

Certification course
On
Non-Conventional Energy Sources
Organized
By
Department of H&S

Dates: 1/9/2021 to 15/9/2021

Course Coordinator: M. Mary Jasmine

Course Instructors: Dr. I. Sreevani,
M. Mary jasmine
Dr. K. Venkata Ramana



K.S.R.M. COLLEGE OF ENGINEERING

(UGC-AUTONOMOUS)

Kadapa, Andhra Pradesh, India- 516 003

Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu.

An ISO 14001:2004 & 9001: 2015 Certified Institution



Lr./KSRMCE/ (Humanities & science)/2021-22/

Date: 26.08.2021

To

The Principal,
K.S.R.M.College of Engineering
Kadapa.

From

M.Mary Jasmine,
Assistant Professor,
Department of H&S,
K.S.R.M College of Engineering
Kadapa.

Respected Sir,

Sub:KSRMCE - (Department of H&S) Permission to conduct Certificate course on Non-Conventional Energy Sources- Requested -Reg.

It is being brought to your kind notice that,With reference to the cited, the H&S Department is planning to conduct Certificate Course on Non-Conventional Energy Sources for B.Tech students from 1st September 2021 to 15th September 2021 in Online mode.In this regard I kindly request you to sir to grant permission to conduct certificate course.This is submitted for your kind perusal.

Thanking you Sir,

Yours Faithfully

Mary
M.Mary jasmine,
Asst. professor,
Dept. of H&S,
K.S.R.M.C.E.

*Forwarded to
Principal
Dept of H&S*

*Permitted
U.S.S. Murthy*



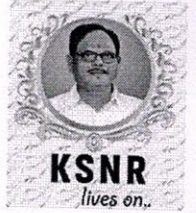
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Cr./KSRMCE/(Department of H&S)/2021-22

Date:26-8-2021

Circular

All the B. Tech students are here by informed that Department of H&S is going to conduct certificate course on Non-Conventional Energy Sources from 1st September 2021 to 15th September 2021. Interested students may register their names with the following link before 29th August 2021.

Registration Link: <https://forms.gle/gsj4ugcYrNM2dUA9A>

For any queries Contact,

Coordinators

M.Mary jasmine, Asst. prof, Dept. of H&S

Dr.K.Venkata Ramana, Asst. prof, Dept. of H&S

HOD/H&S

Dr. I. SREEVANI M.Sc., Ph.D.

Head of Humanities & Sciences

K.S.R.M. College of Engineering

KADAPA - 516 005

Cc to:

The Management / Director /Deans/HoDs/IQAC for information

Registration link for Certificate course on Non-Conventional Energy Resources

By Department of H&S, KSRMCE

* Required

1. Email *

2. Name of the student *

3. Year & Semester *

Check all that apply.

- B.Tech I Sem
- B.Tech II Sem
- B.Tech III Sem
- B.Tech IV Sem
- B.Tech V Sem
- B.Tech VI Sem
- B.Tech VII Sem
- B.Tech VIII Sem
- Completed
- Others

4. Branch *

Check all that apply.

- Civil
- Mechanical
- EEE
- ECE
- CSE

5. Roll Number *

6. Mobile Number(Preferably Whats app number) *

7. Address for Communication *

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Google Forms



label:certification-course-2021

Mail



Autonomous

B.Tech attendance shee...

Biology for engineer... 1

Certification course-20...

Chem & ES SUBJECTS I...

Chemistry Lab info

ECE-Running notes... 56

Exam section

Chat

Rooms



No rooms

Create or find a room

Meet

Google meet link on Certification co



Mary Jasmine <jasmine@ksrmce.ac.in>
to me

Certification Course on Non-Conventional energy Sources
Wednesday, September 1 · 4:00 – 6:00pm

Google Meet joining info

Video call link: <https://meet.google.com/fnm-qbvn-pdw>

M.MARY JASMINE

Asst.Prof
Dept.of H&S
KSRMCE
Kadapa

Reply

Forward

K.S.R.M College of Engineering (Autonomous), Kadapa
Department of Humanities & Sciences
Certification Course on Non-Conventional Energy Sources
Registration form

