

9786769961



- ★ Air Conditioner      ★ Refrigerator
- ★ Solar PV Panel        ★ Inverter

Boys HS School Opposite – Thirumayam.

Date: 03.11.21

From

KSP Services,  
Boys GHS School Opposite,  
Thirumayam – 622 507.

*forwarded to*

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

*HOD / EEG*

*[Signature]*  
*03/11/21*

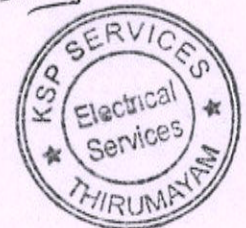
Respected Madam,

With the previous consultancy services offered by the Department of Electrical and Electronics Engineering in the domain of solar panel estimation and selection, we would like to continue with the same. We kindly request the consulting team to reach out to us for any additional information.

*C. Palani Samy*

*[Signature]*

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



***KSP Services, Thirumayam.***



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,

**Kaikkurichi, Pudukkottai - 622 303.**

Date : 09/11/2021

To

KSP Services,

Boys GHS School Opposite,

Thirumayam – 622 507.

Dear Sir/Madam,

Greetings from Sri Bharathi Engineering College for Women!

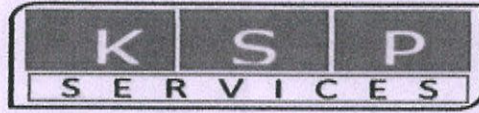
We are delighted to extend our consultancy activities for identifying the rating of solar panel for your clients. Mr. A. Abdul Baseeth, our faculty from Electrical and Electronics Engineering Sri Bharathi Engineering College for Women is designated to complete the task promptly. The cost for the proposed work estimation is approximately Rs. 3500. We await your favourable response.

Thanking you

Dr. **S. THILAGAVATHI** M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

PRINCIPAL

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT



9786769961



- ★ Air Conditioner      ★ Refrigerator
- ★ Solar PV Panel        ★ Inverter

Boys HS School Opposite – Thirumayam.

Date: 15.11.21

From

KSP Services,  
Boys GHS School Opposite,  
Thirumayam – 622 507.

*HOD / EEG*

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

*for necessary  
action please*  
*[Signature]*  
*15/11/21*

Respected Madam,

We are satisfied with your quotation for the estimation of PV panel rating and its quantity for our clients and on negotiation we grant Rs. 3250 towards the consultancy work on submission of the proposed work report within 5 to 7 days.

*C. Palani Samy*

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



***KSP Services, Thirumayam.***



# **SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**CONSULTANCY PROJECT WORK**

**REPORT**

**Estimation of Power Rating and Numbers of Solar PV Panel Require For  
Installation in Domestic Appliances**

**SUBMITTED**

**TO**

KSP Services,

Boys GHS School Opposite,

Thirumayam – 622 507.

**REPORT DATE: 25.11.2021**

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

As requested, / Order by KSP Services, Thirumayam dated 15.11.21, the following are the details for your kind perusal.

### 1. Load estimation

Load	Watts	Hour/Day	Number of loads	Watt-Hr
LED	10	7	5	350
BLDC Fan	30	10	3	900
LCD TV (55'')	150	5	1	750
Laptop	35	6	2	420
Total Daily Watt-Hour/day or Wh/day	360			2420

### 1.a. Load Estimation with power factor of 0.8 approximately.

Load	Watts	Hour/Day	Number of loads	Watt-Hr
LED	10	7	5	350
BLDC Fan	30	10	3	900
LCD TV (55'')	150	5	1	750
Laptop	35	6	2	420
Total Daily Watt-Hour/day or Wh/day	450			3025

### 2. Determining the inverter rating:

The require energy is supplied from a battery bank through an inverter. The total load that would be connected to the inverter is around 450 [360/0.8] Watt.

Then, the inverters power handling capacity should be around 500/1000 Watt as available in market.

### 3. Daily energy supplied to the inverter:

The daily energy consumed by the load is 3025 Wh.

The energy input to the inverter with the efficiency of 93%, is  $(3025)/(0.93) = 3252.68$  Wh, approximated to 3253 Wh.

### 4. Deciding the system voltage:

2 Batteries each of 12V connected in series to have typical PV system voltage as 24V.

  
Dr. S.THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.

### 5. Sizing of batteries:

The required charge capacity =  $(3253\text{Wh}) / (24\text{ V}) = 135.5\text{ Ah}$ .

The number of batteries of rating 12V, 100 Ah with Depth of Discharge (DOD) of 70% required is  $(136\text{ Ah}) / (100 \times 0.70) = 1.94$ .

### 6. Sizing of PV modules:

The energy supplied at the input of battery terminal with battery efficiency of 90% is,  $(3025\text{ Wh}) / (0.90) = 3361.11\text{ Wh}$ .

