清華大學
Tsinghua University

srii
Service Research & Innovation Institute

Innovation and Entrepreneurship for Digital Economy IEDE Spring 2024

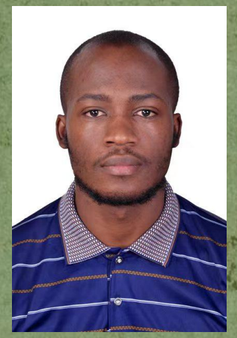
Program Director: Professor Kris Singh

SUSTAINABILITY

GREEN ENERGY THROUGH ADVANCED AI

TEAM MEMBERS

Name: **LUKE SAYE NENWON KRUA**
Nationality: Liberian
School: Central South University
Major: Environmental Science & Engineering
IEDE-ID: 2024031
Attendance: 10



Name: TCHEPSEU PATENG URICHE CABREL
Nationality: Cameroonian
School: NUIST
Major: Artificial Intelligence
IEDE-ID: 2024144
Attendance: 10

Name: CHRISTOPHER DORMA MOMO JR
Nationality: Liberian
School: Tianjin University
Major: Materials Science & Engineering
IEDE-ID: 2024150
Attendance:09

Name: AHMED IMTIAJ
Nationality: Bangladeshi
University: JUST
Department: Naval Architecture and Ocean Engineering
IEDE-ID: 2024059
Attendance: 09

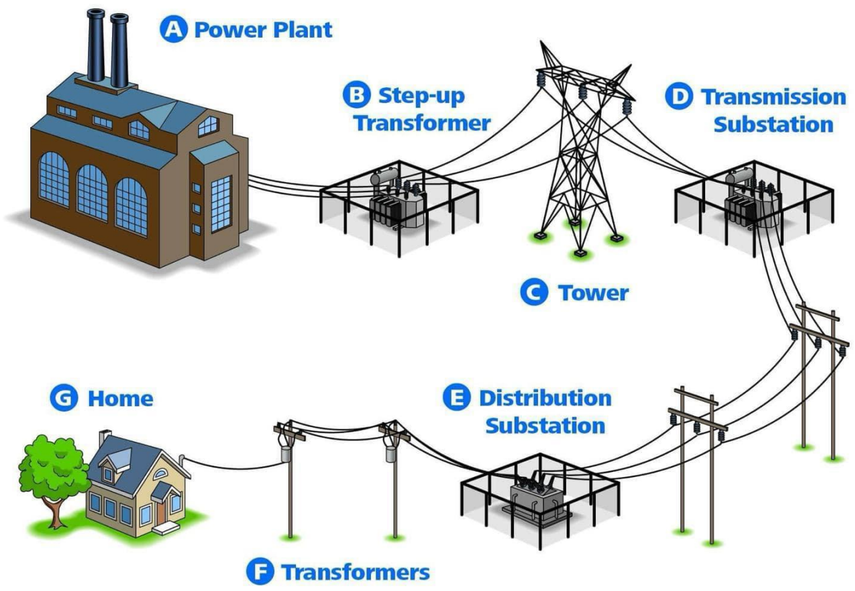
Name: SINTHIA CHOWDHURY
Nationality: Bangladeshi
School: North China Electric power University
Major: School of Electrical & Electronic Engineering
IEDE-ID2024036
Attendance:02