Timestamp	Email Address	Name of the student	Year & Semester	Branch	Roll Number	Mobile Number(Preferably Whats app number)	Address for Communication
8/27/2021 11:35:14	bunnysujith@gmail.com	B.Sujith	B.Tech VII Sem	Mechanical	189y1a0307	9494035452	Raja reddy street
8/28/2021 11:27:10	189y5a0236@ksrmce.ac.in	PALLA REDDAIAH	Completed	EEE	189Y5A0236	9182693643	Gangarapuvandiapalli(p),(v),Chakravapet mandal,kadapa district
8/28/2021 13:51:55	janggaladheeraj@gmail.com	J. Dheeraj	B.Tech II Sem	CSE	209y1a0572	9640979257	Aravinda Nagar, Patel road, kadapa
8/28/2021 16:35:55	209Y1A0542@KSRMCE.AC.IN	C.JAGADEESWAR REDDY	B.Tech II Sem	CSE	209Y1A0542	9553584470	BHARATH NAGAR ,KADAPA
8/28/2021 20:08:22	209y1a0462@ksrmce.ac.in	G Hari Babu	B.Tech II Sem	ECE	209Y1A0462	9611364844	Somandepalli
8/28/2021 20:10:15	209Y1A0481@ksrmce.ac.in	M.Bramhanandam	B.Tech II Sem	ECE	209Y1A0481	7569889107	Ksrm College of engineering kadapa
8/28/2021 20:12:15	209Y1A04A3@ksrmce.ac.in	N.harathi	B.Tech II Sem	ECE	209Y1A04A3	9848803909	No
8/28/2021 20:16:38	209y1a0464@ksrmce.ac.in	Ganesh	B.Tech II Sem	ECE	209Y1A0464	8247040443	42/665-4,NGO Colony, Kadapa, Andhrapradesh
8/28/2021 20:19:12	199y1a0136@ksrmce.ac.in	Phatan arfathulla khan	B.Tech V Sem	Civil	199Y1A0136	9618566075	9/185-22-4-1
8/28/2021 20:21:15	209y1a0123@ksrmce.ac.in	Tilakreddy	B.Tech II Sem	Civil	209Y1A0123	+917675897913	17/47 gowamma katta street proddatur
8/28/2021 20:21:29	209Y1A04A4@ksrmce.ac.in	O. Praveen kumar	B.Tech II Sem	ECE	209Y1A04A4	9347088041	Bestavaripeta, prakasam dist., A.P. 523334
8/28/2021 20:34:22	209y1a05f0@ksrmce.ac.in	Shaik Mohammed Amaan	B.Tech II Sem	CSE	209Y1A05F0	7288838904	N-10-220, Near Alpha School, Shahipet, Kadapa
8/28/2021 20:48:08	209y1a0443@ksrmce.ac.in	Anantha reddy Dodda	B.Tech II Sem	ECE	209Y1A0443	8186989936	Dechavaram (village), Guntur(district)
8/28/2021 21:26:05	siddiqkhan2417@gmail.com	DADE SIDDIQ	B.Tech II Sem	Mechanical	209Y1A0311	7382339395	H. NO. 1/89, KARATAMPADU, ATMAKUR, NELLORE, AP.
8/29/2021 5:33:04	209y1a0238@ksrmce.ac.in	Saggam sreekanth	B.Tech II Sem	EEE	209y1a0238	9390593534	Chintalajuturu
8/29/2021 8:19:54	209y1a0246@ksrmce.ac.in	S. Sudharshan	B.Tech II Sem	EEE	209y1a0246	7095914634	4-1-205, Sai Baba Street pullivendula, kadapa
8/29/2021 9:00:24	209y1a0171@ksrmce.ac.in	S.vamsi krishna	B.Tech II Sem	Civil	209y1a0171	8688581603	Kurnool (D) devankonda (M) qudimiralla (v)
8/29/2021 10:27:37	209y1a0434@ksrmce.ac.in	C. Sivapavani	B.Tech I Sem	ECE	209y1a0434	8106483795	5.9985E+11
8/29/2021 11:50:51	209Y1A05I9@ksrmce.ac.in	Yelugoti Jeshnavi	B.Tech II Sem	CSE	209Y1A05I9	6305872486	Ksrm college of engineering
8/30/2021 7:33:53	209Y1A0440@ksrmce.ac.in	D. V.Babru Vahan Reddy	B.Tech II Sem	ECE	209Y1A0440	8331827691	Alavalapadu Vempalli KADAPA
8/30/2021 8:34:48	209y1a0236@ksrmce.ac.in	R.Madhukrishna	B.Tech I Sem	EEE	36	6301996406	Kalasapadu village
8/30/2021 12:20:38	209y1a0455@ksrmce.ac.in	G.DADA VALI	B.Tech II Sem	ECE	209Y1A0455	7993626020	KSRM COLLEGE OF ENGINEERING KADAPA
8/31/2021 9:45:10	209y1a05d1@ksrmce.ac.in	PORALLA THANUSHA	B.Tech II Sem	CSE	209Y1A05D1	7675928281	Pamidi,ananthapur district
8/31/2021 11:37:36	209y1a0112@ksrmce.ac.in	C.HARSHA VARDHAN	B.Tech II Sem	Civil	209y1a0112	8341239440	57/291-3,AKKAYAPALLI SASTRI NAGAR, KADAPA -516003
8/31/2021 18:42:37	samuelsaronkingsam@gmail.com	SHARON SAMUEL	B.Tech VII Sem	Mechanical	189Y1A0365	9963582502	9963582502
8/31/2021 18:46:53	199y1a0133@ksrmce.ac.in	P.Venkata Siva	B.Tech V Sem	Civil	199Y1A0133	62817444119	Chinna Chowk, Kadapa
8/31/2021 20:09:10	209y1a0448@ksrmce.ac.in	Galaganta Raghu	B.Tech II Sem	ECE	209Y1A0448	6309483767	Kurnool (district), Tuggali (mandal), Marella (village)
9/1/2021 18:12:13	199y1a0127@ksrmce.ac.in	M.Yagna Priya	B.Tech V Sem	Civil	199y1a0127	7330651925	13/2056,Raja Thota,Vempalli(M),Kadapa
9/1/2021 18:12:14	199Y1A455@ksrmce.ac.in	Jampala anjali	B.Tech V Sem	ECE	199Y1A0455	9347816173	Kapada kim hostel
9/1/2021 18:16:14	199y1A0457@ksrmce.ac.in	K. Anusha	B.Tech V Sem	ECE	199Y1A0457	8688691840	Kadapa kim hostel
9/1/2021 18:12:15	209y1a0569@ksrmce.ac.in	Deekshitha. G	Semester 1	Cse	209y1a0569	7569977508	Ksrm College of engineering kadapa
9/1/2021 18:14:16	209y1a0575@ksrmce.ac.in	K Sai Krupa	1st&II nd	CSE	209Y1A0575	8309299487	Kapada kim hostel
9/1/2021 18:12:18	209y1a05b7@ksrmce.ac.in	P.shirisha	1st year,2nd sem	CSE B	209y1a05b7	7816063964	Kapada kim hostel
9/1/2021 19:10:20	209y1a0589@ksrmce.ac.in	L.Tharun	First year first sem	Cse	209y1a0589	9985735869	Ksrm College of engineering kadapa
9/1/2021 6:12:31	209y1a0599@ksrmce.ac.in	Mvs Jaswanth	1 st -2 nd sem	Cse	209Y1A0599	9121640396	Ksrm College of engineering kadapa
9/1/2021 1:12:33	209y1a05b9@ksrmce.ac.in	P. SAI KRISHNA REDDY	1&2nd sem	CSE	209Y1A05B9	6304050130	Ksrm College of engineering kadapa
9/1/2021 8:12:43	209y1a05a7@ksrmce.ac.in	M jaya simha	2nd sem	Cse	209Y1A05A7	8464055125	Ksrm College of engineering kadapa
9/1/2021 18:02:46	209Y1A05A0@ksrmce.ac.in	M NAVANESWAR	1st year 2nd sem	CSE	209Y1A05A0	6300580508	Ksrm College of engineering kadapa
9/1/2021 1:01:51	189Y1A0355@ksrmce.ac.in	Shaik.Faizaan habeeb	4th year 7th semester	Mechanical	189Y1A0355	9912627096	Nabikola kadapa
9/1/2021 8:02:53	189y1a0339@ksrmce.ac.in	P. Anil kumar	4th year 1st sem	Mechanical	189Y1A0339	9133782271	Railway station road kadapa
9/1/2021 18:12:53	189y1a0303@ksrmce.ac.in	A. Vamsi	4& 7	Mechanical	189y1a0303	9676729780	Ksrm College of engineering kadapa
9/1/2021 18:17:55	sivavenkatasai710@gmail.com	L. siva Venkata sai Reddy	4-1	Mechanical	189Y1A0327	6281471917	Balaji nagar kadapa

Coordinator

HOD

Dr. I. SREEVANI M.Sc.,Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA - 516 005

Non-Conventional Energy Sources

Certification Course

(30 Hrs)

Course Objective:

- To understand the need of energy resources due to degradation of convention sources
- Familiarize the use of non-conventional resources
- To establish sustainable growth

Course Outcomes:

1. Understand the need of energy sources and advantages of renewable energy resources over conventional resources
2. Estimate the solar energy utilization and Principles involved in solar energy collection and conversion of it to electricity generation
3. Explore the concepts involved in Wind energy conversion
4. Explain the operational methods of utilization of Tidal energy
5. Demonstrate the biogas production and its applications

Module-1- Introduction to Energy resources

Introduction, Differences between Renewable and Non-renewable Energy resources, Advantages and Disadvantages of Renewable Energy resources over Conventional Energy Resources, Need for alternate source of Energy, Types of Renewable Energy resources

Module-2-Solar Energy

Advantages and Limitations of Solar energy, Solar Radiation, Measurement of Solar Radiation, Solar Conversion, Solar Collectors, Photovoltaic cells, Solar Energy Storage, Solar Energy Applications

Module-3-Wind Energy

Introduction, Wind Mills-Basic components in wind mills, Classification, Horizontal Axis wind mills, Vertical Axis wind mills, Advantages and Limitations of Wind energy

Module-4-Tidal Energy

Introduction, Tidal power generation, Components of Tidal power plant, Operating methods of utilization of tidal energy, Advantages and Disadvantages of Tidal power

Module-5-Bio Energy

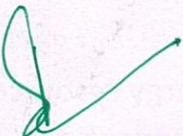
Introduction, Biogas generation, Different sources of biomass production Biomass conversion, materials used for Biogas generation, Advantages and disadvantages of Bio energy

Textbooks:

1. Fundamentals of non-Conventional Energy Sources, Inamdar KH Dr, Electrotech Publications
2. Renewable Energy Sources and their Environmental Impact, Abbasi S Anaseena, Dhanapat Rai publications

Reference books:

1. Non-Conventional Energy Sources, Rai G.D, Cambridge, Printed Books publications
2. Hand book of Energy Conservations Vol-1, Basics Concepts of energy, Robert H M Collins, Cengage
3. Renewable Energy Sources & Engineering Technologies, Kothari D P, Singal K.C, Ranjan Rakesh, PHI Publications



Dr. I. SREEVANI M.Sc.,Ph.D.
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K.S.R.M COLLEGE OF ENGINEERING, KADAPA

(Autonomous)

Yerramasupalli, Kadapa, Andhra Pradesh – 516003

Department of Humanities & Sciences



Certification Course

On

Non-Conventional Energy Sources

Schedule

Date	Timing	Course Instructor	Topic to be covered
01-09-2021	4.00pm-6.00pm	Smt. M. Mary jasmine	Introduction, Need for the use of non-conventional energy sources
02-09-2021	4.00pm-6.00pm	Smt. M. Mary jasmine	Differences between Renewable and Non-renewable Energy resources, Advantages and Disadvantages
03-09-2021	4.00pm-6.00pm	Smt. M. Mary jasmine	Types of renewable sources- Classification
04-09-2021	4.00pm-6.00pm	Smt. M. Mary jasmine	Case study on global consumption of energy sources
05-09-2021	4.00pm-6.00pm	Dr. I. Sreevani	Wind Mills-Basic components in wind mills
06-09-2021	4.00pm-6.00pm	Dr. I. Sreevani	Classification
07-09-2021	4.00pm-6.00pm	Dr. I. Sreevani	Advantages and Limitations of Wind energy
08-09-2021	4.00pm-6.00pm	Dr. I. Sreevani	Case studies on usage of renewable sources
09-09-2021	4.00pm-6.00pm	Smt. M. Mary jasmine	Advantages and Limitations of Solar energy, Solar Radiation

