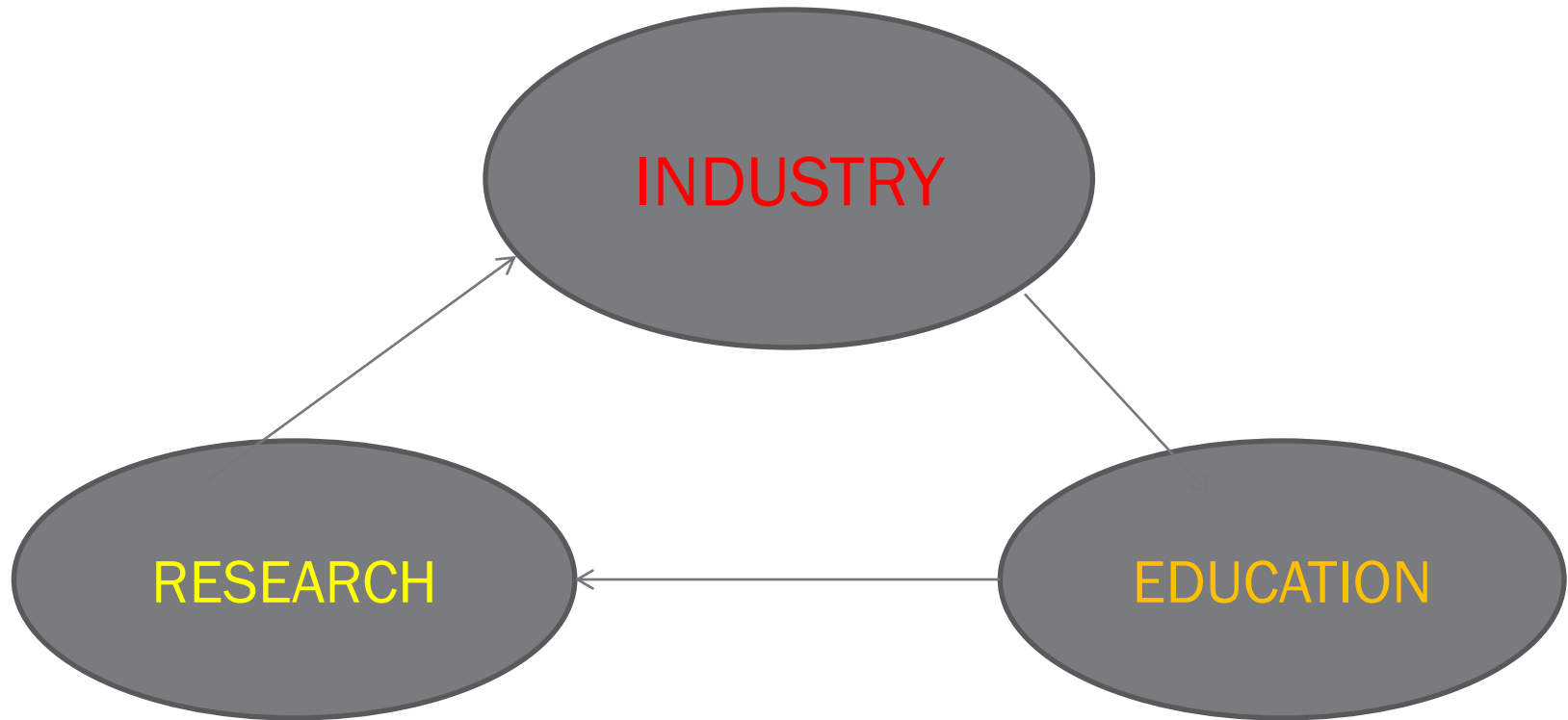# INDUSTRY 4.0 AND