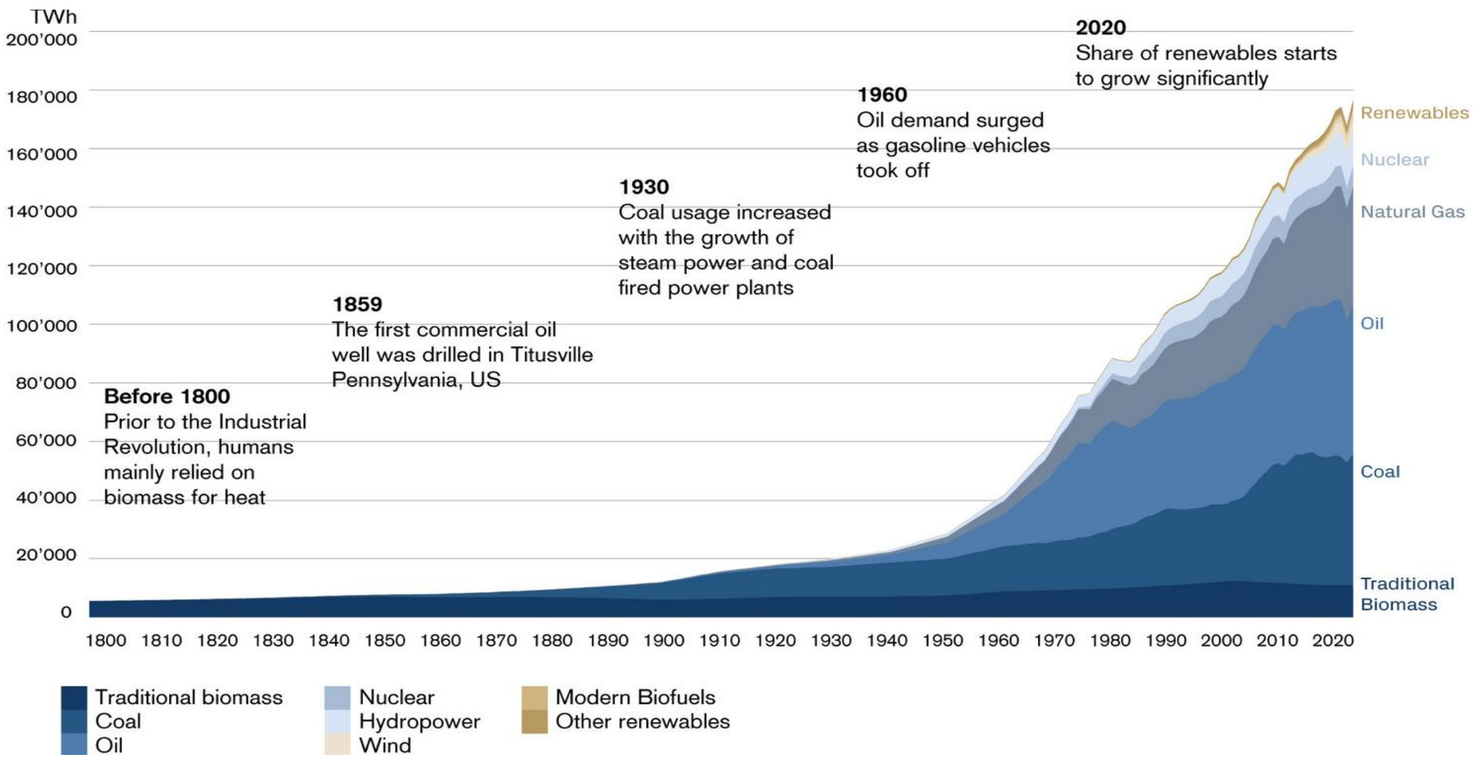
TABLE OF CONTENT

Introduction

- Transitioning to green energy is crucial for addressing environmental concerns like carbon emissions and climate change.
- This project focuses on innovating efficient green energy solutions for generation, storage, and distribution.
- Green energy helps reduce pollution, conserve resources, and promote economic growth.
- Advanced AI enhances energy efficiency and accelerates the adoption of renewables, driving sustainability for a cleaner, prosperous world.

Introduction





- The integration of Artificial Intelligence (AI) in the green energy sector represents a transformative shift, enhancing efficiency, security, and sustainability.
- AI's capabilities in data analysis, prediction, and system management significantly contribute to the optimization of renewable energy resources.
- This synergy between AI and green energy is pivotal in advancing sustainable development goals, particularly in addressing climate change challenges and promoting environmental conservation.

Objectives

▪Renewable energy source incorporated into the product.

