Gas Customer models:

Residential heating Customers

System: SYS01_GASRESCUST_LOG
Estimation Method: Iterative Seemingly Unrelated Regression

Sample: 2001M04 2008M04
Included observations: 85
Total system (balanced) observations 170
Simultaneous weighting matrix & coefficient iteration

Dependent Variable: LOG(GASRESCUST_HT)	Coefficient	Std. Error	t-Statistic	Prob.
Odd_Months	-0.81134	0.31074	-2.61100	0.00990
Even_Months	-0.79355	0.30998	-2.56001	0.01140
January	0.04923	0.00395	12.45171	0.00000
LOG(GASRESCUST [-2])	0.83719	0.03827	21.87500	0.00000
LOG(HOUSEHOLDSGAS)	0.54785	0.13173	4.15892	0.00005
March, 2005	-0.02457	0.00959	-2.56344	0.01130
R-squared	0.97791	Mean dependent var		10.80494
Adjusted R-squared	0.97651	S.D. dependent var		0.06349
S.E. of regression	0.00973	Sum squared resid		0.00748
Durbin-Watson stat	2.16882			
Residual correlation:	0.70594			

Key:

• Odd_Months is a dummy variable, taking on the value one in the months of January/March/May/July/September/November, and zero otherwise;

• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• GASRESCUST [-2] is the dependent variable lagged two months;

• HOUSEHOLDSGAS is Central Hudson's gas sales-weighted calculation of households, using county-specific data from Economy.com.

Residential non-heating Customers

System: SYS01_GASRESCUST_LOG
Estimation Method: Iterative Seemingly Unrelated Regression

Sample: 2001M04 2008M04
Included observations: 85
Total system (balanced) observations 170
Simultaneous weighting matrix & coefficient iteration

Dependent Variable: LOG(GASRESCUST_NH)	Coefficient	Std. Error	t-Statistic	Prob.
Odd_Months	1.61930	0.49390	3.27860	0.00128
Even_Months	1.66669	0.50528	3.29854	0.00120
January	0.05947	0.00576	10.32359	0.00000
LOG(GASRESCUST_NH [-2])	0.83903	0.04978	16.85573	0.00000
SH Cust / HH Ratio	-0.00036	0.00011	-3.22491	0.00153
March, 2005	-0.03645	0.01389	-2.62455	0.00953
Observations: 85				
R-squared	0.98222	Mean dependent var		9.23426
Adjusted R-squared	0.98109	S.D. dependent var		0.10164
S.E. of regression	0.01398	Sum squared resid		0.01543
Durbin-Watson stat	2.22898			
Residual correlation:	0.70594			

Key:

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• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• January is a dummy variable, taking on the value one in the month of January, and zero otherwise;

• GASRESCUST_NH [-2] is the dependent variable lagged two months;

• SH Cust / HH Ratio is the current saturation of gas space heating;

• March, 2005 is a dummy variable, taking on the value one in that month/year, and zero otherwise.

Commercial heating Customers

Dependent Variable: D{LOG(GASCOMCUST_HT)}
Method: Least Squares

Sample (adjusted): 2001M04 2008M04
Included observations: 85 after adjustments

MA Backcast: 2001M02 2001M03

	Coefficient	Std. Error	t-Statistic	Prob.
D{Even_Months}	0.04445	0.00722	6.15749	0.00000
D{January}	0.05467	0.00546	10.02161	0.00000
D{June}	-0.02207	0.00464	-4.75184	0.00000
D{August}	-0.02741	0.00467	-5.86322	0.00000
D{LOG(Emp. Nonman. [-1])}	0.54365	0.17952	3.02839	0.00330
D{LOG(GASCOMCUST_HT [-2])}	0.71346	0.08098	8.81057	0.00000
Moving Average Error [-1]	-0.32071	0.10223	-3.13699	0.00240
Moving Average Error [-2]	-0.65331	0.10524	-6.20803	0.00000
R-squared	0.98622	Mean dependent var		0.00298
Adjusted R-squared	0.98496	S.D. dependent var		0.09530
S.E. of regression	0.01169	Akaike info criterion		-5.97155
Sum squared resid	0.01051	Schwarz criterion		-5.74165
Log likelihood	261.79070	Durbin-Watson stat		2.48590

Key:

• D{} signifies a first difference;

• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• January is a dummy variable, taking on the value one in the month of January, and zero otherwise;

• June is a dummy variable, taking on the value one in the month of June, and zero otherwise;

• August is a dummy variable, taking on the value one in the month of August, and zero otherwise;

• Emp. Nonman. [-1] is non-manufacturing employment lagged one month;

• GASCOMCUST_HT [-2] is the dependent variable lagged two months.