11-09-2021	10.00am-12.00pm	Smt. M. Mary jasmine	Measurement of Solar Radiation, Solar Conversion, Solar Collectors
11-09-2021	2.00pm-4.00pm	Smt. M. Mary jasmine	Solar ponds, solar heaters, Applications
12-09-2021	4.00pm-6.00pm	Dr. K. Venkata Ramana	Tidal power generation, Components of Tidal power plant
13-09-2021	4.00pm-6.00pm	Dr. K. Venkata Ramana	Operating methods, Advantages and Disadvantages of Tidal power
14-09-2021	4.00pm-6.00pm	Dr. K. Venkata Ramana	Biogas generation, Biomass conversion
15-09-2021	4.00pm-6.00pm	Dr. K. Venkata Ramana	Materials used for Biogas generation, Advantages and disadvantages of Bio energy

M. Mary Jasmine
Coordinator

Course Instructor-1:-

Course Instructor-2:- Mary Jasmine

Course Instructor-3:-



HOD
H&S

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Date: 15-09-2021


Name of the Event: Certification Course on Non-Conventional Energy Sources

Venue : Google meet

List of Participants

S. No	Name	Department	Contact No	Email Id
1.	Tilak reddy	Civil	7675897913	209y1a0123@ksrmce.ac.in
2.	S. Vamsi Krishna	Civil	8688581603	209y1a0171@ksrmce.ac.in
3.	Yelugoti Jeshnavi	CSE	6305872486	209Y1A05I9@ksrmce.ac.in
4.	Shaik Mohammed Amaan	CSE	7288838904	209y1a05f0@ksrmce.ac.in
5.	G. Dada Vali	ECE	7993626020	209y1a0455@ksrmce.ac.in
6.	Poralla Thanusha	CSE	7675928281	209y1a05d1@ksrmce.ac.in
7.	O. Praveen Kumar	ECE	9347088041	209Y1A04A4@ksrmce.ac.in
8.	P. Venkata Siva	Civil	9347088041	199y1a0133@ksrmce.ac.in
9.	C. Siva Pavani	ECE	8106483795	209Y1A0434@ksrmce.ac.in
10.	Anantha Reddy Dodda	ECE	8186989936	209y1a0443@ksrmce.ac.in
11.	Saggam Sreekanth	EEE	9390593534	209y1a0238@ksrmce.ac.in
12.	Dade Siddiq	Mech	7382339395	209y1a0311@ksrmce.ac.in
13.	S. Sudharshan	EEE	7095914634	209y1a0246@ksrmce.ac.in
14.	D. V. Babru Vahan Reddy	ECE	8331827691	209Y1A0440@ksrmce.ac.in
15.	Jampala Anjali	ECE	9347816173	199Y1A0455@ksrmce.ac.in
16.	Jalla Ganesh	ECE	8247040443	209y1a0464@ksrmce.ac.in
17.	K. Anusha	ECE	8688691840	199Y1A0457@ksrmce.ac.in
18.	Bandla Sujith	Mech	9494035452	189y1a0307@ksrmce.ac.in
19.	Phatan Arfathulla Khan	Civil	9618566075	199Y1A0136@ksrmce.ac.in
20.	C. Jagadeeswar Reddy	CSE	9553584470	209Y1A0542@ksrmce.ac.in
21.	Sharon Samuel	MECH	9963582502	samuelsharonkingsam@gmail.com
22.	A. Vamsi	Mech	9676729780	189y1a0303@ksrmce.ac.in

23.	L. Siva Venkata Sai Reddy	Mech	6281471917	sivavenkatasai710@gmail.com
24.	J. Dheeraj	CSE	9640979257	jangaladheeraj@gmail.com
25.	Deekshitha. G	CSE	7569977508	209y1a0569@ksrmce.ac.in
26.	K Sai Krupa	CSE	8309299487	209y1a0575@ksrmce.ac.in
27.	P. Shirisha	CSE	7816063964	209y1a05b7@ksrmce.ac.in
28.	L. Tharun	CSE	9985735869	209y1a0589@ksrmce.ac.in
29.	Mvs Jaswanth	CSE	9121640396	209y1a0599@ksrmce.ac.in
30.	P. Sai Krishna Reddy	CSE	6304050130	209y1a05b9@ksrmce.ac.in
31.	M Jaya Simha	CSE	8464055125	209y1a05a7@ksrmce.ac.in
32.	M Navaneswar	CSE	6300580508	209Y1A05A0@ksrmce.ac.in
33.	Shaik. Faizaan Habeeb	Mech	9912627096	189Y1A0355@ksrmce.ac.in
34.	P. Anil Kumar	Mech	9133782271	189y1a0339@ksrmce.ac.in


Co-ordinator


HOD

Dr. I. SREEVANI M.Sc., Ph.D.
Head of Humanities & Sciences
K.S.R.M. College of Engineering
KADAPA - 516 005

 C-25-5F0- Amaan Sh...	 333-ME - M. Ranjith k...	 542 CHENNURU JAG...	 301-ME-01 AKULA TH...	 455-JAMPALA ANJALI	 343-ME-43 Panjamra...	 323-ME-23 Karthik s...
 317-ME-17 GANGI RE...	 464-JALLA GANESH	 357-ME-57 SHAIK SA...	 342-ME-342 PANDIL...	 303-ME-03- Bandi R...	 351-ME-51 SAGABAL...	 171-SETTE VAMSIKRI...
 306-me-06 c. DINES...	 C-25-5F0- Amaan Sh...	 348-ME-48 POTTEN...	 C-65-519- YELUGOTI ...	 332-ME-32 Prakash	 572 DHEERAJ	 C-06-5D1- PORALLA ...
 335_ME_36_MARRIP...	 362-ME-62 VALLAPU ...	 Mary Jasmine	 364-64-ME- VELLAT...	 367-ME-67 YARRAVA...	 349-ME-49 PUTTA M...	 You

 C-25-5FO- Amaan Shaik	 329-ME-29-KOTTE VENKA...	 349-ME-49 PUTTA MAHA...	 357-ME-57 SHAIK SADIQ ...	 362-ME-62 VALLAPU VEN...	 308-ME-08CHANDA YAS...
 572 DHEERAJ	 348-ME-48 POTTENDLA ...	 332-ME-32 Prakash	 REG -133 P.Venkata Siva	 346-ME-46 VAMSIDHAR P	 323-ME-23 Karthik sarma
 366-ME-66 YEERRADODD...	 351-ME-51 SAGABALA BH...	 318-ME-18 GAVIREDDY LA...	 342-ME-342 PANDILLAPA...	 301-ME-01 AKULA THULA...	 Mary Jasmine
 367-ME-67 YARRAVAGARI...	 353-ME-53 SHAIK MASO...	 You	 353-ME-53 SHAIK MASOOD AHAMED joined		

4:07 PM | Certification Course on Non-Convention...
305-Me-05bnajanthan Dinesh Kumar
308-Me-08chanda Yaswanth Kumar

28	L. Tharun	209y1a0589	CSE	P	P	P	P	P	P	A	P	P	P	A	P	P	P
29	Mvs Jaswanth	209y1a0599	CSE	P	P	P	P	P	P	P	P	P	P	P	P	P	P
30	P. Sai Krishna Reddy	209y1a05b9	CSE	P	P	P	P	P	A	P	P	P	P	P	P	P	P
31	M Jaya Simha	209y1a05a7	CSE	P	P	P	P	P	P	P	P	P	P	P	P	P	P
32	M Navaneswar	209Y1A05A0	CSE	P	P	P	P	P	P	P	P	P	P	P	P	P	P
33	Shaik. Faizaan Habeeb	189Y1A0355	Mech	A	A	A	A	P	P	P	P	P	P	P	P	P	P
34	P. Anil Kumar	189y1a0339	Mech	A	A	A	A	P	P	P	P	P	P	P	T	P	P

Coordinator

16/9/21

HOD

Dr. I. SREEVANI M.Sc., Ph.D.
 Head of Humanities & Sciences
 K.S.R.M. College of Engineering
 KADAPA - 516 005