The total Ampere hour to be supplied by PV Panel should be,  $3361.11\text{ Wh} / (24\text{ V}) = 140.04\text{ Ah}$ .

The total amperes from the PV modules,  $(140\text{ Ah}) / (8\text{ h}) = 17.5\text{ Ampere}$ .

The typical value of voltage and current of 440  $W_p$  module at maximum power point ( $V_m$  and  $I_m$ ) would be about 49 V and 11 A, respectively.

The number of PV modules required is,  $18 / 11 = 1.63$  Therefore, 2 PV Panels required as per calculation.

**Considering various environmental factors and solar efficiency 2 panels of rating 440  $W_p$  is required to deliver Total Daily Watt- Hour/day of 2420.**

### Design Details:

Sl. No	Description	Rating	Quantity
1.	Inverter	500/1000 Watt	01
2.	Battery	12V, 100 Ah	04
3.	Solar PV Panel	440 $W_p$ , 49 V / 11 A	02

*A. Baseeth.*

PROJECT INVESTIGATOR

[ A. ABDUL BASEETH, AP/IEEE ]

*[Signature]*

PRINCIPAL  
PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

*[Signature]*

Dr. S. THILAGAVATHI M.E., Ph.D.,

PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,

**Kaikkurichi, Pudukkottai - 622 303.**

Date : 25/11/21

## Utilization Certificate

Certified that the amount of rupees Rs.3250 (Three thousand two hundred and fifty only) was sanctioned by KSP Services, Thirumayam during the academic year (2021-2022), in favour of Department of Electrical and Electronics Engineering Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai has been fully utilized for Estimation of solar PV Panel requirement. The purpose of amount sanctioned has been fulfilled and delivered as per conditions of grant were satisfied.

*A. Baseeth*

PROJECT INVESTIGATOR

A. ABDUL BASEETH,  
APIEEE

*[Signature]*

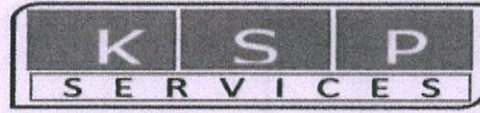
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

*[Signature]*

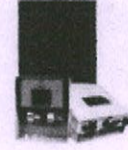
PRINCIPAL

25/11/21

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT



9786769961



- ★ Air Conditioner
- ★ Refrigerator
- ★ Solar PV Panel
- ★ Inverter

Boys HS School Opposite – Thirumayam.

Date: 28.12.21

From

KSP Services,  
Boys GHS School Opposite,  
Thirumayam – 622 507.

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

Forwarded to

HOD / EEE

28/12/21

Respected Madam,

With the previous consultancy work offered by the Department of Electrical and Electronics Engineering of the institution regarding solar panel estimation and selection is satisfactory, we would like to proceed with the same work. We kindly request the consulting team to get in touch with us for additional details.

C. Palani Samy

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



**KSP Services, Thirumayam.**





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,

**Kaikkurichi, Pudukkottai - 622 303.**

Date : ...05.01.2022

To

KSP Services,

Boys GHS School Opposite,

Thirumayam - 622 507.

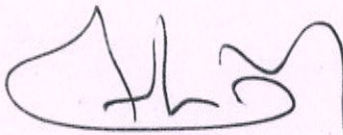
Dear Sir/Madam,

Greetings from Sri Bharathi Engineering College for Women!

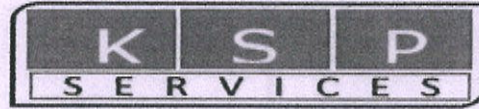
We are delighted to extend our consultancy activities for identifying the rating of solar panel for your clients. Mr. A. Abdul Baseeth, our faculty from Electrical and Electronics Engineering Sri Bharathi Engineering College for Women is designated to complete the task promptly. The cost for the proposed work estimation is approximately Rs. 3500. We await your favourable response.

Thanking you

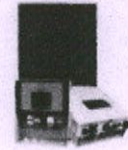
  
**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
**SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN**  
Kaikkurichi - 622 303, Pudukkottai Dt.

  
PRINCIPAL  
05/01/22

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT



9786769961



- ★ Air Conditioner      ★ Refrigerator
- ★ Solar PV Panel        ★ Inverter

Boys HS School Opposite – Thirumayam.

Date: 13.1.2022

From

KSP Services,  
Boys GHS School Opposite,  
Thirumayam – 622 507.

To

The Principal,  
Sri Bharathi Engineering college for women,  
Kaikkurichi,  
Pudukkottai – 622 303.

Respected Madam,

We are satisfied with your quotation for the estimation of PV panel rating and its quantity for our clients and on negotiation we grant Rs. 3250 towards the consultancy work on submission of the proposed work report within 5 to 7 days.

