



ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Piglipur(V), Batasingaram(Post), Adbullapurmet (M), R R Dist., Hyderabad - 501512

(Approved by A.I.C.T.E, Recognized by the Govt. of T.S., Permanent Affiliation from JNTUH, Hyderabad)

Accredited by "NAAC with "B+" Grade, Recognized by UGC Under Section 2(f) and 12(B).

Website: [www. https://aits-hyd.org/](https://aits-hyd.org/), E-mail : principalaith@gmail.com , Contact No: 9848924705

7.1.2.

1: The Institution has facilities and initiatives for Alternate sources of energy and energy conservation measures.

GEO-TAGGING Photographs of the Facilities and initiatives for Alternate sources of energy and energy conservation measures:

INDEX

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4	Sensor-based energy conservation.	6
5	Use of LED bulbs or power efficient equipments.	6


 PRINCIPAL
 Annamacharya Institute of
 Technology & Sciences
 Piglipur (V), Batasingaram (Post)
 Adbullapurmet (M), R.R. Dist. HYD-501 525



ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Piglipur(V), Batasingaram(Post), Adbullapurmet (M), R R Dist., Hyderabad - 501512
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7.1.2.1: The Institution has facilities and initiatives for Alternate sources of energy and energy conservation measures.

1. Solar Energy:



Front view of Solar Power plant with 5 KWp.

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2. Biogas Plant:

AITH practices in the collection of solid waste in the campus by placing dust bins at every corner of the corridor, class rooms, canteen, ground etc. Separate bins are used for dry and wet waste. The collected waste is dumped in the biogas plant of AITH to convert waste to energy.



Bio Gas plant at college



ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES

Vill: Piglipur, Post: Batasingaram, Md: Abdullapurmet,
Dist: Ranga Reddy - Telangana

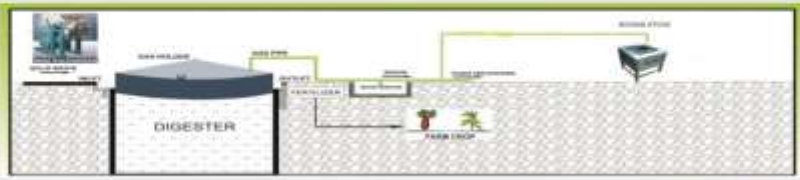
APPLICATION OF BIO-METHANATION FOR ECO-FRIENDLY MANAGEMENT OF WASTE



AIM : To treat 15-20kg per day Biodegradable wastage from institution premises to improve sanitation, emission reduction, generating organic manure, to Create clean sustainable environment and using the generated gas as a fuel for cooking purpose.

METHOD: Conversion of Organic waste into Methane by anaerobic fermentation. Manure produced anaerobically is a good compost for promotion of sustainable agriculture.

CAPACITY: Output of Biogas plant is 2M³/ day, it replaces LPG of 1kg / day (Approximately)



Associated by: 'NextEra Energy Resources', Hyderabad - Mob: 94412 84442 Email: neerul@nseru.co

Bio Gas plant at college


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3. Wheeling to the GRID:



Wheeling to GRID connection.



Wheeling to GRID arrangement with display of Metering.

4. Sensor-Based energy conservation:


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Sensor-Based street lights in Campus.


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5. Use of LED bulbs or power efficient equipment.



Usage of LED bulbs in LAB



Usage of LED bulbs

[Handwritten Signature]
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Additional and Other relevant Information:

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Website: www. <https://aits-hyd.org/>, E-mail : principalath@gmail.com , Contact No: 9848924705



College Code : T8

ESTD: 2005

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Phone : 08415-201689 (O)

Mobile : 9848924705

Website : aits-hyd.org

E-mail : principalath@gmail.com

Fax : 08415-201688

Purchase Order

Date: 01.04.2021

To
M/s Grace Solar
#42-738, S.P. Nagar, Moula Ali
HYDERABAD - 500 040

Sub : Solar Power - Reg.
Ref : Your Quotation No.333 dt. 30.03.2021

-D-

S.No	Description o	Unit Price	Qty	Total in Rs.
01	5KWp Roof Mount Grid-Tie PV System Components of this system includes:	2,55,000.00	1	2,55,000.00
02	Solar Panel of 390 Wp/Cells		14	--
03	Fronius Symo 5.0-3-5 Inverter with WLAN/LAN		01	--
04	HBL T GEL VRLA Battery:2V Series, Cap: 48V 120 Ah		NA	--
05	Fronius Smart Meter 57KA		01	22,000.00
06	AC/DC Safety Disconnects		01	--
07	Electrical Distribution Equipment		01	--
08	Electrical Material and Internal Wiring		01	--
09	Fixed Angle Roof Mounting Galvanised structures		01	--
10	Engineering Design			--
11	Module Cleaning System			--
12	Boom Lift charges			--
13	AMC for 5 years as per MNRE specifications			--
14	Freight			--
			Installation charges	5,000.00
			Sub Total	2,77,000.00
			GST @ 5%	9,695.00
			GST @ 18%	14,958.00
			Cost of Project	3,06,653.00
			Discount @ 5%	15,332.65
			Net Cost of Project	2,91,320.35
			TOTAL PROJECT COST ROUNDED	2,90,000.00

