

The FREQ Procedure

File identifier

fileid	Frequency	Percent	Cumulative Frequency	Cumulative Percent
chap09	708852	100.00	708852	100.00

Table of scenario by year

scenario(Scenario)	year(Year)		
Frequency Percent	2017	2040	Total
BC1	111924 15.79	186540 26.32	298464 42.11
HH3	0 0.00	186540 26.32	186540 26.32
HHHE	0 0.00	74616 10.53	74616 10.53
MHLE	74616 10.53	74616 10.53	149232 21.05
Total	186540 26.32	522312 73.68	708852 100.00

The FREQ Procedure

Table of feedstock by srce

feedstock(Feedstock) srce(Source)

Frequency Percent	Delv	Prod	Total
Corn	55962 7.89	55962 7.89	111924 15.79
Corn stover	55962 7.89	55962 7.89	111924 15.79
Logging residue	55962 7.89	55962 7.89	111924 15.79
Miscanthus	37308 5.26	37308 5.26	74616 10.53
Straw	55962 7.89	55962 7.89	111924 15.79
Switchgrass	37308 5.26	37308 5.26	74616 10.53
Whole tree	55962 7.89	55962 7.89	111924 15.79
Total	354426 50.00	354426 50.00	708852 100.00

The FREQ Procedure

Table of indicator by units

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indicator(Indicator)
units(Units)
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Frequency Percent	Mt	Total
NH3	118142 16.67	118142 16.67
NOX	118142 16.67	118142 16.67
PM10	118142 16.67	118142 16.67
PM25	118142 16.67	118142 16.67
SOX	118142 16.67	118142 16.67
VOC	118142 16.67	118142 16.67
Total	708852 100.00	708852 100.00

The FREQ Procedure

Table of feedstock by year

feedstock(Feedstock) year(Year)

Frequency Percent	2017	2040	Total
Corn	37308 5.26	74616 10.53	111924 15.79
Corn stover	37308 5.26	74616 10.53	111924 15.79
Logging residue	37308 5.26	74616 10.53	111924 15.79
Miscanthus	0 0.00	74616 10.53	74616 10.53
Straw	37308 5.26	74616 10.53	111924 15.79
Switchgrass	0 0.00	74616 10.53	74616 10.53
Whole tree	37308 5.26	74616 10.53	111924 15.79
Total	186540 26.32	522312 73.68	708852 100.00