16/9/2021



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Kadapa, Andhra Pradesh, India- 516 003

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Certificate Course on Non-Conventional Energy Sources

Organized by
Department of H&S

Date of Event
01-09-2021 to 15-09-2021

Platform
Google meet



COURSE INSTRUCTORS

VAISA
AD AGENCY
9849 075432

Dr. I Sreevani.,
HOD, H&S

M.Mary jasmine., Asst. professor
Dr. K.Venkata Ramana., Asst. professor

f i t ▶ **kasmceofficial**
☎ **8143731980, 8575697569**

Dr. V.S.S. Murthy
Principal

Prof. A. Mohan
Director

Sri. K. Chandra Obul Reddy
Management Member

Smt K. Rajeswari
Correspondent,
Secretary, Treasurer

Sri K. Madan Mohan Reddy
Vice-Chairman

Sri K. Raja Mohan Reddy
Chairman



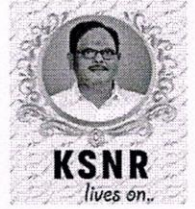
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ACTIVITY REPORT

Certification Course

On

“Non-Conventional Energy Sources”

1st September, 2021 to 15th September, 2021

Target Group	:	Students
Details of Participants	:	34 Students
Co-ordinator	:	M.Mary jasmine Asst. Prof, Dept. of H&S
Organizing Department	:	Department of Humanities & Sciences
Venue	:	Online mode (Google meet)

Description : Certification course on Non-Conventional Energy sources was organized by Dept. of H&S from 1st September 2021 to 15th September 2021 in online mode. Dr. I. Sreevani, Dr. K. Venkata Ramana & Mrs. M. Mary Jasmine acted as Course instructors. The main aim of the course is to create awareness among students on operating principle of a range of non-conventional energy sources, materials used, characterization, key performance, advantages and limitations of these technologies in comparison to conventional sources of energy. Certificate course was successfully completed and participation certificates were provided to the participants.

Photo :

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Certificate Course on Non-Conventional Energy Sources

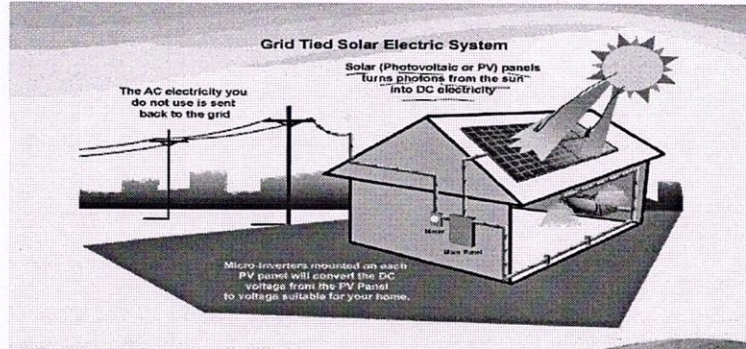
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Dr. V.S.S. Murthy, Principal; Prof. A. Mohan, Director; Dr. E. Chandra Obul Reddy, Management Member; Smt. K. Rajeswari, Correspondence Secretary, Kadapa; Sri K. Madan Mohan Reddy, Vice-Chancellor; Sri K. Raja Mohan Reddy, Chairman



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Certificate of Completion

This is to certify that Mr. Tilak Reddy bearing Roll No. 209Y1A0123 has successfully completed his Certification Course on Non-Conventional Energy Sources organized by Department of H&S, K.S.R.M.C.E, Kadapa, A.P from 01/09/2021 to 15/09/2021.

Dr. I. Sreevani, HOD, H&S; Dr. V.S.S. Murthy, Principal, KSRMCE; Prof. A. Mohan, Director, KSRMCE

M. Mary Jasmine
M. Mary Jasmine
Coordinator

Dr. I. Sreevani
Dr. I. Sreevani M.Sc., Ph.D
HOD/H&S
Head of Humanities & Sciences
K.S.R.M. College of Engineering
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Certificate of Completion

This is to certify that Mr. A. Vamsi bearing Roll No. 189Y1A0303 has successfully completed his Certification Course on Non-Conventional Energy Sources organized by Department of H&S, K.S.R.M.C.E, Kadapa, A.P from 01/09/2021 to 15/09/2021.

Sreevani

Dr.I.Sreevani
HOD, H&S

V. S. S. Murthy

Dr. V.S.S.Murthy
Principal, KSRMCE

Mohan

Prof. A. Mohan
Director, KSRMCE



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Certificate of Completion

This is to certify that Mr. Bandla. Sujith bearing Roll No. 189Y1A0307 has successfully completed his **Certification Course on Non-Conventional Energy Sources** organized by **Department of H&S, K.S.R.M.C.E, Kadapa, A.P** from **01/09/2021 to 15/09/2021.**

Sreevani

Dr.I.Sreevani
HOD, H&S

V.S.S.Murthy

Dr. V.S.S.Murthy
Principal, KSRMCE

Mohan

Prof. A. Mohan
Director, KSRMCE



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Certificate of Completion

This is to certify that Mr. L. Siva Venkata Sai Reddy bearing Roll No. 189Y1A0327 has successfully completed his **Certification Course on Non-Conventional Energy Sources** organized by **Department of H&S, K.S.R.M.C.E, Kadapa, A.P** from **01/09/2021 to 15/09/2021.**

I. Sreevani

Dr.I.Sreevani
HOD, H&S

V. S. S. Murthy

Dr. V.S.S.Murthy
Principal, KSRMCE

A. Mohan

Prof. A. Mohan
Director, KSRMCE

Feedback on Certificate Course on Non-Conventional Energy Sources

from M.Mary jasmine,Asst.prof, K.S.R.M.C.E

* Required

1. Email *

Certificate Course on Non-Conventional Energy Sources

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Principal Director Management Member Correspondent, Secretary, Treasurer Vice-Chairman Chairman

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2. Name of the student *

3. Year & Semester *

4. Branch *

5. Roll Number (Write roll number completely) *

6. Is the course content met your expectation *

Mark only one oval.

Yes

No

Maybe

7. Is the lecture sequence well planned *

Mark only one oval.

Yes

No

Maybe

8. The contents of the course is explained with neat diagrams and examples *

Mark only one oval.

Agree

Disagree

Maybe

9. Is the level of course high *

Mark only one oval.

- Agree
 Disagree
 Maybe

10. Is the course exposed you to the new knowledge and practices *

Mark only one oval.

- Strongly Agree
 Strongly Disagree

11. Rate the knowledge of the speakers in providing you the expected outcome *

Mark only one oval.

	1	2	3	4	5	
Low	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	High

12. Is the lecturer clear and easy to understand *

Check all that apply.

