Bangladesh University of Business and Technology

Single Phase Shell Type Transformer

Team: “Kinetic Vision”

Course Name: Energy Conversion II (lab)

Course Code: EEE210

MEET OUR TEAMMATES

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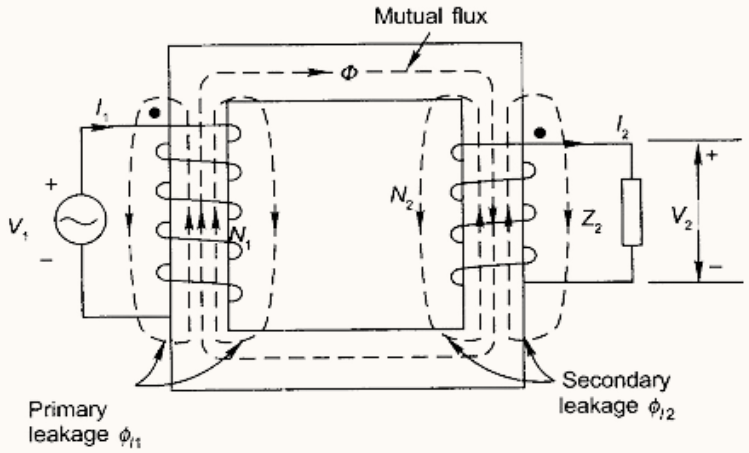
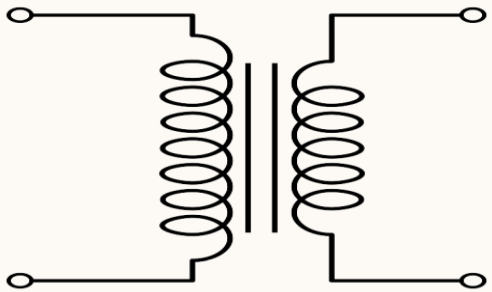
Kinetic Vision

AGENDA





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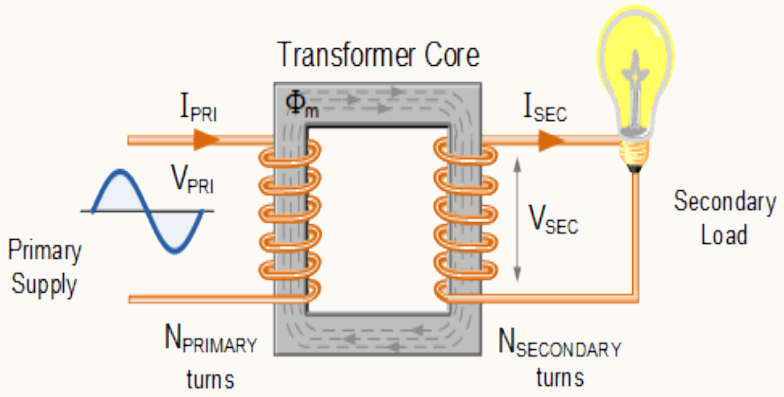
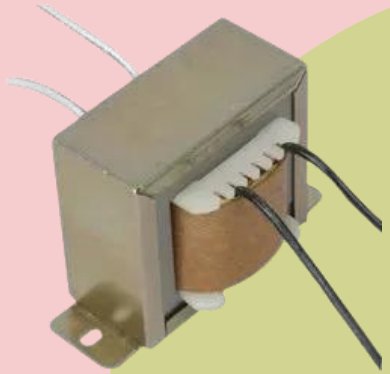
- Introduction
- Background
- Literature Review
- Materials Explanation
- Proposed Method
- Methodology
- Circuit Diagram
- Working Principle
- Social Economy Impact
- Conclusion

ABSTRACT





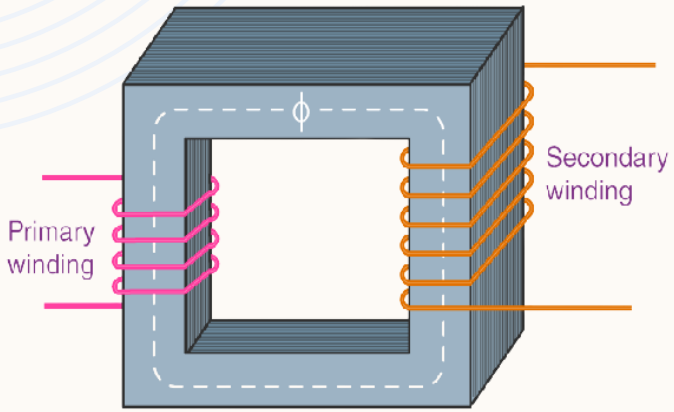
- A transformer construction provides a magnetic circuit, known more commonly as the “transformer core”, which is designed to provide a path for the magnetic field to flow around.

