558	326	75411	3083650	0	3159388	0	0
13	Trips	571	690829	2314	0	693715	0	0	22	72942	72965	115	487	4004	0	4607	23	4419	171226	0	175669	0	0
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	0	0.14879	0	0
16	Idle Exh	0	0	0	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	0	0.0042	0	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	0	0.15299	0	0
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	0	0.00151	0	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	0	0.00291	0	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	0	0.00531	0	0

Exercise #1: Format of the MVEI7G File with *.BCD.CSV Extension

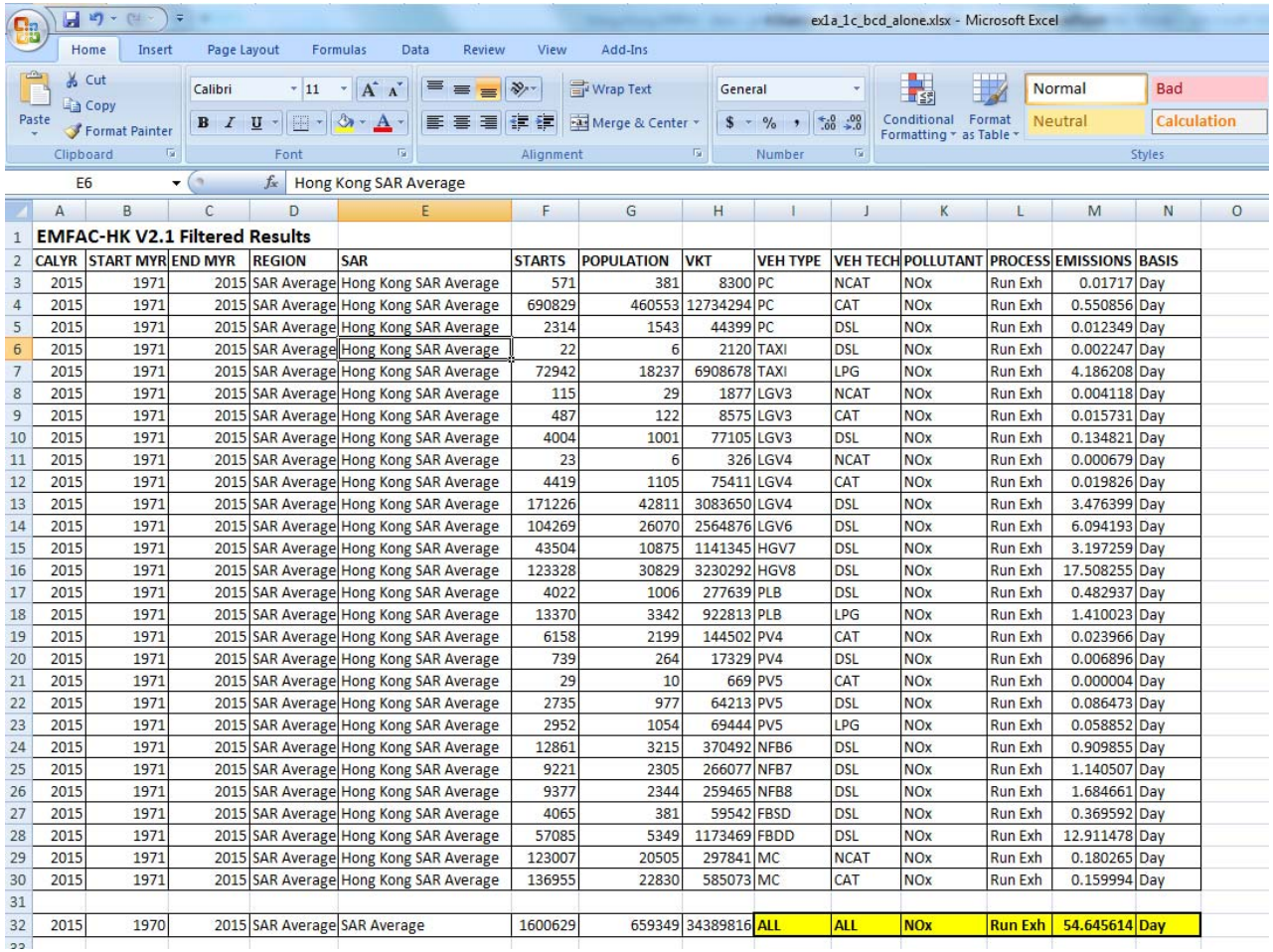


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	CALYR	START MY	END MYR	REGION	SAR	STARTS	POPULATI	VKT	VEH TYPE	VEH TECH	POLLUTAN	PROCESS	EMISSION	BASIS		
2	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO	Run Exh	0.383199	Day		
3	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	NOx	Run Exh	0.01717	Day		
4	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	SOx	Run Exh	0	Day		
5	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	PM	Run Exh	0.000169	Day		
6	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	Pb	Run Exh	0.000006	Day		
7	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	VOC	Run Exh	0.017355	Day		
8	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO2	Run Exh	2.00059	Day		
9	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO	Idle Exh	0	Day		
10	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	NOx	Idle Exh	0	Day		
11	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	SOx	Idle Exh	0	Day		
12	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	PM	Idle Exh	0	Day		
13	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	Pb	Idle Exh	0	Day		
14	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	VOC	Idle Exh	0	Day		
15	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO2	Idle Exh	0	Day		
16	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO	Start Ex	0.027391	Day		
17	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	NOx	Start Ex	0.003962	Day		
18	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	SOx	Start Ex	0	Day		
19	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	PM	Start Ex	0.000007	Day		
20	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	Pb	Start Ex	0	Day		
21	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	VOC	Start Ex	0.004836	Day		
22	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO2	Start Ex	0.114808	Day		
23	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO	Total Ex	0.41059	Day		
24	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	NOx	Total Ex	0.021132	Day		
25	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	SOx	Total Ex	0	Day		
26	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	PM	Total Ex	0.000177	Day		
27	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	Pb	Total Ex	0.000006	Day		
28	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	VOC	Total Ex	0.022191	Day		
29	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO2	Total Ex	2.115398	Day		
30	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	CO	Hot Soak	0	Day		
31	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	NOx	Hot Soak	0	Day		
32	2015	1971	2015	SAR Avera	Hong Kon	571	381	8300	PC	NCAT	SOx	Hot Soak	0	Day		

