SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 19EEO305 /Renewable Energy Generation Technology

IV YEAR / VII SEMESTER

UNIT 5- OTHER RENEWABLE ENERGY SOURCES

Topic 9 – Hybrid energy systems

SUCCESSFUL STUDENT

Positive Attitude

Professionally Groomed

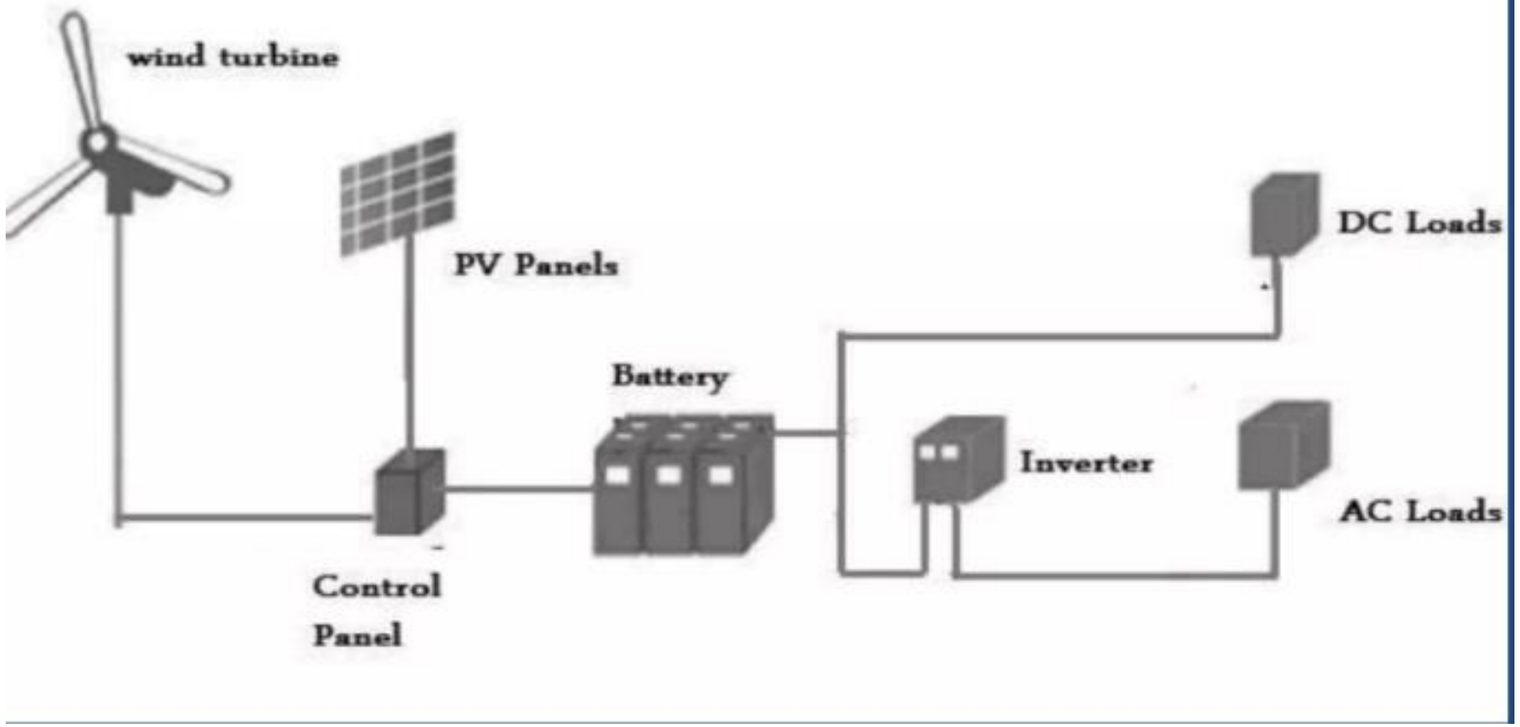
Socially Interactive

Technically Skillful

Solar-Wind Power System

- When one source isn't available (overcast skies or calm air), the system will still be able to provide energy from the alternate energy source. The clean, emission-free power acts as a reliable backup or supplemental power source.
- When both sun and wind is present, the batteries will charge even faster.

Implementation of Hybrid Energy System



Advantages of Hybrid System

- Very high reliability (combines wind power, and solar power)
- Long term Sustainability and Long term warranty
- High energy output (since both are complimentary to each other)
- Cost saving (only one time investment)
- Low maintenance cost (there is nothing to replace)
- No pollution, Clean and pure energy
- Provides un-interrupted power supply to the equipment
- The system gives quality power out-put DC to charge directly the storage battery or provide AC.
- The system can be designed for both off-grid and on grid applications.
- Efficient and easy installation, longer life

Disadvantages of Hybrid System

- Large number of harmonics is produced.
- Initial investment is more.
- Large space is required for larger generations
- Wind energy systems are noisy in operation; a large unit can be heard many kilometers away.
- Efficiency is less than conventional power plants.
- The arrangement becomes complicated due to hybrid structure.
- Large space is required for larger generations.

- Solar insolation in Lucknow are given below; (in W/m²)

Time	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
7:00-8:00	37	36	36	35	34	23	33	33	27	33	39	39
8:00-9:00	150	147	147	150	151	154	150	150	113	150	146	150
9:00-10:00	202	211	208	202	209	229	202	202	236	202	227	203
10:00-11:00	233	233	233	240	249	308	241	241	265	234	242	242
11:00-12:00	253	253	250	250	282	345	251	268	283	252	252	252
12:00-01:00	250	258	250	251	340	173	252	263	269	253	254	255
01:00-02:00	237	253	238	238	303	265	240	268	241	241	250	243
02:00-03:00	205	248	207	207	263	251	209	251	210	211	220	221
03:00-04:00	163	177	165	166	155	185	169	176	170	171	172	181
04:00-05:00	79	73	81	83	82	51	88	81	89	91	93	91
Avg.	181	189	182	182	207	198	184	193	190	184	190	188

ASSESSMENT

REFERENCE

Reference Book:

1. S.P. Sukhatme, ‘Solar Energy’, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997. (UNIT II)

2. G.N. Tiwari, ‘Solar Energy – Fundamentals Design, Modelling and applications’, Narosa Publishing House, New Delhi, 2002. (UNIT II)

3. S.M. Muyeen,” Wind Energy Conversion Systems: Technology and Trends”, Springer 2012. [UNIT III]

Text Book:

1. G.D. Rai, ‘Non Conventional Energy Sources’, Khanna Publishers, New Delhi, 2006. (UNIT I - V)

2. D.P.Kothari, K.C.Singal and Rakesh Ranjan,”Renewable energy sources and Emerging Technologies”, PHI Pvt. Ltd., 2009. (UNIT I-V)

THANK YOU!!