High side 220 V
Low side 220 V

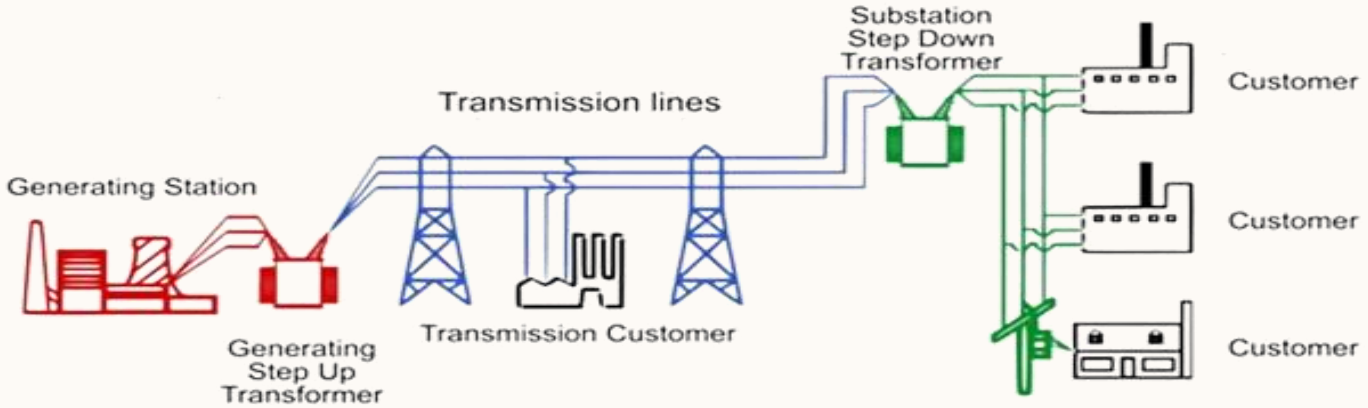
E-type and I-type core

High side-0.253 A
High side-2.315 A

INTRODUCTION



- Transformer is a device that is used to transfer electrical energy from one circuit to another circuit without changing the frequency of the electrical energy.



Structure of Transformer

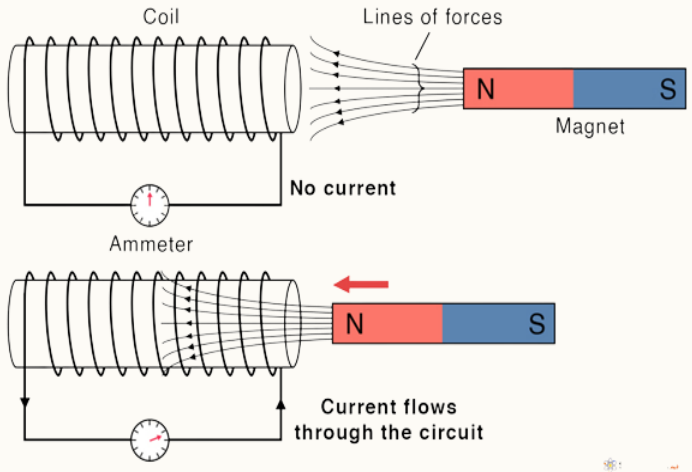
Faraday's Electromagnetic Induction Law

Working Principle of Transformer

Designing of A Transformer

Demonstration

BACKGROUND



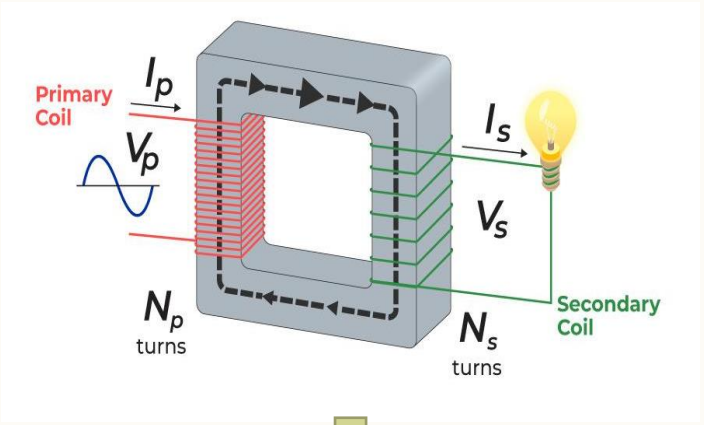
Electromagnetic Induction Law

- Faraday's Electromagnetic Induction Law states that a time-varying magnetic field through a loop of wire will induce an electromotive force (EMF) in the wire, which can cause a current to flow. **(EMF = N dΦ/dt)**

$$E = 4.44\, f\, \Phi_m\, N$$

E.M.F. Equation

- By this equation, we can easily find the number of turns for per voltage and other quantity for transformer.

