



Dr.T. THIMMAIAH INSTITUTE OF TECHNOLOGY
(Estd. 1986) Oorgaum, Kolar Gold Fields, Karnataka – 563120
(Affiliated to VTU, Belgaum, Approved by AICTE - New Delhi)

7.1.2 The institution has facilities for alternate sources of energy

INDEX

Sl. No	Description
1	Solar energy and LED
2	Bio gas plant


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DETAILED PROJECT REPORT FOR 1.5KW

Roof Top SOLAR PV POWER PLANT

Customer: M/s. Dr.TTIT

Plant Location: Kolar Gold Fields

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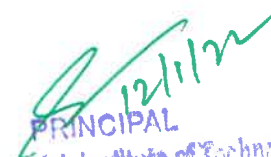
1. EXECUTIVE SUMMARY

1. India is both densely populated and has high solar isolation, providing an ideal combination for **Solar Power in India**. Power is the lifeline of any development of the nation. At present the Power requirement is being met by three main sources viz., Thermal, Hydel and Nuclear. While Hydel and Nuclear have their inherent limitations, Thermal Power is often confronted by the challenge associated with the availability of fuel. Currently Thermal Power stations which meet the major part of the power demand use coal as fuel. Conventional fuels such as oil, gas and coal

Cannot meet the increasing demand forever. In addition to the requirement of huge funds, the Implementation of more such projects using conventional means of power generation will also involve issues of growing environmental concern, with depletion of fossil fuels.

2. In order to bring down the dependence of finite fossil fuel for power generation, it is necessary to look into the viability of generating power locally using renewable energy sources.

3. Fortunately, India lies in sunny regions of the world. Most parts of India receive 4.7 kWh of solar radiation per square meter per day with 300-325 sunny days in a year. India has abundant solar resources, as it receives about 3000 hours of sunshine every year, equivalent to over 5,000 trillion kWh. India can easily utilize the solar energy. Today The Government is encouraging generation of electricity from various renewable energy sources such as wind, solar, small hydro, biomass by giving various fiscal & financial incentives. This apart, the state governments are procuring electricity from renewable energy projects at preferential tariff. So far 29,536 MW of renewable power capacity have been installed in the country, which includes 19,933 MW from wind, 2079 MW from solar, 3746 MW from small hydro and 3776 MW from bio energy. The Ministry of New and Renewable Energy is providing various renewable energy systems for Decentralized generation of electricity. So far, 10,752 villages have been electrified using various


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Renewable energy systems. About 2.55 lakh solar street lights, 9.93 lakh solar home lightening Systems, 9.39 lakh solar lanterns and 138 MW of decentralized solar power plants have been installed.

4. Considering the good potential of Solar Power and utilizing the abundant Solar Power in the Campus of Dr.TTIT for Power Generation, **M/s Dr.TTIT** is proposing to set up

1.5KW Roof Top Solar PV based Power Plant in Dr.TTIT, KGF.

5. The proposed Power Plant will have Solar PV modules, Inverters as the major components & other accessories for the Power production.

6. All the necessary auxiliary facilities of the Power Plant like Plant Monitoring system, Safety Equipment's, Instrumentation, Control system etc., will be provided for the Power Plant. The water

Requirement for the module cleaning & for other requirements can be met from bore-wells at site.

7. The site selection for a Solar Power Plant is pre-dominantly determined by solar isolation Availability for exporting power. The proposed site where M/s Dr.TTIT Power Plant is to be located in Dr. TTIT Campus is found favoring the above factors to a great extent.

8. The Plant and equipment facilities will be designed to comply with all applicable stipulations / Guidelines of statutory authorities such as State and Central Pollution Control Boards, Electrical Inspectorate, Inspector of Factories etc.

9. For the purpose of this report, it is considered that the capital requirement of the project will be

Met by M/s Dr.TTIT

10. This report highlights the details of the proposed Power generation scheme, site facilities, and features of the main plant, electrical systems evacuation of generated power, Cost estimation, risk mitigation plan and Project viability. It also highlights the complete schedule for the project implementation.


