

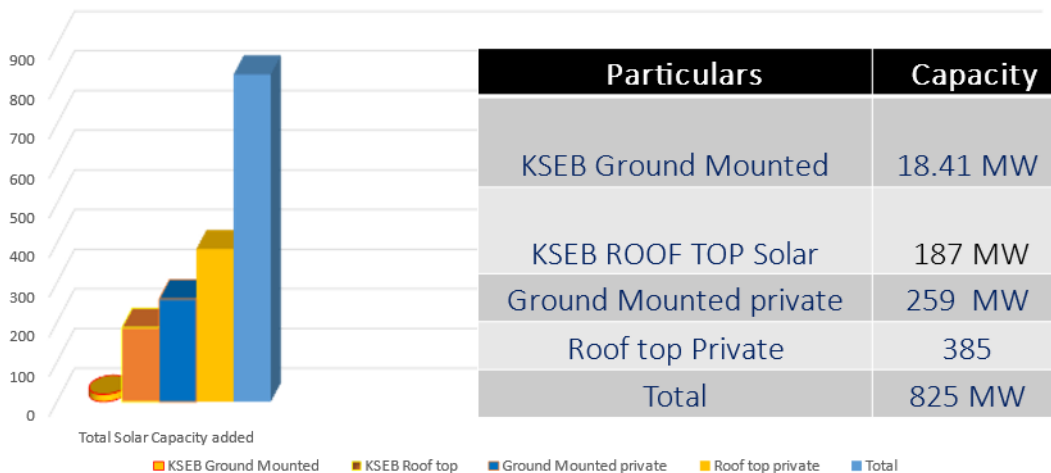
KSEBL Renewable Energy (Solar) - success stories:

One of the key objectives identified in the draft State Power Policy is "enhancing share of 'renewable energy in the Generation' Mix". The major challenge in developing solar Power Generation in the State is identified as the lack of vast tracts of land required to establish large sized plants. Hence, decentralized solar panels on roof tops is identified as the desired mode for massive deployment of solar projects in Kerala. The State is committed to resolve barriers occurring if any, through institutional intervention. KSEB Ltd have taken the lead in implementation, with deployment through organizational revamping and creation of new business models.

Kerala has launched '**Urja Kerala Mission**', an aggressive Energy Generation and Conservation programme. To shore up this KSEBL implemented the flagship project "SOURA " to add 1000 MWp Solar Power Plants to the network of KSEB Ltd.

Total RE Installation(Solar) as on date.

Total solar Installation.



Until September 2023, KSEBL added up **1230 MW** capacity in the entire RE scenario where as **825 MW** capacity is from Solar plants. An exponential growth is noticed in the RE scenario.



To perpetrate this KSEBL mapped out the following business models:

1. KSEB Investment plan (A front runner Soura Phase -1).
2. Kerala Model- Soura
3. Soura subsidy scheme- Phase 2
4. Non Soura solar Projects.
5. Renewable Energy Park
6. Green Energy for BPL Consumers,
7. Grid independent- Remote Village electrification.
8. Simplified roof top program – Subsidy program of MNRE.

KSEB Investment plan (A front runner Soura Phase -1)

Three business models were formulated to suit the requirement of prosumers for whom solar plants were to be installed.

Model-1: Under this scheme, KSEBL will utilize the rooftop of consumers for installing solar plant and maintenance of the plant for 25 years, incurring full cost by KSEBL. The energy generated will be fed into the grid for a period of 25 years and a fixed percentage of generation (10%) will be given to the consumer, free of cost for utilizing his / her / their roof.

Model-2: KSEBL will install a rooftop plant at consumer premises and the energy generated will be sold to the consumer at fixed price for 25 years through PPA. KSEBL will install and maintain the plant for 25 years, incurring the entire cost of installation.

Model-3: KSEBL will set up the solar plant after collecting the cost of the plant from the consumer. Excess energy ,if any, after the consumption of the consumer (plant owner) will be settled at APPC (Average Power Purchase Cost) rate approved by KSERC at the end of settlement period.

