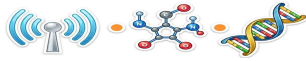


Energy Harvesting from RF and Organic Wastes for Electricity Generation



INTRODUCTION

Over the years, increasing energy demand, rising energy prices, and climate change concerns have gained significant attention. To address these challenges, two autonomous solutions are proposed to improve access to electricity for basic commodities including lighting, security and communications, and to reduce reliance on polluting energy sources: Ambient Radio Frequency (RF) energy harvesting and Microbial Fuel Cells (MFC). These methods leverage electromagnetic signals and the energy potential of organic waste, respectively, to generate decentralized low power electricity.

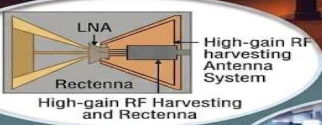
TECHNOLOGY 1: AMBIENT RF ENERGY HARVESTING (RFI)

Source Signals

- Radio
- Television
- Phones
- Routers

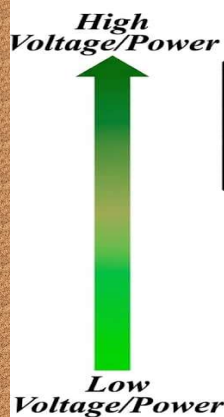


Phones



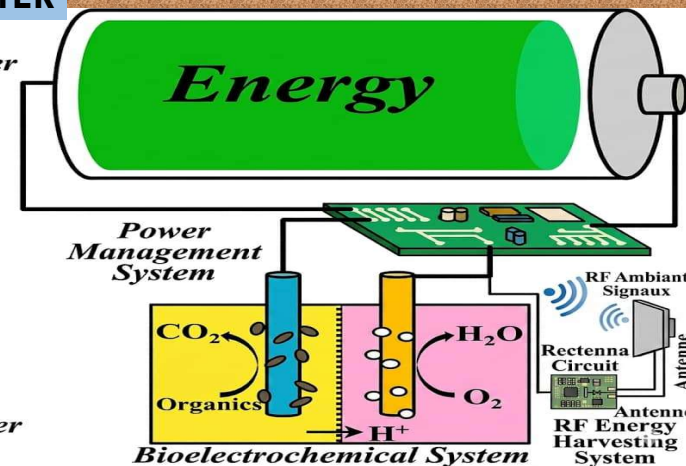
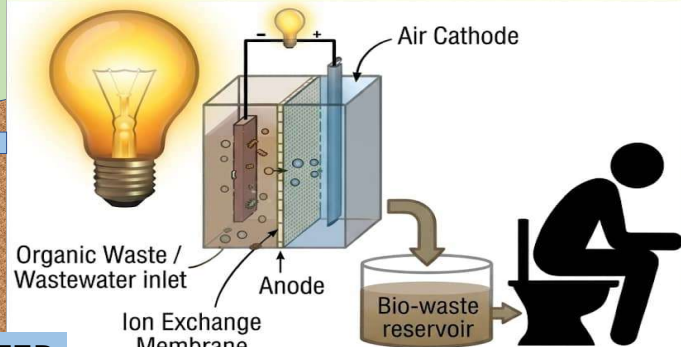
RESULTS

HARVESTER



BIO-ENERGY FROM ORGANIC WASTE (MFC)

Microbial Fuel Cells: Converting organic matter (faeces, urine, company wastewater, biodegradable waste) directly into electricity.



RFI

MFC

CONCLUSION

- We have successfully demonstrated two distinct and functional systems: an Ambient RF Energy Harvesting rectenna and a Microbial Fuel Cell (MFC) from diverse waste. Viable results have been obtained for both technologies.
- Beyond their shared role as autonomous power sources for low-power devices, they provide specific benefits: waste management and resource production (hydrogen, bio-fertilizers) for MFCs, and emergency power backup capabilities for RF systems.