



TARIFF

PRICE

A yellow wavy line surrounds the word "TARIFF" in pink. A large, thick pink arrow points from the word "PRICE" towards a computer monitor on the right.



TARIFF

What is

Tariff



Power Suppliers

or
Utility



Rate or Price change



Consumer

Objective of Tariff



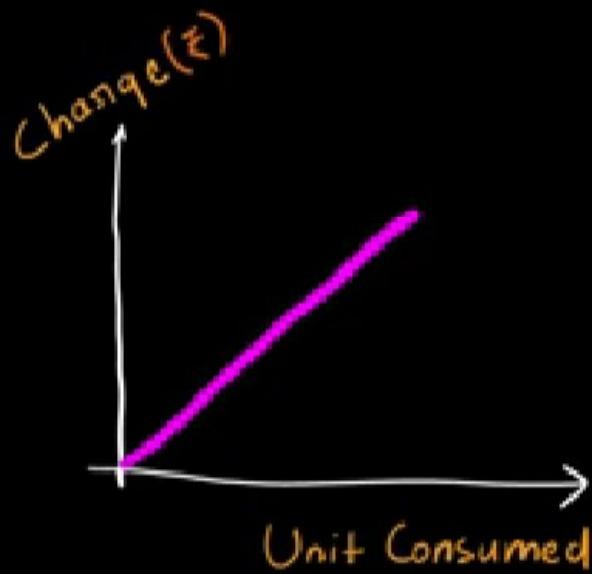
Types of Tariff

1. Simple
2. Flat rate
3. Block Rate
4. Two Part
5. Three Part
6. Power Factor
7. Maximum Demand

1. Simple Tariff



Rate of per unit
energy consumed



eq. $1 \text{ unit} \longrightarrow 1 \text{ ₹}$ **Fix**
irrespective of Load Type



consume 100 units

$$\text{Bill} = 100 \text{ ₹}$$



consume
 $500 \text{ units} \times 1 \text{ ₹}$

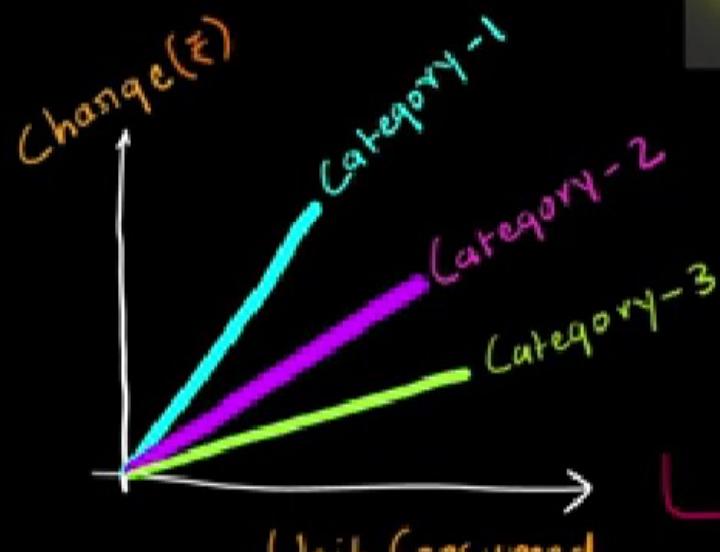
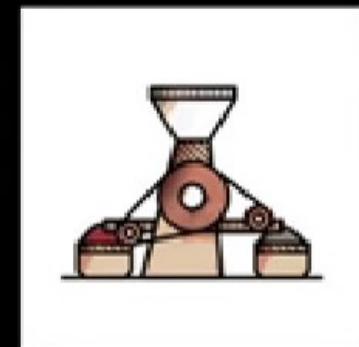
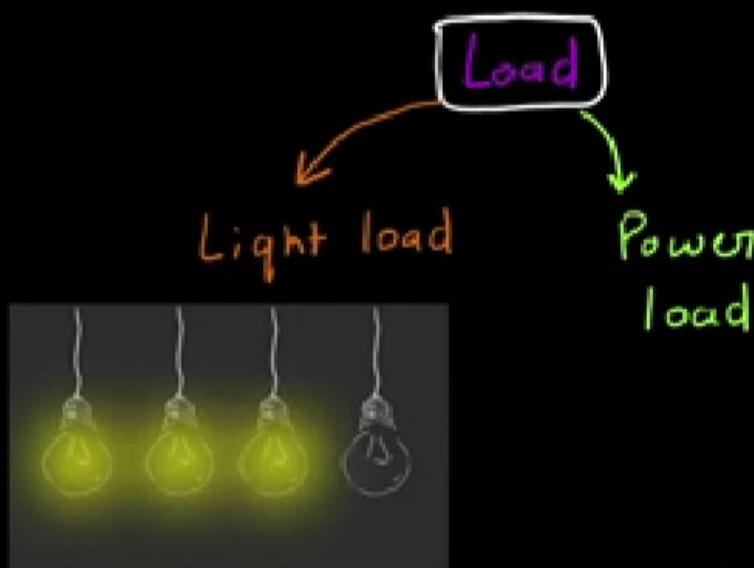
$$\text{Bill} = 500 \text{ ₹}$$