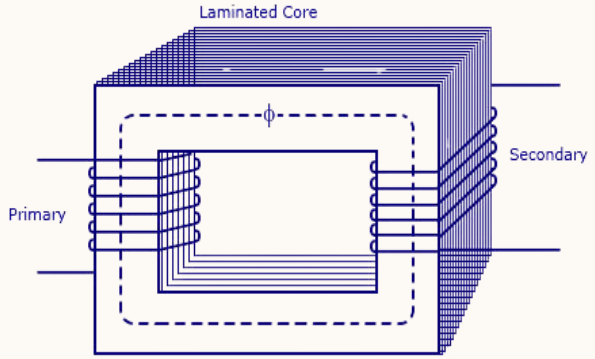


Single Phase Transformer

- We use transformer to convert voltage and transfer current to a long distance.

LITERATURE REVIEW

Turns for Per Voltage



$B_m = 1.2\ Wb/m^2$

A = length * width

- By this equation, we have calculated the cross section area of the bobbin

Flux, $\Phi_m = B_m * A$

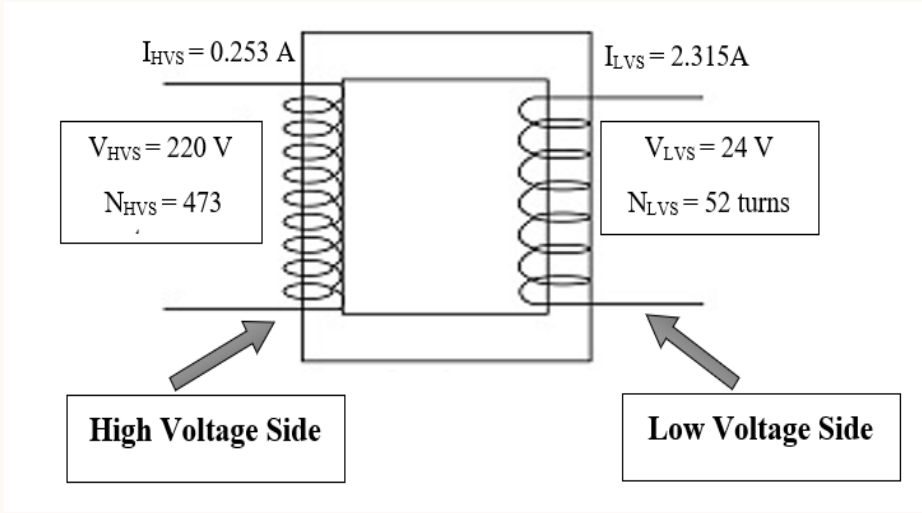
- By this equation, we have calculated the flux in core of this transformer

$E = 4.44\ f\ \Phi_m\ N$

- By this equation, we have calculated the turns for per voltage

LITERATURE REVIEW

High Voltage and Low voltage Side



Selected Apparent Power = 50 VA

The Efficiency of This Transformer = 90%

Number of turns for windings,

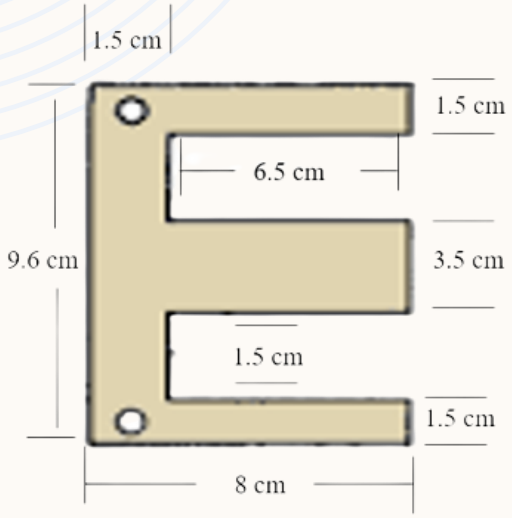
N = V * turns for per voltage

- By this equation, we have calculated the number of turns for both sides.