ELECTRICAL SECTOR
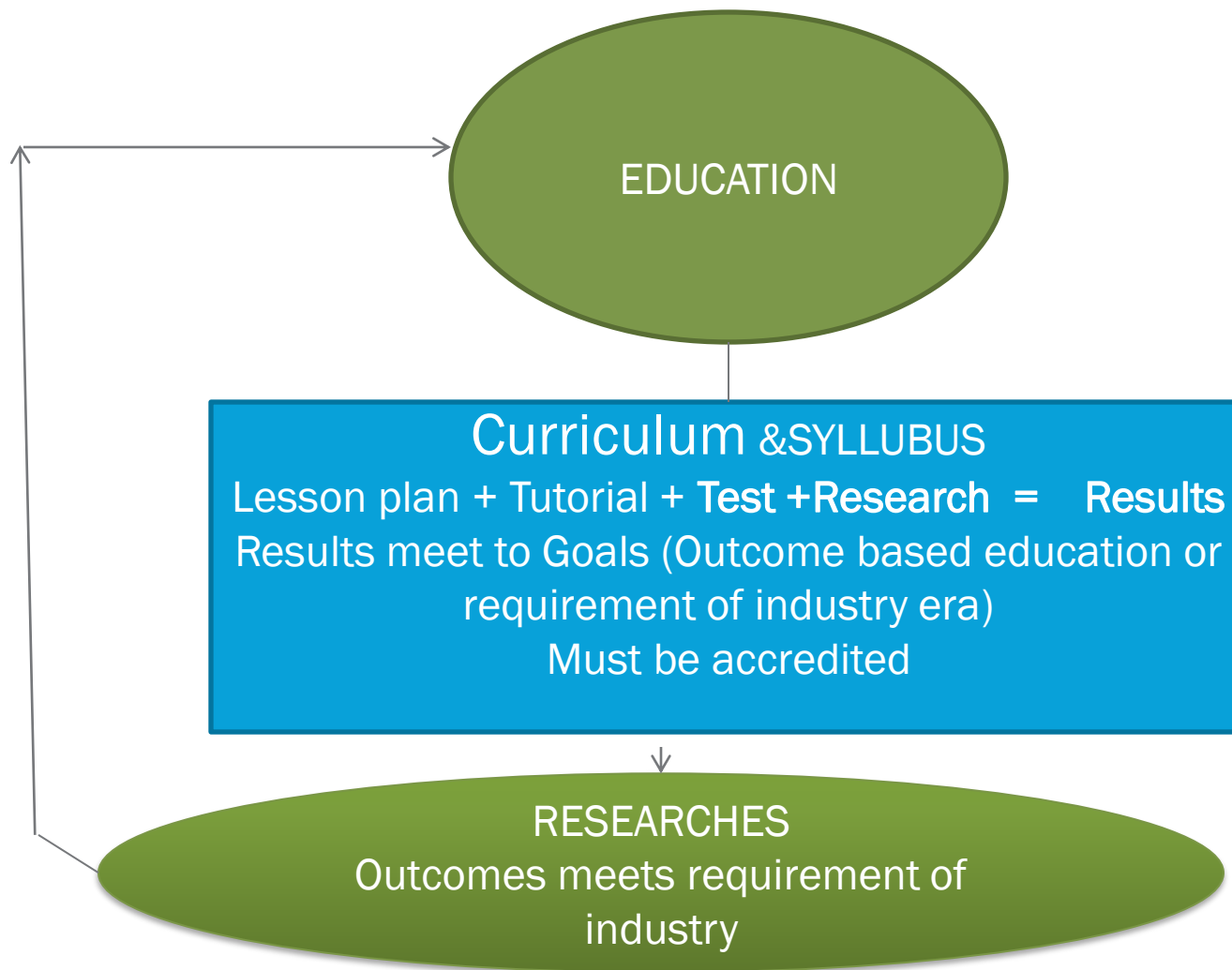
BY