Tariff doesn't change with
change in no. of units
Consumed.

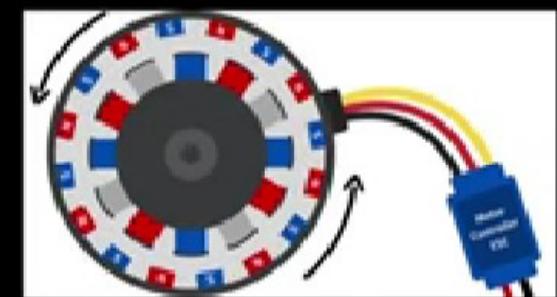
Ignore the amount of units
Consumed ₹

2. Flat Rate

Fix Rate for
specific category
of load



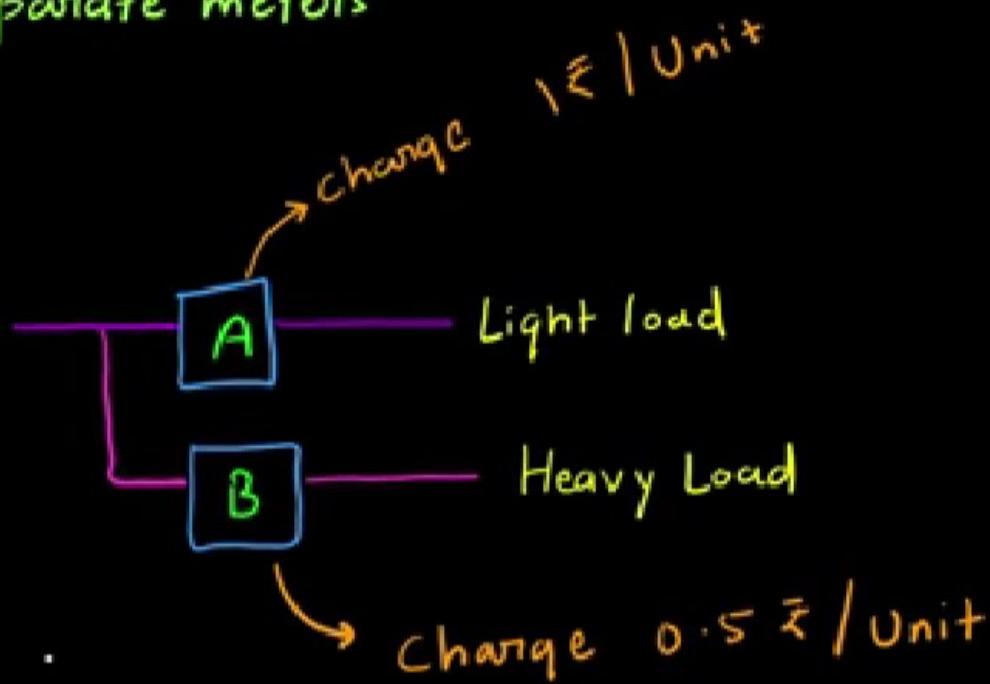
$$\text{Fix Rate} = 1 \text{ ₹/Unit}$$



$$\text{Fix Rate} = 0.5 \text{ ₹/Unit}$$

Disadvantages

- ① Need separate meters



- ② Ignore the amount of energy Consumed

Block Rate

Electric Energy Units Consumed

Blocks of energy units

B_1

B_2

B_3

Charged
at
higher
Rates

↓
1 €/Unit

Charged
at
lower
Rate

↓
0.75 €/Unit

Charged
at
lowest
Rate

↓
0.5 €/Unit

250

50

$$50 \times 1 = 50$$

150

$$100 \times 1 = 100$$

$$\boxed{50 \times 0.75} = \frac{37.5}{137.5}$$

$$100 \times 1 = 100$$

$$100 \times 0.75 = 75$$

$$50 \times 0.5 = \frac{25}{200}$$

~~Stock~~ ^{280 units.} → 200 €
→ Flat → 212.5 €
∴ Simple → 250 €

3. Block Rate

Electric Energy Units Consumed



Blocks of energy units

B_1

B_2

B_3

Charged
at
higher
Rates

$1\text{ \text{₹}/Unit}$

Charged
at
lower
Rate

$0.75\text{ \text{₹}/Unit}$

Charged
at
