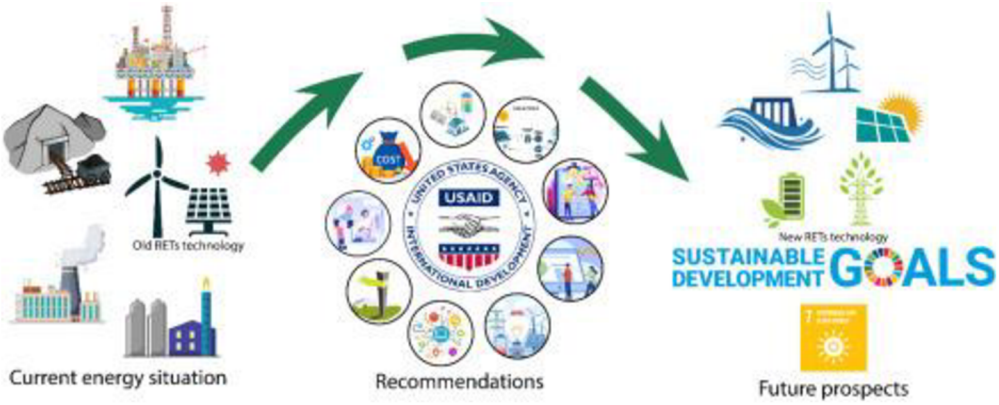
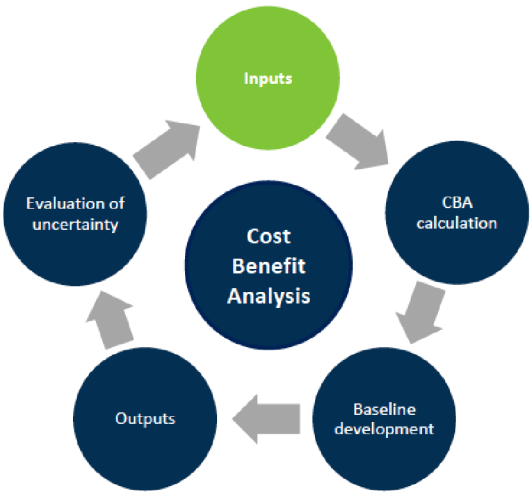
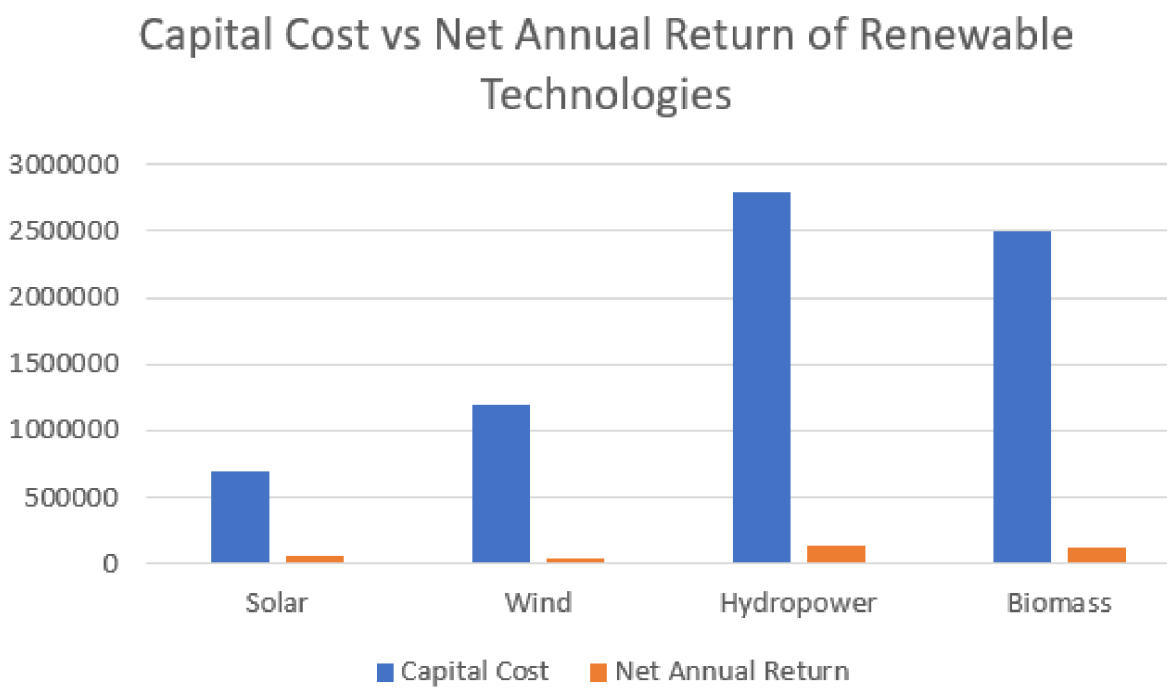
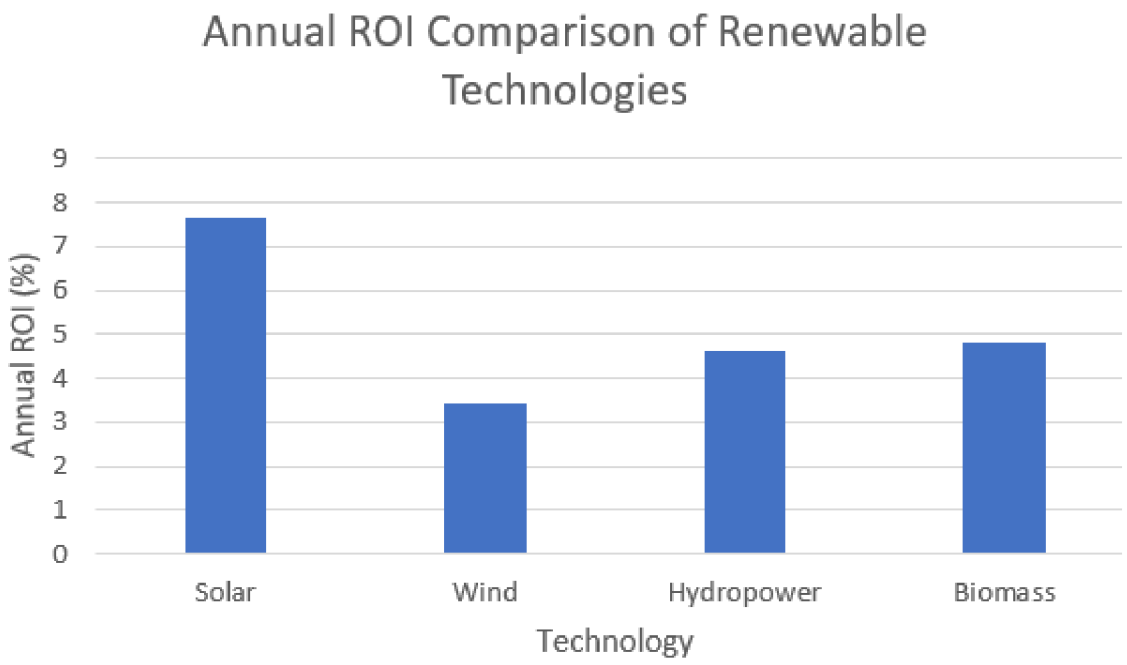
Appendix

