Billing Data
How To Read It & What To Do With It

- Natural Gas Bill
  - Values and Determinants
- Electric Bills
  - Values and Determinants
  - Example Calculation of Electric Bill
  - Interval Data and Load Profile Importance
- Energy Usage & Cost Spreadsheet
- Common Billing Errors

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Natural GasMeter

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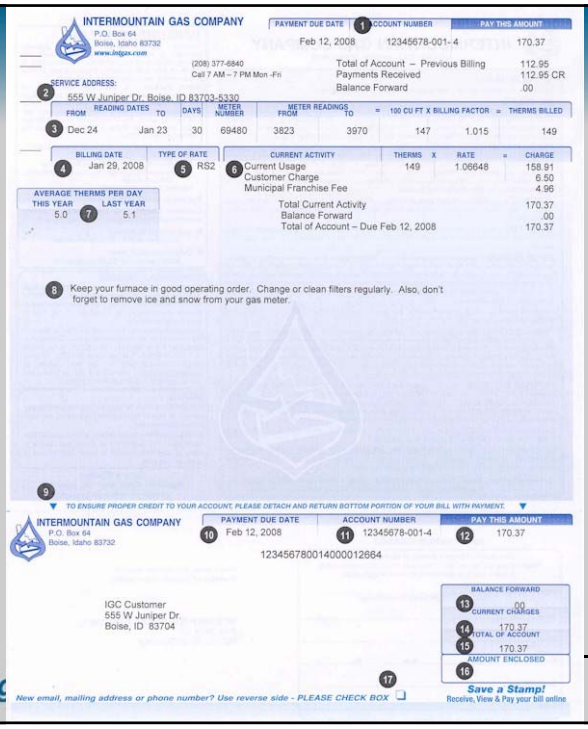

INTERMOUNTAIN GAS COMPANY
P.O. Box 64
Boise, Idaho 83732
www.intgas.com

(208) 377-6840
Call 7 AM – 7 PM Mon -Fri

PAYMENT DUE DATE	ACCOUNT NUMBER	PAY THIS AMOUNT
Feb 12, 2008	12345678-001- 4	170.37

Total of Account – Previous Billing	112.95
Payments Received	112.95 CR
Balance Forward	.00

SERVICE ADDRESS:
555 W Juniper Dr. Boise, ID 83703-5330

READING DATES FROM	TO	DAYS	METER NUMBER	METER READINGS FROM	TO	= 100 CU FT X	BILLING FACTOR =	THERMS BILLED
Dec 24	Jan 23	30	69480	3823	3970	147	1.015	149

BILLING DATE	TYPE OF RATE
Jan 29, 2008	RS2

CURRENT ACTIVITY	THERMS X	RATE =	CHARGE
Current Usage	149	1.06648	158.91
Customer Charge			6.50
Municipal Franchise Fee			4.96
Total Current Activity			170.37
Balance Forward			.00
Total of Account – Due Feb 12, 2008			170.37

AVERAGE THERMS PER DAY THIS YEAR	LAST YEAR
5.0	5.1

Keep your furnace in good operating order. Change or clean filters regularly. Also, don't forget to remove ice and snow from your gas meter.

TO ENSURE PROPER CREDIT TO YOUR ACCOUNT, PLEASE DETACH AND RETURN BOTTOM PORTION OF YOUR BILL WITH PAYMENT.