lowest
Rate

$0.5\text{ \text{₹}/Unit}$



1. Simple Tariff

2. Flat rate Tariff

3. Block rate Tariff

Running changes → No. of units
Consumed by the
Consumer



Design



Power Consumption Curve

Size of Power Plant

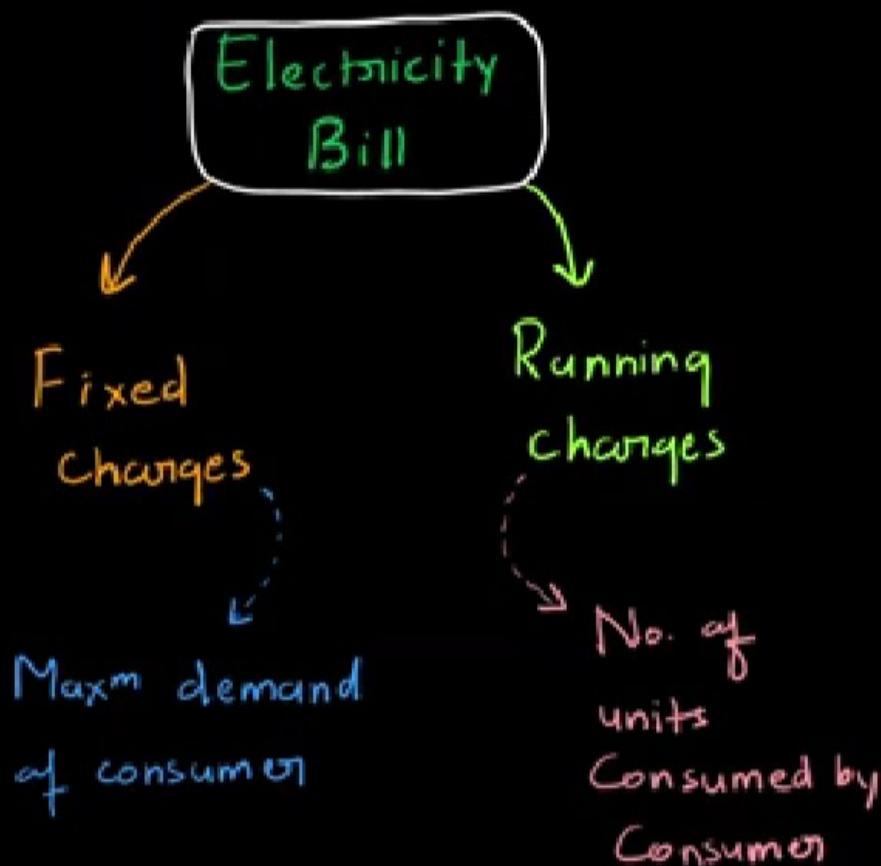
depends on maximum Demand



TWO & THREE PART TARIFF

4. Two - Part Tariff

Mathematically



$$\text{Total Charges} = \text{Fixed charge} + \text{Running charge}$$

↓ ↓
 b.kW C.kWh

Named as 2-Part Tariff

How THIS SYSTEM AFFECTS THE CONSUMER

Case-1: Consumer use certain Units

$$\text{Bill} = \text{Fixed charge} + \text{Energy unit Consumed} = 130 \text{ ₹}$$

Based on your
max^m demand

30 ₹ ↓
 100 ₹

Case-2: Consumer is out of station

$$\text{Bill} = \text{Fixed charge} + \text{Energy unit Consumed} = .$$

30 ₹ → 0
 ↓

30 ₹

- * "Recovery fixed charges, irrespective of energy consumed"
 - Advantage for utilities
 - Disadvantage for consumer

* Bill = **Fixed Cost** + Running Cost

↓

Decided by
maximum demand
of consumer

10[₹] 30[₹]

ERROR

depends on Rooms, AC,
Fan, People living.....