Exercise #1a: Processing BCD Output

- Problem: using BCD output from Exercise #1, determine total NOx running exhaust emissions for 2015.
- Purpose: postprocessing of BCD output, multi-year scenario
- Hints:
  - Import *.BCD.CSV directly into spreadsheet
  - Use data filters
    - calendar year (2015), pollutant (NOx), process (“Run Exh”)
  - Copy filtered results to a separate tab in spreadsheet for analysis

Exercise #1a: Solution



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**EMFAC-HK V2.1 Filtered Results**														
2	CALYR	START MYR	END MYR	REGION	SAR	STARTS	POPULATION	VKT	VEH TYPE	VEH TECH	POLLUTANT	PROCESS	EMISSIONS	BASIS	
3	2015	1971	2015	SAR Average	Hong Kong SAR Average	571	381	8300	PC	NCAT	NOx	Run Exh	0.01717	Day	
4	2015	1971	2015	SAR Average	Hong Kong SAR Average	690829	460553	12734294	PC	CAT	NOx	Run Exh	0.550856	Day	
5	2015	1971	2015	SAR Average	Hong Kong SAR Average	2314	1543	44399	PC	DSL	NOx	Run Exh	0.012349	Day	
6	2015	1971	2015	SAR Average	Hong Kong SAR Average	22	6	2120	TAXI	DSL	NOx	Run Exh	0.002247	Day	
7	2015	1971	2015	SAR Average	Hong Kong SAR Average	72942	18237	6908678	TAXI	LPG	NOx	Run Exh	4.186208	Day	
8	2015	1971	2015	SAR Average	Hong Kong SAR Average	115	29	1877	LGV3	NCAT	NOx	Run Exh	0.004118	Day	
9	2015	1971	2015	SAR Average	Hong Kong SAR Average	487	122	8575	LGV3	CAT	NOx	Run Exh	0.015731	Day	
10	2015	1971	2015	SAR Average	Hong Kong SAR Average	4004	1001	77105	LGV3	DSL	NOx	Run Exh	0.134821	Day	
11	2015	1971	2015	SAR Average	Hong Kong SAR Average	23	6	326	LGV4	NCAT	NOx	Run Exh	0.000679	Day	
12	2015	1971	2015	SAR Average	Hong Kong SAR Average	4419	1105	75411	LGV4	CAT	NOx	Run Exh	0.019826	Day	
13	2015	1971	2015	SAR Average	Hong Kong SAR Average	171226	42811	3083650	LGV4	DSL	NOx	Run Exh	3.476399	Day	
14	2015	1971	2015	SAR Average	Hong Kong SAR Average	104269	26070	2564876	LGV6	DSL	NOx	Run Exh	6.094193	Day	
15	2015	1971	2015	SAR Average	Hong Kong SAR Average	43504	10875	1141345	HGV7	DSL	NOx	Run Exh	3.197259	Day	
16	2015	1971	2015	SAR Average	Hong Kong SAR Average	123328	30829	3230292	HGV8	DSL	NOx	Run Exh	17.508255	Day	
17	2015	1971	2015	SAR Average	Hong Kong SAR Average	4022	1006	277639	PLB	DSL	NOx	Run Exh	0.482937	Day	
18	2015	1971	2015	SAR Average	Hong Kong SAR Average	13370	3342	922813	PLB	LPG	NOx	Run Exh	1.410023	Day	
19	2015	1971	2015	SAR Average	Hong Kong SAR Average	6158	2199	144502	PV4	CAT	NOx	Run Exh	0.023966	Day	
20	2015	1971	2015	SAR Average	Hong Kong SAR Average	739	264	17329	PV4	DSL	NOx	Run Exh	0.006896	Day	
21	2015	1971	2015	SAR Average	Hong Kong SAR Average	29	10	669	PV5	CAT	NOx	Run Exh	0.000004	Day	
22	2015	1971	2015	SAR Average	Hong Kong SAR Average	2735	977	64213	PV5	DSL	NOx	Run Exh	0.086473	Day	
23	2015	1971	2015	SAR Average	Hong Kong SAR Average	2952	1054	69444	PV5	LPG	NOx	Run Exh	0.058852	Day	
24	2015	1971	2015	SAR Average	Hong Kong SAR Average	12861	3215	370492	NFB6	DSL	NOx	Run Exh	0.909855	Day	
25	2015	1971	2015	SAR Average	Hong Kong SAR Average	9221	2305	266077	NFB7	DSL	NOx	Run Exh	1.140507	Day	
26	2015	1971	2015	SAR Average	Hong Kong SAR Average	9377	2344	259465	NFB8	DSL	NOx	Run Exh	1.684661	Day	
27	2015	1971	2015	SAR Average	Hong Kong SAR Average	4065	381	59542	FBSD	DSL	NOx	Run Exh	0.369592	Day	
28	2015	1971	2015	SAR Average	Hong Kong SAR Average	57085	5349	1173469	FBDD	DSL	NOx	Run Exh	12.911478	Day	
29	2015	1971	2015	SAR Average	Hong Kong SAR Average	123007	20505	297841	MC	NCAT	NOx	Run Exh	0.180265	Day	
30	2015	1971	2015	SAR Average	Hong Kong SAR Average	136955	22830	585073	MC	CAT	NOx	Run Exh	0.159994	Day	
31															
32	2015	1970	2015	SAR Average	SAR Average	1600629	659349	34389816	**ALL**	**ALL**	**NOx**	**Run Exh**	**54.645614**	**Day**	