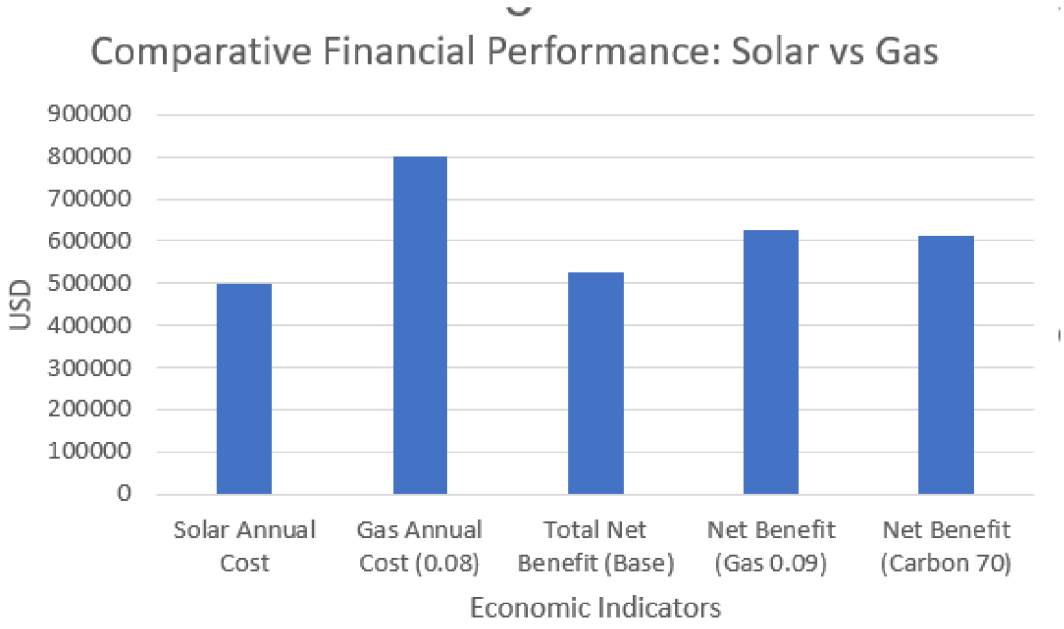




Technology	Capital Cost (USD)	Net Annual Return (USD)	Payback (Years)	Annual ROI (%)
Solar	700,000	53,500	13	7.64%
Wind	1,200,000	41,000	29	3.41%
Hydropower	2,800,000	129,500	22	4.63%
Biomass	2,500,000	120,000	21	4.80%