Under this KSEB investment scheme, Model 1, 2 & 3 collate 2038 plants with a capacity of 24.7 MW were completed and connected to the grid. Two project management units Viz. South (From Thiruvananthapuram to Thrissur) and North (From Thrissur to Kasargod) were raised across state. Completion of rooftop plants and ongoing status for each unit are shown.

Soura Phase 1

Total Soura – Phase -1 Implementation status

	No	Capacity
Target	2038	24.649 MW
Commissioned sites.	2018	24.050 MW
Completed sites & waiting for Energisation	2	0.074 MW
Works In Progress	18	0.525 MW

Soura – North

	No	Capacity
Target (EPC issued)	889	13.948 MW
Completed sites&waiting for Energisation	2	0.074 MW
Commissioned sites.	883	13.773 MW
Work In progress	4	0.101 MW

Soura – South

	No	Capacity
Target (EPC issued)	1149	10.701 MW
Completed sites&waiting for Energisation	0	0 MW
Commissioned sites.	1135	10.277 MW
Work In Progress	14	0.424 MW

Kerala Model- Soura

This special model devised by KSEBL has been appreciated nationwide and by the World Bank and MNRE. In order to attract more consumers into the project, KSEB Ltd have devised another model named **KERALA MODEL** wherein the financial investment by the consumer for the plant apart from subsidy portion is shared by KSEBL itself so as to ease the burden of consumers and to bring low earning group as prosumers. The scheme has been approved by the Government of Kerala vide G.O.(Rt) No.5/2020/POWER dtd 13/01/2020. The consumer is eligible for proportionate energy generation from the plant based on their investment.

Advantage:

1. Requires only very low investment by consumers.
2. The energy share almost meets their present energy requirement.
3. 25 years O & M of the plant by KSEB Ltd

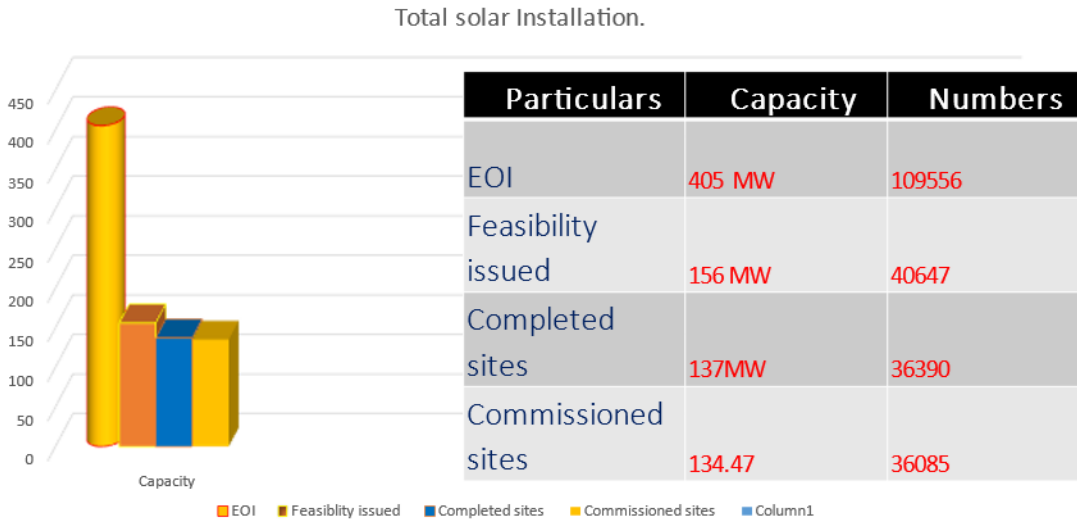
Meanwhile MNRE introduced PHASE II GRID CONNECTED ROOFTOP SOLAR PROGRAMME and KSEBL shifted its focus to promote the scheme since the scheme is more beneficial for the domestic consumers.