▪Intelligent energy management system that adapts to user behavior and external environmental factors

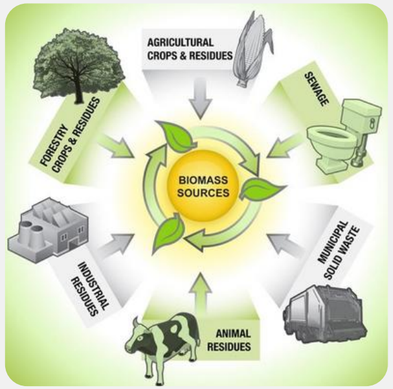
Evaluate the economic and environmental impact of AI-driven green energy sustainability

Significance of the project

Contributes to the ongoing efforts towards sustainable and eco-friendly green energy through AI

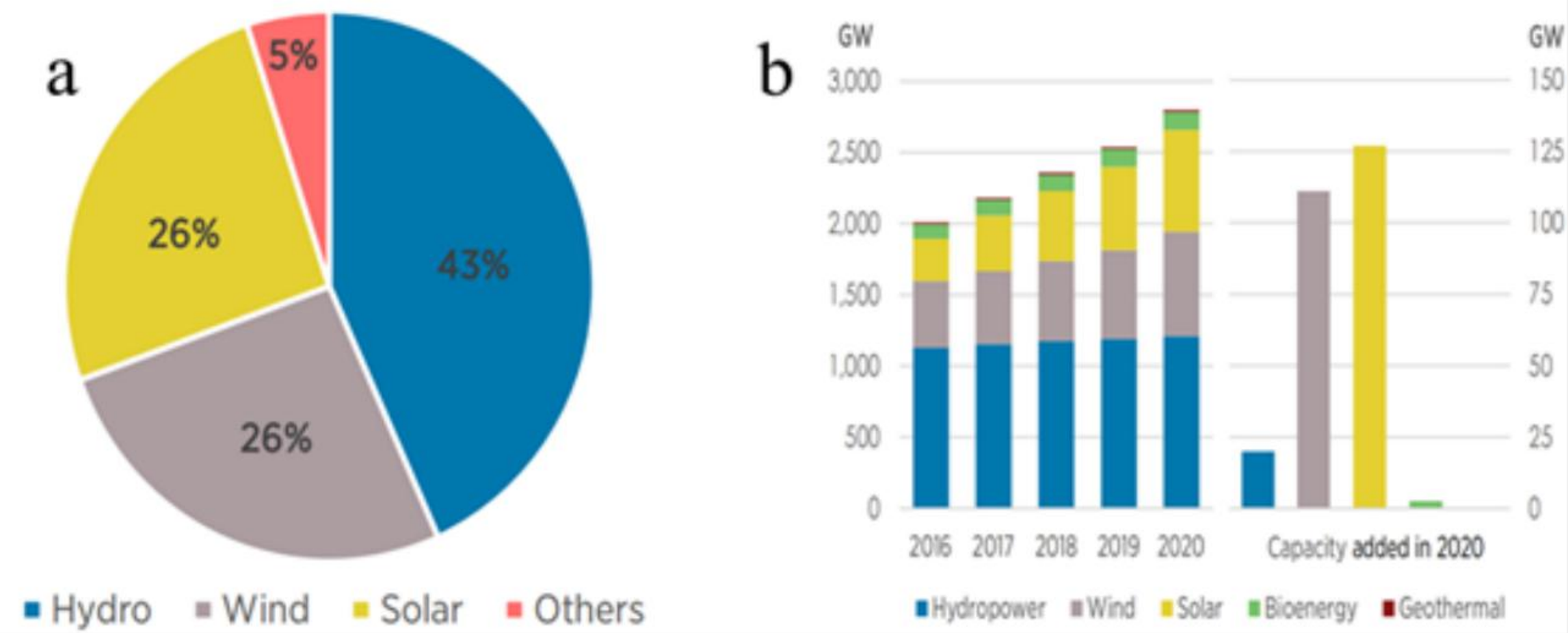
▪Provides valuable insights for policymakers, building managers, and industry stakeholders.