5. Maximum Demand Tariff



MDI
Maximum Demand Indicator

Similar to 2-Part Tariff

$$\text{Bill} = \boxed{\text{Fixed charge}} + \text{Running charge}$$

Maximum demand calculation

Maximum Demand Meter

2 - Part Tariff

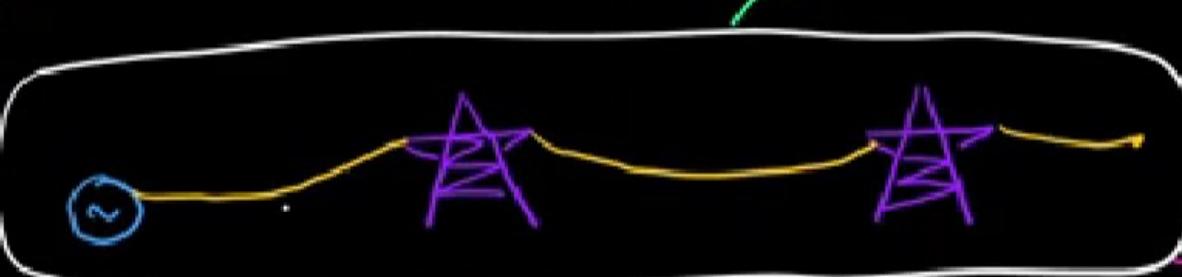
Maximum demand Tariff

Covers Running + Generating Station
Sizing cost

PROBLEM

3-PART TARIFF

Cost of Land



Cost of Labor

depreciation cost

Interest
on
Capital

6. Three Part Tariff

Electricity bill is divided into 3 Parts

Used In India