Exercise #1b: Processing Text/CSV Output

- Problem: using Text/CSV output from Exercise #1, determine total NOx running exhaust emissions for 2015.
- Postprocessing of Text/CSV output

Exercise #1c: Determine Fleet-Average Emissions

- Problem: using spreadsheet results obtained in Exercise #1a, determine the *fleet-average* NOx emission factor (gram/km) for all vehicles for 2015.
- Purpose: Convert emission rate to an emission factor
- Steps
  - Divide EMISSIONS Column by VKT Column
  - Sum over all vehicle classes to get composite.
  - Convert units to obtain grams/km

Exercise #1c: Solution

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**EMFAC-HK V2.1 Filtered Results**														
2	**CALYR**	**START MYR**	**END MYR**	**REGION**	**SAR**	**STARTS**	**POPULATION**	**VKT**	**VEH TYPE**	**VEH TECH**	**POLLUTANT**	**PROCESS**	**EMISSIONS**	**BASIS**	**EMISSION FACTOR (g/km)**
3	2015	1971	2015	SAR Average	Hong Kong SAR Average	571	381	8300	PC	NCAT	NOx	Run Exh	0.01717	Day	2.0687
4	2015	1971	2015	SAR Average	Hong Kong SAR Average	690829	460553	12734294	PC	CAT	NOx	Run Exh	0.550856	Day	0.0433
5	2015	1971	2015	SAR Average	Hong Kong SAR Average	2314	1543	44399	PC	DSL	NOx	Run Exh	0.012349	Day	0.2781
6	2015	1971	2015	SAR Average	Hong Kong SAR Average	22	6	2120	TAXI	DSL	NOx	Run Exh	0.002247	Day	1.0599
7	2015	1971	2015	SAR Average	Hong Kong SAR Average	72942	18237	6908678	TAXI	LPG	NOx	Run Exh	4.186208	Day	0.6059
8	2015	1971	2015	SAR Average	Hong Kong SAR Average	115	29	1877	LGV3	NCAT	NOx	Run Exh	0.004118	Day	2.1939
9	2015	1971	2015	SAR Average	Hong Kong SAR Average	487	122	8575	LGV3	CAT	NOx	Run Exh	0.015731	Day	1.8345
10	2015	1971	2015	SAR Average	Hong Kong SAR Average	4004	1001	77105	LGV3	DSL	NOx	Run Exh	0.134821	Day	1.7485
11	2015	1971	2015	SAR Average	Hong Kong SAR Average	23	6	326	LGV4	NCAT	NOx	Run Exh	0.000679	Day	2.0828
12	2015	1971	2015	SAR Average	Hong Kong SAR Average	4419	1105	75411	LGV4	CAT	NOx	Run Exh	0.019826	Day	0.2629
13	2015	1971	2015	SAR Average	Hong Kong SAR Average	171226	42811	3083650	LGV4	DSL	NOx	Run Exh	3.476399	Day	1.1274
14	2015	1971	2015	SAR Average	Hong Kong SAR Average	104269	26070	2564876	LGV6	DSL	NOx	Run Exh	6.094193	Day	2.3760
15	2015	1971	2015	SAR Average	Hong Kong SAR Average	43504	10875	1141345	HGV7	DSL	NOx	Run Exh	3.197259	Day	2.8013
16	2015	1971	2015	SAR Average	Hong Kong SAR Average	123328	30829	3230292	HGV8	DSL	NOx	Run Exh	17.508255	Day	5.4200
17	2015	1971	2015	SAR Average	Hong Kong SAR Average	4022	1006	277639	PLB	DSL	NOx	Run Exh	0.482937	Day	1.7394
18	2015	1971	2015	SAR Average	Hong Kong SAR Average	13370	3342	922813	PLB	LPG	NOx	Run Exh	1.410023	Day	1.5280
19	2015	1971	2015	SAR Average	Hong Kong SAR Average	6158	2199	144502	PV4	CAT	NOx	Run Exh	0.023966	Day	0.1659
20	2015	1971	2015	SAR Average	Hong Kong SAR Average	739	264	17329	PV4	DSL	NOx	Run Exh	0.006896	Day	0.3979
21	2015	1971	2015	SAR Average	Hong Kong SAR Average	29	10	669	PV5	CAT	NOx	Run Exh	0.000004	Day	0.0060
22	2015	1971	2015	SAR Average	Hong Kong SAR Average	2735	977	64213	PV5	DSL	NOx	Run Exh	0.086473	Day	1.3467
23	2015	1971	2015	SAR Average	Hong Kong SAR Average	2952	1054	69444	PV5	LPG	NOx	Run Exh	0.058852	Day	0.8475
24	2015	1971	2015	SAR Average	Hong Kong SAR Average	12861	3215	370492	NFB6	DSL	NOx	Run Exh	0.909855	Day	2.4558
25	2015	1971	2015	SAR Average	Hong Kong SAR Average	9221	2305	266077	NFB7	DSL	NOx	Run Exh	1.140507	Day	4.2864
26	2015	1971	2015	SAR Average	Hong Kong SAR Average	9377	2344	259465	NFB8	DSL	NOx	Run Exh	1.684661	Day	6.4928
27	2015	1971	2015	SAR Average	Hong Kong SAR Average	4065	381	59542	FBSD	DSL	NOx	Run Exh	0.369592	Day	6.2072
28	2015	1971	2015	SAR Average	Hong Kong SAR Average	57085	5349	1173469	FBDD	DSL	NOx	Run Exh	12.911478	Day	11.0028
29	2015	1971	2015	SAR Average	Hong Kong SAR Average	123007	20505	297841	MC	NCAT	NOx	Run Exh	0.180265	Day	0.6052
30	2015	1971	2015	SAR Average	Hong Kong SAR Average	136955	22830	585073	MC	CAT	NOx	Run Exh	0.159994	Day	0.2735
31															
32	2015	1970	2015	SAR Average	SAR Average	1600629	659349	34389816	**ALL**	**ALL**	**NOx**	**Run Exh**	**54.645614**	**Day**	**1.5890**

