

1. Smart Grid System with Renewable Energy Integration

- **Description:** Design a smart grid that integrates renewable energy sources like solar and wind, optimizing energy distribution based on demand.
- **Technologies:** Microgrid, Solar Panels, Wind Turbines, Smart Meters, IoT.

2. Wireless Power Transfer System

- **Description:** Build a wireless power transfer system for charging devices without physical connections.
- **Technologies:** Inductive Coupling, Resonant Circuits, Power Electronics.

3. Electric Vehicle Charging Station

- **Description:** Design an electric vehicle (EV) charging station with smart features like billing automation and remote monitoring.
- **Technologies:** Power Electronics, IoT, Smart Meters, DC Fast Charging.

4. Solar-Powered Water Pumping System

- **Description:** Develop a solar-powered water pumping system for irrigation, controlled remotely via IoT.
- **Technologies:** Solar Panels, MPPT Controllers, IoT, DC Motors.

5. Smart Energy Meter for Load Management

- **Description:** Create an energy meter that monitors and manages energy consumption, reducing peak load using smart scheduling.
- **Technologies:** Power Meters, IoT, Smart Load Management.

6. Power Factor Correction System

- **Description:** Design a system to improve power factor in industrial applications, reducing energy loss and costs.
- **Technologies:** Power Electronics, Capacitor Banks, Reactive Power Control.

7. Automatic Transfer Switch for Uninterrupted Power Supply

- **Description:** Create an automatic transfer switch to ensure seamless power supply switching between grid and backup sources (solar, generator, etc.).
- **Technologies:** Relays, Power Electronics, Automatic Switching.

8. Smart Lighting System using DALI Protocol

- **Description:** Design a smart lighting control system using the DALI (Digital Addressable Lighting Interface) protocol for energy efficiency.
- **Technologies:** DALI Protocol, Power Electronics, IoT, Smart Sensors.

9. Remote Monitoring of Solar Power Plants

- **Description:** Develop a system for remote monitoring of solar power plant parameters like energy generation, voltage, and current.
- **Technologies:** Solar Panels, IoT, Energy Meters, Cloud Platforms.

10. Smart Inverter for Hybrid Energy Systems

- **Description:** Create a smart inverter that integrates and switches between different power sources (solar, grid, battery) based on availability.
- **Technologies:** Power Inverters, Battery Management Systems, IoT.

11. Transformer Health Monitoring System

- **Description:** Build a system to monitor the health of transformers by measuring parameters like temperature, oil levels, and vibrations.
- **Technologies:** Sensors, IoT, Power Transformers, Real-time Monitoring.

12. Automated Load Shedding System

- **Description:** Design a system that performs automated load shedding during peak demand to maintain grid stability.
- **Technologies:** Power Distribution, IoT, Automated Control Systems.

13. Battery Management System for Electric Vehicles

- **Description:** Develop a smart battery management system to optimize battery charging and discharging in electric vehicles.
- **Technologies:** Lithium-ion Batteries, BMS, Power Electronics.

14. Induction Motor Control with Variable Frequency Drive (VFD)

- **Description:** Build a VFD to control the speed of an induction motor for industrial automation.
- **Technologies:** Power Electronics, Induction Motors, VFD.

15. Wireless Electrical Appliances Control

- **Description:** Design a system that allows users to control electrical appliances remotely using IoT.
- **Technologies:** IoT, Relays, Smart Meters, Wi-Fi Modules.

16. Energy Harvesting from Piezoelectric Devices

- **Description:** Create a system to harvest energy from piezoelectric devices installed in roads or floors.
- **Technologies:** Piezoelectric Materials, Power Electronics, Energy Harvesting.

17. Automatic Voltage Regulator (AVR) for Generators

- **Description:** Develop an AVR to maintain a stable voltage output in generator systems.
- **Technologies:** Power Electronics, Voltage Control, Generators.

18. IoT-Based Fault Detection in Power Lines

- **Description:** Design a system to detect faults in power lines and send real-time alerts to utility companies.
- **Technologies:** IoT, Fault Detection Algorithms, Power Lines Monitoring.

19. Home Energy Management System

- **Description:** Create a system that monitors and optimizes energy consumption in homes by controlling appliances and devices.
- **Technologies:** Smart Meters, IoT, Energy Optimization Algorithms.

20. Smart Street Lighting with Motion Sensors

- **Description:** Design a smart street lighting system that turns on or adjusts brightness based on pedestrian or vehicle movement.
- **Technologies:** Motion Sensors, LDRs, IoT, Relays.