INTERMOUNTAIN GAS COMPANY
P.O. Box 64
Boise, Idaho 83732

PAYMENT DUE DATE	ACCOUNT NUMBER	PAY THIS AMOUNT
Feb 12, 2008	12345678-001-4	170.37

12345678001400001266 4

IGC Customer
555 W Juniper Dr.
Boise, ID 83704

BALANCE FORWARD	.00
CURRENT CHARGES	170.37
TOTAL OF ACCOUNT	170.37
AMOUNT ENCLOSED	

New email, mailing address or phone number? Use reverse side - PLEASE CHECK BOX

Save a Stamp!
Receive, View & Pay your bill online

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Review of Typical Gas Bill

- Account Status: This area summarizes the status of your account. Displayed is your payment due date, your account number and the amount that you should pay. Below this you will find the total of your last billing, payments received, and the balance forward.
- Service Address: Identifies the physical location of your service.
- Meter Reading Information: This area has the date that your meter was read, number of days you were billed, your meter number, and actual readings taken from your meter. The difference between the two readings shows the cubic feet used. The cubic feet multiplied by the billing factor equals the therms* billed.
- Billing Date: The actual date your account was billed.
- Type of Rate: Identifies the charges used to calculate your bill.
- Current Activity: This area details the charges for the current billing period. The number of therms multiplied by the rate equals your current monthly charge for usage. Also listed under the current activity is your customer charge and the municipal franchise fee. This area also shows any adjustments made to your account during the current billing period; giving you the total of your account, which includes any balance forward.
- Usage Comparison: A comparison of usage from this year to last year.
- News and Information: Watch this area for important news and information about your account.

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Review of Typical Gas Bill

- Bill Remittance Stub: Send this stub with your payment.
- Payment Due Date: Payment is due 15 days from the date the bill was mailed.
- Account Number: The number assigned to your service address.
- Pay This Amount: Total amount due on your account as of the billing date.
- Balance Forward: The amount from your previous month's bill less any payments received.
- Current Charges: The charges for the current billing are found here.
- Total of Account: This is the total of your balance forward and the current charges.
- Amount Enclosed: As a convenience, you may write in the amount you enclose on your payment stub.
- Mailing Address Change: Check this box if you have a change in your mailing address, phone number or email address. An area is provided on the back to notify us of the necessary changes.

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Electric Meter

Mechanical

Electronic

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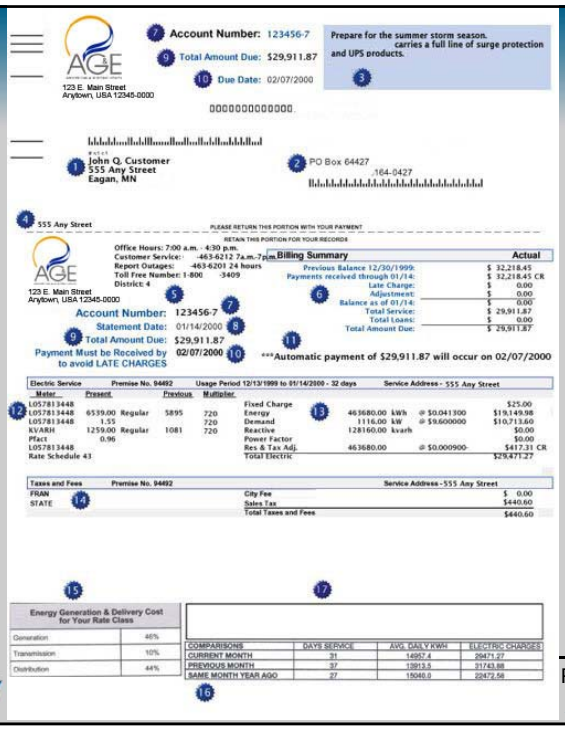

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Review of Typical Electric Bill

- **Customer and Mailing Address:** To the left you will find the responsible name on the Utility account and the mailing address (this may be different than the actual service address).
- **Payment Address:** On the right is the Utility's mailing address for paying your electric bill
- **Service Address:** This is the address where the electric service is located.
- **Customer Service Information:** The Utility's office lobby hours are 7:00 a.m. to 4:30 p.m. To report any outages call: 555-555-5555 available 24x7. To call toll free dial 1-800-555-5555.

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Review of Typical Electric Bill Continued

- **Billing Summary:** This section shows your previous bill's balance and any payments received up to the current bill's statement date. Any late charges (see #10), adjustments on your account and loans will appear here
- **Account Number:** This is your Utility's account number. For service refer to this account number when calling or e-mailing the utilties office. If you receive service at more than one location, you will have a different account number for that location.
- **Statement Date:** This is the date of your monthly billing cycle and the date the bill is prepared.
- **Total Amount Due:** This is the amount that must be paid by the due date to avoid any late charges.
- **Payment must be received by (date) to avoid Late Charges:** A late payment charge of 1.5% (percent) on any unpaid balance over $10.00 (minimum late charge is $1.00) will be applied to the next monthly bill if payment is not received by the date specified on the current bill.