(Rupees Two Lakh Ninety Thousand only)

Terms & Conditions:

Payments : 50% advance payment, 30% payment after delivery at the college premises. 20% after installation and inspection.
Delivery : Within One week
Transportation : College premises at the company cost.
Warranty : 25 Years

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 Website: www. <https://aits-hyd.org/>, E-mail : principalath@gmail.com , Contact No: 9848924705

Tax Invoice

<p>Grace Solar # 42-738 SP Nagar, MoulaAli, Hyderabad GSTIN/UIN: 36AFNPM1874N1ZQ State Name : Telangana, Code : 36 E-Mail : solarpeople@gmail.com</p> <p>Buyer (Bill to) Annamacharya Institute Of Technology And Sciences Piglipur, Batasingaram, Hayathnagar, Hyderabad, State Name : Telangana, Code : 36</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Invoice No.</td> <td>1</td> <td>Dated</td> <td>1-Apr-21</td> </tr> <tr> <td>Delivery Note</td> <td>3</td> <td>Mode/Terms of Payment</td> <td></td> </tr> <tr> <td>Reference No. & Date.</td> <td></td> <td>Other References</td> <td></td> </tr> <tr> <td>Buyer's Order No.</td> <td></td> <td>Dated</td> <td></td> </tr> <tr> <td>Dispatch Doc No.</td> <td>3</td> <td>Delivery Note Date</td> <td>1-Apr-21</td> </tr> <tr> <td>Dispatched through</td> <td>Road</td> <td>Destination</td> <td>AITs</td> </tr> <tr> <td>Bill of Lading/LR-RR No.</td> <td>239834 dt. 1-Apr-21</td> <td>Motor Vehicle No.</td> <td>AP29AN1395</td> </tr> <tr> <td>Terms of Delivery</td> <td></td> <td></td> <td></td> </tr> </table>	Invoice No.	1	Dated	1-Apr-21	Delivery Note	3	Mode/Terms of Payment		Reference No. & Date.		Other References		Buyer's Order No.		Dated		Dispatch Doc No.	3	Delivery Note Date	1-Apr-21	Dispatched through	Road	Destination	AITs	Bill of Lading/LR-RR No.	239834 dt. 1-Apr-21	Motor Vehicle No.	AP29AN1395	Terms of Delivery			
Invoice No.	1	Dated	1-Apr-21																														
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Bill of Lading/LR-RR No.	239834 dt. 1-Apr-21	Motor Vehicle No.	AP29AN1395																														
Terms of Delivery																																	

Sl No	Description of Goods	HSN/SAC	GST Rate	Quantity	Rate per	Amount
1	Solar Power Generating Systems Consisting of 5Kwp Solar PV Modules 5Kw Grid Tie Inverter Zero Export Meter Structures for Tin Roof Cables As Required	85	5 %			2,76,000.00
		CGST			2.50 %	6,900.00
		SGST			2.50 %	6,900.00
Total						₹ 2,89,800.00 E & OE

Amount Chargeable (in words) **INR Two Lakh Eighty Nine Thousand Eight Hundred Only**

HSN/SAC	Taxable Value	Central Tax Rate	Central Tax Amount	State Tax Rate	State Tax Amount	Total Tax Amount
85	2,76,000.00	2.50%	6,900.00	2.50%	6,900.00	13,800.00
Total	2,76,000.00		6,900.00		6,900.00	13,800.00

Tax Amount (in words) **INR Thirteen Thousand Eight Hundred Only**

Declaration:
 We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.

Company's Bank Details:
 Bank Name: Indian Overseas Bank
 A/c No: 15850200000950
 Branch & IFS Code: ECIL Branch & IFS: IOBA0001585

Customer's Seal and Signature: _____
 For Grace Solar

 Authorised Signatory

SUBJECT TO HYDERABAD JURISDICTION
 This is a Computer Generated Invoice.