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
BC1	2017	Delv	Corn	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000
				PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
BC1	2017	Delv	Corn stover	NH3	Mt	3109	0	0	9.22	0.128
				NOX	Mt	3109	0	0	2179.48	29.710
				PM10	Mt	3109	0	0	102.20	1.833
				PM25	Mt	3109	0	0	89.81	1.290
				SOX	Mt	3109	0	0	5.04	0.070
				VOC	Mt	3109	0	0	141.59	1.959
BC1	2017	Delv	Straw	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000
				PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
BC1	2017	Prod	Corn	NH3	Mt	3109	0	0	1942.45	136.431
				NOX	Mt	3109	0	0	828.09	65.013
				PM10	Mt	3109	0	0	1490.08	111.815
				PM25	Mt	3109	0	0	324.60	24.604
				SOX	Mt	3109	0	0	6.68	0.127
				VOC	Mt	3109	0	0	531.14	39.990
BC1	2017	Prod	Corn stover	NH3	Mt	3109	0	0	443.00	19.961
				NOX	Mt	3109	0	0	111.51	5.211
				PM10	Mt	3109	0	0	229.53	11.927
				PM25	Mt	3109	0	0	46.60	2.465
				SOX	Mt	3109	0	0	0.03	0.001
				VOC	Mt	3109	0	0	2.17	0.114
BC1	2017	Prod	Straw	NH3	Mt	3109	0	0	313.50	2.217
				NOX	Mt	3109	0	0	84.85	0.730
				PM10	Mt	3109	0	0	1058.97	13.087
				PM25	Mt	3109	0	0	213.32	2.636
				SOX	Mt	3109	0	0	0.03	0.000
				VOC	Mt	3109	0	0	2.20	0.027
BC1	2040	Delv	Corn	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
BC1	2040	Delv	Corn	PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
BC1	2040	Delv	Corn stover	NH3	Mt	3109	0	0	5.91	0.179
				NOX	Mt	3109	0	0	315.90	9.664
				PM10	Mt	3109	0	0	29.97	1.277
				PM25	Mt	3109	0	0	8.12	0.305
				SOX	Mt	3109	0	0	2.97	0.090
				VOC	Mt	3109	0	0	24.17	0.733
BC1	2040	Delv	Miscanthus	NH3	Mt	3109	0	0	4.09	0.164
				NOX	Mt	3109	0	0	219.00	8.743
				PM10	Mt	3109	0	0	62.25	1.642
				PM25	Mt	3109	0	0	9.04	0.327
				SOX	Mt	3109	0	0	2.06	0.083
				VOC	Mt	3109	0	0	16.78	0.674
BC1	2040	Delv	Straw	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000
				PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
BC1	2040	Delv	Switchgrass	NH3	Mt	3109	0	0	5.48	0.168
				NOX	Mt	3109	0	0	295.60	8.805
				PM10	Mt	3109	0	0	53.03	1.754
				PM25	Mt	3109	0	0	8.29	0.343
				SOX	Mt	3109	0	0	2.78	0.086
				VOC	Mt	3109	0	0	22.46	0.693
BC1	2040	Prod	Corn	NH3	Mt	3109	0	0	2112.67	128.769
				NOX	Mt	3109	0	0	487.34	32.152
				PM10	Mt	3109	0	0	1511.87	99.806
				PM25	Mt	3109	0	0	304.38	20.164
				SOX	Mt	3109	0	0	7.51	0.116
				VOC	Mt	3109	0	0	504.01	35.144
BC1	2040	Prod	Corn stover	NH3	Mt	3109	0	0	663.05	34.358
				NOX	Mt	3109	0	0	135.64	7.059
				PM10	Mt	3109	0	0	273.52	14.024
				PM25	Mt	3109	0	0	54.81	2.810
				SOX	Mt	3109	0	0	0.03	0.001
				VOC	Mt	3109	0	0	1.47	0.077

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
BC1	2040	Prod	Miscanthus	NH3	Mt	3109	0	0	761.24	19.044
				NOX	Mt	3109	0	0	137.88	3.450
				PM10	Mt	3109	0	0	360.36	9.123
				PM25	Mt	3109	0	0	72.19	1.827
				SOX	Mt	3109	0	0	0.03	0.001
				VOC	Mt	3109	0	0	36.43	0.922
BC1	2040	Prod	Straw	NH3	Mt	3109	0	0	407.36	3.556
				NOX	Mt	3109	0	0	84.53	0.755
				PM10	Mt	3109	0	0	1101.51	17.814
				PM25	Mt	3109	0	0	220.39	3.564
				SOX	Mt	3109	0	0	0.02	0.000
				VOC	Mt	3109	0	0	1.29	0.019
BC1	2040	Prod	Switchgrass	NH3	Mt	3109	0	0	567.39	20.480
				NOX	Mt	3109	0	0	104.33	3.734
				PM10	Mt	3109	0	0	470.60	13.710
				PM25	Mt	3109	0	0	94.25	2.746
				SOX	Mt	3109	0	0	0.03	0.001
				VOC	Mt	3109	0	0	64.01	1.867
HH3	2040	Delv	Corn	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000
				PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
HH3	2040	Delv	Corn stover	NH3	Mt	3109	0	0	9.86	0.173
				NOX	Mt	3109	0	0	536.95	9.328
				PM10	Mt	3109	0	0	38.80	1.315
				PM25	Mt	3109	0	0	10.60	0.303
				SOX	Mt	3109	0	0	4.96	0.087
				VOC	Mt	3109	0	0	40.24	0.706
HH3	2040	Delv	Miscanthus	NH3	Mt	3109	0	0	6.77	0.338
				NOX	Mt	3109	0	0	364.46	18.018
				PM10	Mt	3109	0	0	101.49	3.541
				PM25	Mt	3109	0	0	14.74	0.692
				SOX	Mt	3109	0	0	3.44	0.171
				VOC	Mt	3109	0	0	27.81	1.386
HH3	2040	Delv	Straw	NH3	Mt	3109	0	0	0.00	0.000
				NOX	Mt	3109	0	0	0.00	0.000
				PM10	Mt	3109	0	0	0.00	0.000