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Review of Typical Electric Bill Continued

- **Charge Information Message Area:** If your account is on the Electronic Funds Transfer (EFT) program (automatic withdrawal of payment from checking or savings) a message will appear (as shown on bill display) monthly, stating the date of withdrawal.
- **Electric Service:** This section shows information about your meter. It includes the **meter serial number** (e.g. L057813448), **present** and **previous** meter reading and **reading type** (regular or estimated). **Multiplier** number is determined by the metering equipment installed for this account and used to determine amount of usage.
- **Usage period** shows the meter reading dates and number of days in this billing cycle.
- The **rate schedule**, listed below the meter number, is used to calculate your bill. The electricity the consumer/member uses is measured as follows:
- **kW** = The read demand times the meter multiplier. **kWh** and **KVAR** total usage is determined by taking the difference between the present reading and the previous reading times the meter multiplier.

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Review of Typical Electric Bill Continued

- **Fixed Charge** - This fee helps defray those specific costs not associated with the amount of energy used. Examples include - cost of the meter, cost of reading the meter monthly, maintaining the account, etc.
- **Energy Charge** - This is the total amount of energy (kWh) used times the charge per kWh for the rate schedule assigned to this account.
- **Demand Charge** - Demand (kW) is the greatest 15-minute demand during the

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Review of Typical Electric Bill Continued

- **Reactive (kvarh) -** Total amount of reactive power used during this billing period. This reading is used to determine the 'Power Factor'. The total is determined by taking the difference between the present reading and the previous reading times the meter multiplier.
- **Power Factor (Pfact) -** The member/consumer agrees to maintain as near unity power factor as practicable. Should such measurements indicate that the average power factor is less than 90 percent, the demand for billing purposes shall be the demand as recorded by the demand meter multiplied by 90 percent and divided by the percent power factor. *Pfact adjustments are part of the demand charge and are not shown here.
- **Resource and Tax Adjustment (RTA) -** The energy charge shall be adjusted for incremental changes in purchased power costs, incremental changes in the Utility's conservation tracker account balance, and incremental changes in real and personal property taxes above or below base costs.

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Review of Typical Electric Bill Continued

Franchise Fees - This is a city fee based on a percentage of the consumer/members' monthly billings. The percentage may vary from city to city. The Utility makes no profit from the collection and payment of these fees. This fee is a requirement of our franchise agreement with the city.

Sales Tax - State tax rate set forth based on taxes as of January 1, 1991. The amount of any increase in existing or new taxes on the transmission, distribution, or sales of electricity allocable to sales hereunder, excluding real and personal property taxes already recovered through the RTA, shall be added to the above rate as appropriate.

- **Energy Generation & Delivery Cost for your Rate Class:** This table shows how much of the monthly bill is related to the generation, transmission and distribution of electricity by rate class.
- **Comparison Chart:** This chart compares the current month, previous month and same month a year ago account activity.

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- Electric Bill Calculation Example

Electric Rate Structure

- Electric rates vary greatly from utility to utility, but they all have several common features.
- Commercial, Industrial, and Institutional Customers have three major components to their electric bill.
  - customer cost
  - energy cost
  - demand cost
  - others such as power factor, time of day, voltage levels, quality of power (interruptible rates), and rate class.

Electric Rate Structure Continued

- Customer Cost - a constant monthly cost; covers the utility's expenses in providing a meter, reading the meter, sending a bill, etc.
- Energy Cost – a factor based on the number of kWh of electric energy consumed each month; calculated from the utility's fuel and operating expenses.
- Demand Cost - a proportional factor based on the number of kW of power measured over small time period (15 min). In some cases, it is hidden in the energy cost.

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Typical Cost Components

- Energy cost - e.g. $0.06/kWh
- Demand cost – e.g. $15.50/kW/mo
- Fuel adjustment - e.g. $0.014/kWh
- Power factor penalty - e.g. $6.50/kVA/mo
  or kW billed = kW * (0.85/PF)
- Ratchet clause - e.g. Maximum of [kW this month, or 75% of maximum kW in last 11 months]

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Demand Ratchet

- Some utilities want to make sure a customer pays a reasonable share of the cost of providing them electrical power. One way they do this is to add a demand ratchet to their rate structure.
- The demand ratchet is usually set such that the customer pays a large percentage of the highest demand experienced over the previous ll months even if that peak was only reached one time.
- Typical demand ratchets range from 60% to 100%.