Commercial non-heating Customers

Dependent Variable: D{LOG(GASCOMCUST_NH)}
Method: Least Squares

Sample (adjusted): 2001M04 2008M04
Included observations: 85 after adjustments

MA Backcast: 2001M03

	Coefficient	Std. Error	t-Statistic	Prob.
D{Even_Months}	0.22802	0.00639	35.67534	0.00000
D{January}	0.03672	0.00700	5.24342	0.00000
D{March}	0.02720	0.00684	3.97998	0.00015
Autoregressive Error [-1]	-0.47725	0.12420	-3.84257	0.00024
Moving Average Error [-1]	-0.52532	0.11687	-4.49497	0.00002

R-squared	0.99275	Mean dependent var	0.00197
Adjusted R-squared	0.99238	S.D. dependent var	0.22082
S.E. of regression	0.01927	Akaike info criterion	-5.00346
Sum squared resid	0.02971	Schwarz criterion	-4.85978
Log likelihood	217.64711	Durbin-Watson stat	1.92346

Key:

• D{} signifies a first difference;

• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• January is a dummy variable, taking on the value one in the month of January, and zero otherwise;

• March is a dummy variable, taking on the value one in the month of March, and zero otherwise.

OPA Customers

Dependent Variable: GASOPACUST
Method: Least Squares

Sample (adjusted): 2001M01 2008M03
Included observations: 87 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
Odd_Months	661.82755	6.79813	97.35439	0.00000
Even_Months	722.25382	7.08969	101.87377	0.00000
March	28.28734	8.75650	3.23044	0.00179
June / August	-28.07590	7.23334	-3.88145	0.00021
Months Since December, 2000	0.35490	0.12445	2.85181	0.00551
Autoregressive Error [-1]	0.22437	0.10604	2.11589	0.03743

R-squared	0.63050	Mean dependent var	705.21839
Adjusted R-squared	0.60769	S.D. dependent var	36.03791
S.E. of regression	22.57231	Akaike info criterion	9.13780
Sum squared resid	41270.22590	Schwarz criterion	9.30786
Log likelihood	-391.49415	Durbin-Watson stat	1.98336

Key:

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• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• March is a dummy variable, taking on the value one in the month of March, and zero otherwise;

• June is a dummy variable, taking on the value one in the month of June, and zero otherwise;

• August is a dummy variable, taking on the value one in the month of August, and zero otherwise;

• Months Since December, 2000 is a time trend starting at one in January, 2001.

Industrial Customers

Dependent Variable: LOG(GASINDCUST)
Method: Least Squares

Sample: 2001M04 2008M04
Included observations: 85

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.90030	0.36421	7.96333	0.00000
January	0.05962	0.01004	5.94121	0.00000
March	0.04033	0.01163	3.46817	0.00090
April	0.02823	0.00947	2.98081	0.00380
December	0.02346	0.01010	2.32368	0.02280
March, 2002	-0.18873	0.02754	-6.85362	0.00000
LOG(GASINDCUST [-2])	0.29836	0.08177	3.64885	0.00050
LOG(Emp. Man.)	0.44667	0.06232	7.16725	0.00000

R-squared	0.79498	Mean dependent var	5.68680
Adjusted R-squared	0.77634	S.D. dependent var	0.05274
S.E. of regression	0.02494	Akaike info criterion	-4.45499
Sum squared resid	0.04791	Schwarz criterion	-4.22509
Log likelihood	197.33690	F-statistic	42.65271
Durbin-Watson stat	2.20801	Prob(F-statistic)	0.00000

Key:

• January is a dummy variable, taking on the value one in the month of January, and zero otherwise;

• March is a dummy variable, taking on the value one in the month of March, and zero otherwise;

• April is a dummy variable, taking on the value one in the month of April, and zero otherwise;

• December is a dummy variable, taking on the value one in the month of December, and zero otherwise;

• March, 2002 is a dummy variable, taking on the value one in that month/year, and zero otherwise.