Exercise #2: Hourly Emissions Inventory

- Problem: Repeat Exercise #1, except generate an hourly emissions estimates for Hong Kong for calendar year 2015 only.
- Context: This output is useful to ambient air quality modelers who are interested in hourly emission estimates.
- Scenario data:
  - Geographic Area: Hong Kong SAR
  - Calendar Years: 2015
  - Season: Annual
  - Scenario Type: BURDEN
  - Output File types: Text (CSV), BCD
  - Output Frequency: hourly
  - Pollutants: PM10, VOC
- Purpose: generating/processing BURDEN hourly output formats

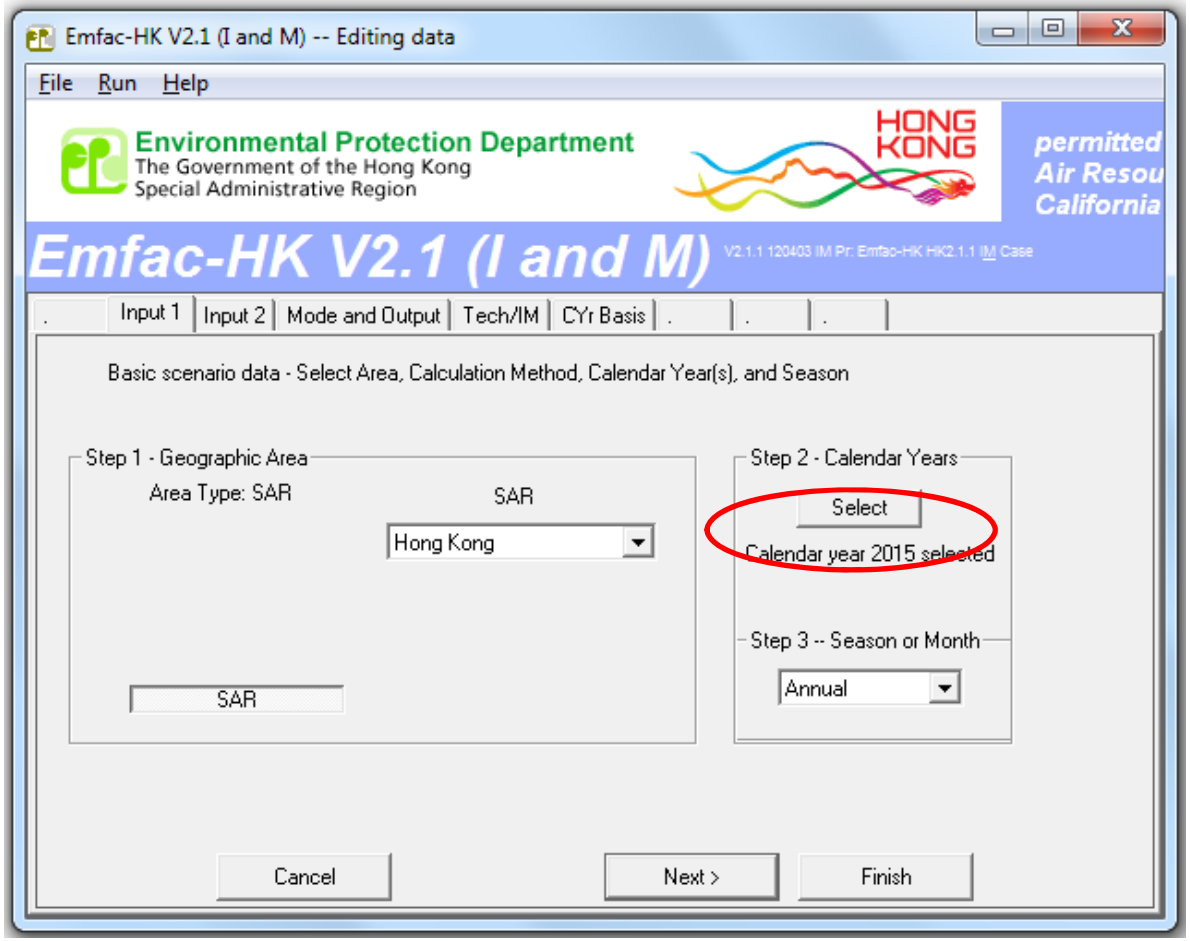
Exercise #2: Hourly Emissions Estimates

- Problem: Repeat Exercise #1, except generate an hourly emissions inventory for Hong Kong for calendar year 2015 only.