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2. PROJECT SUMMARY

- | | |
|--|--|
| 1. Name of the Company: | Dr.TTIT |
| 2. Proposed Project Location: | KGF |
| 3. District Name | Kolar |
| 4. State | Karnataka |
| 5. Proposed Power Plant capacity | 1.5KW |
| 6. Technology | Solar Photovoltaic |
| 7. Location of place on Earth | (i) Latitude:12.9585° N
(ii) Longitude:78.2710° E |
| 8. Altitude | 848 M |
| 9. Average annual solar isolation | 5.3 kWh/m ² /day |
| 10. Nearest Town | Kolar |
| 11. Nearest airport | Bangalore Airport |
| 12. Nearest Railway station | Bangarpet |
| 13. Type of Module proposed | Mono Crystalline |
| 14. Type of Inverter proposed | String |
| 15. Total Inverter capacity | 55kW |
| 16. Projected Gross Energy Production per year | 89MWh @100% grid availability |


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3. Proposed Power Plant

Considering the good potential available and also the thrust given by the Government of India and

State Government to this national endeavor of exploiting renewable source of energy for power generation and with the availability of abundant Solar Power Dr.TTIT is proposing to set up a 1.5KW Roof Top Solar PV Power Plant in Dr.TTIT Campus, KGF

The proposed Power Plant site is well connected & all necessary infrastructure facilities are available in & around the site. The proposed plant will have crystalline modules, module mounting structures, inverters and all accessories as the major components. The power generated will be evacuated to the LT panel.

Thus in Promoter's perception, setting-up of the above power plant will go a long way to Meet the growing energy demand and also benefit the College.


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4. LOCATION AND INFRASTRUCTURE FACILITIES

4.1 Site Selection

The site selection for a Solar Power Plant is pre-dominantly determined by solar isolation availability & load connectivity for exporting power. Equally important are other essential factors/considerations such as:

- Availability of adequate roof top space for Power Plant and green belt development
- Technical staff is available for care taking the technical things.
- Round the clock security is available.
- Availability of water and power during construction
- Availability of labor force in the proximity
- The power produced by this project will be directly fed to LT side.
- Easy accessibility of the site

The proposed site where Power Plant is to be located is near KGF city of Karnataka state and is Found favoring all the above factors to a reasonable extent.

4.2 Proposed Location and Land Availability

KGF is the industrial city in Karnataka

Topographical & Geological Conditions

DRTTIT is located at Latitude: 12.9585° N & Longitude: 78.2710° E

Electric Power

The power generated from the Power Plant will be connected to the existing load line within the College premises.

4.3 BENEFITS FROM THE PROJECT

Since, KGF is the small town which has no other source of power generation except roof top SPV power generation. This project will help in adding the power in load in the campus thus indirectly will reduce the import of power from other sources.