$$\text{Bill} = A + B \cdot \text{kW} + C \cdot \text{kWh}$$

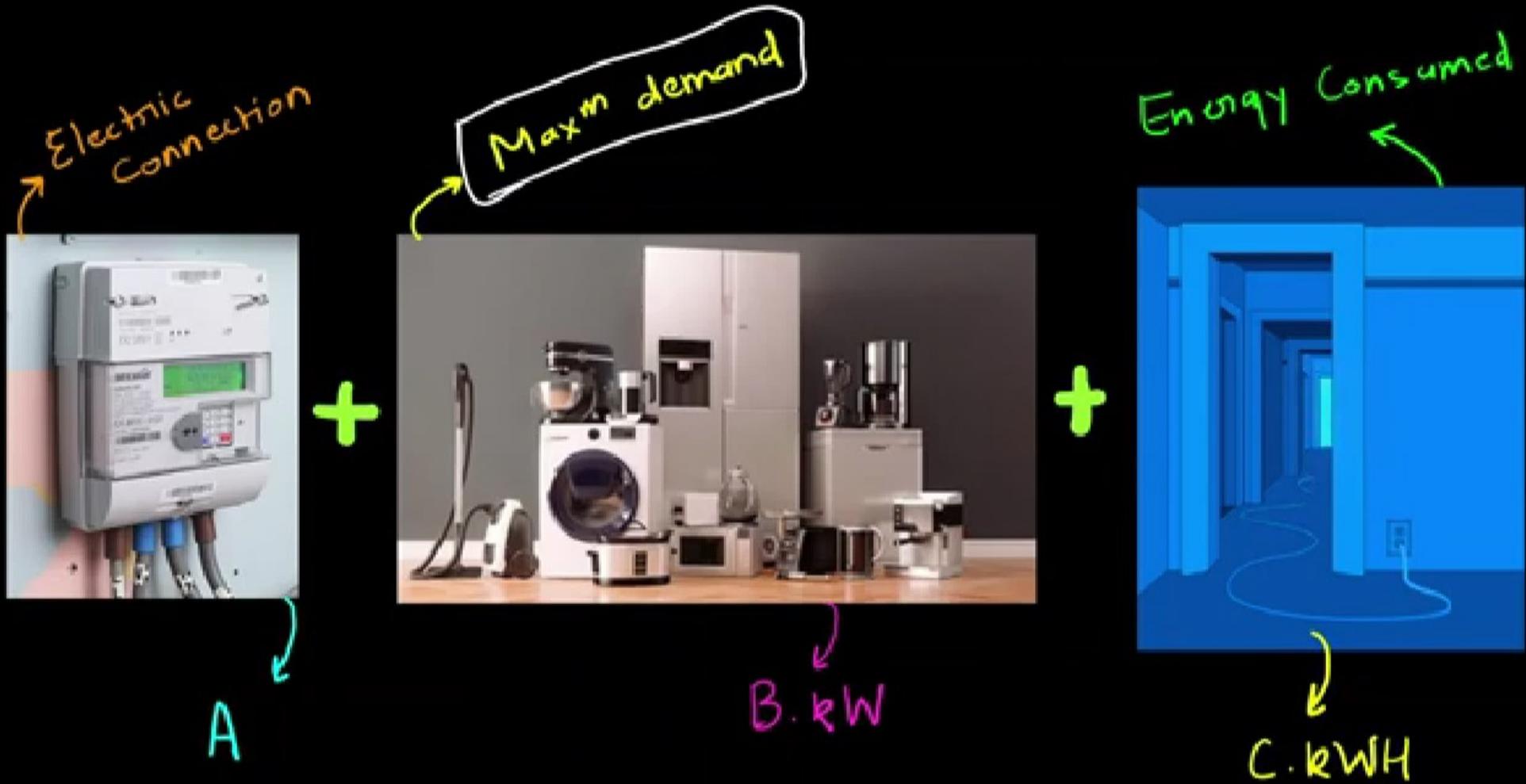
Fixed Charge

Charge based on maximum Demand

Charge based on per unit energy consumed

Covers capital,

Labor, depreciation cost → Independent from max^m demand and amount of energy consumed



- 1. Simple Tariff
- 2. Flat rate Tariff
- 3. Block rate Tariff

Based on
Running charges

- 4. Two Part Tariff
- 5. Maximum demand Tariff
- 6. Three Part Tariff

Based on
Running + Maxm demand

"What about REACTIVE POWER"