Soura subsidy scheme- Phase 2

The Ministry of New and Renewable Energy had announced the subsidy programme of setting up of 4000 MW of Grid connected Solar Rooftop Plants in the residential sector with central financial support. Appertained to this, MNRE has allocated 50 MW capacity in the year 2019-20 to KSEBL under Soura Phase-II subsidy scheme. Due to massive popularity across state, a capacity of another 200 MW has been sanctioned to KSEBL for the year 2020-21. Out of which 175MW was set apart for KSEBL and 25 MW for ANERT. Tenders had been floated for the empanelment of contractors. In order to provide ease in empanelment and smooth flow of bulk consumer registration, the tender conditions were customized and 38 vendors who were having enough experience in implementation of RTS were empaneled. Thus, the consumers /general public got more opportunity to choose the vendors based on the locality and to their satisfaction and the prosumers will be getting proper service of the project throughout.

KSEBL is committed to give best service in the RTS platform with strong emphasis on quality, reliability and service for 25 years long term, for successful working and maintaining the generation of top quality on RTS.

Phase 2- Soura subsidy update.



Empanelment of Developers/ Vendors:

As per guideline on the scheme, KSEBL published a list of empaneled developers for the scheme along with the rates for solar plants through competitive bidding. Consumer selected these developers from an empaneled list and installs the plant availing MNRE subsidy through KSEBL.

- Conducted developers CONCLAVE before finalizing Tender.
- Transparent but strict evaluation process for empanelment of Developers as per MNRE guidelines.
- Simplification and relaxation of procedures without compromising quality for speedy accomplishment of target.
- Stringent Quality Assurance Plans in tender and pre-commissioning and post-commissioning testing and insisting test values (Performance Ratio > 75 %)

Developers Meet/Manufacturers Meet

Developer Meet at Vydyuthi Bhavan, Pattom was inaugurated by the Honorable Minister of Electricity in the presence of various departments including Electrical Inspectorate, ANERT and EMC.

The Developers meet was convened to familiarize about the execution process of the project, challenges that may arise and to mitigate the problems that have arisen, and for the smooth completion of the Project. For the timely completion of the project, the matters related to the availability of net meters, modules, formalities with respect to testing, PR measurement, FAT etc. were discussed in detail.

Solar Panel Manufacturers Meet: To have liaison with EPC contractors, Panel manufacturers meet were arranged and raised a platform for procurement and approval of Quality panels.

Inverter manufacturers meet: Leading inverter manufacturers were invited along with developers and other stake holders. KSEBL specification was discussed and opened a platform for introduction of quality Inverters in the roof top grid connected plants



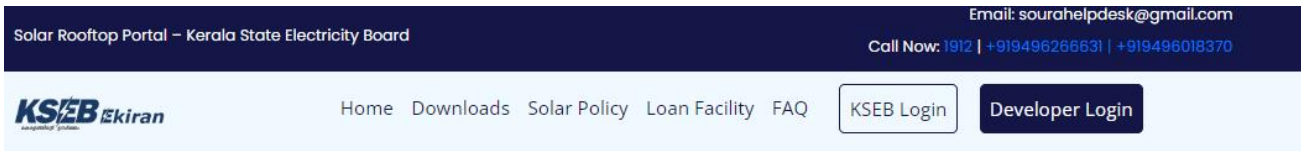
Developers Meet



Manufacturers Meet

Fully automated tracking Portal – E Kiran:

The E-Kiran portal has been developed by KSEBL through the MNRE Technical Assistance program. All grid connected solar plants application process and connectivity procedure will be managed through this single window system. All data transfer to MNRE SPIN portal for grant of Phase II subsidy programme and claiming of incentive for RTS capacity addition will be through the portal. Any solar developer implementing grid connected solar plants shall be registered in the portal



"വർഷാന്ത്യ സ്പെഷ്യൽ സൗര സബ്സിഡി സ്കീം"

സൗര സബ്സിഡി പദ്ധതി

പുരപ്പുറ സൗരോർജ്ജ നിലയം സ്ഥാപിക്കാൻ 40% വരെ സബ്സിഡി



Application Processing

- Tracking facility
- Integrated with KSEB customer relation management application (ORUMANET)
- Uploading documents to MNRE spin portal
- Event by event progress updation for consumers.
- Task by task process management for developers.