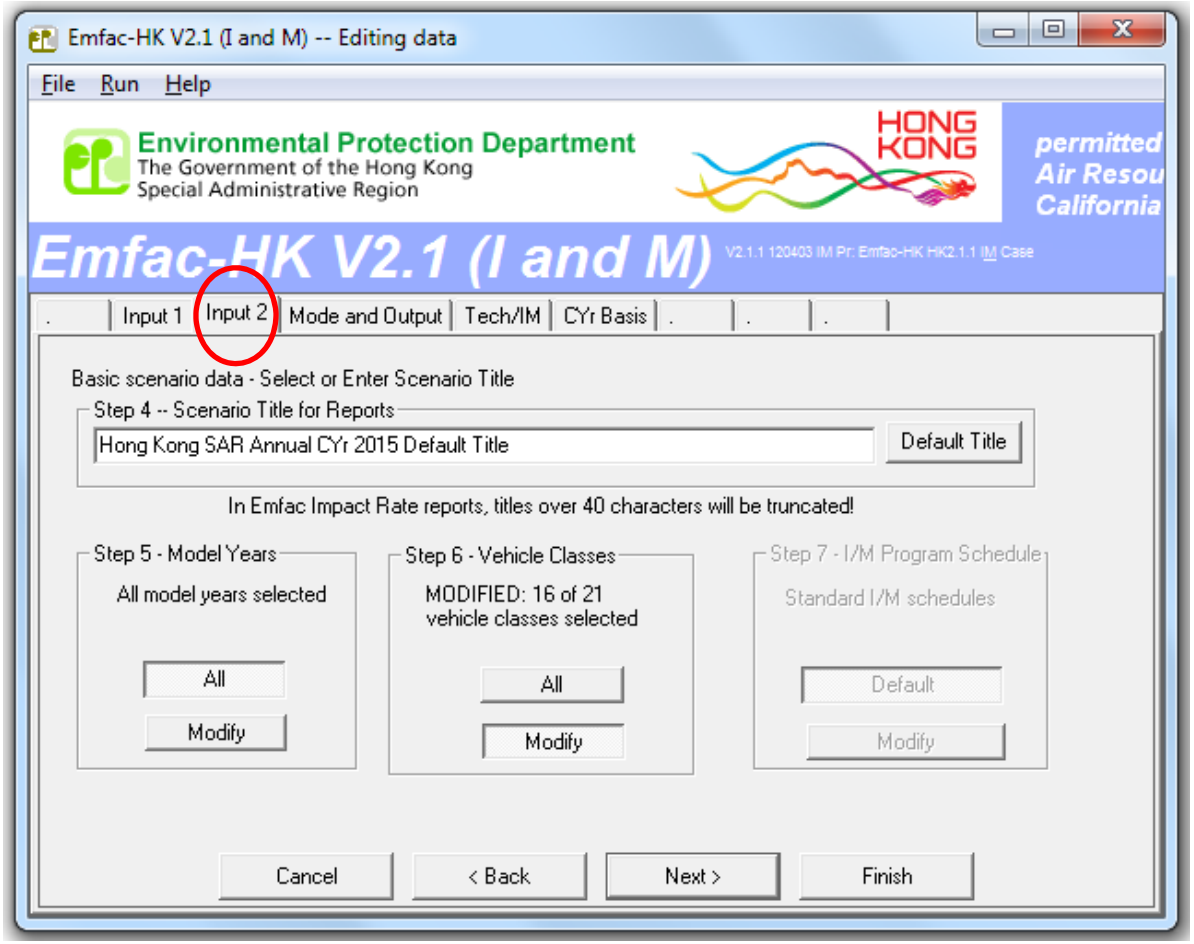
- Purpose: generating/processing BURDEN hourly output formats

- Context: This output is useful to ambient air quality modelers who are interested in hourly emission inventories.
- In this run the Burden inventories are calculated on an hourly basis, and then aggregated to show an inventory for the entire day. The hourly inventories are mainly based on disaggregating daily activity to an hourly basis. The data provide default diurnal distribution of hourly trip starts, and vehicle kilometers travelled.