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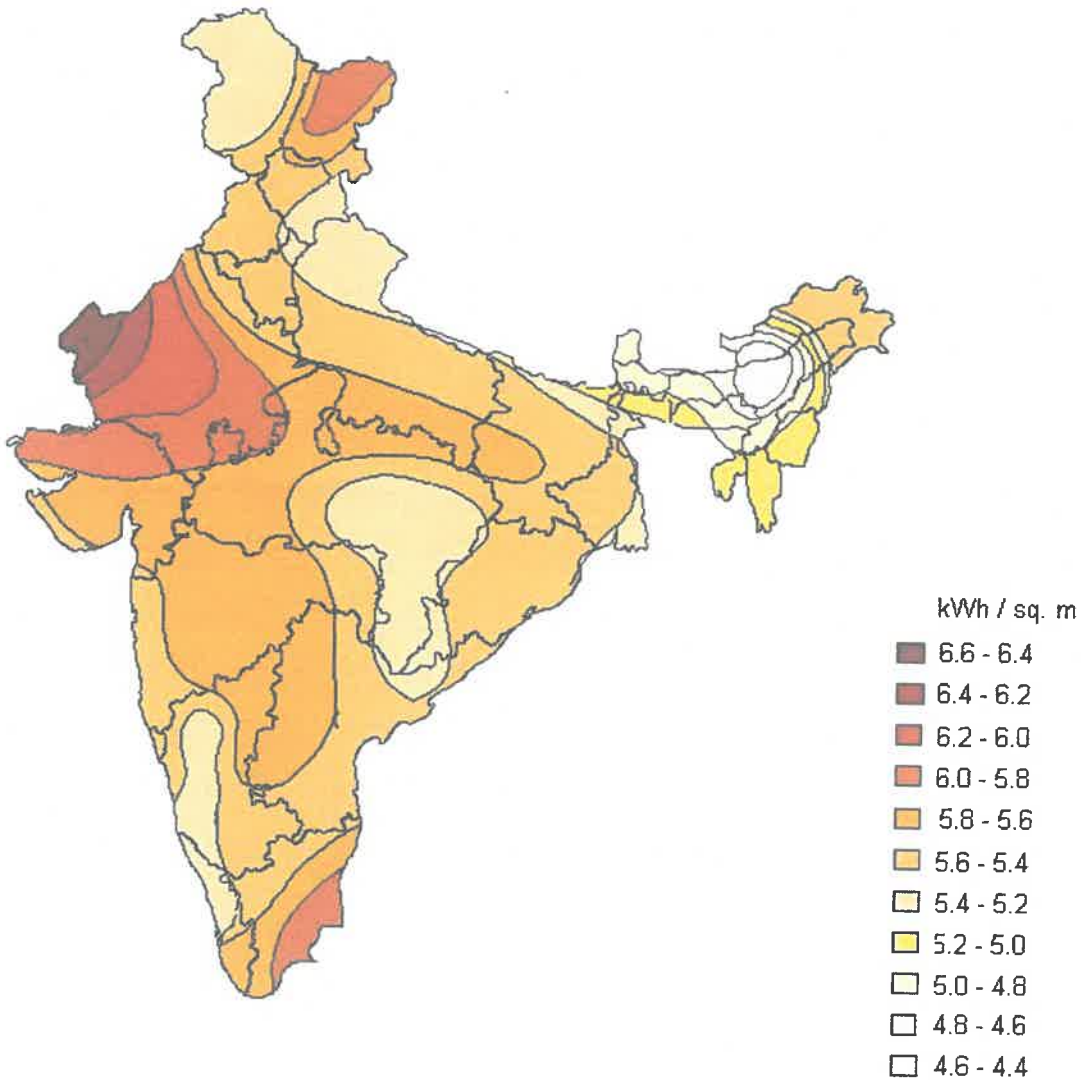
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5: IRRADIATION DATA

KGF irradiation level is in the level of 5.4 to 5.2 kWh / Sq.m and since the site is very close to the KGF town, the Irradiation data of the KGF town is considered for all design purpose.



The following are the actual site co-ordinates.

Latitude: 12.9585° N & Longitude: 78.2710° E

Building Elevation: 30 m

Annual Solar radiation: 5.3 kWh / Sq.m/day

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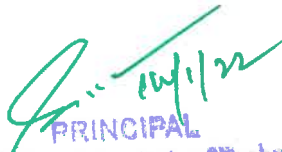
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6. POWER PLANT COMPONENT DESCRIPTION

This chapter discusses in detail the technical aspects of the components that shall be used in the Power Plant. As indicated the following are the major components of the Power Plant.

Sl. No.	Item Description
1	Solar Module 250WpMono Crystal solar panel
2	Module Mounting Structure Fixed Tilt Angle
3	Luminous solar inverter with auto AC charging 1.5VA
4	Combiner box Array Junction Boxes
5	Control Panels LT (Low Tension) Panel
6	Cables PVC Copper Cables
7	Accessories for cable interconnection, installation kit & conduits
8	Lightning Protection Units


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7. Design Assumption for Crystalline Modules

Location:	KGF
Place of installation:	Dr.TTIT
Latitude:	12.9585° N
Longitude:	78.2710° E
Elevation:	75 m
Annual Solar radiation:	5.3 kWh/ Sq.m/day
Module Facing:	True South
Module Tilt angle:	15°
Type of System:	Load Connected System
Sun hours:	8.30 – 4 Hrs.
Modules in series per String:	Will be designed as per site conditions
Strings in parallel:	Will be designed as per site conditions
Shading:	No Shading
NOCT :	45°C
Module efficiency loss :	2.5%
Power loss at MPP :	2%
Soiling loss :	2%

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8. PROJECT IMPLEMENTATION AND SCHEDULE

The project is planned to be implemented at the earliest. The most essential aspect regarding the implementation of this project is to ensure that the project is completed within the schedule, spanning. A good planning, scheduling, and monitoring program is imperative to complete the project on time and without cost overruns.