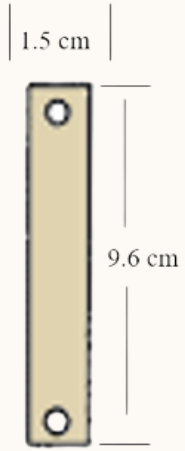
Current, I = VA / (90% of V)

- By this equation, we have calculated the current for both sides.

MATERIALS EXPLANATION



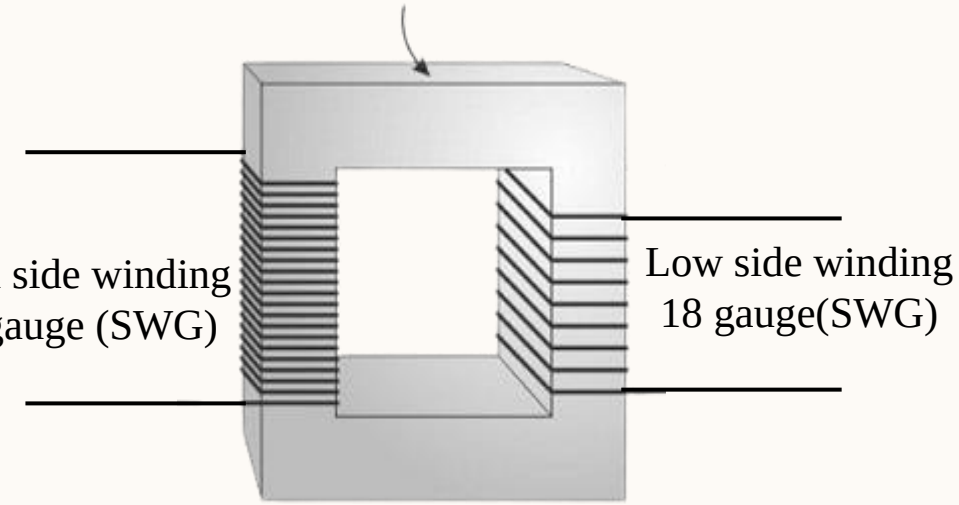
E-type Core



I-type Core

Length - 5 cm
Width – 3.5 cm
Height – 4 cm

Made by Pressboard



Copper Wire

Silicon Steel

PROPOSED METHOD

- Transformer 220/24
- Induction Law

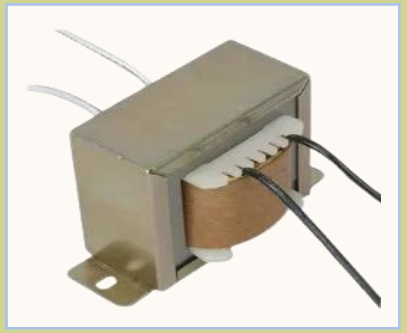
Method

Calculation

- EMF Equation
- Quantity Measurements

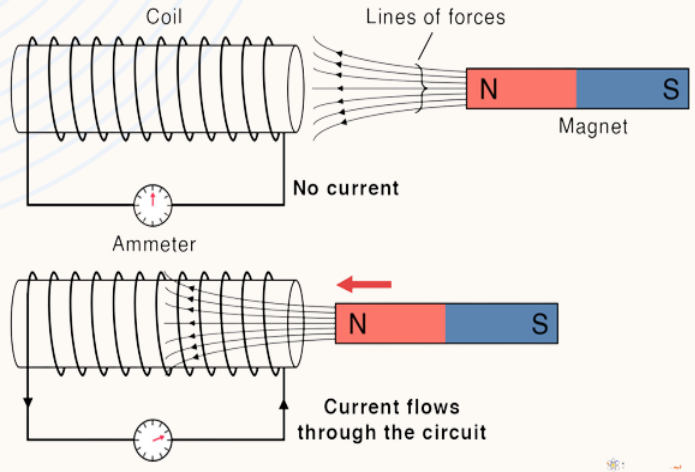
- Material selection
- Settings of materials

Making of Transformer



Theory of Transformer → **Applying The Equation** → **Selection of The Materials**