PROF: THAN THAN WIN(RETIRED)

ELECTRICAL POWER DEPARTMENT, YTU
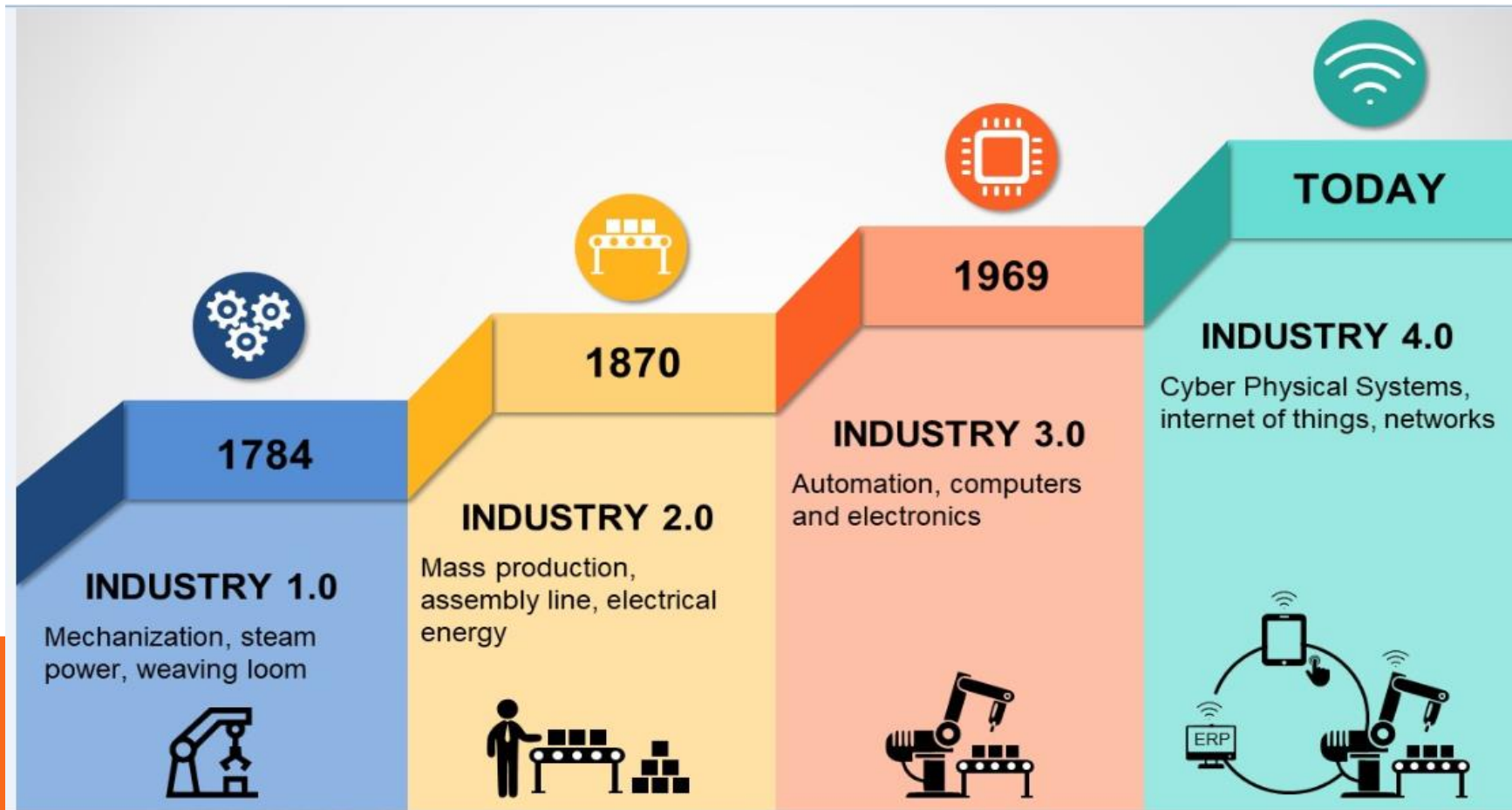
(SATURDAY,13.8.2022)

RELATION AMONG INDUSTRY,EDUCATION AND RESEACH

EDUCATION

Curriculum &SYLLUBUS
Lesson plan + Tutorial + Test +Research = Results
Results meet to Goals (Outcome based education or requirement of industry era)
Must be accredited