Capital Cost vs Net Annual Return of Renewable Technologies
3000000
2500000
2000000
1500000
1000000
500000
0
Solar
Wind
Hydropower
Biomass
Capital Cost
Net Annual Return


Annual ROI Comparison of Renewable Technologies
Annual ROI (%)
9
8
7
6
5
4
3
2
1
0
Solar
Wind
Hydropower
Biomass
Technology

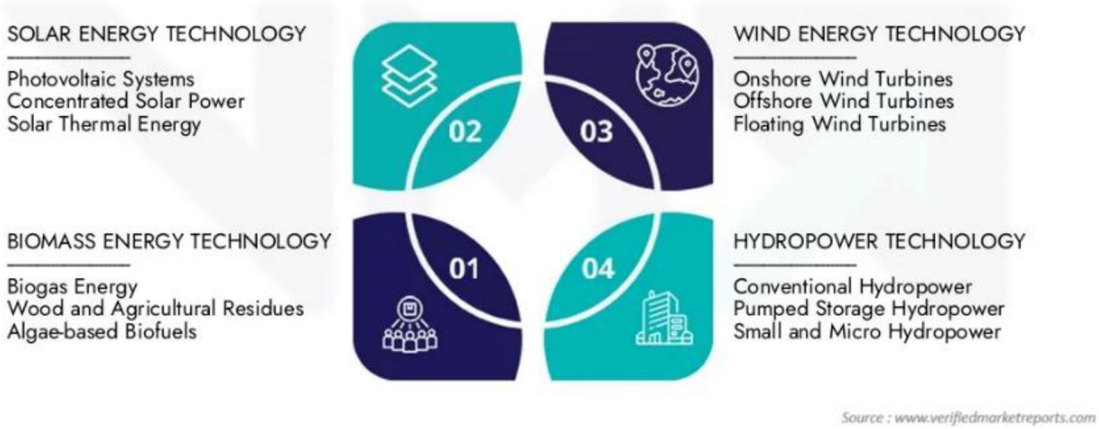


Components	Formula	Annual Value (USD)
Fuel Cost Saving	0.04 * 1,500,000	60,000
Carbon Value	1,050 * 40	42,000
Carbon Value	60,000 * 42,000	102,000

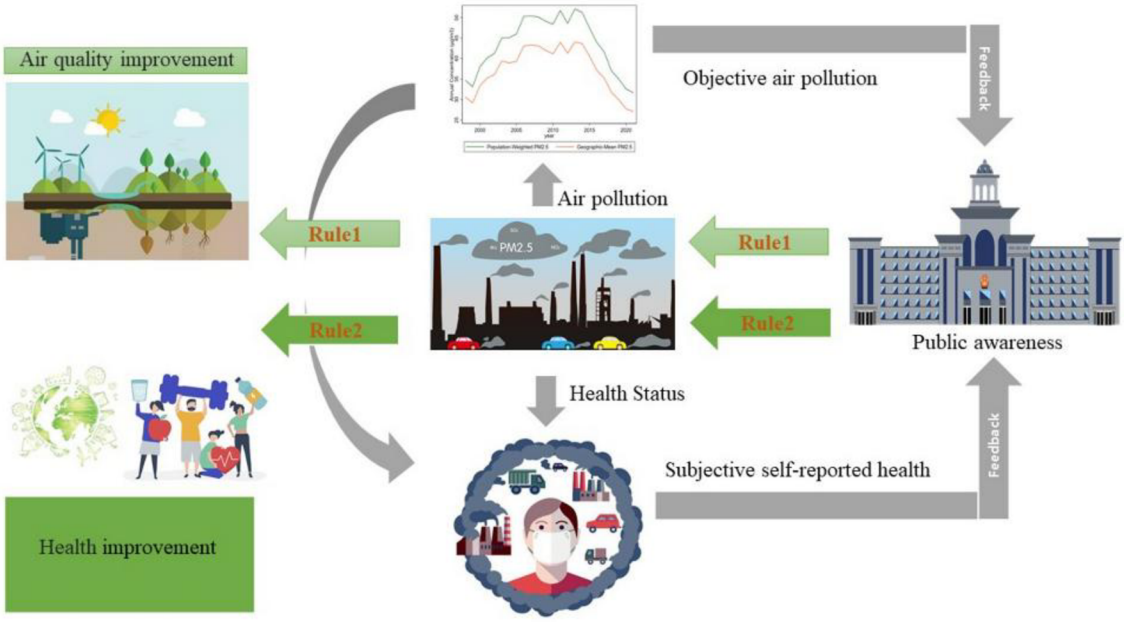
Installed Capacity	Direct Jobs	Indirect Jobs (1.5x multiplier)	Total Jobs
10 MW	30	15	45
100 MW	300	150	450
500 MW	1500	750	2250