- Yes
 No
 May be

13. Rate the value of course in increasing your skills *

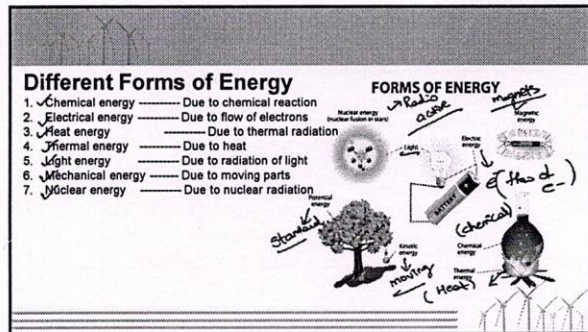
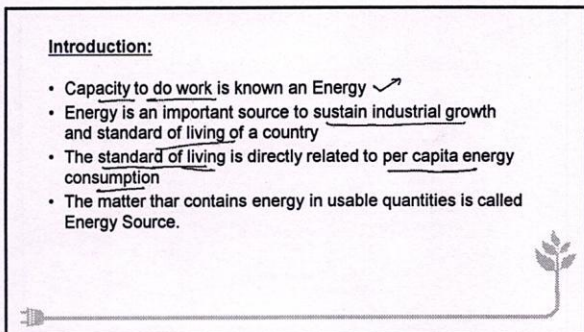
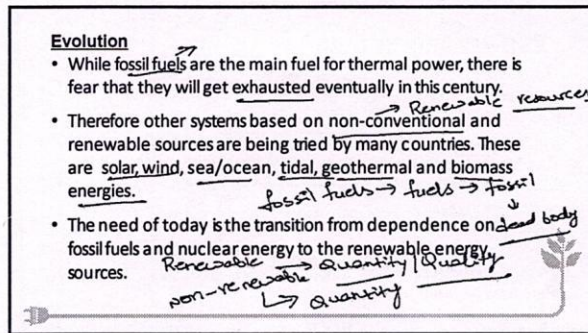
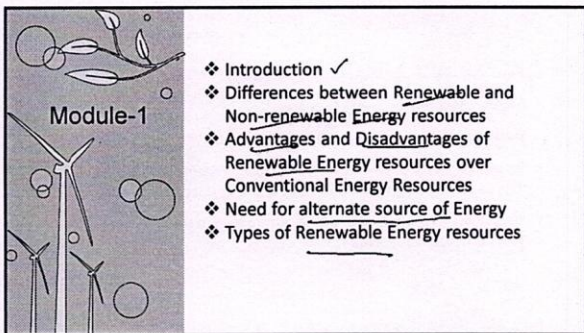
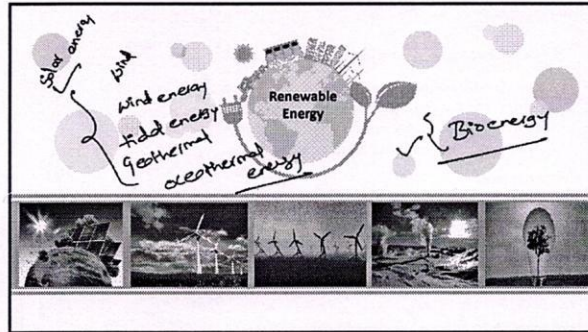
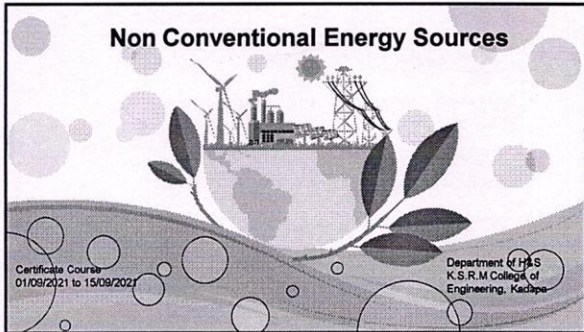
Mark only one oval.

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poor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	excellent

14. Any issues *

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Google Forms



conservation of energy, amount

Energy transformations

- ❖ The SI Units for energy are Joule ✓
- ❖ Law of conservation of Energy: According to law of conservation of energy, Energy can neither be created nor destroyed. But, one form of energy can be converted to another form. ✓
- ❖ Examples:
 - ❖ A heater convert electrical energy into heat energy.
 - ❖ A battery converts chemical energy into electrical energy, etc.

Energy Sources

- The available energy sources can be divided into three categories.
 1. Primary Energy Sources ✓
 2. Secondary Energy Sources ✓
 3. Supplementary Energy Sources ✓

Primary Energy Sources

- The energy sources which provide a net supply of energy are defined as Primary Sources.
- Examples are Coal, Oil, Natural Gas and Nuclear.
- The energy required to produce energy from these sources is very less as compared to the energy produced by them.
- Energy Yield Ratio of these sources is very high.

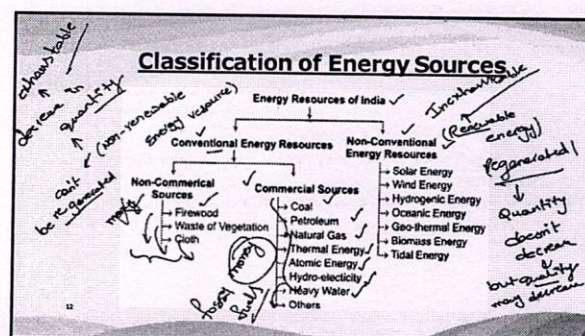
Energy Yield Ratio is defined as the ratio of energy fed back by the material to the energy taken from the environment.

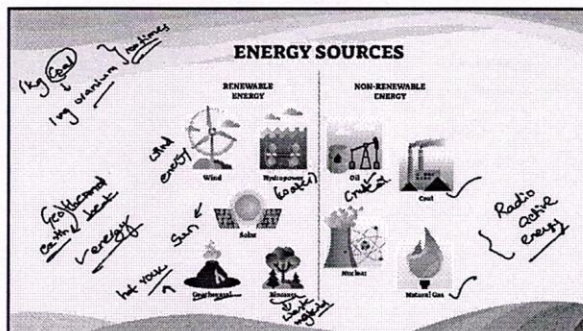
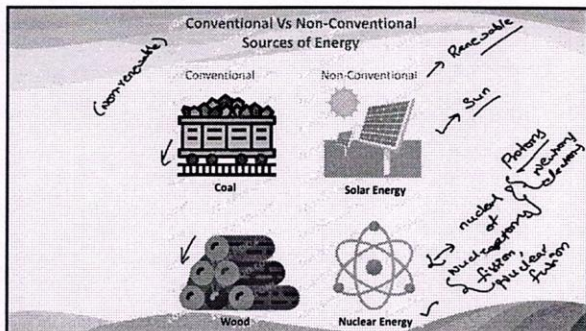
Secondary Energy Sources

- These sources produce no net energy. ✓
- Examples include Solar, Wind, Water (Hydro, Tidal, Wave etc.)
- These sources produce no harm to the environment and earth, and so they must be more preferable source of energy for us.
- But due to low Energy Yield Ratio (as compared to the Primary Sources) they are not that efficient.

Supplementary Sources

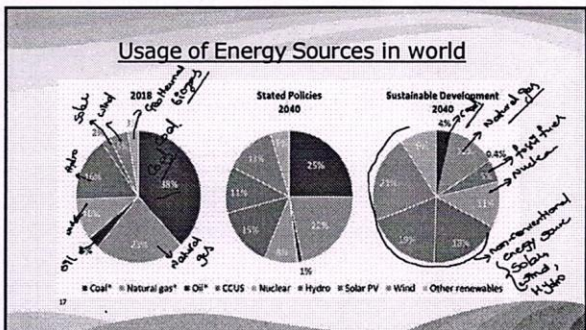
- For these energy sources the net energy yield is zero and they require highest amount of investment.
- The Thermal insulation is an example for supplementary source





Conventional Sources	Non-conventional Sources
Conventional sources of energy (e.g. coal, petroleum and natural gas) are non-renewable sources of energy.	Non-conventional sources of energy (e.g. solar and wind energy) are renewable sources of energy.
They have been in use since a long time. For example, firewood and coal have been in use since a long time.	These sources have recently developed and are still developing. For example, the technology of producing electricity from solar panels has recently developed.
Most of these energy sources (e.g. coal and firewood) cause pollution when used.	They do not cause any pollution (e.g. solar energy, geothermal energy etc)
They are common and widely used sources (e.g. thermal power).	They are comparatively new sources of energy and hence are not widely used. For example, solar panels and wind mills are not widely used.

Commercial energy	Non-commercial energy
1. It is available to the users for some price.	1. It is available to the users free of cost.
2. This form of energy is used for commercial purposes.	2. This form of energy is used for domestic purposes.
3. Example - Coal, Petroleum and natural gas electricity, etc.	3. Example - Firewood, agricultural waste, animal waste, etc.



