

# Infinity Hybrid Power Hub Project Report



## Abstract

The Infinity Hybrid Power Hub is a cutting-edge, intelligent renewable energy system that integrates multiple green technologies-dual-axis solar tracking, wind generation, thermoelectric generation (TEGs), and a fuelless generator-into a single autonomous platform. Enhanced with IoT technology (ESP32 + Blynk), the system enables real-time monitoring, control, and performance optimization. It is designed to provide reliable, off-grid power for both residential and industrial use.

## Objectives

- Design and build a hybrid energy system integrating solar, wind, thermoelectric, and fuelless sources.
- Maximize energy harvesting with a dual-axis solar tracker.
- Implement remote monitoring and control using ESP32 and Blynk.
- Monitor and calculate real-time system efficiency.
- Provide a stable, redundant, and modular energy solution.

## Abbreviations

- TEG: Thermoelectric Generator
- MPPT: Maximum Power Point Tracking
- IoT: Internet of Things
- ESP32: Microcontroller with Wi-Fi & Bluetooth

- SOC: State of Charge
- DC: Direct Current
- AC: Alternating Current
- BOM: Bill of Materials

## System Schematic