SPOT REGISTRATION:

53,000 spot registration campaigns were arranged across the state and obtained 405 MW capacity of consumer registration. The campaign started early 2022, and raised the interest from consumers from the grass root level during FY2022 itself.

- Circle level, Division level, Sub Division level & Section level SPOT REGISTRATION.
- Direct phone call to selected consumers by section level SOURA OFFICERS
- SPOT REGISTRATION at Local Body, Libraries and other public places.
- Special “SPOT REGISTRATION” drive among all KSEBL employees.
- Wide publicity was given through FM Radio, Newspapers, KSEB Facebook page, Instagram, Twitter and Mass Media Communication.

Solar Awareness Programmes

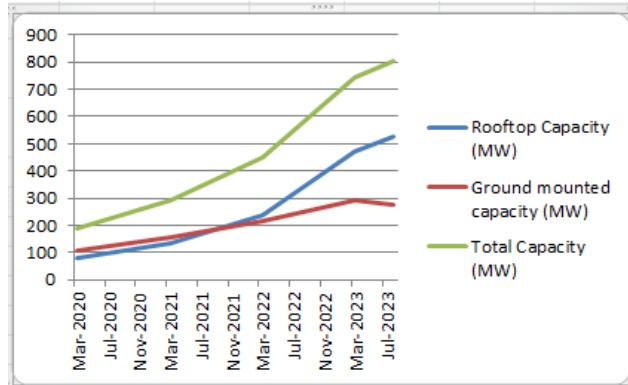
The Developer selection and data received vide Consumer Registration by KSEBL resulted in increased number of interested consumers and thereby resulted in progressive installation. Rooftop Solar plants are being installed throughout Kerala in line with the State Govt. policy of Green Energy in Kerala Power Sector.

To get more attention and acceptance for the solar projects among the public, one each solar plant was inaugurated in 140 Assembly Constituencies by respective Hon. Minister / Hon. Speaker / Hon. MLA for popularizing the scheme. Moreover, one solar plant each was inaugurated in all Panchayaths by the Panchayath Presidents. Few are shown below.



Due to this campaign state witnesses an exponential growth in solar rooftop segment. As per Power system statistics total capacity added **until 2022-23 is 743 MW**. Those added during 2020, 2021 and 2022 are respectively 188,293 and 451 MW.

	Rooftop Capacity (MW)	Ground mounted capacity (MW)	Total Capacity (MW)
Mar-2020	82	106	188
Mar-2021	134	159	293
Mar-2022	237	214	451
Mar-2023	471	294	743
Aug-23	528	277	805



Non SOURA Project & Renewable Energy Park

Completed solar parks.

1. 105 MW at Kasargod (100 MW completed and 5 MW is under implementation)
2. 50 MW solar parks commissioned at Ambalathara in 223 acres of land.
3. 50 MW solar parks in Paivalika, Kasargod. Developed by THDCIL (Thehari Hydro development Corporation Indi Limited).
4. 5MW SOLAR Park at Nellithadam in 27 acres in Ambalathara Village.

Solar Park under pipe line:

100MW solar park at Cheemeni. Land of 475 acres allotted by Gok. Submitted to MNRE for approval. Once approval is obtained DPR will be submitted

In addition to above KSEB venture into **Green corridor**,

North Green corridor (NGC) - 911.8 crore.

Ramakalmedu Green corridor (RGC) - 243.64 crore

Attappady Green Corridor (AGC) - 311.11 crore.

Green Energy for BPL Consumers

As a pilot project KSEB implemented 2 kW plant in BPL house hold at Palghat in Kuzhalmannam at Nocholly Grama panchayath. This colony is famed by the well-constructed by Sri. Nocholly Balakrishnan and Mahatma Gandhi to circumvent the denial of water from public well to Harijans. The cost of plant was born by Palakkad District panchayath. The beneficiaries need not pay electricity charge for the next 25 Years and they will be getting an income as well for the excess power exported to the grid through net meter in the next 2.5 decades. The project is commissioned on June 2022.

Model Project commissioned at Kuzhalmannam.