Sets the stage for developing advanced AI-driven solutions for green energy in various sectors

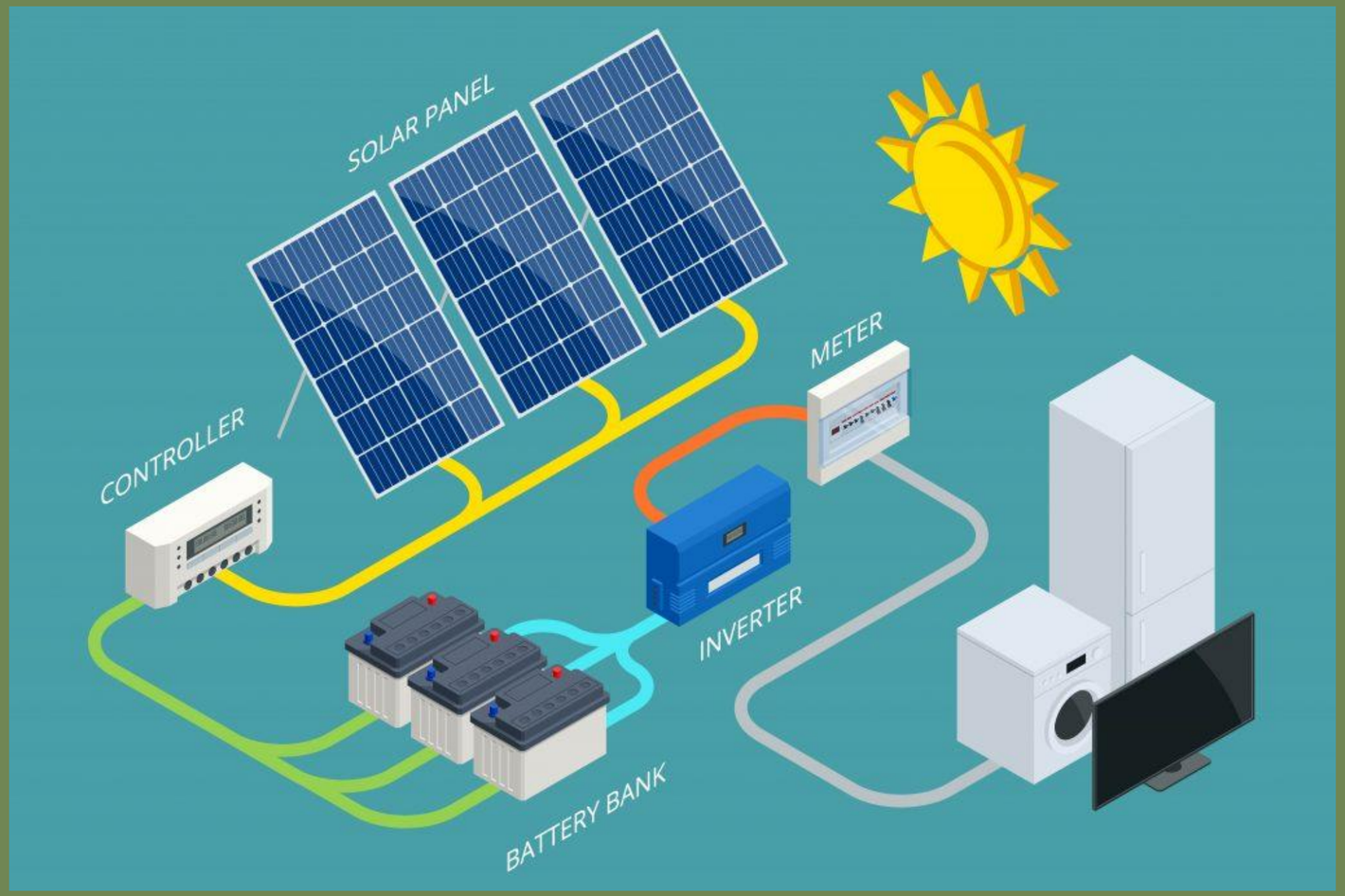


GREEN ENERGY SOURCES

Green energy is essential for mitigating climate change and reducing carbon emissions. It includes renewable sources like solar, wind, hydro, geothermal, and biomass


a
5%
26%
43%
26%
Hydro
Wind
Solar
Others
b
GW
GW
3,000
2,500
2,000
1,500
1,000
500
0
150
125
100
75
50
25
0
2016
2017
2018
2019
2020
Capacity added in 2020
Hydropower
Wind
Solar
Bioenergy
Geothermal