• GASINDCUST [-2] is the dependent variable lagged two months;

• Emp. Man. is manufacturing employment.

Gas Sales models:

Residential heating Sales per Customer

Dependent Variable: GASRESUPC_HT
Method: Least Squares

Sample: 2001M04 2008M03
Included observations: 84

	Coefficient	Std. Error	t-Statistic	Prob.
February	0.74071	0.16772	4.41646	0.00000
May	-0.61731	0.15232	-4.05265	0.00010
July	0.78309	0.17270	4.53442	0.00000
August	1.32752	0.18692	7.10197	0.00000
September	0.96575	0.17741	5.44361	0.00000
November	-1.11276	0.15450	-7.20211	0.00000
"X" – HEATING	0.00002	0.00000	69.73277	0.00000
"X" – OTHER	0.02821	0.00818	3.44753	0.00090
Autoregressive Error [-1]	0.27893	0.11489	2.42785	0.01760

R-squared	0.99568	Mean dependent var	8.09024
Adjusted R-squared	0.99522	S.D. dependent var	5.84212
S.E. of regression	0.40389	Akaike info criterion	1.12560
Sum squared resid	12.23445	Schwarz criterion	1.38605
Log likelihood	-38.27526	Durbin-Watson stat	1.93521

Key:

• February is a dummy variable, taking on the value one in the month of February, and zero otherwise;

• May is a dummy variable, taking on the value one in the month of May, and zero otherwise;

• July is a dummy variable, taking on the value one in the month of July, and zero otherwise;

• August is a dummy variable, taking on the value one in the month of August, and zero otherwise;

• September is a dummy variable, taking on the value one in the month of September, and zero otherwise;

• November is a dummy variable, taking on the value one in the month of November, and zero otherwise.

Residential non-heating Sales per Customer

Dependent Variable: GASRESUPC_NH
Method: Least Squares

Sample: 2001M04 2008M03
Included observations: 84

	Coefficient	Std. Error	t-Statistic	Prob.
"X" – OTHER	0.03556	0.00494	7.19742	0.00000
"X" – HH Size Index	0.00110	0.00012	8.88679	0.00000
Income Elasticity on Income Index	1.02321	0.28635	3.57327	0.00060
GASRESUPC_NH [-12]	0.28718	0.08237	3.48670	0.00080
Autoregressive Error [-1]	0.25309	0.11072	2.28593	0.02490

R-squared	0.96174	Mean dependent var	1.67679
Adjusted R-squared	0.95980	S.D. dependent var	0.68173
S.E. of regression	0.13669	Akaike info criterion	-1.08460
Sum squared resid	1.47594	Schwarz criterion	-0.93990
Log likelihood	50.55300	Durbin-Watson stat	2.06594

Key:

• GASRESUPC_NH [-12] is the dependent variable lagged 12 months.

Commercial heating Sales per Customer

Dependent Variable: GASCOMUSE_HT
Method: Least Squares

Sample (adjusted): 2001M04 2008M03
Included observations: 84

	Coefficient	Std. Error	t-Statistic	Prob.
Even_Months	-5.26326	0.89181	-5.90179	0.00000
April	-6.47547	1.08333	-5.97739	0.00000
May	-9.11431	1.08414	-8.40695	0.00000
August	4.89780	1.20467	4.06566	0.00010
November	-7.02232	1.05324	-6.66734	0.00000
"X" – HEATING	0.04979	0.00049	102.28070	0.00000
"X" – OTHER	149.06210	7.86090	18.96247	0.00000
Autoregressive Error [-1]	-0.32262	0.11020	-2.92750	0.00450
R-squared	0.99138	Mean dependent var		40.89774
Adjusted R-squared	0.99059	S.D. dependent var		26.34393
S.E. of regression	2.55570	Akaike info criterion		4.80492
Sum squared resid	496.40300	Schwarz criterion		5.03643
Log likelihood	-193.80680	Durbin-Watson stat		1.91823