Advantages:

- Free electricity for 25 Years.
- Balance amount will be taken up by KSEB and 2.69 Rupees per unit will be given
- 1,35,000 Rupees is the cost of plant. Subsidy amount 29,176 Rupees. Customer/ LSGD will pay 1, 05,824.
- 2 kW RTS plant in each household x Units generated/month (4 x 2 x 30) = 240 units
- Average Monthly consumption = 50 units x Excess unit generated = 190 units x Monthly income earned by the consumers (190 x 3.22) = Rs 611.88.

Similar projects are implemented in SC-ST colonies like Ellaikkadu, Ramarpannai, Muthuswamy, Pudur, Poovarathai, Arathikkadu, Ramarpannai etc. These projects will be implemented across state with the support of LSGD

Grid independent- Remote Village electrification

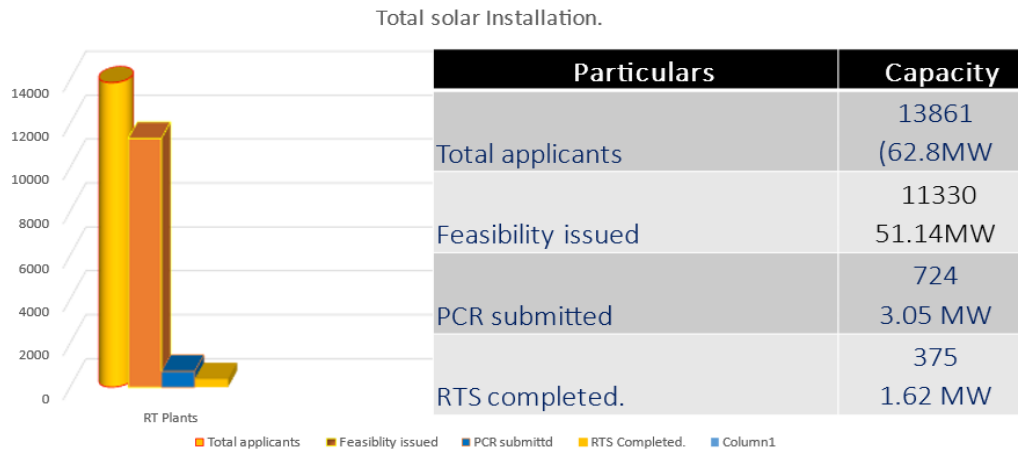
To cater Power to hamlets where PowerGrid's are not available, battery managed solar plants are set up by KSEB. Many habitations like Alimoothan, 30-acre colony, Oruvampady, Kathithode, Kuriyarkutty, Sooriyappara etc. in Muthalamada and Nelliampathy Villages in Palakkad district.

Colony	Alimoothan Colony	30 Acre	Oruvampady Colony	Kathithode	Kuriyarkutty	Sooriyappara	Anamada
Capacity	14 kWp	14kWp	14 kWp	14 kWp	14 kWp	14 kWp	14 kWp
Battery	11Hrs	11Hrs	10Hrs	11Hrs	10Hrs	10Hrs	11Hrs

Simplified roof top program – Subsidy program of MNRE.

In addition to the existing procedure of tendering/empanelment by the state electricity distribution companies (DISCOMs), MNRE has introduced a simplified procedure through which the beneficiaries can install the rooftop solar project through any vendor registered with the concerned DISCOM at mutually decided project cost. The beneficiary will have to first register on National Portal and then submit online application to the concerned DISCOM for issuance of technical feasibility. After receiving online technical feasibility approval, the beneficiary has to sign agreement with any of the vendors registered with the concerned DISCOM and get the system installed. The list of vendors registered with the concerned DISCOM is available under the 'Vendors in my area' tab of the beneficiary interface at National Portal after login. After installation of the system by the registered vendor, the beneficiary will have to submit online project completion report and submit it to the concerned DISCOM for inspection and installation of net-meter. After successful inspection and installation of net-meter, the DISCOM will approve the project completion report on the portal and an online commissioning certificate would be generated. The beneficiary can now submit CFA claim request to the Ministry by filling the required bank details and uploading a copy of the cancelled cheque pertaining to the bank account. The CFA/subsidy will be credited to the bank account of the beneficiary within 30 working days of claim submission.