METHODOLOGY



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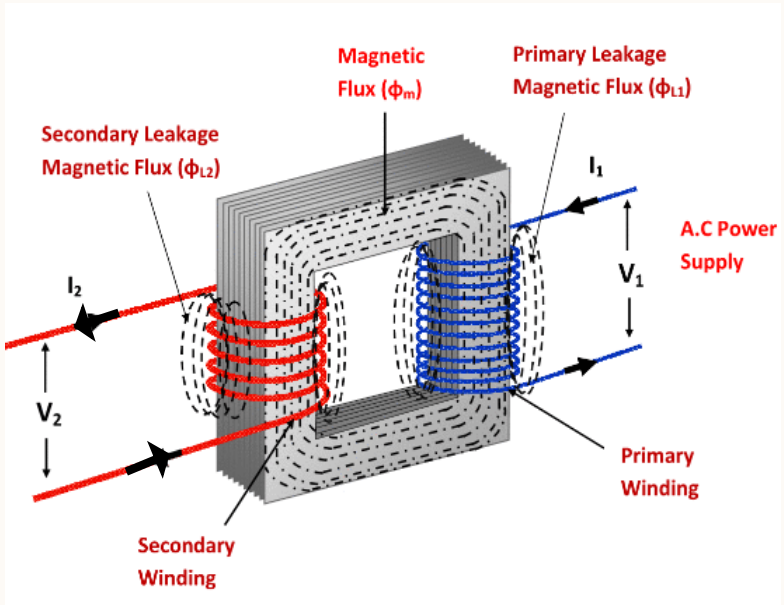