Key:

• Even_Months is a dummy variable, taking on the value one in the months of February/April/June/August/October/December, and zero otherwise;

• April is a dummy variable, taking on the value one in the month of April, and zero otherwise;

• May is a dummy variable, taking on the value one in the month of May, and zero otherwise;

• August is a dummy variable, taking on the value one in the month of August, and zero otherwise;

• November is a dummy variable, taking on the value one in the month of November, and zero otherwise.

Commercial non-heating Sales per Customer

Dependent Variable: GASCOMUSE_NH
Method: State Space - Maximum likelihood (Marquardt)

Sample: 2001M04 2008M03
Included observations: 84

	Coefficient		Std. Error	t-Statistic	Prob.
"X" – HEAT	0.00898		0.00173	5.19821	0.00000
"X" – OTHER	201.53130		25.72110	7.83525	0.00000
Output Elasticity on GDP Index	1.20000	**			
GASCOMUPC_NH [-12]	0.38941		0.08511	4.57558	0.00000
Autoregressive Error [-1]	-0.83582		0.19351	-4.31918	0.00000
Moving Average Error [-1]	0.70144		0.22189	3.16123	0.00160
Log likelihood	-275.47120		Akaike info criterion		6.70170
Parameters	6.00000		Schwarz criterion		6.87533
Diffuse priors	0.00000		Hannan-Quinn criter.		6.77149

** The estimated elasticity was approximately 2.06; it was subsequently constrained to 1.20, a value just above the lower boundary of a 95% confidence interval.

Key:

• GASCOMUPC_NH [-12] is the dependent variable lagged 12 months.

OPA Sales per Customer

Dependent Variable: GASOPAUPC
Method: Least Squares

Sample (adjusted): 2001M04 2008M03
Included observations: 84

	Coefficient	Std. Error	t-Statistic	Prob.
Odd_Months / August	9.40032	1.65863	5.66751	0.00000
January / December	18.96682	3.22644	5.87857	0.00000
May	-22.71175	4.01941	-5.65053	0.00000
"X" – HEATING	0.10476	0.02652	3.95094	0.00020
Output Elasticity on GDP Index	1.03922	0.03552	29.25671	0.00000
Autoregressive Error [-1]	0.27836	0.10981	2.53502	0.01320

R-squared	0.98584	Mean dependent var	94.73548
Adjusted R-squared	0.98493	S.D. dependent var	77.06256
S.E. of regression	9.45995	Akaike info criterion	7.40076
Sum squared resid	6980.27800	Schwarz criterion	7.57439
Log likelihood	-304.83200	Durbin-Watson stat	2.02397

Key:

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• January is a dummy variable, taking on the value one in the month of January, and zero otherwise;

• May is a dummy variable, taking on the value one in the month of May, and zero otherwise;

• August is a dummy variable, taking on the value one in the month of August, and zero otherwise;

• December is a dummy variable, taking on the value one in the month of December, and zero otherwise.

Industrial Sales per Customer

Dependent Variable: GASINDUPC
Method: Least Squares

Sample (adjusted): 2003M01 2008M03
Included observations: 63 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
April	-42.23860	14.43222	-2.92669	0.00490
"X" – HEATING	0.15292	0.00686	22.28568	0.00000
"X" – OTHER	532.38410	80.59355	6.60579	0.00000
Seasonal Autoregressive Error [-12]	0.26098	0.11850	2.20235	0.03160

R-squared	0.93502	Mean dependent var	148.94700
Adjusted R-squared	0.93172	S.D. dependent var	86.34013
S.E. of regression	22.56192	Akaike info criterion	9.13179
Sum squared resid	30033.37000	Schwarz criterion	9.26786
Log likelihood	-283.65140	Durbin-Watson stat	1.94345

Key:

• April is a dummy variable, taking on the value one in the month of April, and zero otherwise.