RESEARCHES
Outcomes meets requirement of industry
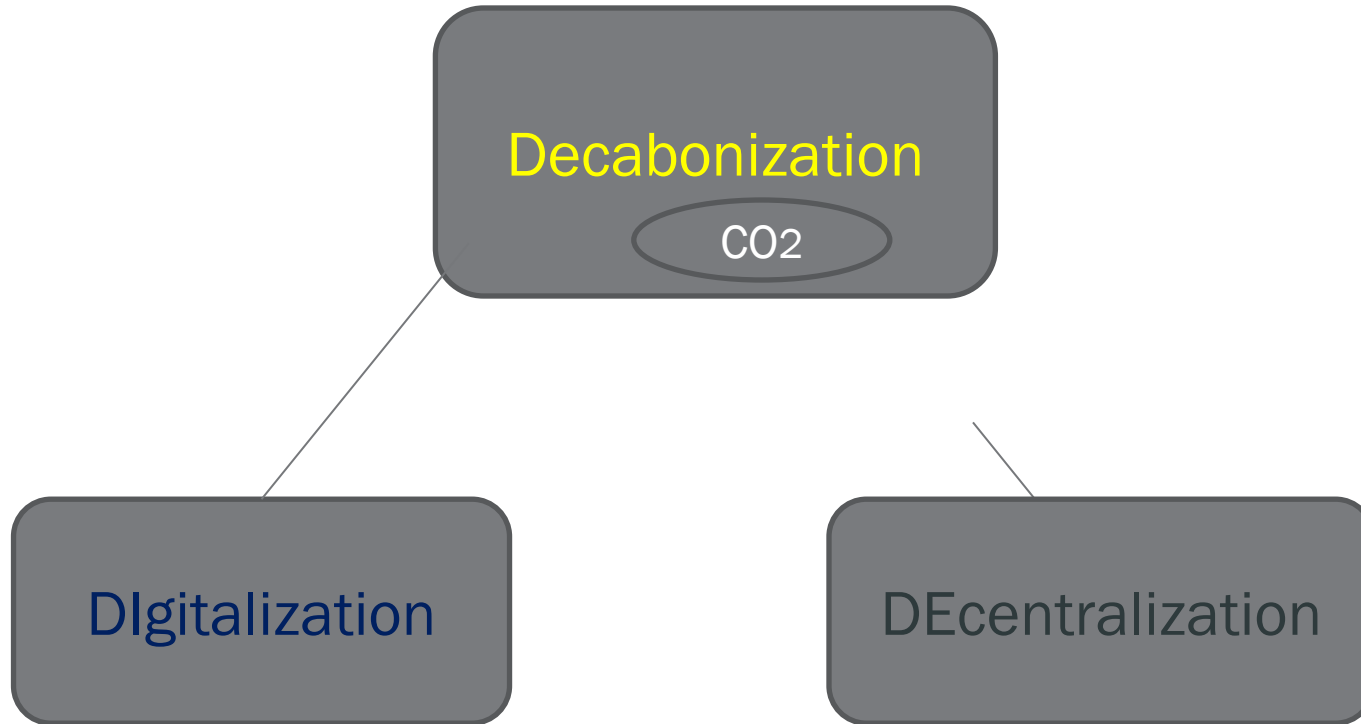
CHANGE OF INDUSTRY ERA

RESEARCH

Based on the industrial needs

Outcome may be apply to requirement of industrial needs

Result may improve the syllabus and curriculums of relative field

NEW ERA OF INDUSTRIAL UTLIZATION

Decabonization

CO_2

DIgitalization

DEcentralization

DECARBONIZATION

CARBON CAPTURE, UTILIZATION, STORAGE (CCUS)

❖ POLICY AND REGULATION

❖ RENEWABLE COST DECLINES

DECENTRALIZATION

❖ ENERGY STORAGE

❖ DISTRIBUTED GENERATION

❖ DER AGGREGATION

❖ COGENERATION

❖ BACKUP GENERATION

❖ BTMG

❖ MICRGRIDS

DIGITIZATION

❖ SENSORS

❖ COMMUNICATION

❖ SOFTWARE

❖ ANALYTICS

❖ ADVANCED TECHNOLOGIES

DISINTERMEDIATION

- ❖ P2P TRADING

- ❖ DISTRIBUTED LEDGER TECHNOLOGY

- ❖ NEW BUSINESS MODEL

DECENTRALIZATION

❖ DISTRIBUTED GENERATION

❖ ENERGY STORAGE

❖ DER AGGREGATION

❖ COGENERATION

❖ BACKUP GENERATION

❖ BTMG

❖ MICRGRIDS

DIGITAL OR DEAD

DIGITIZATION SENSORS

Wireless/Batteryless
Temperature and Humidity Sensor
Wireless Connectivity
Wireless Connectivity Device
Voltage and Current Sensor

DIGITIZATION

COMMUNICATIONS

❖Better Flexibility for specific applications

❖Increased communication capability (Multiple Protocols)

-IEC 61850 edition 1&2

-Profibus

-Modbus

-DNP3

-Ethernet IP

-IEC 60870-5-103/101

-Device Net

-Redundancy protocols (PSTP,PRP)

DIGITIZATION

SOFTWARE

- ❖ SUPERVISORY CONTROLLED AND DATA ACQUISITION (SCADA)

- ❖ ADVANCED DISTRIBUTION MANAGEMENT SOFTWARE(ADMS)

- ❖ ADVANCED METERING INFRASTRUCTURE(AMI)

- ❖ ENTERPRISE RESOURCES PLANNING (ERP)

- ❖ POWER SYSTEM ANALYSIS SOFTWARE(eTAP)

- ❖ ELECTRICAL PLANNING AND ENGINEERING SOFTWARE (EPLAN)

- ❖ MAGNETIC MODELLING SOFTWARE (FEM)

- ❖ etc.