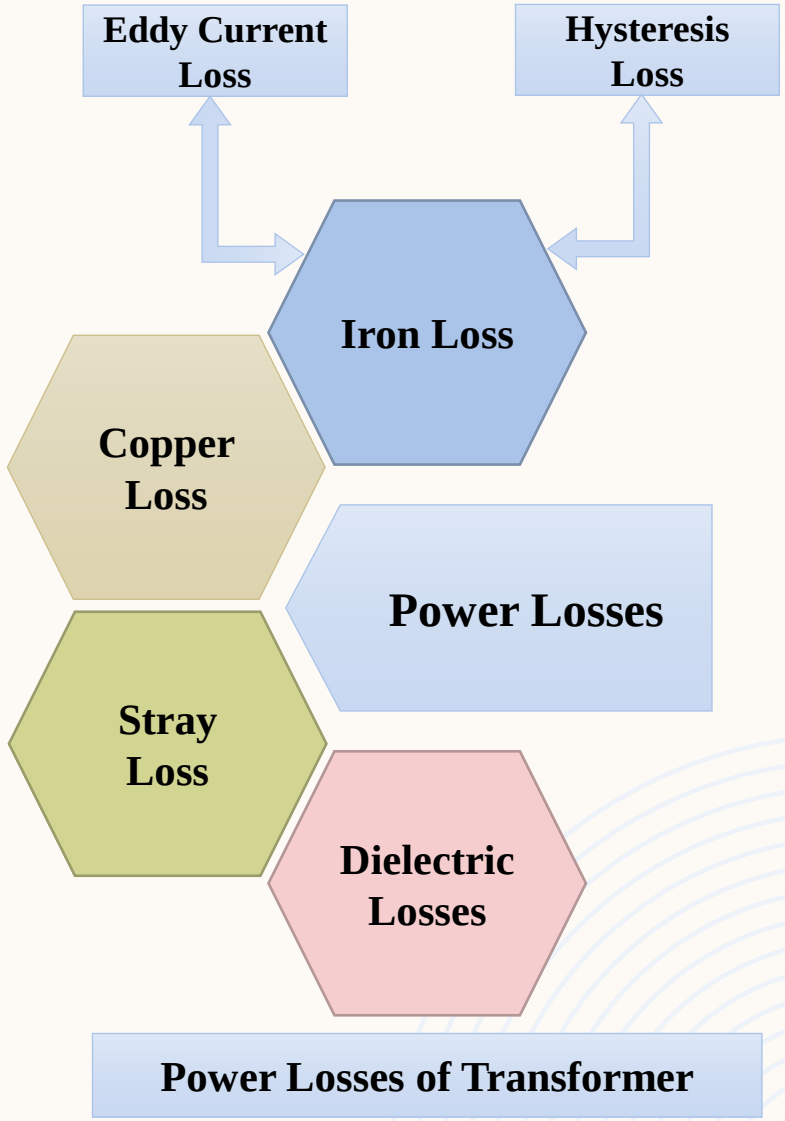
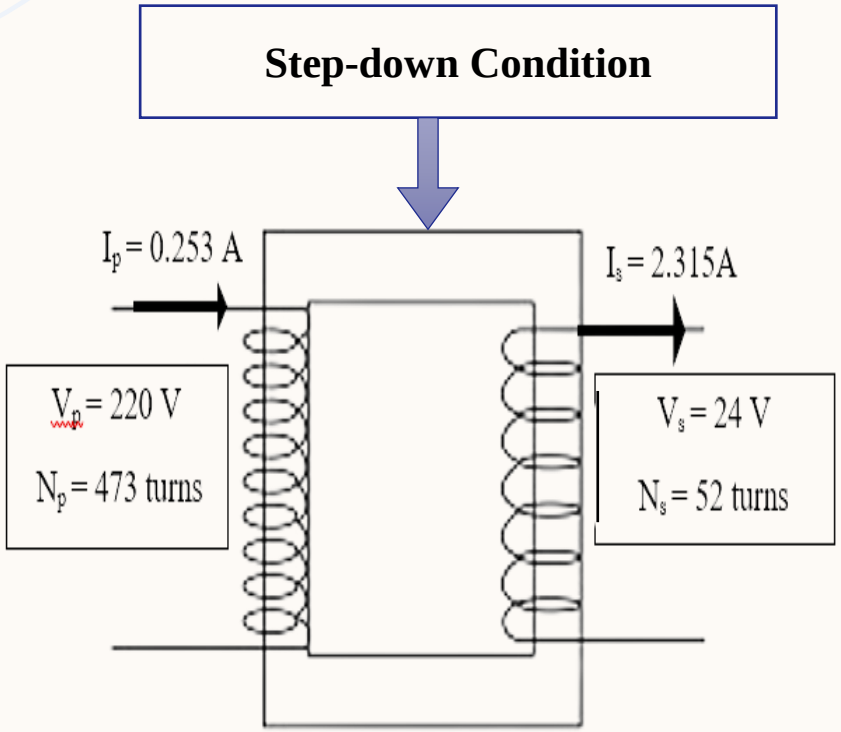
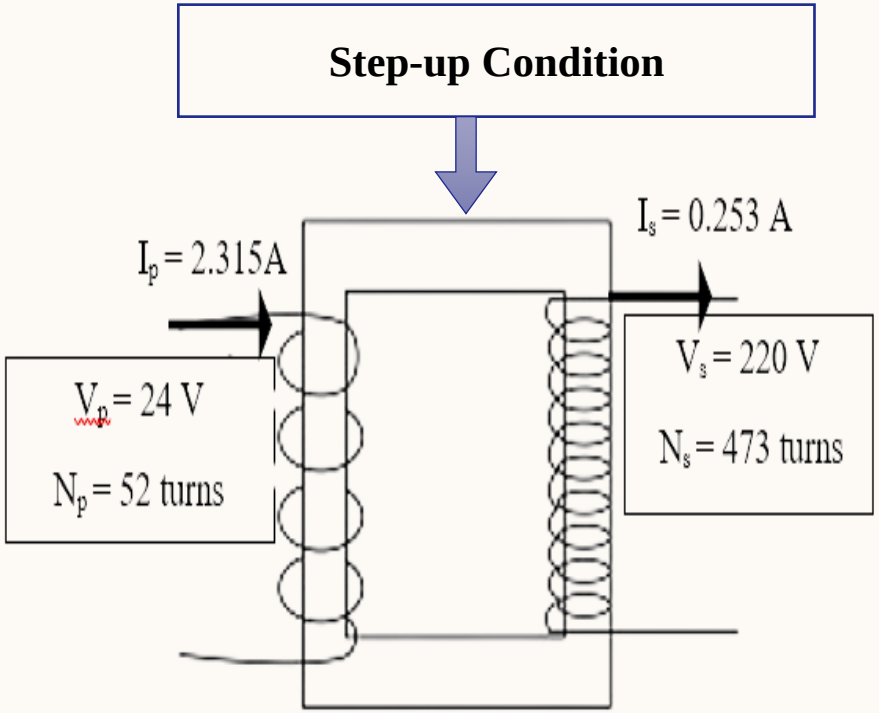