SOLAR ENERGY

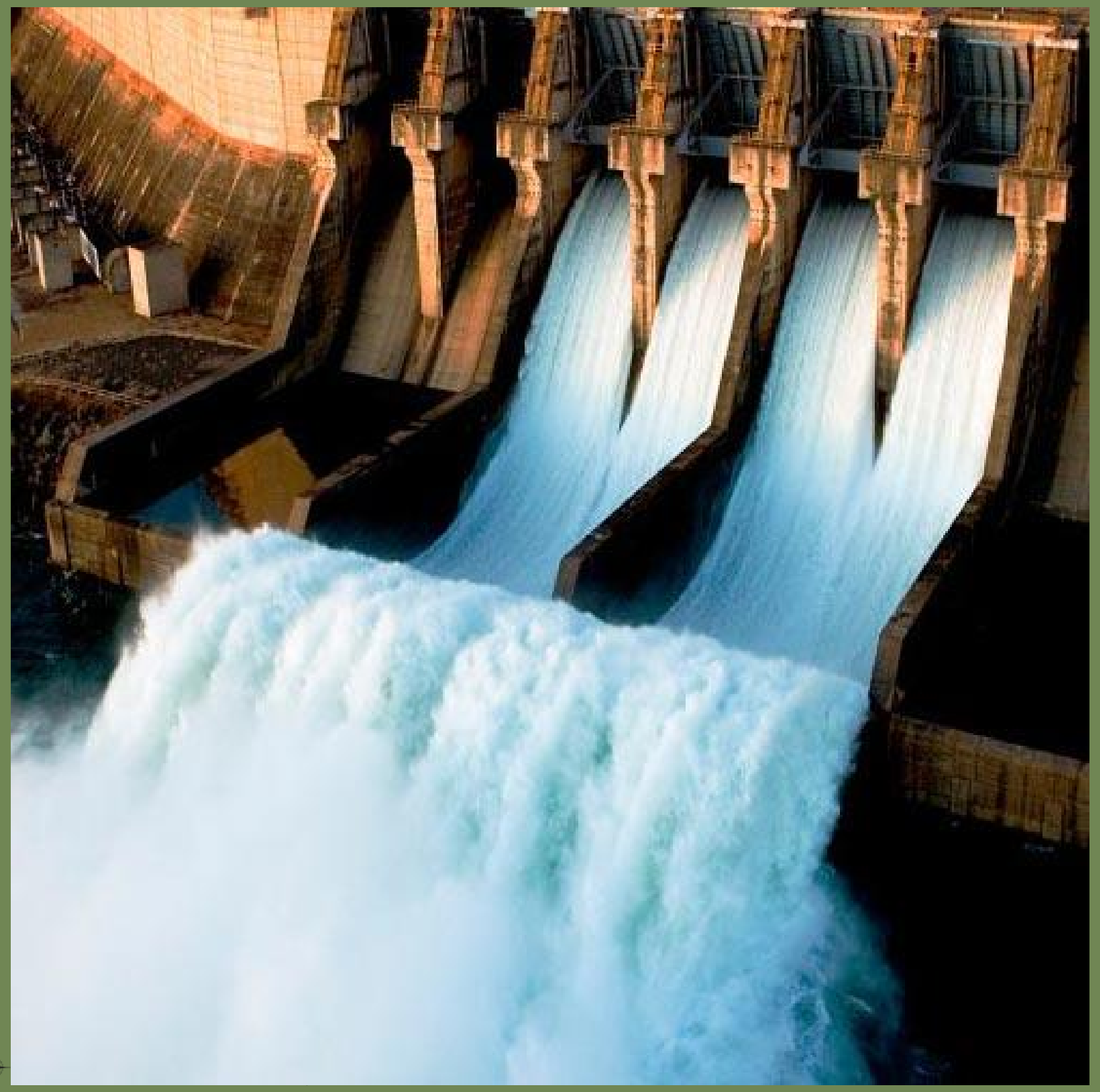


- What is solar energy?
- Type of solar energy
- Solar thermal energy
- Photovoltaic energy (PV)
- How are solar panels made?
- How does solar energy work?
- Strengths of solar energy
- weaknesses of solar energy