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Sample Electric Rate Structure Business Customer

- Customer charge $200.00/bill/month
- Demand charge applicable to all kW/month of billing demand:
  - On-peak season $15.50/kW
  - Off-peak season $5.75/kW
- Season Definition:
  - On-peak season: Revenue months of June-October of any year.
  - Off-peak season: Revenue months of November of any year through May of the succeeding year.

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- Energy charge:
  - First one million kWh 6.00 ¢/kWh
  - All kWh over one million 4.25 ¢/kWh
- Power factor clause:
  - When the customer's average power factor is less than 80%, the Billing Demand shall be determined by multiplying the metered demand by 80 and dividing by the actual average power factor expressed in per cent.
- Fuel cost adjustment:
  - A variable amount set by the utility to allow them to recover all their fuel costs.
- Ratchet Clause -- 75% demand ratchet

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Bill Calculation Example

- Using the rate schedule in the previous two slides, calculate the August bill for the company whose electric use is as follows:
- Month: August
  - Actual demand 300 kW
  - Consumption 60,000 kWh
  - Previous high billed demand (July) 450 kW
  - Power factor 75%
- Sales tax: 5%
- Fuel adjustment: 1.4 ¢/kWh

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Bill Calculation Example Continued

- As a first step, calculate the demand:
- *Power factor correction:*

  - PF corrected demand = (actual demand) * (.80/PF)
    = 300 kW * (.80/.75) = 319.99 kW

- Minimum demand charge (ratchet clause)
- = (450 kW) * (.75) = 337.5 kW

- Final Billed demand = Max (319.99 kW, 337.5 kW)
  = 337.5 kW

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Bill Calculation Example Continued

- Demand charge (on-peak season)
- = (337.5 kW) ($15.00/kW) = <u>$5062.5</u>

- Consumption charge*:*
- = (60,000 kWh)($.0600/kWh) = $3,600

- Fuel adjustment)
- = (60,000 kWh)($.014/kWh) = $ 840.00

- Total consumption charge = <u>$4440.00</u>

- Customer charge*:* $200.00

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Bill Calculation Example Continued

- Total charge before sales tax:
- $5062.50 + $4440.00 + $200.00 = $9702.50
- Sales tax:
  - $9702.50 × (.05) = $ 485.15
- Total: $9702.50 + $ 485.15 = $10,187.62

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Interval Data Example

NSTAR ELECTRIC

						Total KWH	Peak KW
						2,618,343	444.2
Customer	ROCHE BROS						
Address	6 MILLISTON RD MLS						
Account	25882481002						
Date / Time	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM
November 7, 2004	268.84	267.84	266.03	270.39	270.58	263.09	282.14
November 8, 2004	276.84	272.23	273.93	278.03	276.60	261.29	273.95
November 9, 2004	261.94	261.98	261.26	262.73	263.38	255.76	266.59
November 10, 2004	273.17	257.91	261.94	256.72	259.68	249.61	264.60
November 11, 2004	265.66	268.42	271.59	268.12	267.27	258.59	275.93
November 12, 2004	258.48	255.38	255.68	258.52	262.36	254.46	275.80

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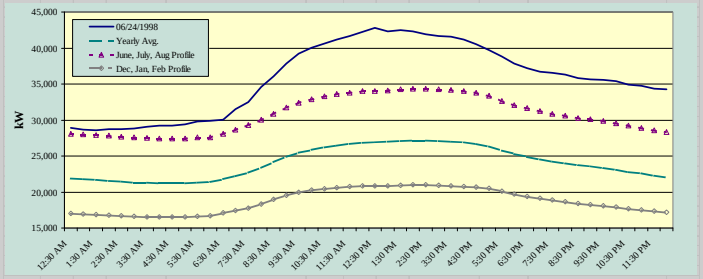
Interval Data Plotted – Load Profile