Magnetic Flux

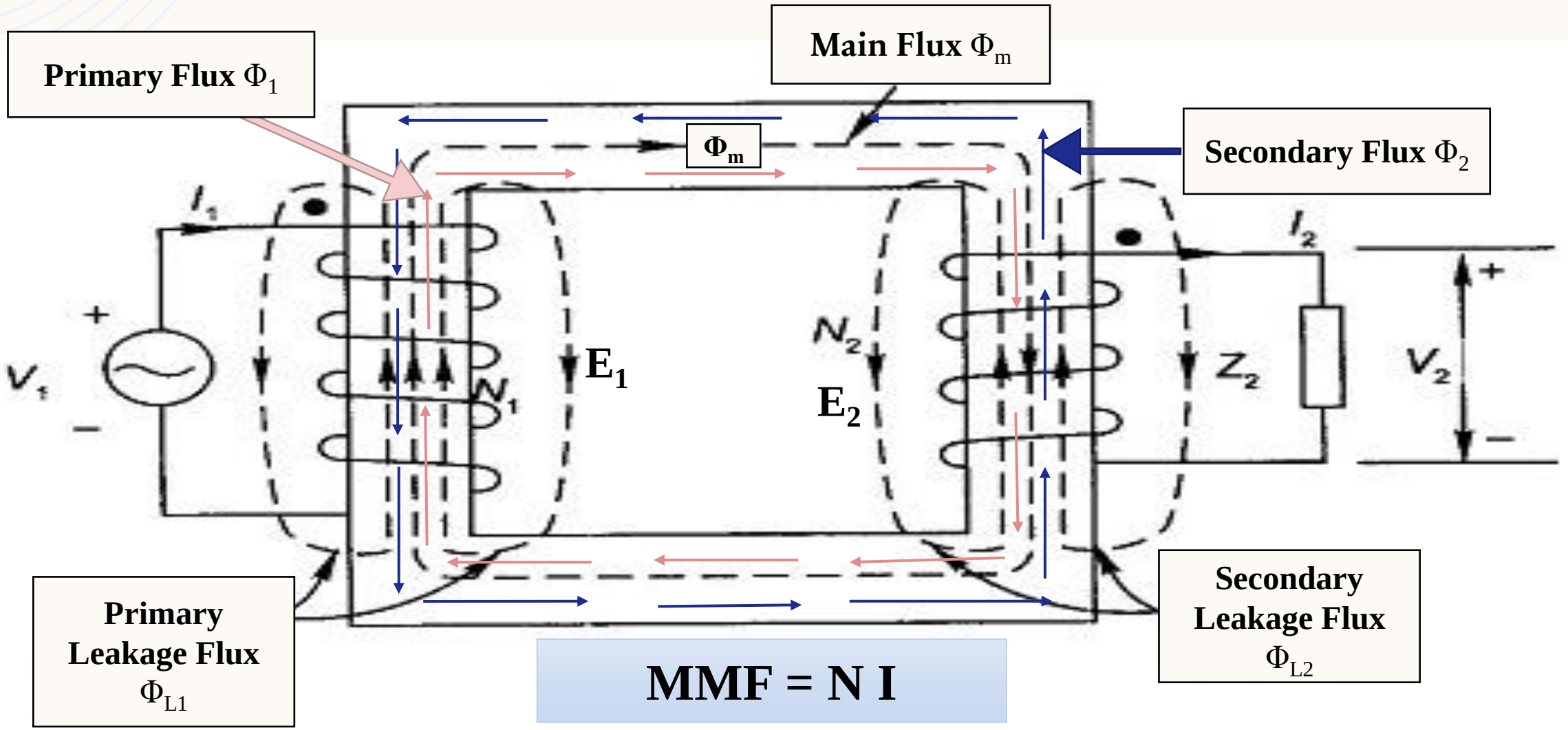


CIRCUIT DIAGRAM

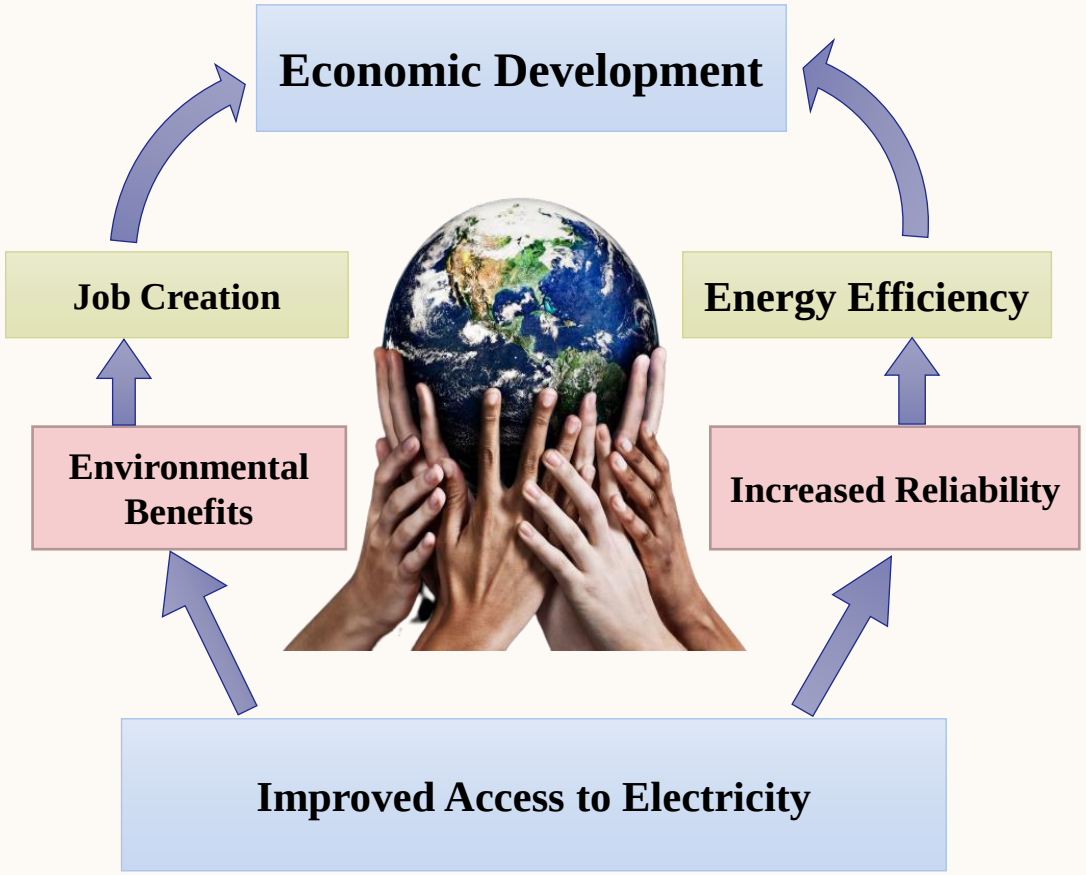




CONSTANT FLUX MACHINE



SOCIAL ECONOMY IMPACT

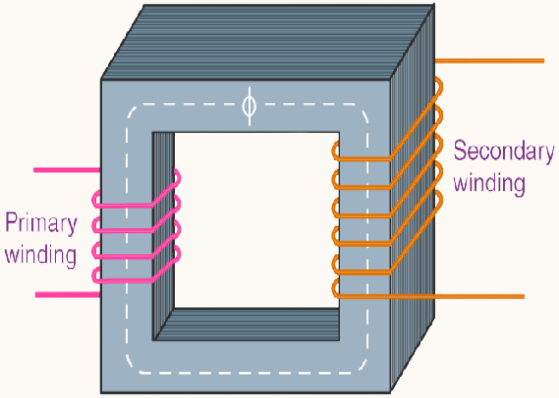


Future Plan

There is chance to research about reducing the thickness of core.

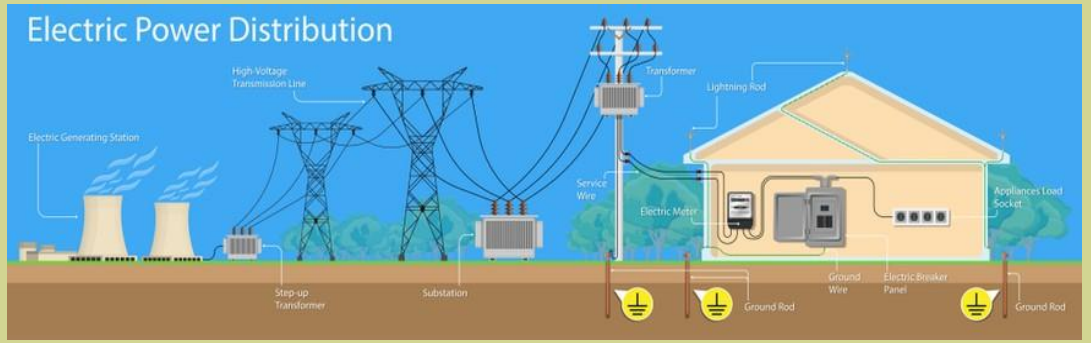
There is chance to research about the conductance of the conductor.

CONCLUSION



- Despite some of the energy losses, transformers are still one of the highly efficient instruments used for power distribution.

- By transformer, electricity is being provided from urban area to rural area.




THANK YOU