Project Implementation Strategy

It is envisaged that the project will have the below mentioned phase of activities. These phases are not mutually exclusive; to implement the project on fast track basis some degree of overlapping is

Envisaged.

Phase I - Project Development

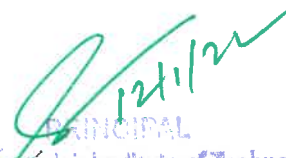
Phase II - Finalization of the Equipment and accessories

Phase III - Procurement and Construction

Phase IV - Plant Commission

09. BILL OF MATERIAL

Based on the design and technical discussion from the above Chapters the Bill of Material for both the option is provided below.


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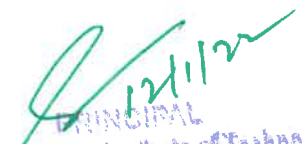


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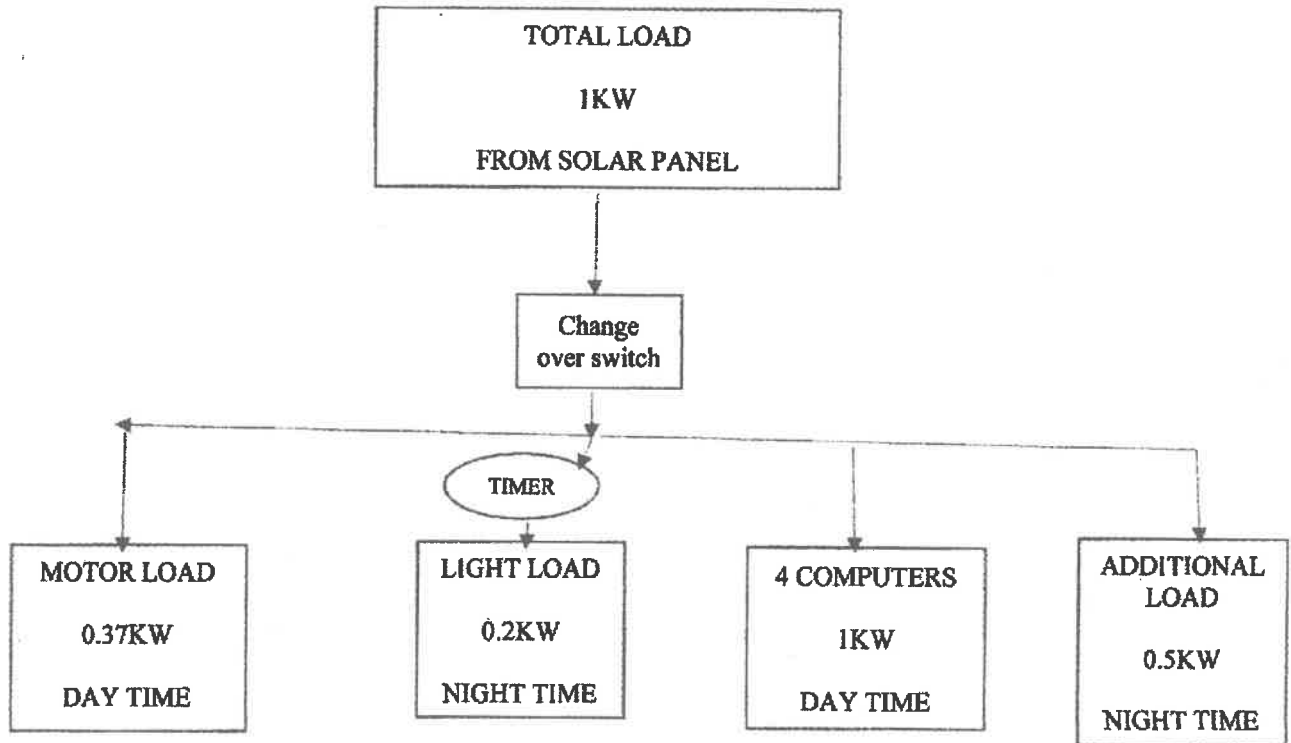
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Bill of Material for Crystalline Modules