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COMMERCIAL PROPOSAL

FOR

ENGINEERING, PROCUREMENT, SUPPLY,
INSTALLATION, TESTING AND
COMMISSIONING OF

3KWp or 5KWp GRID TIE ROOF TOP
SOLAR POWER GENERATING SYSTEM

AT

Annamacharya Institute of Technology
and Sciences; Hyderabad.

From
Grace Solar,
H.No. 42-738, S.P.Nagar,
Moulaali, Hyderabad.
500040. TS.
Website: www.gracesolar.in
Email: solarpeople@gmail.com

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SPACE SAVING

Commercial Offer

Quotation No	333	Date	30-03-2021	
Reference No	Nil	Date	29-03-2021	
Prospect Handled By	M A Raju	Date of Finalisation		
Type of Project	Zero Feed In	Design No	57/2020	
Name of Customer The Principal, Annamacharya Institute of Technology & Sciences, Piglipur, Batasingaram, Hayathnagar Mandal, R.R.District. Hyderabad.		Installation Address Annamacharya Institute of Technology & Sciences, Piglipur, Batasingaram, Hayathnagar Mandal, R.R.District. Hyderabad.		
Phone No. 9848924705 Email Id. principalath@gmail.com		Phone No. 9948295302 Email Id. aithdiploma@gmail.com		
DC Capacity of System		5	KWpdc	
AC Capacity of System		4.5	Wac	
Expected Output per day		25	KWh	
Expected Output per Month		750	Kwh	
Annual Generation		9000	Kwh	
Savings per annum		₹ 90,000	INR	
Item No	Description	Unit Price	Quantity	Amount
1	5KWp ROOF MOUNT GRID-TIE PV SYSTEM	₹ 2,55,000.00	1	₹ 2,55,000.00
Components of this system includes:				
2	Solar Panel of 390 Wp / 72 Cells		14	-
3	Fronius Symo S.0-3-5 Inverter with WLAN/LAN		1	-
4	HBL T GEL VRLA Battery : 2V Series , Cap : 48V 120 Ah		NA	-
5	Fronius Smart Meter 57KA		1	₹ 22,000.00
6	AC/DC Safety Disconnects		1	-
7	Electrical Distribution Equipment		1	-
8	Electrical Material and Internal Wiring		1	-
9	Fixed Angle Roof Mounting Galvanised Structures		1	-
10	Engineering Design			-
11	Module Cleaning System			-
12	Boom Lift charges			-
13	AMC for 5 Years as per MNRE specifications			-
14	Freight			-
Installation Charges				₹ 5,000.00
Subtotal				₹ 2,77,000.00
GST @ 5 %				₹ 9,695.00
GST @ 18 %				₹ 14,958.00
Cost of Project				₹ 3,06,653.00
Liasoning Charges				₹ 0.00
Total Project Cost				₹ 3,06,653.00
Cost of project per watt				₹ 61.33
1. Terms Subject to Working Contract. 2. If you have any questions concerning this proposal, please contact us. 3. Please consult your tax advisor on all State & Central Incentives.				

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Mobile : 9848924705
9912344480

Website : aits-hyd.org
E-mail : principalath@gmail.com
Date: 20.10.2021

PURCHASE ORDER

To
 The NextEra Energy Resources,
 #5-5-846/14, Jahangir nagar colony,
 Chinthalkunta, L.B.Nagar,
 Hyderabad - 500070.
 E-mail: neeru@neeru.co

Dear Sir,

Sub: Biogas Plant for using cooking and Manure generation – Purchase Order- Reg
 Ref: Your Estimate No: 014/IBP-2/TS/21-22 Dated: 01.09.2021

With reference to your Estimation vide Ref.cited, we are pleased to our purchase order.


S.No	Description	Quantity	Rate in INR	GST	Total our scope of work in INR
I	Biogas Palant Gas Reactor: Supply of Reactor made with 2.5 mm thick (12 gauge) MS sheet for the cover angle iron, flange plates, painting etc., and installation testing commissioning and external surface of the done final coats with blue print. Supply, installation and commissioning of the plant including gas generation, supply, gas distribution system, supplying gas from plant site to end user points and total trial run.	01			40,000/-
II	Burner & Gas Pipeline Supply Installation of canteen burners with suitable pipes, valves and instrumentation etc., Laying of pipeline (up to 10 meters)	02	Rs:		20,000/-
	Sub Total				60,000/-
	GST@5%				3000/-
	Total out scope of Work In INR				63,000/-

(Sixty Three Thousand Only)

Terms and Conditions:

- One Year service warranty apply.
- 50% Payment along with purchase order and 50% on successful commission of the project.