POWER
FACTOR
TARIFF



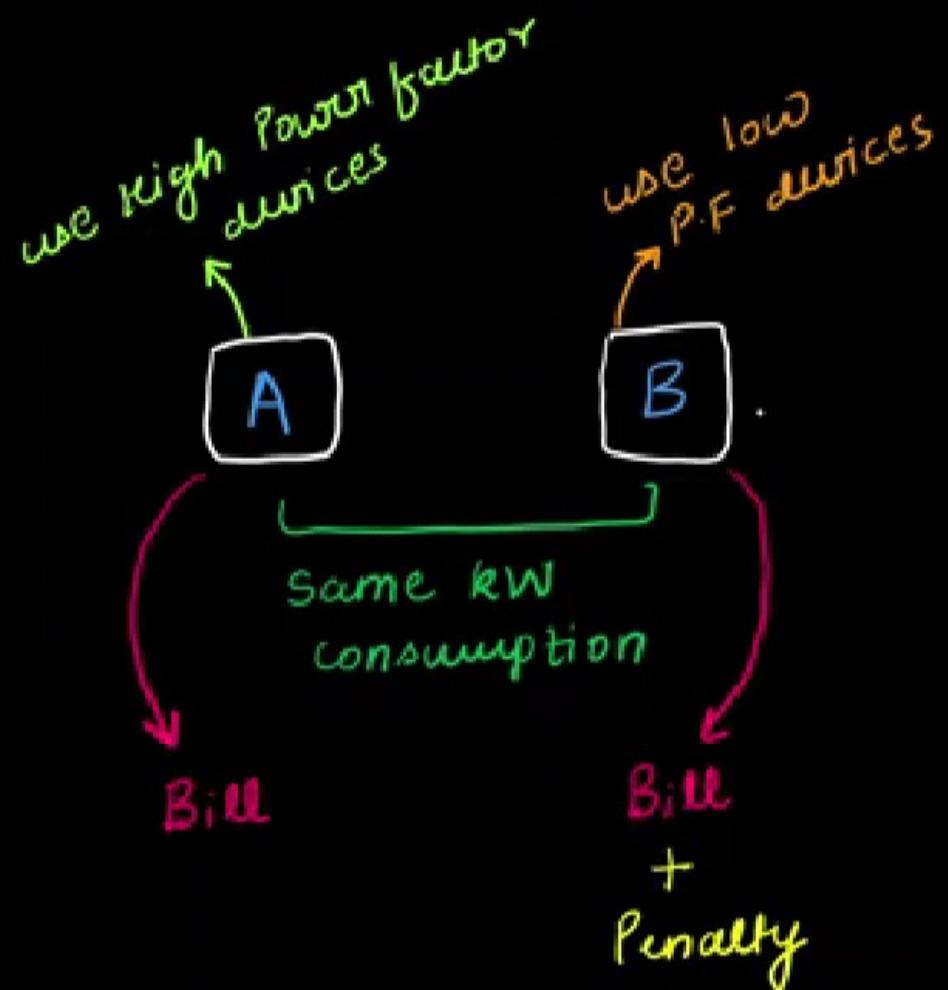
POWER FACTOR TARIFF

7. Power Factor Tariff

Power Factor of consumer's load is taken into consideration

* 3 ways to include P.F in Tariff:

1. kVA maximum demand Tariff
2. Sliding scale Tariff
3. kW and kVAR Tariff



1. kVA maximum demand Tariff

"This modification encourage consumer to use High P.F appliances"