SL.no	Particulars	Units	Quantity	Rate	Cost
1	Mono Crystal solar pannel-25% EFFICIENCY	Watt	1000	45	45,000
2	Luminous solar inverter with auto AC charging 1.5VA	No.	1	12,000	12,000
3	Exedy heavy duty tubulor battery 150 AH with 4 years warrenty	No.	4	15,000	60,000
4	Protected DC cable for solar 6 sq.mm(V-Guard)	Meter	150	70	10,500
5	Conduit pine 1 inch	Length	4	80	320
6	Conduit pine 1/2 inch	Length	6	50	300
7	Wire 2.5 sq.mm for AC Supply (V-Guard)	Meter	120	45	5,400
8	Wire 0.5 sq.mm for earthing (V-Guard)	Meter	50	15	750
9	5 in 1 15 Amps switch& Socket for inverter	No.	1	250	250
10	3 pin top 15 Amps	No.	2	120	240
11	Timer switch 15 AMPS Digital open type	No.	1	1500	1,500
12	Solar pannel clamp and channel fittings (G.I)	Set	1	9000	9,000
13	Double pole MCB of 15 Amps for AC	No.	1	850	850
14	Double pole MCB of 125 Amps for DC	No.	1	1450	1,450
15	Miscellaneous materials such as Screws, Bolts & Nuts etc	Lump Sum	NA	NA	2,000
Grand Total					1,49,560/-


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Load Distribution:



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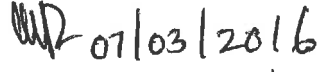


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Verified & Approved By,
Technical Committee:

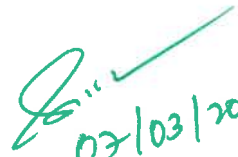
Sl.No	Name	Designation	Signature
1.	B. Somashelkar.	Asst. Prof.	B. Somashelkar 07/03/2016
2.	Devaranand B.R	Asst. Prof.	Devaranand B.R 07/03/16

Guide Sign:  07/03/2016
(N. Lakshmi patthy)

Sanctioned By,


Vice Principal 07/03/2016
VICE PRINCIPAL

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07/03/2016

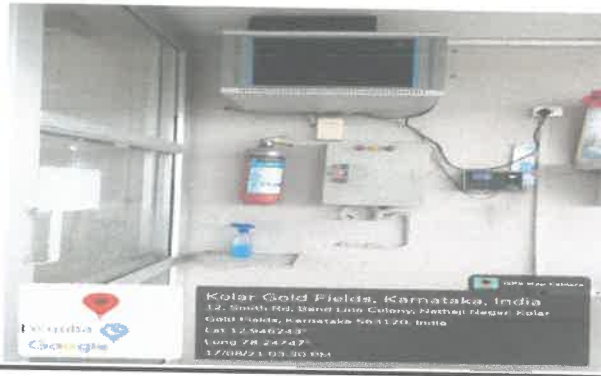
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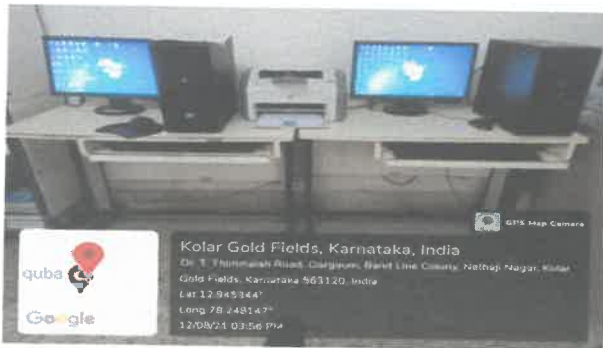
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GEO TAG PHOTOS



SOLAR PANELS

SOLAR UNIT



LED LIGHTS

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Acknowledgement for Receiving Biogas system at your IDC

Name of the Coordinator and IDC: **J. ARTHUR DAVIS**

Address: **District Bio-fuel Information & Development centre
Dr. T. Thimmaiah Institute of Technology,
Oorgaum post, KGF-563120**

Date of Receipt of Biogas unit: **04/03/2013.**

Date of Installation: **09/03/2013.**

Place of Installation: **District Bio-fuel Information & Development centre**

Remarks: **Japan. All the instructions are followed & the Gas is expected to be used from 18th of March 2013 onwards for the purpose of soap Manufacturing**

It is certified that the Biogas unit sent by M/s Synod Bioscience has been received at our IDC in good condition and is being installed at a place suggested by us.