Bank Details:
 Bank Name: AXIS BANK, BNREDDY NAGAR BRANCH, HYDERABAD
 Bank Account No: 917020067741338(Current A C)
 Bank IFSC code: UTIB0003061
 Account Holder's Name: NextEra Energy Resources


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 Abdullapurmet (M), R.R. Dist. HYD-501 512

Purchase Order of Bio Gas Plant


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NextEra Energy Resources

Camp Office: C/o. Centre for Energy Technology, B/12, University College of Engineering, Osmania University, Hyderabad-500 007
 Regd. Office: # 5-5-846/14, Jahangir Nagar Colony, Chinthalkunta, L. B. Nagar, Hyderabad-500 070-Telangana
 Tel: +91 94412 84442, +91 9493862240
 E-mail: neeru@neeru.co, <http://www.neeru.co>

014/IBP-2/TS/21-22

September 1st, 2021

To
 Annamacharya Institute of Technology Sciences
 Piglipur (Village), Batasingaram (Post),
 Abdullapurmet (Mandal),
 Ranga Reddy District,
 Hyderabad 501512, Telangana

Sub:- Submission of Cost Estimation for 2 M³/Day 'Food Waste Based Biogas Plant for using cooking and Manure generation – Reg.
 Ref: Our discussions held on 30-08-2021

Dear Sir,

With reference to the above subject cited, we are submitting the estimation for installation of '2 M³/Day Flouting Dome type biogas plant at your Institution to meet cooking applications and generating bio fertilizer.

Next Era Energy Resources ("NEERU") was registered with an aim to provide turnkey / EPC contract services, developing Biofuel, Biomass and biogas based renewable energy projects for electrical & thermal applications on decentralized basis with intellectual partnership of 'Centre for Energy Technology', Osmania University, Hyderabad <http://www.neeru.co>. We are pleased to submit our Techno-commercial offer cum proposal for setting up of a Biogas Plant detailed below:

Sl. No.	Description	Quantity in Nos.	Rate in INR	Total our scope of work in INR
I	Biogas Plant			
	Gas Reactor : Supply of reactor made with 2.5mm thick (12 gauge) MS Sheet for the cover angle iron, flange plates, painting etc., and installation testing commissioning and external surface of the dome final coats with blue paint. Supply, installation & commissioning of the plant including gas generation system, gas distribution system, supplying gas from plant site to end user points and total trial run.	01		40,000/-
II	Burner & Gas Pipeline			
	Supply installation of canteen burners with suitable pipes, valves, and instrumentation etc. Laying of pipeline [up to 10 Meters]	02	Rs.	20,000/-
	Sub Total			60,000/-
	GST @ 5%			3,000/-
	Total Our Scope of Work in INR			63,000/-

Note: All civil works of above plant are not included in the above estimation.

For above execution of above works following are our terms:

1. Our GSTIN: 36AANFN8274C1ZZ - Our PAN: AANFN8274C
2. The project implementation strategy adopted will be supply, installation & commissioning of the project including gas generation system, gas distribution system, supplying gas from plant site to end user points, electrical and thermal appliances.
3. Delivery/completion of work: The system will be refurbished, supplied, installed, and commissioned within 30 days from the date of receipt of advance amount along with the work order. The work will commence within 10 days from receipt of advance amount.

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4. Payment: 50% advance along with the purchase order and 50% on successful commission of the project. The payment shall be in the favour of "NextEra Energy Resources" payable at Hyderabad. You may also be deposit / transfer to the Current Account No. 917020067741338 with IFS Code: UTIB0003061 at Axis Bank, B N Reddy Nagar Branch, Hyderabad
5. Warranty: The biogas plant will be under warranty for a period of one year from the date of commissioning against all manufacturing defects. We will undertake site visits as & when required to ensure proper functioning of the plant during the warranty period.
6. Taxes: included and any variation in taxes at the time of delivery will be applicable to your account.
7. Validity: The offer shall be valid for 45 days from the date of submission of the offer.
8. Suitable storage for materials, and simple accommodation and sanitation at site for technical staff & labour, during the project execution period.
9. Continuous water and electricity supply during fabrication of the project to be provided by client at free of cost and arrange for erection of gas reactor during installation commissioning processes.


We eagerly await your approval & work order in the name of 'NextEra Energy Resources' to execute the above job.

Thanking you,

Yours faithfully,
For NextEra Energy Resources

M.V.N REDDY]
* Founder & CEO
Tel: 9441284442

Encl: Description and technical specifications of the plant


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INTRODUCTION

Institutions messes operate daily and provide meals and snacks to all the students and staff. The messes in the Institute's campus generate good amount of kitchen waste (uncooked) and food waste. Besides, there is wet organic waste generated from the staff/ faculty quarters/ residence.