WIND ENERGY

- What is wind energy?
- How is wind made?
- How does wind energy work?
- Strengths of wind energy
- weaknesses of wind energy

HYDRO ENERGY

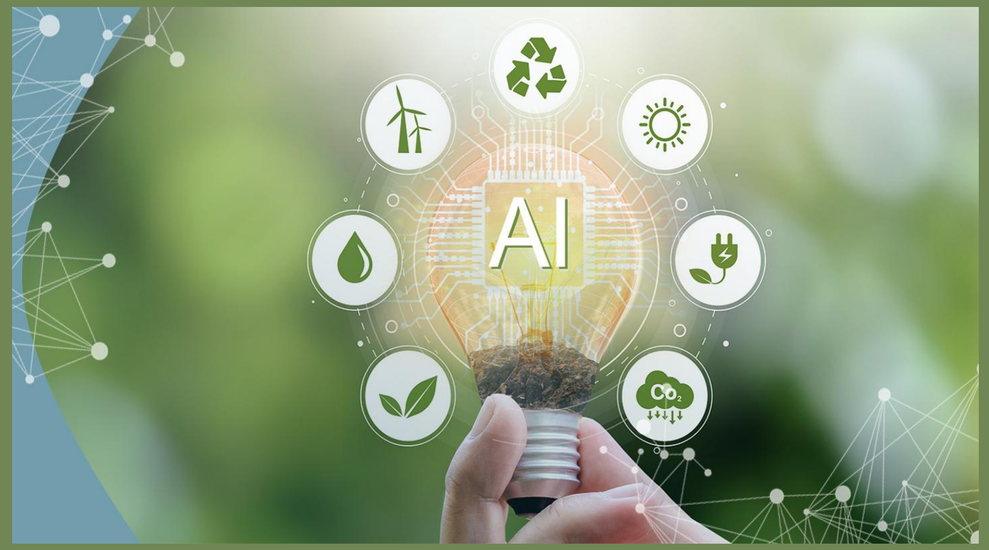


- What is hydro energy?
- How is hydro made?
- How does hydro energy work?
- Strengths of hydro energy
- weaknesses of hydro energy

