Chapter 11

Fingertip Facts

This fact sheet contains statistical energy information-conversion factors, R-values, fuel prices, energy efficiency recommendations, and climatic data for Louisiana. It serves as a reference guide for those seeking a quick answer to an energy question.

Abbreviations

Btu	British Thermal Unit, the amount of heat needed to increase the temperature of one pound of water one degree Fahrenheit (about the amount of heat released when a kitchen match burns)
1° F	one degree Fahrenheit
MMBtu	one million Btu
kWh	kilowatt-hour
kW	kilowatt
cf	cubic foot
cfm	cubic foot per minute
bbl	barrel
gal	gallon

Energy and Fuel Data

Energy Units

1 kWh = 3,412 Btu
1 MMBtu = 293 kWh
1 Btu = 252 calories
1 Btu = 1,055 joules

Power Units

1 kW = 3,412 Btu/hour
1 horsepower = 746 watts
1 ton of heating/cooling = 12,000 Btu/hour

Fuel Units

1 cf of natural gas ≈ 1,000 Btu
1 therm = 100,000 Btu
1 bbl fuel oil = 42 gallons = 5.88 MMBtu
1 ton fuel oil = 6.8 bbl
1 gallon fuel oil = 136,000 Btu
1 gallon of propane = 91,500 Btu
1 ton bituminous (Eastern) coal = 21-26 MMBtu
1 ton subbituminous (Western) coal = 14-18 MMBtu
1 cord wood = 128 cubic feet (4 ft x 4 ft x 8 ft)
1 cord dried pine = 14.2 MMBtu

Average Daily Solar Radiation

(Btu/sq ft on a Vertical, South-Facing Surface)

	Latitude	***January***	***July***
Baton Rouge	30.5	889	786
Lake Charles	30.1	790	795
New Orleans	30.0	950	801
Shreveport	32.5	920	804

Insulating Values

The R-value is the measure of resistance to heat flow via conduction. R-values vary according to specific materials and installation.

Insulation	*R-value per inch*
Fiberglass batts/rolls	3.1 to 4.3
Fiberglass loose-fill	2.2 to 2.6
Rock wool loose-fill	2.6
Cellulose	3.7
Vermiculite	2.1
Perlite	3.3

Rigid Insulation Boards	*R-value per inch*
Fiberboard sheathing (non-insulating blackboard)	2.6
Expanded polystyrene (beadboard)	4.0
Extruded polystyrene	5.0
Polyisocyanurate and polyurethane	6.8 to 7.2

Building Materials	*R-value per inch*
Drywall	0.9
Wood siding	0.9 to 1.2
Common brick	0.2
Lumber and siding	
Hardwood	0.8 to 0.94
Softwood	0.9 to 1.5
Plywood	1.3
Particle Board (medium density)	1.1
Asbestos-cement (entire shingle)	0.21
Concrete block (entire block)	
Unfilled	0.4 to 1.2
Filled with vermiculite/perlite	1.3 to 2.0
Filled with cement mortar	0.2

Dead Air Spaces	*R-value of air space*
1/2-inch	0.75
3/4-inch	0.77
3–1/2-inch	0.80
3–1/2-inch, reflecting surface on one side	1.6
3–1/2-inch, reflecting surface both sides	2.2

Air Films	*R-value of air film*
Still air (vertical wall)	0.68
15 mph wind (winter)	0.17
7.5 mph wind (summer)	0.25

HVAC Equipment Efficiencies

Annual Fuel Utilization Efficiency (AFUE) shows the average annual efficiency at which fuel-burning or electric resistance furnaces operate.

Coefficient of Performance (COP) measures how many units of heating or cooling are delivered for every unit of electricity used in a heat pump or air conditioner.

Heating Season Performance Factor (HSPF) measures the average number of Btu of heating delivered for every watt-hour of electricity used by a heat pump.

Seasonal Energy Efficiency Ratio (SEER) measures how readily air conditioners convert electricity into cooling—a SEER of 10 means the unit provides 10,000 Btu's of cooling per kilowatt-hour of electricity.

Ranges of Efficiency	***Low***	***Moderate***	***High***
Gas furnaces (AFUE)	0.78	0.80	0.95
Air conditioning (SEER)	10	13	15
Heat Pump (HSPF)	6.8	7.2	8.0

Climatic Data for Louisiana

Heating Degree Days (HDD) are a measure of how cold a location is in winter. Heating degree days are calculated by multiplying the difference in temperature below 65°F by the amount of time at that temperature. For example, if the temperature were 41°F for 10 hours, it would mean 10 heating degree days: (65°F - 41°F) * (10 hrs) / (24 hrs per day).

Cooling Degree Days (CDD), are a measure of how hot a location typically is during summer. They are calculated similarly to heating degree days, but for temperatures above 65°F. For example, if the temperature were 89°F for 6 hours, it would mean 6 cooling degree days: (89°F - 65°F) * (6 hrs) / (24 hrs per day).

Winter and Summer Design Temperatures should be used by heating and cooling contractors when sizing heating and cooling systems. They show the temperatures that are exceeded in summer or dipped below in winter only ***2.5% of the time.***

Table 11-1
Climatic Data for Louisiana

Location	***Winter Design Temperature***	***Heating Degree Days***	***Summer Design Temperature***	***Cooling Degree Days***
Alexandria	27	2066	94	2991
Baton Rouge	29	1526	93	3275
Lafayette	30	1547	94	3238
Lake Charles	31	1646	93	3095
Monroe	25	2484	96	2754
New Orleans	33	1374	92	3213
Shreveport	25	2286	96	2974

Table 11-2
Average Monthly Temperatures

	Baton Rouge	***Lake Charles***	***New Orleans***	***Shreveport***
JAN	50.1	50.9	52.6	46.4
FEB	53.5	54.4	55.7	51.2
MAR	60.3	61.0	62.4	58.5
APR	66.6	67.3	68.2	65.2
MAY	74.0	74.9	75.6	73.0
JUN	79.7	80.5	80.7	79.9
JUL	81.7	82.6	82.7	83.4
AUG	81.4	82.4	82.5	82.9
SEP	77.5	78.4	78.9	77.0
OCT	68.1	69.5	70.0	66.7
NOV	59.0	60.1	61.4	56.1
DEC	52.4	53.3	55.1	48.4
YEAR	67.1	68.0	68.9	65.8

Table 11-3
Comparative Climatic Data
****For February 2006 through February 2009***

Location	***Average Temperature***	****Heating Degree Days***	****Cooling Degree Days***
Honolulu, HI	77	11	4,746
Miami, FL	76	182	4,791
Brownsville, TX	74	707	4,396
Houston, TX	69	1,561	3,459
Tucson, AZ	68	1,969	3,390
Mobile, AL	67	1,894	2,867
Jackson, MS	65	2,434	2,788
Birmingham, AL	62	2,902	2,535
Atlanta, GA	61	3,721	2,099
Memphis, TN	62	3,222	2,650
New York, NY	55	5,007	1,258
Washinton, DC	54	4,274	1,804
Chicago, IL	51	6,539	1,189
Glasgow, MT	42	9,100	941
Fargo, ND	41	9,622	826
Caribou, ME	39	9,974	351
International Falls, MN	37	11,169	418
Fairbanks, AK	20	14,746	159

Notes: