Electricity Bill: Demand Charge, Energy Charge and Load Factor

Monthly HT electricity bill from recorded maximum demand, contract demand with a minimum billing share, demand and energy rates, with load factor and cost per kWh.

Method: Two-part tariff arithmetic

Input parameters

Unit system: SI

Parameter	Value	Unit
Energy used in the month	150,000	kWh
Recorded maximum demand	400.00	kVA
Contract demand	500.00	kVA
Minimum billing demand as a share of contract demand	75.000	%
Demand rate per kVA per month	400.00	
Energy rate per kWh	7.0000	
Hours in the billing month	720.00	h

Calculated results

Parameter	Value	Unit
Billing demand	400.00	kVA
Demand charge	160,000	
Energy charge	1,050,000	
Demand plus energy charge	1,210,000	
Average cost per kWh	8.0667	
Load factor (kWh over MD × hours)	52.083	%
Demand above contract	0	kVA

Notes for this case

• Two-part tariffs charge for energy (kWh) and for the highest demand recorded in any demand interval (usually 15 or 30 minutes), billed at no less than a set share of the contract demand. A low load factor (energy over maximum demand × hours) spreads the demand charge over fewer kWh, raising the average cost. Shaving peaks, staggering motor starts and improving power factor (on kVA billing) cut the demand charge. Taxes, power-factor and time-of-day adjustments and excess-demand penalties vary by tariff and are not included.

Formula and method

$$BD = \max(MD,\ f_m CD), \quad C = r_d BD + r_e E, \quad LF = \frac{E}{MD \cdot t}$$

Variables

E	Energy used in the month	J
MD	Recorded maximum demand	VA
CD	Contract demand	VA
f_m	Minimum billing demand as a share of contract demand	-
r_d	Demand rate per kVA per month	-
r_e	Energy rate per kWh	-
t	Hours in the billing month	s

BD	Billing demand	VA
C_d	Demand charge	-
C_e	Energy charge	-
C	Demand plus energy charge	-
c	Average cost per kWh	-
LF	Load factor (kWh over MD × hours)	-
ΔS	Demand above contract	VA

Method and standards

Electricity bill.

Assumptions and limits

- Simple two-part tariff; no taxes or rebates.

References

Two-part tariff arithmetic

Report details

Report reference	FCC-ME2C-678H (the same inputs always give the same reference)
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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/electricity-bill-demand-charge

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.