BIOMASS ENERGY

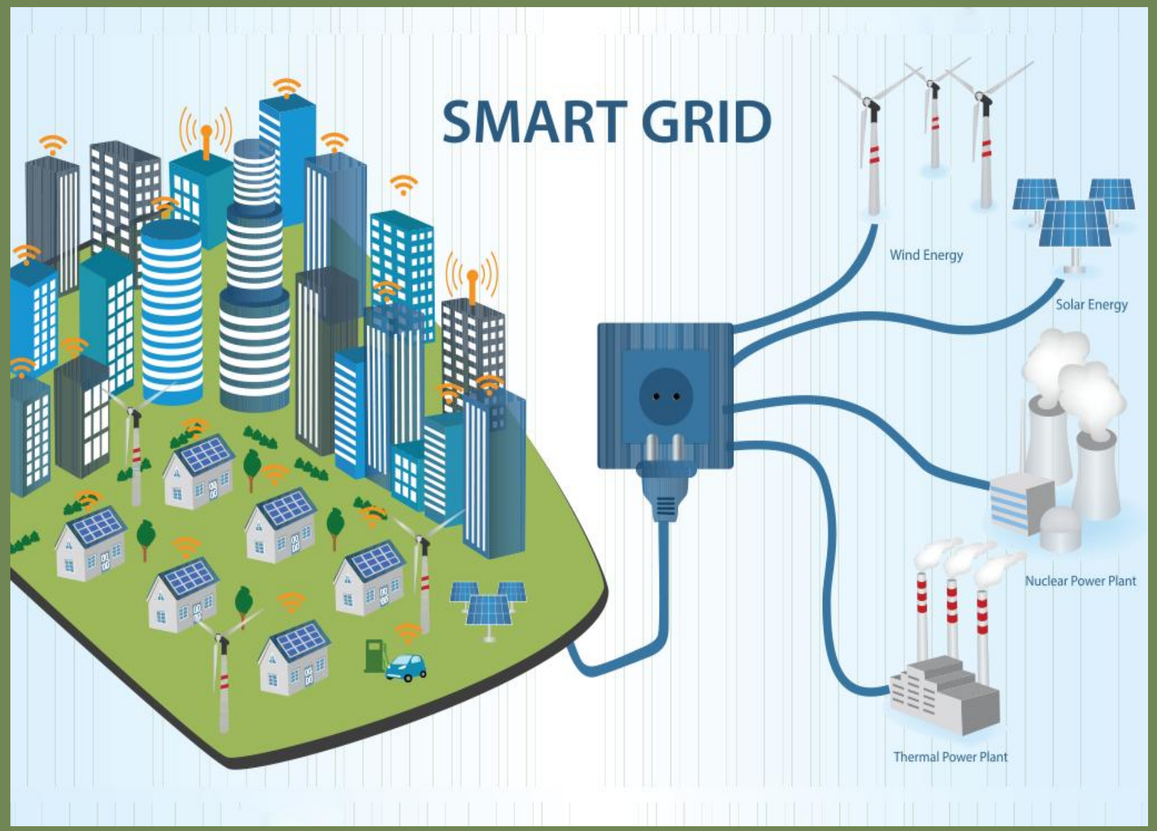
- ❑ What is biomass energy?
- ❑ Type of biomass energy?
- ❑ How is biomass made?
- ❑ How does biomass energy work?
- ❑ Strengths of solar energy
- ❑ weaknesses of solar energy

ROLE OF AI IN GREEN ENERGY

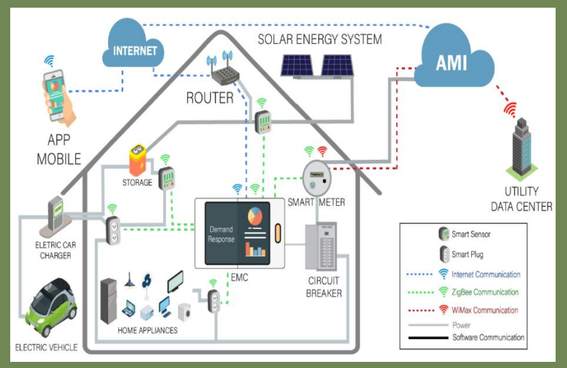


AI's integration into green energy drives efficiency, security, and sustainability, optimizing renewable resources through data analysis and system management. This synergy is crucial for advancing sustainable goals, addressing climate change, and promoting environmental conservation. AI enhances resilience in decentralized systems and aids strategic development in solar energy and beyond, shaping sustainable energy infrastructures globally.

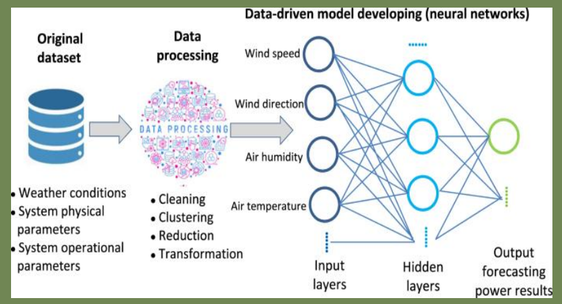
Smart Grids



Demand Response Management



Renewable energy forecasting



Energy trading

Smart homes

Predictive Maintenance

Energy storage

Conclusions

- ✓ The combination of green energy and advanced AI has great potential to transform energy systems despite challenges like technical interoperability and economic constraints.
- ✓ AI-powered solutions can enhance efficiency, reduce emissions, and promote sustainability, especially in renewable energy sources and smart grids.
- ✓ Continued research, collaboration, public awareness, education, and policy support are crucial for scaling up AI-driven green energy globally.

Thank you very much!