Advantages and Disadvantages of Renewable Energy Sources Over Non-Conventional Energy Sources

Advantages:

- Pollution free and have less impact on environment
- Can easily be adjusted to meet the requirements
- Energy sources are freely available, thus cost is low
- Cannot be depleted i.e., continuously restored by nature

Disadvantages:

- Conversion efficiency is low ✓
- Depends on weather condition ✓
- For the same capacity large area is required for installation

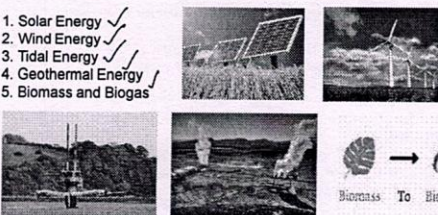
Need for Alternate Sources of Energy

The conventional source of energy are depleting very fast and by the turn of the century, man will have to depend on Renewable sources of energy. The use of Renewable sources of energy is favored under following conditions as

- Non availability of present sources ✓
- Increased cost of available energy ✓
- Environmental or legal conditions ✓
- Improved reliability of renewable sources of energy ✓

Types of Renewable Sources of Energy

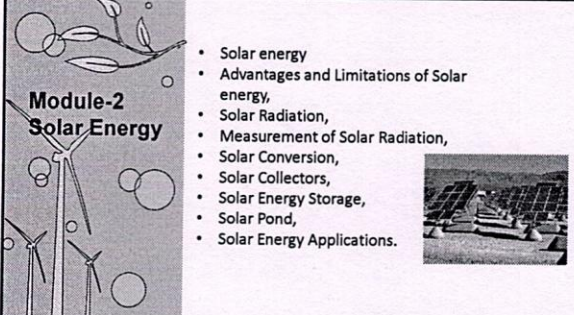
1. Solar Energy ✓
2. Wind Energy ✓
3. Tidal Energy ✓
4. Geothermal Energy ✓
5. Biomass and Biogas ✓



Biomass To BioGas

Module-2 Solar Energy

- Solar energy
- Advantages and Limitations of Solar energy,
- Solar Radiation,
- Measurement of Solar Radiation,
- Solar Conversion,
- Solar Collectors,
- Solar Energy Storage,
- Solar Pond,
- Solar Energy Applications.



Non Conventional Energy Sources

- The NCES are Solar, Wind, Sea/Ocean, Geothermal, Biomass etc.
- Many people are continuously trying to find more NCES.
- The other terms used to describe the non-conventional energy are 'Alternative', 'Appropriate', 'Natural', 'New', and 'Renewable'.

1. Solar Energy

- Energy produced through the sunlight is called solar energy.
- Sun's energy comes to earth in form of Light and Heat. This energy keeps the temperature of earth's atmosphere at normal level, so that living things can survive, the heat causes currents in atmosphere (wind) and ocean (tide), causes the water cycle and generates photosynthesis in plants.
- Solarenergy can be utilized in two ways, either Thermally or by Photovoltaics.

- The solar photovoltaic cells are exposed to sunlight and in turn the electricity is produced. Photovoltaic cells convert the sun light energy into electricity.
- The Solar energy's potential is about 178 Billion MW, which is a round 20000 times more than the world's total energy demand.
- Various applications of Solar energy are:
 1. Solar Water Heating
 2. Solar Cookers

HOW SOLAR WORKS

1. Sun photons convert the sun's energy into electricity.
2. A control device changes this electricity, making it to power electrical loads.
3. The electricity then passes through a meter back to meters in the building.
4. Same such as a refrigerator and many other plug into the outlets for power.

Green Mountain Energy

Grid Tied Solar Electric System

Solar (Photovoltaic or PV) panels turns photons from the sun into DC electricity

The AC electricity you do not use is sent back to the grid

Microinverters mounted on each PV panel convert the DC voltage from the PV Panel to voltage suitable for your home.

Advantages and Limitations of Solar Energy

Advantages	Disadvantages
<ul style="list-style-type: none"> • Large inexhaustible energy • Freely available • Clean and free from environmental pollution • Can be utilized without highly specialized skills 	<ul style="list-style-type: none"> • Availability of solar energy depends on weather conditions • Not available during cloudy or rainy day • Large area is required to collect the energy at useful rate • Requires large capital investment

Solar Radiation

- Solar Energy is the electromagnetic energy or radiation emitted by the Sun
- Solar energy arrive at the outer edge of the earth's atmosphere. Part of this radiation is reflected back to space, part is absorbed by the atmosphere and reemitted and part is scattered by atmospheric particles
- As a result only 1/3 rd of the sun's energy reaches the surface of the earth.

Reflected

Scattered

Reaches Earth

Scattered

Solar radiation received at the earth's surface without change of direction is called **Beam or Direct radiation**
 Radiation received at the Earth's surface from all the parts of the sky hemisphere is called **Diffuse radiation**
 The sum of beam and diffuse radiation is called **Global radiation**.

Solar Constant

- The rate at which Solar energy arrives the Earth's surface is called Solar Constant.
- It is defined as the amount of energy received in unit time on a unit area perpendicular to the direction of radiation.
- The value of Solar Constant is about 1.353 kW/m^2 which is considered as the standard value by NASA (National Aeronautics And Space Administration)

Measurement of Solar Radiation

Solar Radiation can be measured by the following instruments

1. Pyrheliometer
2. Pyranometer

Pyrheliometer is used to measure the Beam radiation
 Pyranometer is used to measure the Global radiation

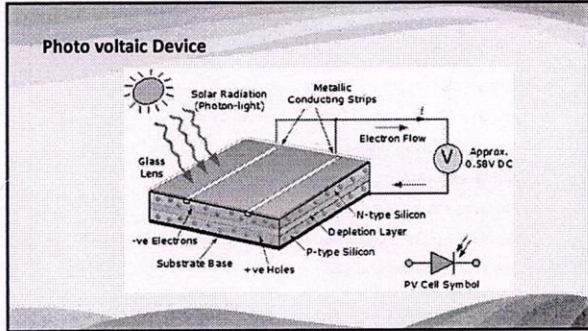
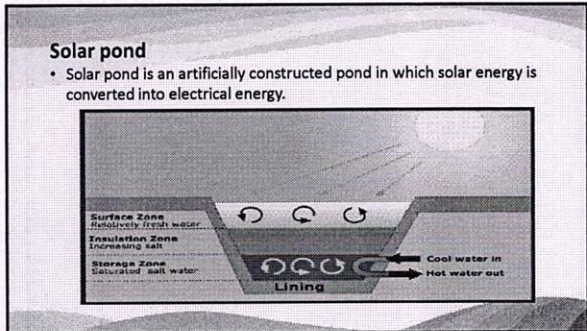
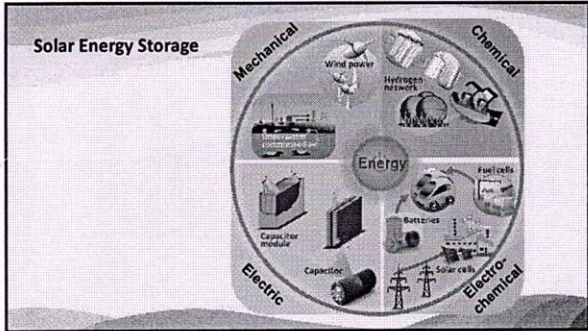
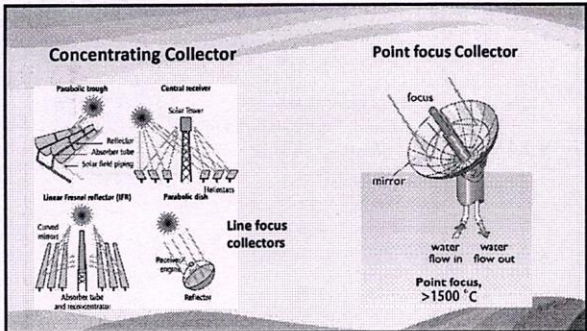
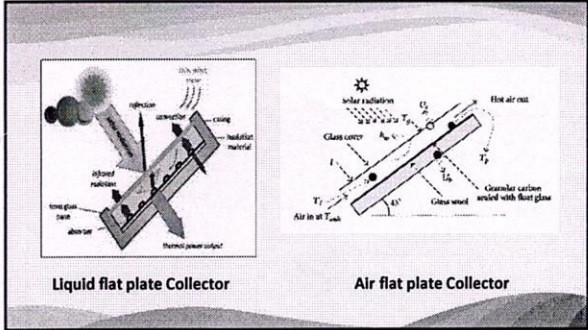
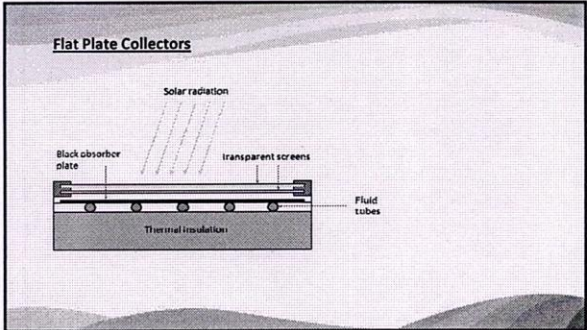
Solar Energy Conversion