The waste generated from these facilities is eminently suited for biogas and bio-manure production. Presently, LPG is used as fuel for cooking food in these canteen.

A clean energy project is proposed to treat this solid organic waste generated from different sources within the campus premises in Bio-digester using bio-methanation technology to produce biogas and bio-manure.

Biomethanation is an attractive technology among the biological methods since it generates biogas comprising mainly methane and carbon dioxide. Methane in biogas can be used as fuel for thermal applications or it can be converted into electricity. The digestate/slurry from biomethanation plant has high nutritive value and it can be used as manure.



The kitchen/ food waste has high carbohydrate and high moisture content and thus is a good substrate for the production of biogas through biomethanation process. Biomethanation process also reduces the load of organic pollutants in terms of reduction of TS, VS, BOD and COD. Thus, biomethanation is an eco-friendly technology for the treatment of solid waste organic waste.

Brief Introduction of NextEra Energy Resources

NextEra Energy Resources (hereinafter referred to as "NEERU") is a leading firm having more than two decades of expertise in setting up of Biogas based renewable energy projects for electrical & thermal applications.

NEERU has installed more than 50 Biogas Power [off-grid] Projects up to 50 KVA in universities, colleges, institutions, farm houses, dairy farms, poultry farms, agro industries, etc. In addition,


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NEERU has installed more than 5,000 domestic biogas plants in rural areas in Odisha, Andhra Pradesh and Telangana and 1,400 fixed chullahsin institutions and dhabas. NEERU has built over 36 large size Biogas plants at various institutions, which are being used for cooking purposes.

Benefits of the Proposed Biogas Plant

- ↓ The solids organic waste generated within the campus from various sources can be treated in Biogas plant for generation of clean/ green energy and manure
- ↓ Bio-methanation based biogas plant provides eco-friendly solution for disposing large quantity of waste generated in Institution premises
- ↓ To create a green/Swaatch Institution
- ↓ Use of biogas in place of LPG for cooking avoids greenhouse gas emissions (GHG)
- ↓ It keeps environment clean and eco-friendly
- ↓ The manure produced from Biogas plant is a good compost and excellent fertilizer, which can be used for plantations and gardens developed in the campus. The manure can substitute chemical based fertilizers, if any.

Feedstock for the Proposed Biogas Plant

- ↓ Uncooked Vegetable & fruit waste from Kitchen
- ↓ Food waste from messes
- ↓ Wet organic waste from residential quarters
- ↓ Green garden waste/cattle Dung
- ↓ Food waste generated from food courts
- ↓ Any other biodegradable, solid waste generated within the farm areas

The above feed stock is produced entirely within the premises of the farm on daily basis and there is no need to depend on external sources.

Brief Description of Bio-methanation Technology and its Products

Biogas is a gaseous fuel produced from biomass such as animal waste, food waste, Solid waste, fruit waste, dry leaves, grass, straw etc. during the anaerobic fermentation process. Biogas contains 55-65% methane (CH₄) and 30-40% carbon dioxide (CO₂), water vapour (H₂O), hydrogen, carbon monoxide (CO), and about 5% hydrogen sulphide (H₂S). The heat value (calorific value) of biogas is 4,713 kCal/m³. The picture below depicts the schematic of a biogas plant.

Advantages of Biogas

The quantum of biodegradable waste generated such as cow dung, food waste, fruit waste, and vegetable waste has become a social and environmental problem. Inadequate capturing, storage, and lack of proper treatment techniques led to degradation of local air, soil, and water quality. Pollutants generated by mismanaged waste include biochemical oxygen demand (BOD), pathogens, nutrient loading, methane, and ammonia. If the above organic materials are left to atmosphere, they

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decay and emit methane to the atmosphere. Methane is 20 times more hazardous than carbon dioxide in terms of greenhouse effect and global warming.

The generation of biogas from such solid wastes protects the environment by not only reducing the harmful emissions to the environment but also reducing the burning of fossil fuels. Utilization of biogas can reduce or eliminate energy costs. The thermal energy required for water heating or buildings heating can be obtained by directly burning biogas in a boiler or furnace or from a heat recovery system connected to the engine-generator.

The energy generated from biogas will also reduce the country's dependence on fossil fuels and contributes to energy security.