Example - Daily Electrical Consumption

06/24/1998 **Wednesday June 24, 1998**



June 24, 1998			June, July, Aug Profile		
Daily Average	35,774	kW	Season Average	30,738	kW
Daily Max	42,764	kW	Average Max	34,699	kW
Daily Load Factor	83.7%	of Daily Maximum Load	Seasonal Load Factor	88.6%	of Daily Maximum Load

April 1998 - March 1999			Dec, Jan, Feb Profile		
Yearly Average	24,116	kW	Season Average	18,737	kW
Yearly Max	42,764	kW (on 6/24/98 at 12:30 pm)	Average Max	21,163	KW
Yearly Load factor	56.4%	of Yearly Maximum Load	Seasonal Load Factor	88.5%	of Daily Maximum Load

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Energy Usage and Costs

"REPORT CARD"

CURRENT ENERGY CONSUMPTION AND COST

MONTH	Electricity		Electrical Demand		# 2 Oil		Natural Gas		Water	
YEAR	kWh	$	kW	$	GAL	$	Therms	$	GAL	$
Jul-08	1,016,313	62,304.49	2,214.4	40,014.21	3,540.10	2,145.30	56,936	15,451.71	4,293,520	32,907
Aug-08	1,326,796	80,586.44	2,369.6	42,818.67	0.00	0.00	78,724	20,507.85	4,054,160	31,062
Sep-08	1,036,177	63,451.67	2,179.2	39,378.14	0.00	0.00	74,795	21,386.32	3,657,720	27,985
Oct-08	908,076	55,689.12	1,955.2	35,330.46	1,600.00	925.00	72,049	20,159.45	3,321,120	25,384
Nov-08	807,746	44,439.99	1,547.2	15,208.98	0.00	0.00	70,376	24,782.89	2,760,120	21,069
Dec-08	734,645	40,453.89	1,736.0	17,064.88	0.00	0.00	87,413	30,235.78	2,700,280	20,612
Jan-09	706,440	39,183.88	1,291.2	12,692.50	5,264.00	2,946.79	83,836	28,103.51	2,819,960	21,519
Feb-09	753,070	41,349.76	1,334.4	13,117.15	10,925.00	6,279.68	71,810	27,174.67	2,468,400	18,837
Mar-09	683,842	39,904.23	1,294.4	12,723.95	0.00	0.00	84,225	27,176.63	2,752,640	21,012
Apr-09	694,355	40,689.20	1,635.2	16,074.02	0.00	0.00	71,980	22,215.00	2,647,920	20,200
May-09	707,782	41,366.85	1,652.8	16,247.02	5,000.00	3,036.56	77,998	21,546.87	3,066,800	23,427
Jun-09	913,047	53,152.75	1,844.8	18,134.38	0.00	0.00	72,565	17,413.88	3,236,840	24,766
Totals	10,288,289	602,572.29	1,754.53	278,804.37	26,329.10	15,333.33	902,708	276,155	37,779,480	288,780.49
Avg. $/unit	kWh	0.0586	Summer $/KW	**18.07**	$/Gal	0.582371976	$/Therm	0.30591793	$/Gal	0.007643845
	KWH&KW	0.0857	Winter $/KW	**9.83**						
Total MBTU's	119,344,152		N.A.		3,651,846		90,270,800		Total Gal	37,779,480
MBTUs/Sq. Ft.	240.53		N.A.		7.36		181.94		Gal/SQ. Ft	76.14313009

MBTU Conversion Factors			
Electricity	11.6	MBTU/KWH	3.413
#2 Distillate Oil	138.7	MBTU/GAL	
Natural Gas	100	MBTU/THERM	

Annual Energy Index	*A.E.I.*	*429.83*
Annual Energy Costs	*A.E.C.*	*$2.36*

Total MBTU	213,266,799
Gross Square Footage of Heated Space:	496,164

Costs	
Total Energy	$1,172,865
Total Water	$288,780
Total E & W	**$1,461,645**

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Common Billing Errors

- Incorrect meter readings or estimated
- Faulty meters or misapplied multipliers
- Usage charges and incorrect normalization
- Surcharges, taxes & tariffs
- Redundant billing charges
- Demand reading errors or calculations
- No longer your Bill!

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Thank You

Any Questions?

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