11.03.13
Signature

J. ARTHUR DAVIS
(IDC) **Coordinator**
Biofuel I& D Centre
Dr. TTTI, Oorgaum, KGF - 5631 20


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DISTRICT BIO-FUEL INFORMATION AND DEMONSTRATION CENTER

Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum Post, K.G.F. - 563 120, Karnataka State



Ref:

Date.....

Date : 08-03-2013.

To,

Karnataka State Bio- fuel Development Board,
BANGALORE.

Sir/Madam,

Sub: Acceptance Letter

The Biogas plant sponsored by Karnataka State Bio fuel Development Board has been delivered by Synod Bio Science without any damage. Plant has been installed successfully in our premises with the supervision of synod techniques.

Thanking you,

Yours faithfully,


(ARTHUR DAVIS. J)

J. ARTHUR DAVIS
Coordinator
Biofuel I& Dt Centre
Dr. TTI, Oorgaum, KGF - 5631 20




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TIN: 32041826919 (C)

CST No:32041826919 (c)

Synod Bio Science
Ezhupunna South P O, Cherthala, Alappuzha Mob.No.9037877870

THE KERALA VALUE ADDED TAX RULES, 2005 FORM NO. 8

(For Customers when input tax credit is not required)

[See rule 58(10)]

RETAIL INVOICE

CASH / CREDIT

(To be Prepared in Duplicate *)

INVOICE No.1100

Date:22-02-2013

Name&Adress ofthe purchaser withTIN,if any:The Managing Director,Karnataka state biofuel
Development board Bangalore

Delivered at:Prof.J Arthur Davis Dept of mechanical Engg.,Dr.T Thimmalah Institute of
Technology,Oorgum post,kolar gold fields-563120,kolar dist.

Telephone: Mobile: 9880675650

Fax:

e-mail:

S I N o	Schl Entry No.	commodity	HS N cod e	Rate Of tax	Unit price	Qt y	value	Exc ise dut y	Gro ss Val ue	C as h Di sc ou nt	Net Taxable value	tax	total	Qty d isco unt
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Bio Plants Gas Holder			22333. 00	1 No	22333. 00				22333.0 0		22333.00 1116.66	
		5% Vat Collected8B		5 %								1116.66		
		Round Off												
						1 No	22333. 00				22333.0 0	1116.66	23450 .00	
GRAND TOTAL IN WORDS RS: Twenty Three Thousand Four Hundred And Fifty Only														

E&OE

Terms of Delivery and payment if any

DECLARATION

(To be furnished by the seller)

Certified that all the particulars shown in the above Tax Invoice are true and correct
and that my/our Registration under KVAT Act 2003 is valid as on the date of this Bill.

657475/c
12/100

Authorized Signatory
(with stamp/seal)



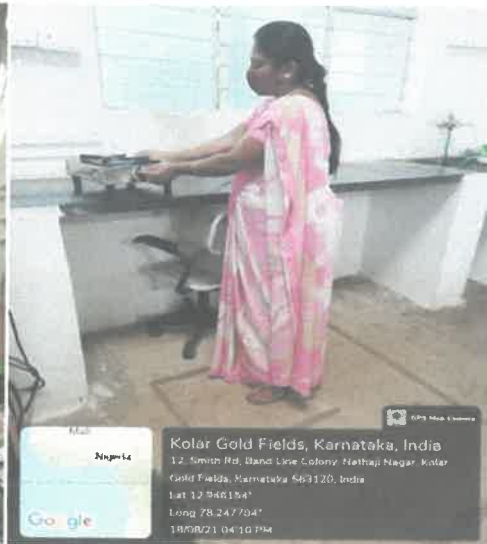
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