Willits Area Imported Energy Usage, Present Day
[Off-grid & local co-generation (solar, hydro, etc.) not considered]

Fuel	Annual Residential	Annual Non-Resid.	Total (annual)	Units	Unit Cost	Annual Value	Total (daily), Therms	Total (daily), MegaWatts	Average Daily per Person (KW)	CO2 Emission Factor	Total CO2 Emissions (tons)	Fuel Source & Processing	Data Sources (see Notes)
Natural Gas	0.91	0.87	1.78	MT	$1,200,000	$2,136,000	4,877	143	11	11.70	10,413	15% Calif., 24% Foreign (Canada); pipelined	1, 2, 3, 7
Electricity	37	28	65	MKWh	$140,000	$9,100,000	6,080	178	13	1.43	46,475	78% Calif. (Calif. Fuels: 33% natural gas, 13% nuclear, 12% hydro, 10% coal, 10% renewable), minor Foreign (Canada); transmission lines	non-resid=1, 12; resid=4; 8
Gasoline			5,626,746	Gallons	$2.00	$11,253,492	17,111	501	38	19.80	55,705	42% Calif., 35% Foreign; pipelined, sea transport; in-state refineries	3, 5, 10
Other Transportation Fuels (e.g. Diesel)			838,026	Gallons	$2.25	$1,885,559	3,031	89	7	19.80	8,296	as above, negligible bio fuels	as above
Propane			750,000	Gallons	$2.00	$1,500,000	1,397	41	3	12.67	4,751	refined, generally from natural gas	14
Firewood			12,252	Cords	$165	$2,021,580	4,699	138	10	1.00	15,254	local (source and processing)	6, 9
Total Daily Consumption:							**37,196**	**1,089**	**82**				
Total Annual Value of Consumed energy:						**$27,896,631**							

Annual Cost [per Person], [per Household] of Total Fuels Consumed (note 11):	**$2,097**	**$5,464.57**
Percentage of Median After-tax Household Income Expended on Energy (note 13):		**22%**

Total Annual Emissions for Consumed Energy (tons):	**140,894**	
Annual CO2 Emissions [per Person], [per Household] in tons from above-noted fuels (notes 11, 15):	**11**	**28**

Abbreviations

MT	MegaTherm (1 Million Therms)
MW	MegaWatt (1 Million Watts)
MKWh	MegaKiloWatt Hour (1 Billion Watts per hour, or 1 GigaWatt)
KWh	KiloWatt Hour (1 Thousand Watts per hour)

Conversion Formulas
1 KWh = 3414.3 BTU (British Thermal Units)
1 Therm = 100,000 BTU = 0.0293 MWh
1 horsepower = 0.746 KiloWatts
1 ton = 2000 lbs (pounds)

Fuel Potentials (Obtainable)

Gasoline	111,000	BTU/gallon		
Grade 1 distil. fuels	132,000	BTU/gallon	(e.g. diesel)	
Biodiesel	119,000	BTU/gallon		
Wood, dry	5650	BTU/lb	14,000,000	BTU/cord
Propane	1870	BTU/ft3	68,000	BTU/gallon (1 gal liq. = 36.3ft^3 gas)

Peak consumptions

Natural Gas:	December, January (15%/mo of annual)
Electricity:	August, December, January (10%/mo of annual)
Transp. Fuels:	August (8.9% of annual)

Transportation Fuel Emissions (lbs per gallon) (note 10)

Hydrocarbons (CxHy)	0.15
Carbon Monoxide (CO)	1.1
Carbon Dioxide (CO2)	19.8
Nitrous Oxides (NOx)	0.07
Benzene	0.004

Willits Area Demographics (95490 zip code) (note 13)

Population:	13302	
Households:	5105	
Pop. / Household:	2.6	
Median Household Income:	$36,000	$25,200 (after tax liability of ~30%)

Sources & Notes
1. PG&E data for town of Willits
2. Distribution of natural gas generally limited to town proper
3. California Energy Commission
4. Extrapolated from (3) figures for Mendocino County using (13)
5. US Department of Transportation, extrapolated for local population
6. Mendocino Air Quality Management
7. Gas costs set @ $1.20/Therm, CO2 emissions in lbs/Therm
8. Electricity costs set @ $0.14/KWh, CO2 emissions in lbs/KWh
9. 1 cord ~= 2500 lbs, CO2 emissions in lbs/lb, conventional wood stove, 20% moisture
10. Emissions data source: Rocky Mountain Institute except firewood (OMNI Environmental)
11. Per-person impacts derived by dividing region total by population (thereby includes share of non-residential consumption)
12. Majority of business & industry located in town proper
13. US Census Figures, 2000
14. Census of local dealers, Propane CO2 emissions in lbs/gallon
15. When agricultural, commercial, industrial, mass transit and other common interests are considered, the per household annual share of GH gasses are estimated at 80 tons (source RMI).

Greenhouse Gas Emissions & Fuel Cost Comparison by Common Energy Units Consumed:

Fuel	Cost Ranking (lowest=1)	Emissions Ranking (lowest=1)	Equiv Annual Qty	Units	Unit Cost	Annual Value	Equiv daily, Therms	Equiv daily MegaWatts	CO2 Emission Factor	Total CO2 Emissions (tons)
Natural Gas	2	1	0.365	MT	$1,200,000	$438,000	1,000	29	11.70	2,135
Electricity	6	6	10.69	MKWh	$140,000	$1,496,600	1,000	29	1.43	7,643
Gasoline	4	4	328,840	Gallons	$2.00	$657,680	1,000	29	19.80	3,256
Other Transp Fuels	3	2	276,485	Gallons	$2.25	$622,091	1,000	29	19.80	2,737
Propane	5	5	536,864	Gallons	$2.00	$1,073,728	1,000	29	12.67	3,401
Firewood	1	3	2,607	Cords	$165	$430,214	1,000	29	1.00	3,246

Possible conclusions that can be drawn from this comparison:
1) Petroleum products (except propane) are underpriced as is firewood
2) Electricity is overpriced and the GH gas emission not as closely controlled as we are led to believe
3) For conventional fuels, wood and wood waste (bio-mass), with a high-efficiency gassifier, is a possible locally-produced long-term fuel
4) Willits would do well to promote wider use of solar electricity due to the high GH gas content of that provided by PG&E