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
HH3	2040	Delv	Straw	PM25	Mt	3109	0	0	0.00	0.000
				SOX	Mt	3109	0	0	0.00	0.000
				VOC	Mt	3109	0	0	0.00	0.000
HH3	2040	Delv	Switchgrass	NH3	Mt	3109	0	0	6.19	0.174
				NOX	Mt	3109	0	0	284.01	9.140
				PM10	Mt	3109	0	0	71.37	2.024
				PM25	Mt	3109	0	0	10.26	0.376
				SOX	Mt	3109	0	0	3.36	0.089
				VOC	Mt	3109	0	0	26.14	0.718
HH3	2040	Prod	Corn	NH3	Mt	3109	0	0	1623.25	111.773
				NOX	Mt	3109	0	0	380.53	28.474
				PM10	Mt	3109	0	0	1230.14	88.842
				PM25	Mt	3109	0	0	247.72	17.964
				SOX	Mt	3109	0	0	5.45	0.099
				VOC	Mt	3109	0	0	467.52	31.525
HH3	2040	Prod	Corn stover	NH3	Mt	3109	0	0	817.70	36.015
				NOX	Mt	3109	0	0	166.45	7.375
				PM10	Mt	3109	0	0	220.43	12.499
				PM25	Mt	3109	0	0	44.17	2.505
				SOX	Mt	3109	0	0	0.02	0.001
				VOC	Mt	3109	0	0	1.17	0.069
HH3	2040	Prod	Miscanthus	NH3	Mt	3109	0	0	1241.21	44.004
				NOX	Mt	3109	0	0	223.21	7.921
				PM10	Mt	3109	0	0	452.98	16.827
				PM25	Mt	3109	0	0	90.75	3.371
				SOX	Mt	3109	0	0	0.04	0.001
				VOC	Mt	3109	0	0	45.95	1.706
HH3	2040	Prod	Straw	NH3	Mt	3109	0	0	317.58	6.224
				NOX	Mt	3109	0	0	66.70	1.307
				PM10	Mt	3109	0	0	1220.73	23.777
				PM25	Mt	3109	0	0	244.24	4.757
				SOX	Mt	3109	0	0	0.03	0.000
				VOC	Mt	3109	0	0	1.38	0.027
HH3	2040	Prod	Switchgrass	NH3	Mt	3109	0	0	763.61	24.077
				NOX	Mt	3109	0	0	138.74	4.345
				PM10	Mt	3109	0	0	470.61	11.787
				PM25	Mt	3109	0	0	94.26	2.361
				SOX	Mt	3109	0	0	0.03	0.001
				VOC	Mt	3109	0	0	64.11	1.608

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
HHHE	2040	Delv	Logging residue	NH3	Mt	3109	0	0	2.51	0.052
				NOX	Mt	3109	0	0	133.56	2.767
				PM10	Mt	3109	0	0	29.22	0.821
				PM25	Mt	3109	0	0	4.49	0.132
				SOX	Mt	3109	0	0	1.31	0.027
				VOC	Mt	3109	0	0	121.52	3.420
HHHE	2040	Delv	Whole tree	NH3	Mt	3109	0	0	6.64	0.139
				NOX	Mt	3109	0	0	364.39	7.255
				PM10	Mt	3109	0	0	81.00	2.091
				PM25	Mt	3109	0	0	13.40	0.340
				SOX	Mt	3109	0	0	3.34	0.071
				VOC	Mt	3109	0	0	224.13	8.691
HHHE	2040	Prod	Logging residue	NH3	Mt	3109	0	0	0.02	0.001
				NOX	Mt	3109	0	0	1.51	0.052
				PM10	Mt	3109	0	0	0.06	0.002
				PM25	Mt	3109	0	0	0.06	0.002
				SOX	Mt	3109	0	0	0.01	0.000
				VOC	Mt	3109	0	0	0.61	0.021
HHHE	2040	Prod	Whole tree	NH3	Mt	3109	0	0	6.45	0.102
				NOX	Mt	3109	0	0	4.97	0.204
				PM10	Mt	3109	0	0	0.19	0.007
				PM25	Mt	3109	0	0	0.18	0.007
				SOX	Mt	3109	0	0	0.04	0.002
				VOC	Mt	3109	0	0	2.23	0.087
MHLE	2017	Delv	Logging residue	NH3	Mt	3109	0	0	5.28	0.076
				NOX	Mt	3109	0	0	1216.19	17.245
				PM10	Mt	3109	0	0	59.42	1.539
				PM25	Mt	3109	0	0	51.47	0.807
				SOX	Mt	3109	0	0	2.98	0.042
				VOC	Mt	3109	0	0	90.79	3.342
MHLE	2017	Delv	Whole tree	NH3	Mt	3109	0	0	9.24	0.174
				NOX	Mt	3109	0	0	2154.80	39.964
				PM10	Mt	3109	0	0	186.63	4.872
				PM25	Mt	3109	0	0	92.33	1.997
				SOX	Mt	3109	0	0	5.05	0.096
				VOC	Mt	3109	0	0	323.03	11.654
MHLE	2017	Prod	Logging residue	NH3	Mt	3109	0	0	0.01	0.001
				NOX	Mt	3109	0	0	3.99	0.219
				PM10	Mt	3109	0	0	0.25	0.013

scenario	year	srce	feedstock	indicator	units	_obs_	_mis_	_min_	_max_	_avg_
MHLE	2017	Prod	Logging residue	PM25	Mt	3109	0	0	0.24	0.013
				SOX	Mt	3109	0	0	0.01	0.000
				VOC	Mt	3109	0	0	0.40	0.021
MHLE	2017	Prod	Whole tree	NH3	Mt	3109	0	0	20.53	0.438
				NOX	Mt	3109	0	0	54.45	1.658
				PM10	Mt	3109	0	0	3.69	0.106
				PM25	Mt	3109	0	0	3.58	0.103
				SOX	Mt	3109	0	0	0.11	0.003
				VOC	Mt	3109	0	0	6.44	0.203
MHLE	2040	Delv	Logging residue	NH3	Mt	3109	0	0	1.71	0.056
				NOX	Mt	3109	0	0	93.07	2.930
				PM10	Mt	3109	0	0	50.09	0.867
				PM25	Mt	3109	0	0	6.05	0.140
				SOX	Mt	3109	0	0	0.86	0.028
				VOC	Mt	3109	0	0	128.22	3.619
MHLE	2040	Delv	Whole tree	NH3	Mt	3109	0	0	6.18	0.178
				NOX	Mt	3109	0	0	336.58	9.337
				PM10	Mt	3109	0	0	188.60	3.100
				PM25	Mt	3109	0	0	22.45	0.479
				SOX	Mt	3109	0	0	3.11	0.091
				VOC	Mt	3109	0	0	520.09	12.837
MHLE	2040	Prod	Logging residue	NH3	Mt	3109	0	0	0.02	0.001
				NOX	Mt	3109	0	0	1.65	0.054
				PM10	Mt	3109	0	0	0.06	0.002
				PM25	Mt	3109	0	0	0.06	0.002
				SOX	Mt	3109	0	0	0.01	0.000
				VOC	Mt	3109	0	0	0.67	0.022
MHLE	2040	Prod	Whole tree	NH3	Mt	3109	0	0	9.15	0.163
				NOX	Mt	3109	0	0	11.41	0.307
				PM10	Mt	3109	0	0	0.43	0.011
				PM25	Mt	3109	0	0	0.42	0.010
				SOX	Mt	3109	0	0	0.09	0.002
				VOC	Mt	3109	0	0	5.12	0.131