*C. Palanisamy*



1/10/EEG

*for necessary action please*

*13/01/22*

Dr. **S.THILAGAVATHI** M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.

**KSP Services, Thirumayam.**



# **SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**CONSULTANCY PROJECT WORK**

**REPORT**

**Estimation of Power Rating and Numbers of Solar PV Panel Require For  
Installation in Domestic Appliances**

**SUBMITTED**

**TO**

KSP Services,

Boys GHS School Opposite,

Thirumayam – 622 507.

**REPORT DATE: 21.1.2022**

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
**SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN**  
Kaikkurichi - 622 303, Pudukkottai Dt.

As requested, / Order by KSP Services, Thirumayam dated 13.1.22, the following are the details for your kind perusal.

### 1. Load estimation

Load	Watts	Hour/Day	Number of loads	Watt-Hr
CFL	12	6	5	360
Fan	60	9	2	1080
TV (21'')	165	6	1	990
Personal Computer	230	4	1	920
Total Daily Watt-Hour/day or Wh/day	575			3350

### 1.a. Load Estimation with power factor of 0.8 approximately.

Load	Watts	Hour/Day	Number of loads	Watt-Hr
CFL	12	6	5	336
Fan	60	9	2	1800
TV (21'')	165	6	1	750
Personal Computer	230	4	1	1250
Total Daily Watt-Hour/day or Wh/day	718.75			4188

### 2. Determining the inverter rating:

The require energy is supplied from a battery bank through an inverter. The total load that would be connected to the inverter is around 718.5 Watt [575 W/0.8].

Then, the inverters power handling capacity should be around 1000 Watt as available in market.

### 3. Daily energy supplied to the inverter:

The daily energy consumed by the load is 4188Wh.

The energy input to the inverter with the efficiency of 94%, is  $(4188)/(0.93) = 4503$  Wh.

### 4. Deciding the system voltage:

2 Batteries each of 12V connected in series to have typical PV system voltage as 24V.

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.

### 5. Sizing of batteries:

The required charge capacity =  $(4503 \text{ Wh}) / (24 \text{ V}) = 187.62 \text{ Ah}$ .

The number of batteries of rating 12V, 100 Ah with Depth of Discharge (DOD) of 70% required is  $(187.62 \text{ Ah}) / (100 * 0.70) = 2.68$ , so 3 number of batteries can be preferred.

### 6. Sizing of PV modules:

The energy supplied at the input of battery terminal with battery efficiency of 90% is,  $(4188 \text{ Wh}) / (0.90) = 4653.3 \text{ Wh}$ .

The total Ampere hour to be supplied by PV Panel should be,  $5744.44 \text{ Wh} / (24 \text{ V}) = 239.35 \text{ Ah}$ .

The total amperes from the PV modules,  $(239.35 \text{ Ah}) / (8 \text{ h}) = 29.9 \text{ Ampere}$ .

The typical value of voltage and current of 330  $W_p$  module at maximum power point ( $V_m$  and  $I_m$ ) would be about 37.67 V and 8.79 A, respectively.

The number of PV modules required is,  $29.9 / 8.79 = 3.40$ . Therefore, 4 PV Panels required as per calculation.

**Considering various environmental factors and solar efficiency 4 panels of rating 330  $W_p$  is required to deliver Total Daily Watt- Hour/day of 3350.**

### Design Details:

Sl. No	Description	Rating	Quantity
1.	Inverter	1000 Watt	01
2.	Battery	12V, 100 Ah	06
3.	Solar PV Panel	330 $W_p$ , 37.67 V/ 8.80 A	04

  
PROJECT INVESTIGATOR

[A. ABDULBASEETH, AP/EEE]

  
Dr. S. THILAGAVATHI M.E., Ph.D.,

PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN

Kaikkurchi - 622 303, Pudukkottai Dt.

  
PRINCIPAL

PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT



# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,

**Kaikkurichi, Pudukkottai - 622 303.**

Date : 21/01/2022

## Utilization Certificate

Certified that the amount of rupees Rs.3250 (Three thousand two hundred and fifty only) was sanctioned by KSP Services, Thirumayam during the academic year (2021-2022), in favour of Department of Electrical and Electronics Engineering Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai has been fully utilized for Estimation of solar PV Panel requirement. The purpose of amount sanctioned has been fulfilled and delivered as per conditions of grant were satisfied.

*A. Baseeth*

PROJECT INVESTIGATOR

A. ABDUL BASEETH, AP/EEE

*[Signature]*

**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN

Kaikkurichi - 622 303, Pudukkottai

*[Signature]*  
21/01/22

PRINCIPAL

PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

Ph. No. 04322 - 242768 Mobile: 99422 28029, 97509 28029

website : [www.sbec.edu.in](http://www.sbec.edu.in) e-mail : [sribharathiengcollege@gmail.com](mailto:sribharathiengcollege@gmail.com)