INTERNET OF THINGS

- ❖ INTERNET CONNECTED DEVICE
  - ❖ CONNECT 50BN DEVICES BY 2020

DECENTRALIZATION

MICROGRIDS

❖ GRATER GRID EFFICIENCY

❖ IDEAL GRID TRANSFORMATION

❖ MINIMIZED POWER INFRASTRUCTURE

❖ GRID 2.0 (SMART GRID)

❖ IMPROVING LOCAL ENERGY DELIVERY

❖ INCREASING RELIABILITY

❖ SAVING MONEY

❖ GENERATING REVENUE (FEED IN TARRIF)

❖ AIDING ECONOMIC GROWTH

❖ MAKING THE GRID MORE RESILIENT

DECENTRALIZATION

ENERGY STORAGE

- ❖ GRID SCALE LITHIUM IRON BATTERY
- ❖ WATER RESERVOIR STORAGE
- ❖ LEAD ACID BATTERY
- ❖ SODIUM SULPHUR BATTERY
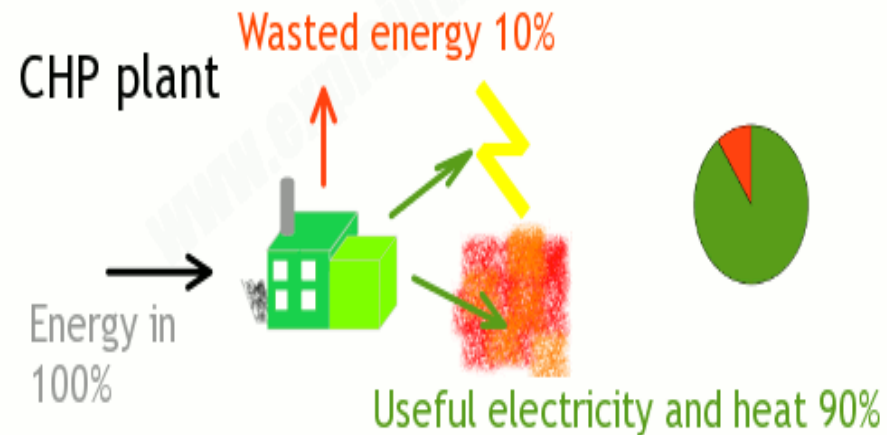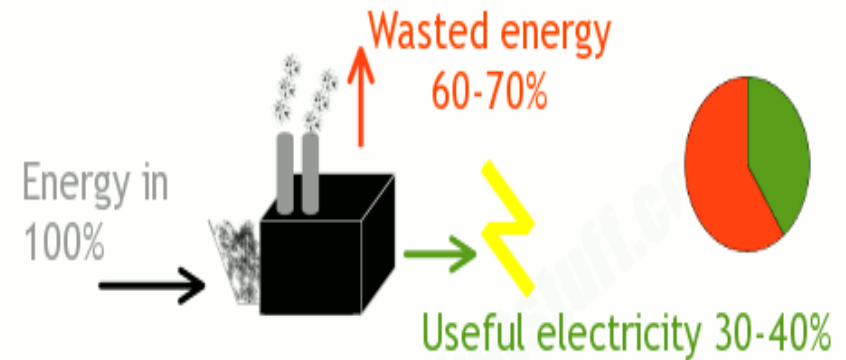- ❖ SOLAR PV AND STORAGE TO ACCOUNT FOR 50% OF NEW CAPACITY ADDITIONS BY 2030

DECENTRALIZATION

COGENERATION

- ❖ COMBINED HEAT AND POWER PLANT
- ❖ **COMBINED CYCLE POWER PLANT**
- ❖ **WASTE HEAT RECOVERY**
- ❖ **LOCAL GENERATION**

THANK

for

YOUR

ATTENDTION