Anaerobic Digestion Technology

Anaerobic digestion of food waste, solid waste, fruit waste is a promising technology that has been shown to effectively address many of the problems associated with food waste/ manure management while providing a reliable energy resource. Anaerobic digestion is by no means a new technology. India has enormous potential for large scale application of anaerobic digestion if properly designed, constructed, and managed. The anaerobic digestion systems can be a successful manure management tool on farms, waste disposal units, landfills, etc. Using food waste and manure as the input, an anaerobic digester yields three daily valuable outputs i.e., Biogas, solid fiber, nutrient-rich liquid.

Production Process of Biogas

The process of bio-gas production is anaerobic digestion of wastes and takes place in two stages and these are: (i) acid formation stage and (ii) methane formation stage. In the acid formation stage, the bio-degradable complex organic compounds of solids and cellulose present in the waste materials are acted upon by a group of acid forming bacteria present in the dung and reduce them into organic acids, CO_2 , H_2 , NH_4 and H_2S . Since the organic acids are the main products in this stage, it is known as acid forming stage and this serves as the substrates for the production of methane by methanogenic bacteria.

In the second stage, groups of methanogenic bacteria act upon the organic acids to produce methane gas and also reduce CO_2 in the presence of H_2 to form methane (CH_4). At the end of the process the amount of oxygen demanding materials in the waste product is reduced to within the safe level for handling by human beings.

There are four types of methanogenic bacteria, namely (i) methano-bacterium, (ii) methano-spirillum, (iii) methano-coccus, and (iv) methano-circina. These bacteria are oxygen sensitive and photo-sensitive and do not perform effectively in the presence of oxygen and light.

Composition of Biogas

Biogas mainly comprises of hydro-carbons which are combustible and can produce heat and energy when burnt. The chemical formula of the hydrocarbon is CH_4 where C stands for carbon and H for hydrogen and chemically the gas is termed as methane gas. The biogas produced by anaerobic digestion does not contain pure methane and has several impurities. A typical composition of biogas gas obtained from the process is given below in Table 1 below:


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Table 1: Typical Composition of Biogas from Anaerobic Digestion

Constituent	Percentage (%)
Methane	60.0
Carbon dioxide	38.0
Nitrogen	0.8
Hydrogen	0.7
Carbon Monoxide	0.2
Oxygen	0.1
Hydrogen Sulfide	0.2

Bio-manure (By-product)

The proposed biogas plant by anaerobic digestion technology will produce manure as a useful byproduct. The average NPK content of the manure (farm yard manure-FYM) is about 0.5, 0.2 and % respectively. The biogas slurry is rich in NPK by more than four times than ordinary dung when converted into FYM.

When the country is faced with shortage of fertilizers and has to spend enormous amount for its import, the application of biogas slurry will go a long way in replacing the chemical fertilizers. Biogas slurry or FYM not only adds NPK but it protects the soil porosity and texture. These are established benefits. Table 2 below presents the typical NPK composition of manures:

Table 2: NPK Composition in Typical Manures

Item	N	P ₂ O ₅	K ₂ O
Bio-gas slurry	1.4	1.0	0.8
Farm Yard Manure (FYM)	0.5	0.2	0.5
Town Compost	1.5	1.0	1.5

Plant Details and components

This design consists of a deep well shaped underground digester connected with inlet and outlet pipes at its bottom, and separated by a partition wall dividing the 3/4th of the total height into two parts.

A mild steel gas storage drum is inverted over the slurry, which goes up and down around a guide pipe with the accumulation and withdrawal of gas.

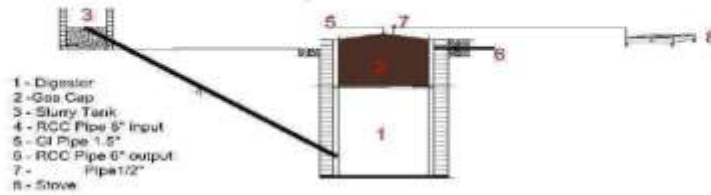
Digester: This is the fermentation tank and is built partially or fully underground. It is generally cylindrical in shape and made up of bricks and cement mortars. It holds the slurry within it for the period of digestion for which it is designed.

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Gas holder: This component is meant for holding the gas after it leaves the digester. It may be a floating drum or a fixed dome on the basis of which the plants are broadly classified. The gas connection is taken from the top of this holder to the gas burners or for any other purposes by suitable pipelines. The floating gas holder is made up of mild steel sheets and angle iron and is required to exert pressure of 10 cms of water in the gas dome masonry and exert a pressure up to 7.5 cm water column.

Slurry mixing tank: This is a tank in which the dung is mixed with water and fed to the digester through an inlet pipe.