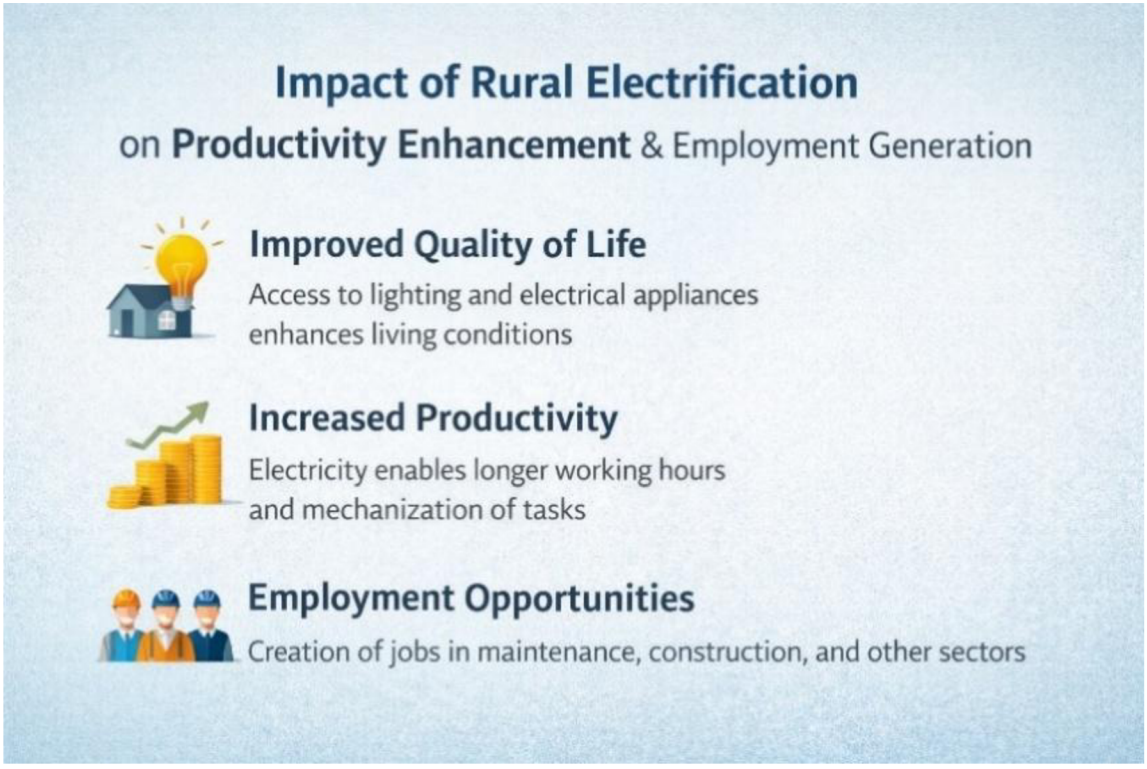
Energy Source	LCOE (USD/kWh)	Annual Cost (USD)
Solar PV	0.05	500,000
Gas-Based	0.08	800,000

Component	Value (USD)
Direct Fuel Saving	300,000
Carbon Cost Avoided	225,000
Total Net Benefit	525,000



Cost	Renewable Energy	Fossil Fuels
Capital Costs	High (but decreasing)	Lower (except for pollution control)
Fuel Costs	None	Significant and fluctuating
O&M Costs	Lower	Higher due to complexity
Environmental & Health Cost	Minimal	High (GHG emissions, pollution)
LCOE	Decreasing and often lower	Higher, especially when including environmental and health costs


Air quality improvement
Objective air pollution
Feedback
Air pollution
Rule1
PM2.5
Rule1
Rule2
Rule2
Public awareness
Health Status
Subjective self-reported health
Feedback
Health improvement


Impact of Rural Electrification
on Productivity Enhancement & Employment Generation
Improved Quality of Life
Access to lighting and electrical appliances enhances living conditions
Increased Productivity
Electricity enables longer working hours and mechanization of tasks
Employment Opportunities
Creation of jobs in maintenance, construction, and other sectors