How to Calculate Electric Costs - Energy 101

1. Problem 1 - What is my unit cost in kWh?

1. Total bill amount is $93.97
2. Total kWh (kilowatt hours) consumed 1,038 kWh
3. Total Cost $93.97 ÷ 1038 kWh = $.09053 per kWh

This is an important concept. You must know how much you could save by replacing inefficient electric appliances with more efficient ones. You may even find it interesting to know how much it costs to operate units you already have. Sometimes it is not worth upgrading, and in other instances you can't afford not to make the change.

If you can't figure out what your unit costs are, and don't know how energy works, effective decisions are impossible to make. Now that you know how to figure out your kWh costs, let's try a practical problem.

2. Problem 2 - A 100-watt light bulb that is on 10-hours a day for 30 days. How much energy will it use?

▪ 10 hours per day x 30 days = 300 hours (energy is all about time of operation)
▪ 300 Hours x 100 Watts = 30,000 watt hours (energy is also about connected load or Watts)
▪ A kilowatt (kW) is 1000 watts
▪ 30,000 watt hours ÷ 1000 watts = 30 kilowatt hours (kWh as on the electric bill)

3. Problem 3 - How much did it cost to operate that lamp?

▪ 30 kWh x $.09053 per kWh = $2.72 cost of operation

4. Problem 4 - How much would I save if I replaced the 100-Watt light bulb with a 60-Watt light bulb that would produce the same amount of light energy?

▪ 100-Watt original light - 60-Watt Replacement light = 40-Watt reduction
▪ 300 Hours of operation (Problem 1) x 40-Watt Reduction = 12000-Watts saved
▪ 12000-Watts hours saved ÷ 1000 Watts = 12 kWh
▪ 12 kWh x $.09053 (Problem 1) = $1.09 savings
▪ $1.09 Savings ÷ $2.72 Original Cost of operation = .40 x 100 = 40%

5. Problem 5 - The 100-Watt bulb has a life expectancy of 1,000 hours. How much will it cost to burn the bulb for 1,000 hours?

- 100 Watts x 1000 Hours = 100,000 watt hours
- 100,000 Watt hours ÷ 1000 Watts = 100 kWh
- 100 kWh x $.09053 per kWh = $9.05

6. Problem 6 - The 60-Watt bulb has a life expectancy of 4,000 hours. How much will it cost to operate during its life?

- 60 Watts x 4,000 Hours = 240,000 watt hours
- 240,000 watt hours ÷ 1000 watts = 240 kWh
- 240 kWh x $.09053 per kWh = $21.72

7. Problem 7 - How much can I reduce my energy costs by replacing the 100-watt lamp with the 60-watt lamp?

- 4,000 hours (60-watt lamp life) ÷ 1,000 hours (100-watt lamp life) = 4
- $9.05 100-Watt life cost x 4 = $36.20 cost of operating 4,000 hours of 100-watt bulbs
- $36.20 cost of equivalent 100-Watt operation - $21.72 cost of 60 Watt life = $14.48 total life time savings
- $14.48 life time savings ÷ $36.20 4,000 hour cost of 100-Watt bulb = 40%

8. Problem 8 - The 100-Watt lamp costs $1.25 each, and the 60-Watt lamp costs $15.00. Can I still save money?

- 4 100-watt lamps x $1.25 each lamp = $5.00
- $15.00 60-Watt cost - $5.00 cost of 4 100-Watt lamps = $10.00 additional lamp cost
- $14.48 life time savings - $10.00 additional lamp cost = $4.48 net savings
- $4.48 net energy savings ÷ $36.20 equivalent 100-watt lamp energy cost = 12% net energy reduction