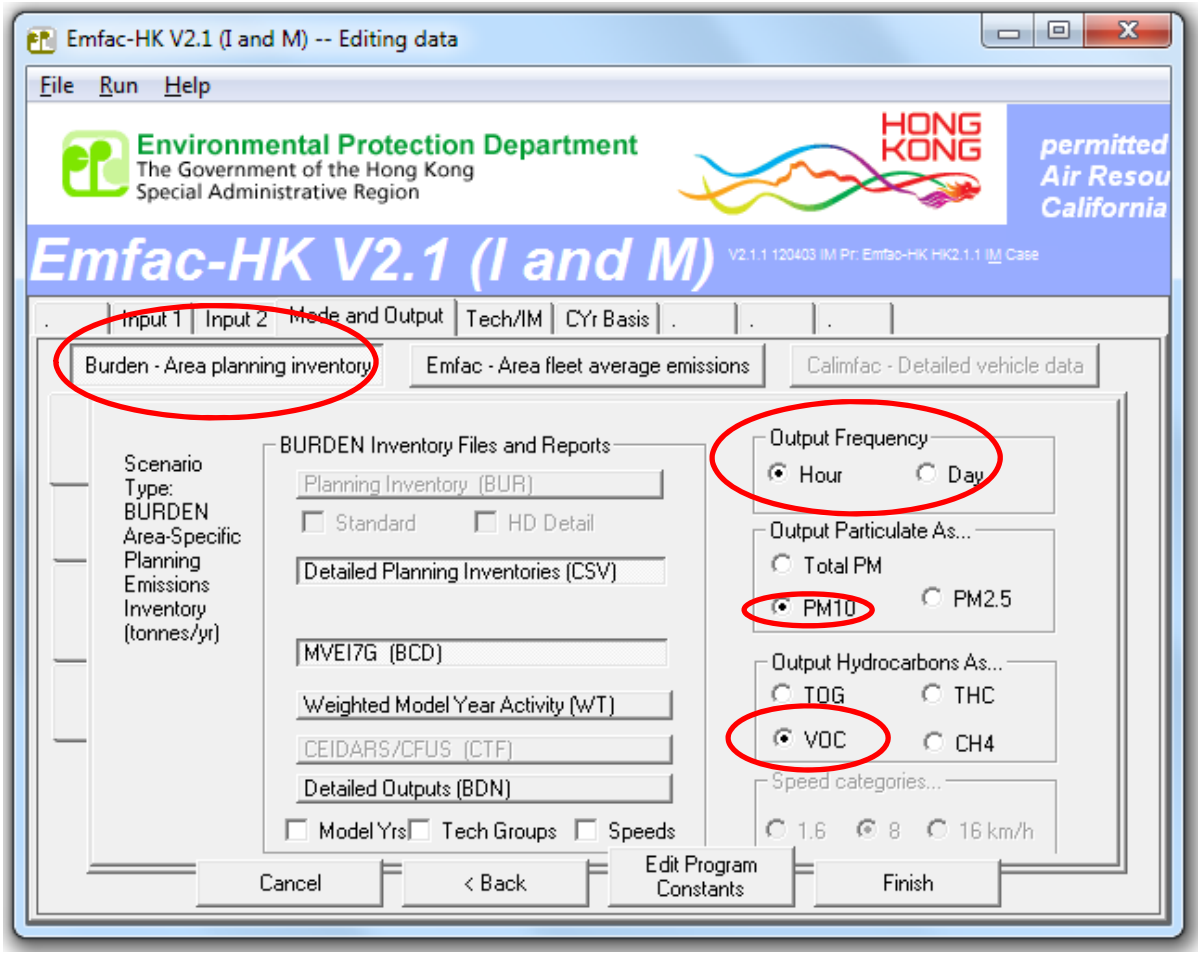
Exercise #2: Input 1 Tab



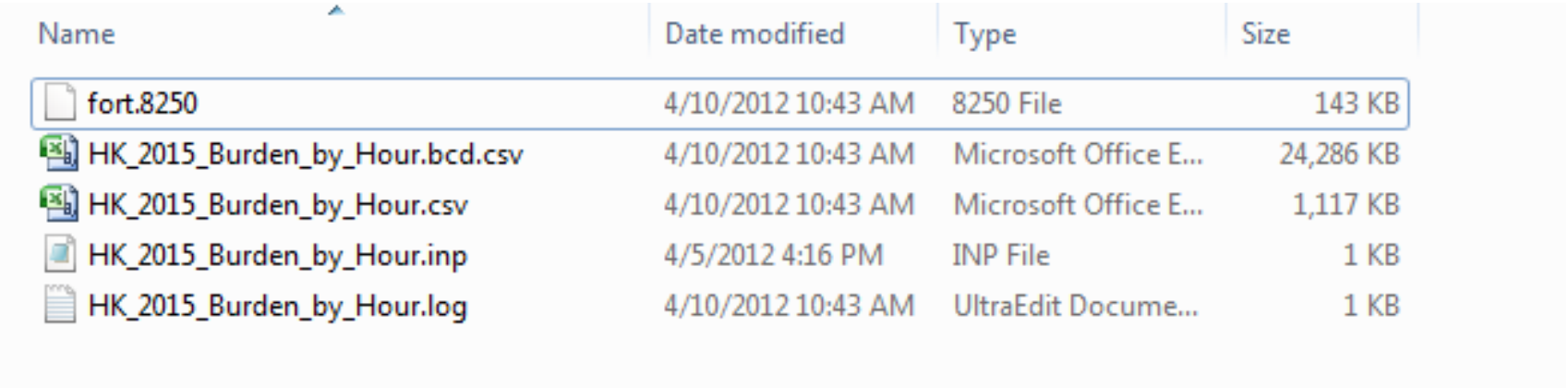
Exercise #2: Input 2 Tab



Exercise #2: Mode and Output Tab



Exercise #2: Output Generated



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HK_2015_Burden_by_Hour.csv	4/10/2012 10:43 AM	Microsoft Office E...	1,117 KB
HK_2015_Burden_by_Hour.inp	4/5/2012 4:16 PM	INP File	1 KB
HK_2015_Burden_by_Hour.log	4/10/2012 10:43 AM	UltraEdit Docume...	1 KB

Exercise #2a: Hourly Emission Rate

- Problem: using BCD output from Exercise #2, determine total NOx running exhaust emission rates by hour for 2015. What is the peak emission rate, and which hour?
- Purpose: determine peak hourly emission rates using hourly BCD output.
- Steps
  - Open *.BCD.CSV (allows BCD file to be directly loaded into spreadsheets)
  - Use data filters
    - pollutant (NOx), process ("Run Exh")
  - Copy filtered results to a separate tab in spreadsheet for analysis
  - Sort by **BASIS**, **VEH TYPE**
  - Perform a group subtotal by **BASIS**
  - Collapse Subtotal Group #2 to see values by hour

Exercise #2a: Solution

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	CALYR	START MY	END MYR	REGION	SAR	STARTS	POPULATI	VKT	VEH TYPE	VEH TECH	POLLUTAN	PROCESS	EMISSION	BASIS	Emission Factor (g/km)
30						26935	659349	699131					0.953545	Hr00 Total	1.36390033
59						15857	659349	471977					0.552808	Hr01 Total	1.17126046
88						11075	659349	350315					0.397458	Hr02 Total	1.13457317
117						8333	659349	274929					0.339383	Hr03 Total	1.23443871
146						8185	659349	261543					0.371956	Hr04 Total	1.42216003
175						12156	659349	348493					0.603427	Hr05 Total	1.73153263
204						30687	659349	739160					1.521438	Hr06 Total	2.05833378
233						86356	659349	1810488					3.225352	Hr07 Total	1.78148212
262						118151	659349	2401076					3.834922	Hr08 Total	1.5971681
291						101611	659349	2144183					3.846289	Hr09 Total	1.79382497
320						89445	659349	1944773					3.418449	Hr10 Total	1.75776247
349						87785	659349	1871315					3.27425	Hr11 Total	1.74970542
378						84038	659349	1807752					3.051246	Hr12 Total	1.68786758
407						82852	659349	1804351					3.11021	Hr13 Total	1.72372781
436						90585	659349	1923040					3.246812	Hr14 Total	1.68837466
465						93981	659349	1986112					3.279384	Hr15 Total	1.65115764
494						96876	659349	2041010					3.420064	Hr16 Total	1.67567234
523						107473	659349	2149155					3.738635	Hr17 Total	1.7395837
552						118349	659349	2241110					3.247792	Hr18 Total	1.44918902
581						94829	659349	1927150					2.628818	Hr19 Total	1.3640962
610						69756	659349	1510849					1.924999	Hr20 Total	1.2741174
639						61771	659349	1349426					1.738471	Hr21 Total	1.28830406
668						57738	659349	1275248					1.531084	Hr22 Total	1.20061666
697						45797	659349	1057222					1.388809	Hr23 Total	1.3136399
726						1600629	659349	34389816					54.64561	Day Total	1.58900571