Outlet tank and slurry pit: An outlet tank is usually provided in a fixed dome type of plant from where slurry is directly taken to the field or to a slurry pit. In case of a floating drum plant, the slurry is taken to a pit where it can be dried or taken to the field for direct applications.

Capacity of the biogas digester	Daily required food/cattle dung waste	Daily replacement of LPG per day	Bio-manure production per day in dry matter
2M ³ /day	25kg/day	0.5- Kg/day	6Kg.

o *Manpower requirement: These plant needs very little maintenance, one person half an hour in every day for general cleanliness and maintenance.*

Climatic twin effect:

The use of renewable energy reduces the CO₂-emissions through a reduction of the demand for fossil fuels. At the same time, by capturing uncontrolled methane emissions, the second most important greenhouse gas is reduced:

The impact on the greenhouse effect

The greenhouse effect is caused by gases in the atmosphere (mainly carbon dioxide CO₂), which allow the sun's short wave radiation to reach the earth surface while they absorb, to a large degree, the long wave heat radiation from the earth's surface and from the atmosphere.

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Proposal for Food Waste based Biogas Plant for Thermal Application

About NEERU

Sl. No.	Item	Details
1	Name of the Firm/Company	NEXT ERA ENERGY RESOURCES [Formerly NextEra Energy Resources LLP and merged to the above]
2	Short Name	NEERU
3	Legal status of the Organization	Registered under the section 58 [1] of the Partnership act, 1932 Govt. of India
4	If Registration under Micro, Small & Medium Enterprises Development (MSMED) Act 2006 Govt. of India	Registered under Micro, Small & Medium Enterprises for Udyog Aadhaar. [TS09B0026556]
5	Registration no and date under startup registration under Department of Industrial Policy and Promotion, Govt. of India	Registered under Department of Industrial Policy and Promotion, Ministry of Commerce & Economy, Govt. of India No. DIPP7592
6	Income Tax Registration number- PAN No.	AANFN8274C
7	GST/CGST Registration	36AANFN8274C1ZZ
8	Office Address with Contact details	# 5-5-811, Jahangir Nagar Colony, Chinthalkunta, L.B. Nagar, Hyderabad-500 070-Telangana-India E-mail: neeru@neeru.co
9	Contact Person with Telephone No. etc.,	Mr. M.V. N. Reddy Tel: 94412 84442/ 94938 62240 E-mail: vnr@neeru.co
10	<u>Business and introduction of the Organization</u> NEERU is a leading firm having more than two decades of expertise in setting up of Biogas based renewable energy projects for electrical & thermal applications.	

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	<p>NEERU has installed more than 50 Biogas Power [off-grid] Projects up to 50 KVA in universities, colleges, institutions, farm houses, dairy farms, poultry farms, agro industries, etc. In addition, NEERU has installed more than 5,000 domestic biogas plants in rural areas in Odisha, Andhra Pradesh and Telangana and 1,400 fixed chullahs in institutions and dhabas. NEERU has built over 100 large size Biogas plants at various institutions, which are being used for cooking purposes.</p> <p>We have also installed Institutional / Community biogas plants for cooking / power generation in Municipalities, Institutions, Industries Temples and Gaushalas with Central Finance Assistance under Biogas Power [Off-grid] programme of Ministry of New and Renewable Energy, Govt. of India..</p>	
11	Mechanism/ process of budgetpreparation,approval& control	Each project is taken up after completion of detailed designs, planning and estimates as per approved design of MNRE.
12	System of monitoring and evaluation of schemes/ budgetary controls within the Firm	Project is monitored at predefined events

Affiliations/PartnershipstoNational/International Agencies

NEERUempanelledwith various Central/State Govt. Organizations doing excellent work in the field of sustainable energy services as below:

- BhabhaAtomicResearch Centre (BARC), Trombay, Mumbai, Govt. of India: 'Technology Transfer & Collaboration Division' for setting up Nisarguna a Biogas Plant Based on Biodegradable Waste Plants in India.
- OSMANIA UNIVERSITY: Service support partner for a joint venture program for developing, conducting a few courses in energy/new renewable energy technologies and service support, working in '**Centre for Energy Technologies**' at Osmania University Campus.
- Ministry of Commerce & Industry, Govt. of India: Recognized Start-up Company, (DIPP7592) underthe Department of Industrial Policy and Promotion, Ministry of Commerce & Industry, Govt. of India
- Biogas Development Training Centre (BDTC), Ministry of New &Renewable Energy, GOI, Bhubaneswar, Odisha: Authorized agency for conducting trainings in biogas based renewable energy technologiesunderthe schemes of Ministry of New & Renewable Energy, Govt. of India in Andhra Pradesh and Telangana.
- Department of Biotechnology, Khadi& Village Industries Commission,(KVIC)Govt. of India Andhra Pradesh /Telangana to establishment of biogas based renewable energy projects in Andhra Pradesh& Telangana States.
- Ministry of Defense, Govt. of India: A recognized agency under Ministry of Defenseand are associated with Defense Institute of Bio-energy Research DIBER/DRDO and DefenseResearchDevelopment Laboratories, DRDL, wereassociated to setup renewable energy generation projects at their sites.