2 Part Tariff

= Fixed charge + Running charge



B.kW



B.kVA

C.kWH

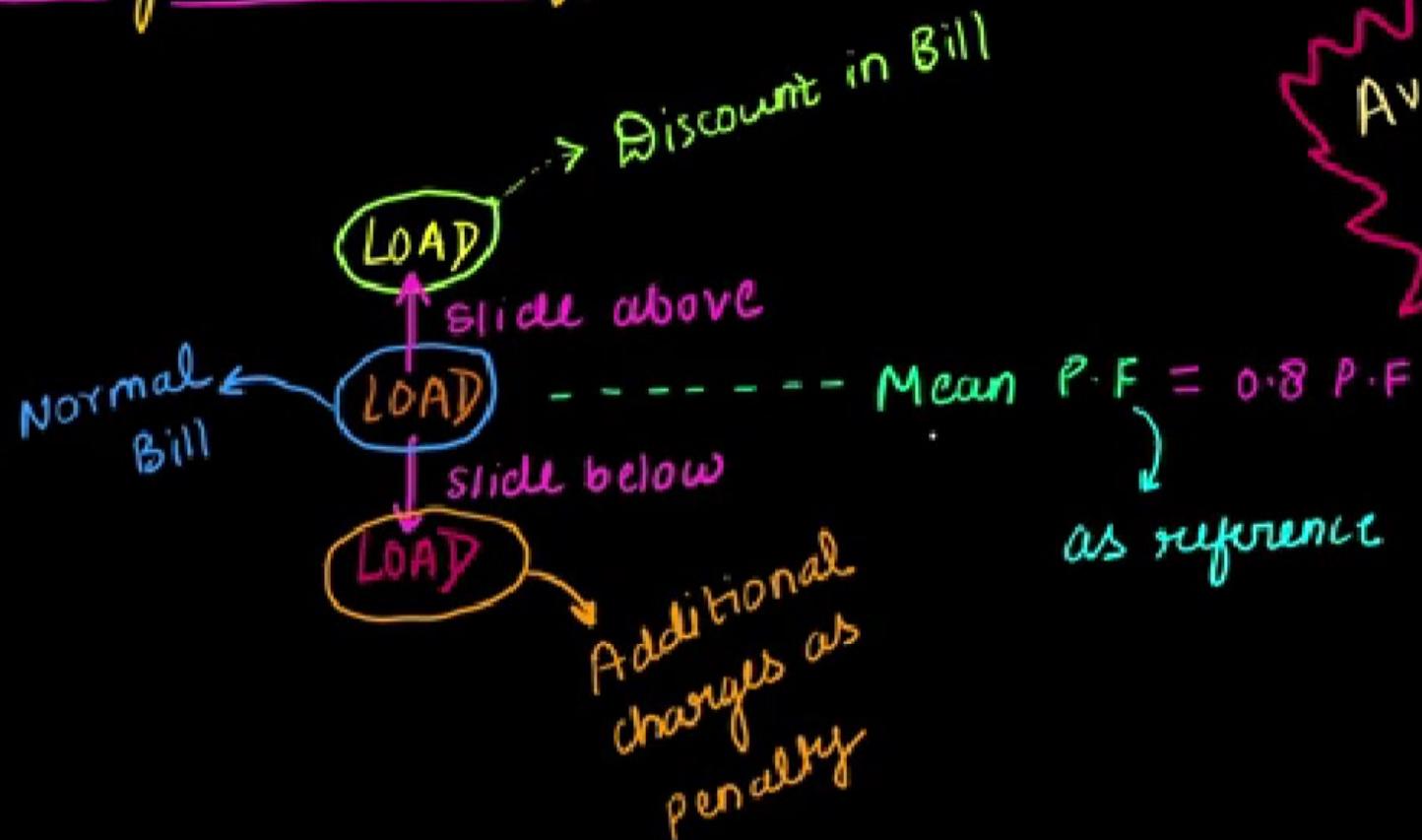
HIGH TARIFF
↑ B.kVA

as

$$P.F = \frac{P}{S} = \frac{kW}{kVA} \propto \frac{1}{kVA}$$

low P.F → High kVA

2. Sliding scale Tariff



3. kW and kVAR Tariff



Both active (kW)
and Reactive Power (kVAR)
are charged separately