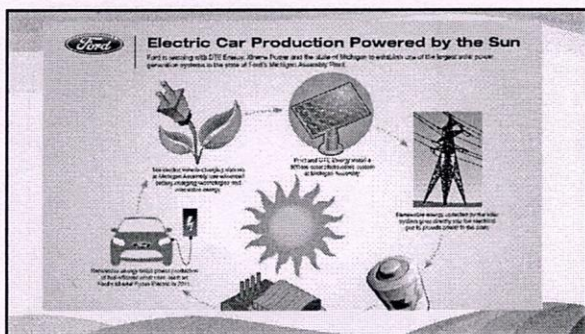
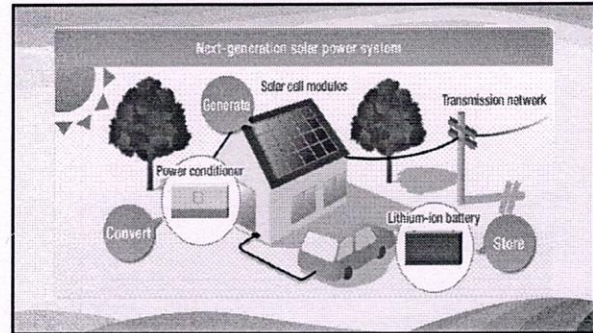
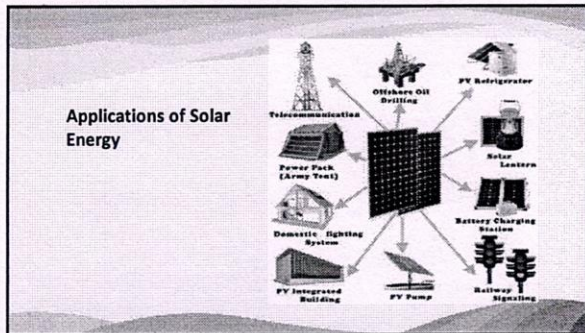
Solar Collectors

Solar Collector is a device for collecting solar radiation and transfer this energy to the fluid passing in contact with it.

```


    graph TD
        SC[Solar Collectors] --> NCC[Non-Concentrating Collectors]
        SC --> CC[Concentrating Collectors]
        NCC --> LC[Liquid Collector]
        NCC --> AC[Air Collector]
        CC --> FC[Focusing Collector]
        CC --> NFC[Non-focusing type]
    
```



Module-3 Wind Energy

- Introduction
- Wind Mills-Basic components in wind mills
- Classification
- Horizontal Axis wind mills
- Vertical Axis wind mills
- Advantages
- Limitations of Wind energy



Wind Energy

- The air movement on the earth surface is caused by unequal heating of the land and water by the Sun
- The temperature gradient induce the circulation of air from high pressure Zone to low pressure zone
- This movement of air is referred as Wind
- Wind Energy is replenished source of energy and can be used for irrigation and lighting

Wind Energy:

- Energy can be produced by harnessing the wind power.
- Wind is caused by mainly two reasons:
 1. Heating & Cooling of the atmosphere which generates convection current.
 2. The Rotation of Earth with respect to its atmosphere and its motion around the Sun.
- The potential of wind energy is very large which is estimated to be about 1.6×10^7 MW.

Wind Energy is an indirect source of Solar Energy. Why?

- In India generally the wind speed is low. Therefore attempts are being made for development of low speed, low cost wind mills.
- Special focus is on development of mill for water pumping which can operate at low wind speed of 8-36 km/hr. Which can be utilised for providing drinking water in small rural area, irrigation of small farms.
- In India high speed winds are available in coastal areas of Saurashtra, Rajasthan and some parts of central India.

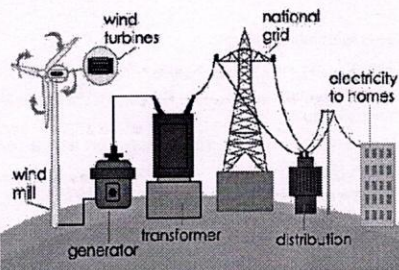
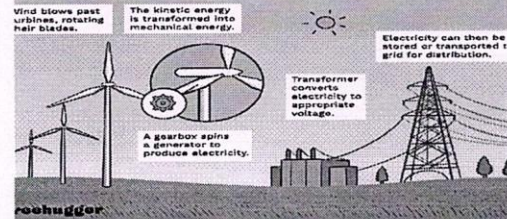
Characteristics of Wind Energy:

1. It is a renewable source of energy.
2. Wind power systems are non-polluting and has no adverse effects of the environment.
3. Wind energy systems avoid fuel provision and transport.
4. On small scale of upto few kilowatts, it is less costly. On large scale the costs are comparable with the costs of conventional energy sources, but low cost can be achieved by mass production.

Wind mills:

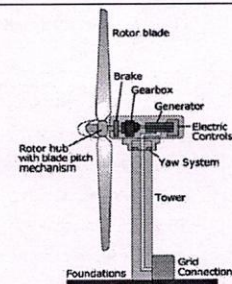
- Wind energy can be economically used for generation of electrical energy by using wind mills
- It involves conversion of Kinetic energy of the wind into mechanical energy that can be utilised to perform useful work or to generate electricity

How Does Wind Energy Work?



Components in Wind mill


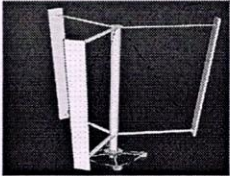
- Rotor Assembly
- Wind mill head
- Tower
- Tail vane
- Set of gear box
- Generator



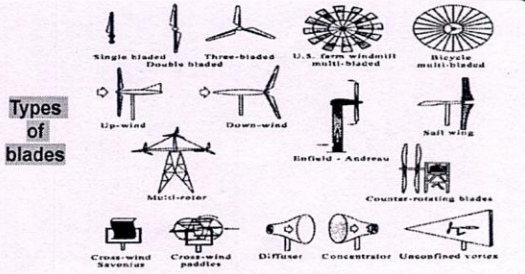
Classification of Wind mills

1. Horizontal axis wind mills
 - a) Multi blade type wind mill
 - b) Sail type wind mill
 - c) Propeller type wind mill
2. Vertical axis wind mills
 - a) Savonious type wind mill
 - b) Darrius type wind mill

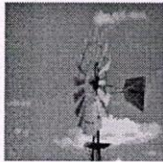
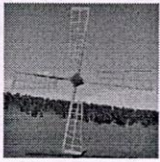

Horizontal Axis Wind mills **Vertical Axis wind mills**

Types of blades





Horizontal Axis wind mills

Multiblade type Sail type Propeller type

Vertical axis Wind mill

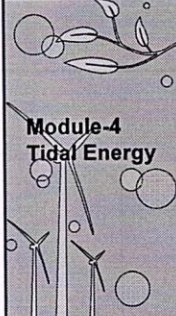



Savonius Type Darrius type

Problems with Wind Energy:


1. Availability of wind is fluctuating or irregular in nature.
2. Unlike water energy, it requires storage means because of irregular nature.
3. Wind energy systems are noisy in operation; a large unit can be heard many km away.
4. Large area is needed for installation of Wind Farms, for Electricity generation.

- **Used for operating water pumps for irrigation purposes.**
Approximately 2256 wind pumps were set up for this purpose.
- **In seven states, wind power operated power houses were installed and their installed capacity is 3000 MW.**
- **India has second position in wind power energy generation.**



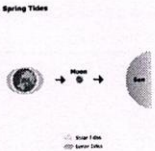
**Module-4
Tidal Energy**

- Introduction
- Tidal power generation
- Components of Tidal power plant
- Operating methods of utilization of tidal energy
- Advantages and Disadvantages of Tidal power



Introduction


- Tide is a periodic rise and fall of the water level of sea
- Tides are caused by the interaction forces of the gravitational pull of the moon and the sun and the rotation of earth
- The moon is approximately twice as effective as the sun in causing tide



Spring Tides

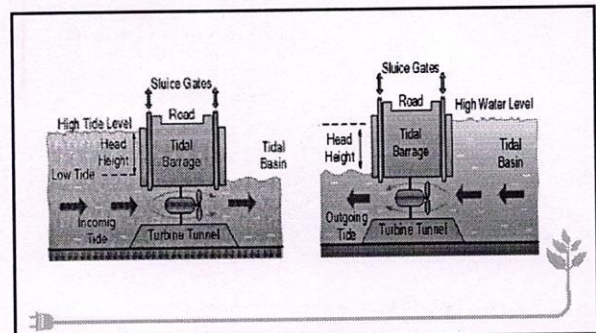
Tidal Range (R) :

- The rise and fall of the water level follows a sinusoidal curve
- The difference between high and low water level is called Range of tide or Tidal range.
- It varies depends on the position of the moon and sun relative to the earth.