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- g) Nuclear Power Corporation of India Limited (NPCIL) Govt. of India: Empanelled to carryout Corporate Social Responsibility 'CSR' related activities/projects at NPCI stations/project sites in India.
- h) MSME, Govt. of India: A 'Udyam Registration' registered enterprise under (MSMED) Act 2006, (UDYAM-TS-09-0014184) Ministry of Micro, Small and Medium Enterprises, Govt. of India
- i) ITE & C Department, Govt. of Telangana: Recognized as start-up (ID:TSSR00176) by the State Innovation Cell, Information Technology, Electronics and Communications Department, Govt. of Telangana.
- j) Telangana State Renewable Energy Development Corporation Ltd., (TSREDCO): Authorized as an approved distributor for distribution of LED Bulbs & BLDC Fans and other renewable energy products in Ranga Reddy District on behalf of TSREDCO, Govt. of Telangana.
- k) Confederation of Indian Industry (CII), New Delhi: 'Awarded Certificate of Appreciation' From CII for our efforts towards sustainable Management of waste through innovative solution as a start-up and participation in the CII 3R Awards 2021.

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GSTIN : 36AANFN8274C1ZZ

PAN: AANFN8274C



NextEra Energy Resources

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L. B. Nagar, Hyderabad-500 070-Telangana

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Tel: +91 94412 84442, +91 9493862240
E-mail: neeru@neeru.co, <http://www.neeru.co>

TAX INVOICE

Invoice No. NEERU/21-22/031

Date: 29-10-2021

Details of Receiver [Billed to]		Details of Consignee [Shipped to:]		Purchase order/supply order No. & Date	
Annamacharya Institute of Technology Sciences Piglipur (Village), Batasingaram (Post), Abdullapurmet (Mandal), Ranga Reddy District, Hyderabad 501512, Telangana		Annamacharya Institute of Technology Sciences Piglipur (Village), Batasingaram (Post), Abdullapurmet (Mandal), Ranga Reddy District, Hyderabad 501512, Telangana		Ref. No. Nil Dated: 01-09-2021	
Buyer's GSTIN					
Sl. No.	HSN Code	Description of Item	Qty.	Rate Rs.	Total Amount in INR
1	84 05 10 90	WASTE TO ENERGY (BIOGAS) PLANT Supply of 6 cum per day waste to energy system etc.,	01	63,000/-	60,000/-
GST @ 5%					3,000/-
TOTAL INVOICE VALUE					63,000/-
Amount Chargeable [in words]: Indian Rupees Sixty three Thousand Only					

Tax Amount Details:

Sl. No.	HSN/SAC Code	Taxable Value	CGST		SGST		IGST		Total Tax in INR
			%	Amount	%	Amount	%	Amount	
1	84051090	60,000/-	2.5	1,500/-	2.5	1,500/-	-	-	3,000/-
Total									3,000/-

Our Banker Details: **Axis Bank**, B N Reddy Nagar, Sagar Road, Hyderabad. A/c. No. 917020067741338 - IFSC : UTIB0003061
 NextEra Energy Resources.

Terms & Conditions:

- Cheque/DD to be made in favor of "NextEra Energy Resources"
- Goods once sold will not be taken back and any disputes, arising out of this sale or subject to Ranga Reddy District, Telangana jurisdiction.
- Declaration: We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct.
- Certified that the particulars given above are true and correct.

Checked by

For NextEra Energy Resources
 Authorized Signatory

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Additional Information

Energy Consumed by the College before & after Solar Power plant Installation.

Energy Consumed by the AITH from TSSPDCL Before and after Solar Power plant Installation.

S.No	Before Solar Plant Installation		After Solar Plant Installation	
	Month & Year	Energy Consumed in KWh(units)	Month & Year	Energy Consumed in KWh(units)
01	Jan'2021	5666	May' 2021	4996
02	Feb'2021	7991	June' 2021	4531
03	Mar'2021	9121	July' 2021	6456
04	April'2021	7922		

Note: AITH has a leased line HT.


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