Electricity Bill: Energy and Demand Charges

Monthly electricity cost from energy (kWh) and maximum demand (kVA) charges, with the average cost per kWh and the plant load factor.

Method: Two-part tariff arithmetic

Input parameters

Unit system: SI

Parameter	Value	Unit
Energy used in the period	600,000	kWh
Maximum demand	1,200.0	kVA
Average power factor	95.000	%
Hours in the billing period	720.00	h
Energy rate per kWh (your currency)	7.0000	
Demand rate per kVA per period (your currency)	400.00	

Calculated results

Parameter	Value	Unit
Total cost (your currency)	4,680,000	
Energy charge	4,200,000	
Demand charge	480,000	
Average cost per kWh	7.8000	
Load factor	73.099	%

Notes for this case

- Taxes, power-factor penalties or rebates and time-of-day rates are not included; add them from your tariff.

Formula and method

$$C_e = E\,c_e \qquad C_d = S_{md}\,c_d \qquad C = C_e + C_d \qquad \bar{c} = \frac{C}{E} \qquad LF = \frac{E}{S_{md}\cos\varphi\,t}$$

Variables

E	energy used	J
S_{md}	maximum demand	VA
$\cos\varphi$	average power factor	–
t	hours in the period	s
c_e	energy rate per kWh	–
c_d	demand rate per kVA	–
C	total cost	–
C_e	energy charge	–
C_d	demand charge	–
$\bar{c}$	average cost per kWh	–
LF	load factor	–

Method and standards

Two-part tariff: energy and maximum demand charges; load factor relative to maximum demand converted to kW.

Assumptions and limits

- Single-rate energy and demand charges.

- The load factor converts the maximum demand to kW with the average power factor; the power factor at the time of the peak may differ.

References

- Two-part tariff arithmetic

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/electrical/power/energy-demand-cost

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.