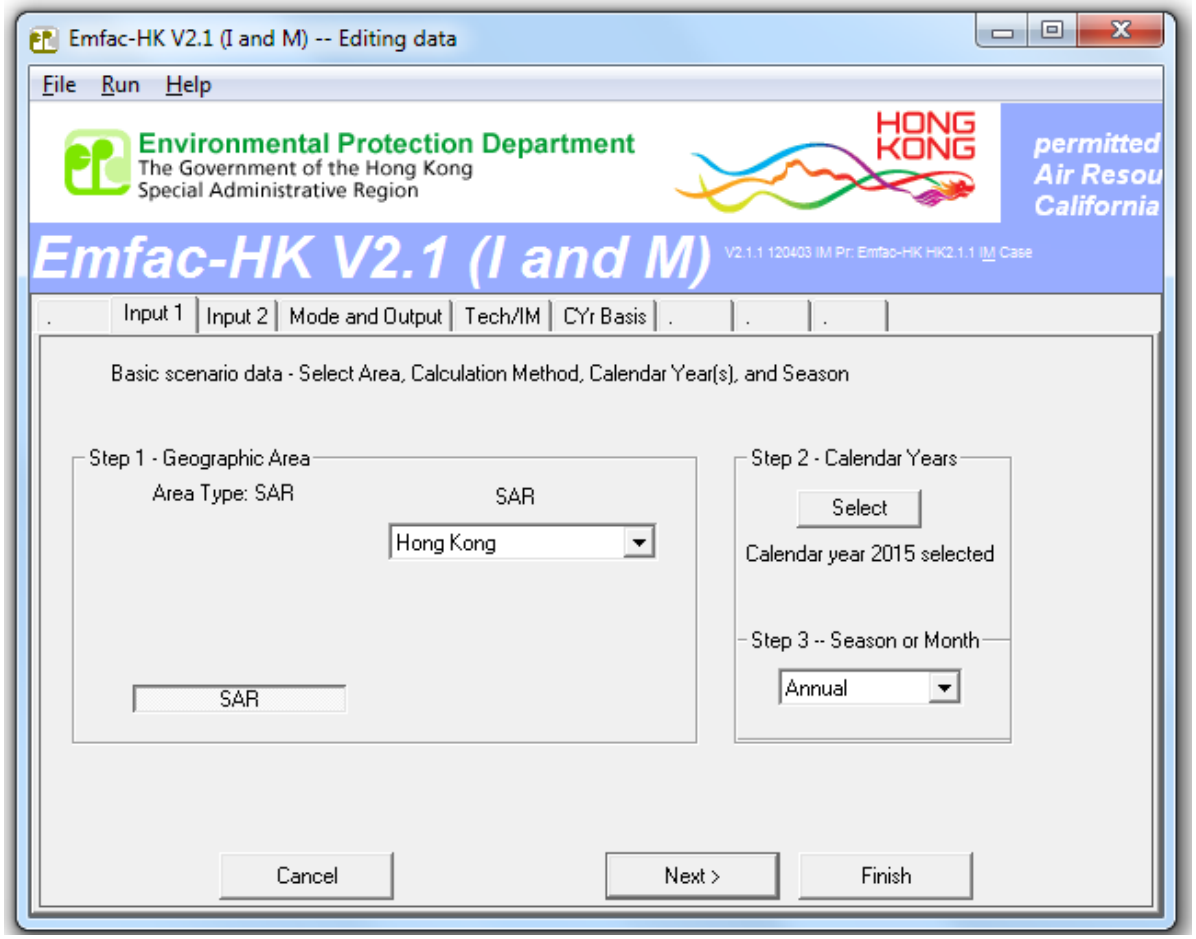
Exercise #3: EMFAC Mode

- Problem: Generate emission factors for 25 ºC and 40% RH for calendar year 2015 using the EMFAC mode.
- Context: In Emfac mode the model calculates emission factors either in grams per hour or grams per kilometer for each temperature, relative humidity and average speed combination specified by the user.
- fleet-average emission factors (grams/km or g/mile) are useful in roadway modeling