Tidal Power Generation:

- Tides can be used to produce electrical energy which is called Tidal energy
- Devices that convert energy from waves can produce much higher power densities than Solar devices
- The main features of the tidal cycle is the difference in water surface elevations at the high tide and at the low tide
- This head can be utilized in operating a hydraulic turbine coupled to the electric generator



Components of the Tidal Power Plant:

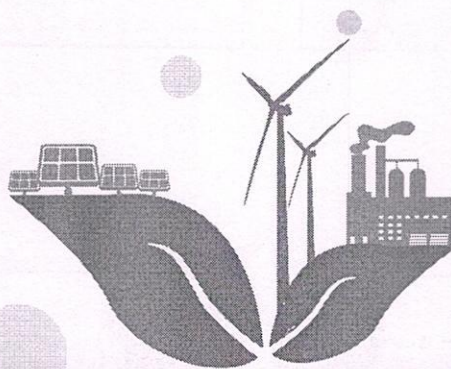
Tidal power plant consists of three main components as

1. Power House

- a) Turbine
- b) Electric generator
- c) Auxilliary equipment

2. The dam to form pool or basin

3. Sluice ways from the basin to the sea and vice versa



Thank You

Insert the Sub Title of Your Presentation

Non-conventional energy Sources

- › Certificate course instructed by
- › Dr. K.Venkata Ramana
- › Assistant Professor
- › Department of H&S (Chemistry)
- › KSRM College of Engineering
- › Kadapa-516003
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Tidal Energy

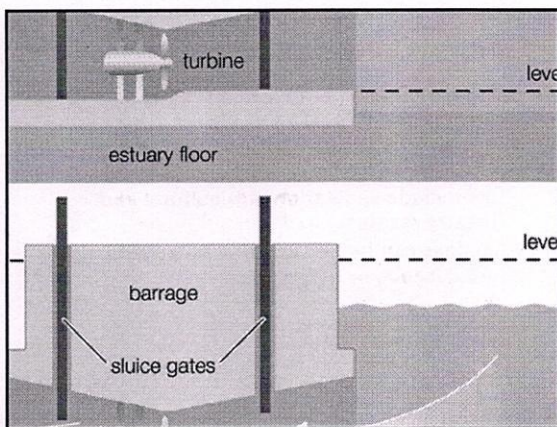
Tide is a periodic rise and fall of the water level of sea.

Tides are caused by the interacting forces of the gravitational pull of the moon and the sun and the rotation of the earth.

- › The moon is approximately twice as effective as the sun in causing tides.
- › **Tide range (R):** -
- › The difference between high and low water level is called the range of the tide.
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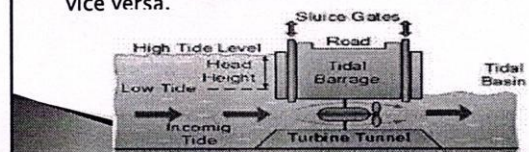
Tidal power generation:

- › Tides can be used to produce electrical energy which is called tidal energy.
- › Devices that convert from waves can produce much higher power densities than solar devices.
- › The main features of the tidal cycle are the difference in water surface elevation at the high tide and the low tide.
- › Based on that phenomenon its generates electricity.



Components of tidal power plants:

- › A tidal energy conversion plant consists of three main components:
- › 1. Power house (Turbine, Electrical generator and Auxiliary equipment).
- › 2. The dam to form pool or basin
- › 3. Sluice ways from the basin to the sea and vice versa.



- ▶ Power house:
- ▶ They convert tidal energy into electrical energy.
- ▶ The dam:
- ▶ The dams forms a barrier between the sea and the basin, thus it create a tidal basin.
- ▶ The sluice ways:
- ▶ The sluice ways allow the tidal flow.

- ### Operating methods of utilization of tidal energy:
- ▶ The power generation from tides involves flow between basin on the sea.
 - ▶ Single basin arrangement
 - ▶ Double basin arrangement

 - ▶ In single basin arrangement:
 - ▶ i) Single ebb-cycle system
 - ▶ ii) Single tide cycle system
 - ▶ iii) Double cycle system

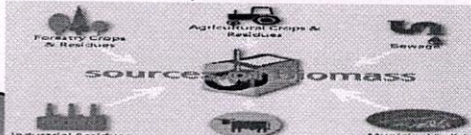
- ▶ Double basin arrangement:
- ▶ In double basin arrangement two separate but adjacent basins are provided and different levels are always maintained in upper basin and lower basin.
- ▶ The operation of two basin scheme can be controlled to cause the continuous water flow from upper basin to lower basin.

- ### Advantages and limitations:
- ▶ Device that converts energy from tides can be produce much higher power densities than solar devices.
 - ▶ It is free from pollution
 - ▶ It is inexhaustible
 - ▶ Its require less area
 - ▶ Less maintain cost

- ▶ Limitations :-
- ▶ Lack of dependability
- ▶ Transmission cost is high
- ▶ Out put is various depends on tidal range different,.

Bio energy:-

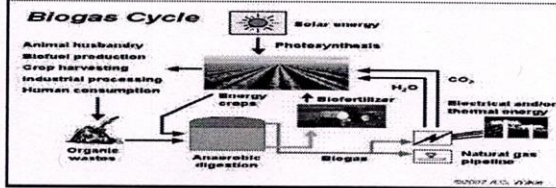
- ▶ Introduction:
- ▶ Biomass is regenerative organic material used for energy production. Sources of biomass fuel include vegetation, agricultural and forestry residue.
- ▶ Biomass can be burned directly or converted into gaseous or liquid fuels.



The diagram illustrates various sources of biomass. At the center is a circular icon with a plant and a gear, labeled 'sources of biomass'. Surrounding this central icon are six categories of biomass sources, each with a small representative image: 'Forestry Crops & Residues' (a tree), 'Agricultural Crops & Residues' (a field of crops), 'Sewage' (a pipe), 'Industrial Residues' (a factory), 'Animal Residues' (a cow), and 'Municipal Solid Waste' (a trash bin).

Biogas generation:

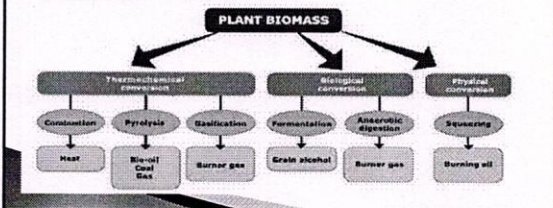
- › In biological conversion process (anaerobic process) biomass is decomposed in the absence of oxygen to produce biogas.
- › Mainly methane 55%, carbon dioxide 30 % and hydrogen sulphide.
- › Biogas is lighter than air and its ignition temperature is 700°C. It is a slow burn gas with clear blue flame. Calorific value produces around 21000 kJ/kg.



- › Advantages:-
- › Investment is less
- › It is used for domestic purpose
- › Reduce CO₂ level in atmosphere
- › Disadvantages:-
- › Requires large land areas
- › Produce pollution if not designed properly.

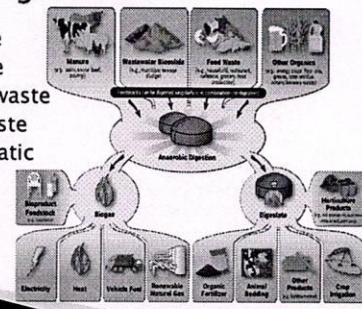
Biomass conversion

- › Biomass energy production can be
- › Direct combustion of biomass
- › Thermal conversion
- › Biochemical conversion



Materials used for biogas generation

- › Animal waste
- › Human waste
- › Agricultural waste
- › Industrial waste
- › Waste of aquatic



advantages and disadvantages:

- › Advantages:
- › Utilization of waste
- › Renewable energy source
- › High calorific value
- › No smoke produced
- › Non polluting

- › Disadvantages:
- › High capital cost
- › Requires control and maintenance
- › Explosion chances happening when improper method used.

Tidal energy

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