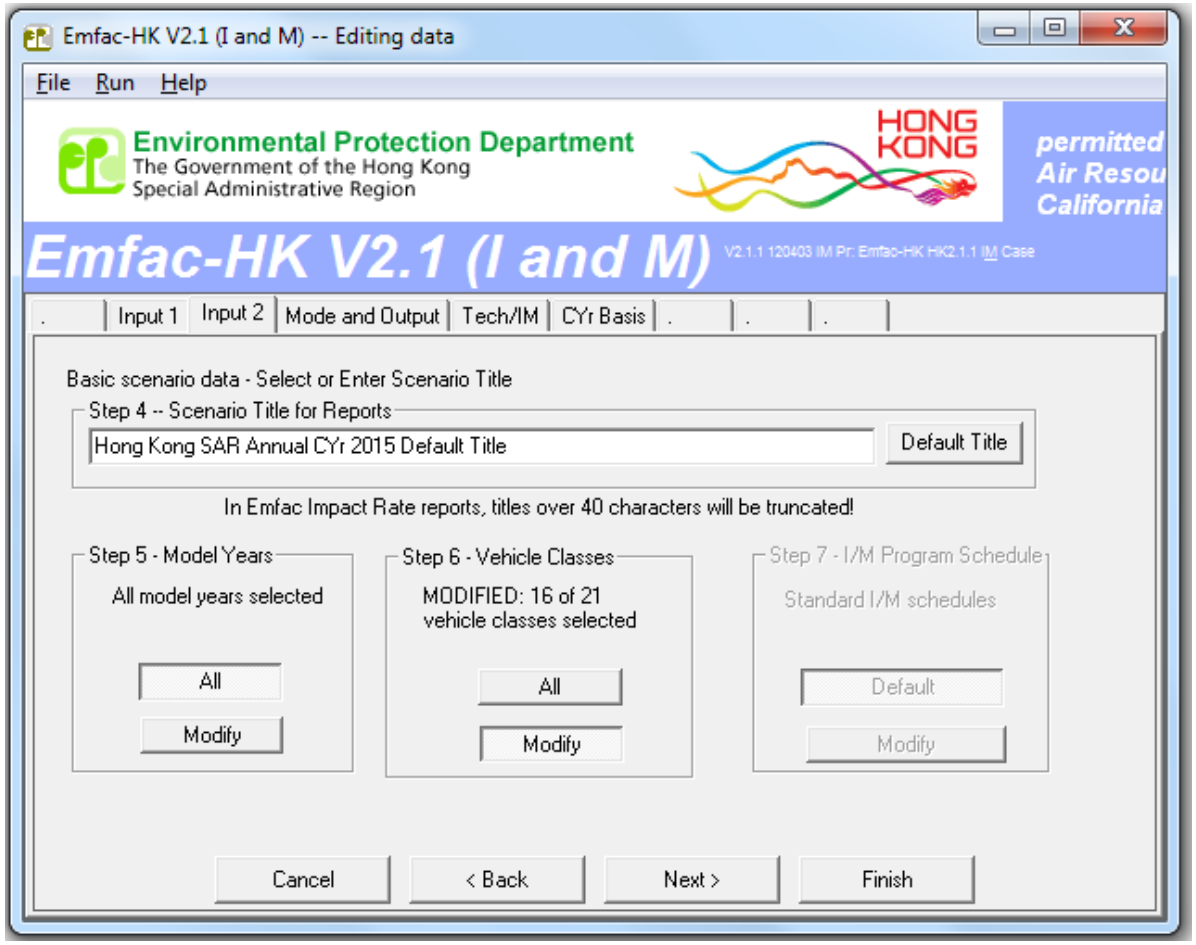
Exercise #3: EMFAC Mode

- Scenario data:
  - Geographic Area: Hong Kong SAR
  - Calendar Years: 2015
  - Season: Annual
  - Scenario Type: EMFAC
  - Output File types: Impact Rate Detail (RTL)
  - Temperatures: 25 ºC
  - Relative Humidity: 40%
  - Pollutants: PM10, VOC
- Purpose: generating/processing EMFAC formats

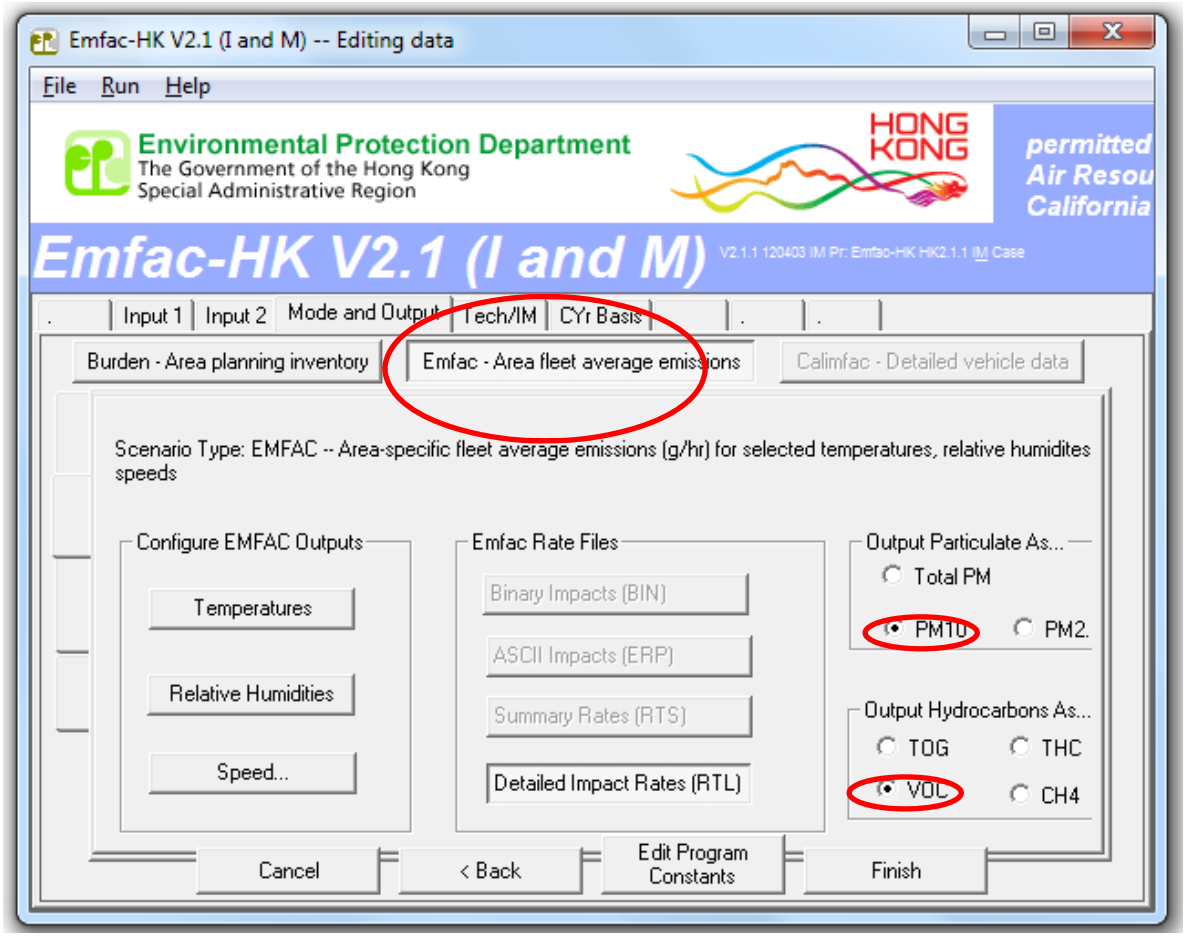
Exercise #3: Input 1 Tab



Exercise #3: Input 2 Tab



Exercise #3: Mode and Output Tab



Exercise #3: Output Generated