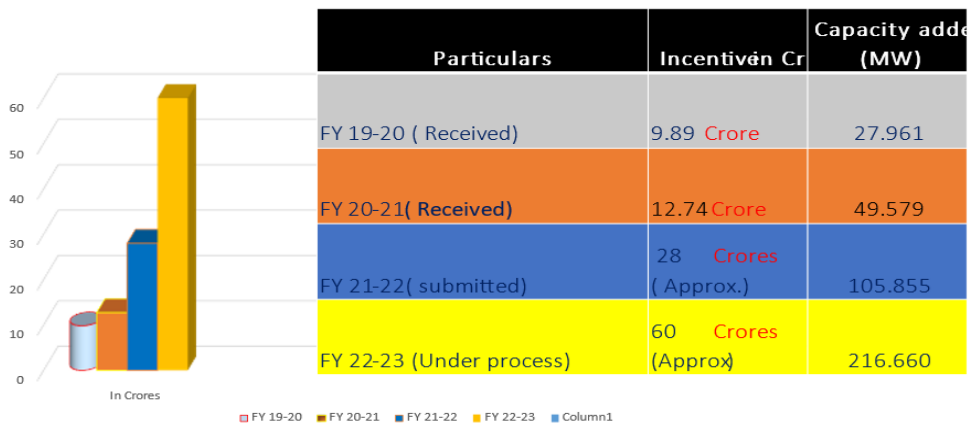
DBT Scheme- MNRE subsidy update.



Incentives received for KSEBL:

Incentives will be delivered to state discoms by MNRE based on their achievements towards grid connected roof tops of solar PV Projects. Incentives will be provided for each MW PV Project installed by the Discom in their distribution area over and above 10% of the base capacity installed at the end of previous year.

Incentive received from MNRE



Awards/Accolades:

The above process resulted in a golden figure of 100 MW capacity of Grid Connected Solar Rooftop. MNRE extended a special invitation in recognition to the remarkable achievement of KSEBL, in Delhi in front of all other state DISCOMS across the country. MNRE invited KSEB to showcase the above success stories before other Discoms across the country on Sep, 2022.

Fw: MNRE || Showcasing the impressive progress of the State Kerala .

Dear Sir,

Pls refer the trailing e-mail, whereby it has been informed that this Ministry is organizing a National Workshop on Rooftop Solar (RTS) on 06.09.2022 from 10 am onwards at Atal Akshay Urja Bhawan, Lodhi Road New Delhi. This Workshop would be attended by all state implementing agencies of the rooftop solar program.

The State of Kerala has made an impressive progress in the installation of RTS plants under RTS Ph-II programme in the last few months. The Ministry would like to congratulate and thank you for this impressive progress. It has been decided that the progress of Kerala may be showcased to all the other implementing agencies for their guidance and motivation.

In this context, this Ministry would like to invite the KSEB official(s) to make a half hour presentation on the impressive growth made in RTS installations, highlighting the details which helped to make this possible.

It is requested to please send the confirmation and presentation for reference by 02.09.2022 via return e-mail.

Warm Regards,

वीपिन कुमार (आइ.ई.एस.)/Dr. Veepin Kumar (I.E.S.),
एक/Deputy Director,
नया दिल्ली/Deputy Director

KSEBL received many awards as well for its outstanding performance in the Renewable Energy Sector.

For the outstanding performance, KSEBL has received the following awards from government and non-government agencies.

- i) Re Asset India – outstanding performance in RE sector award winner 2022.
- ii) PV Invest Tech India Conference – Solar rooftop enabler of the year Award
- iii) APAC 3rd Digital Empowerment award from Uttar Pradesh Govt. & UPDESCO.
- iv) Suryacon Kerala annual solar awards - Outstanding Performance in Grid connected solar rooftop program.

Conclusion:

This outstanding achievement made by KSEBL is due to the wholehearted support from the Ministry of Electricity, Government of Kerala, MNRE and General public., The rooftop solar installation has been popularized especially in the domestic sector whereby the Soura Project has become instrumental in the total facelift of KSEBL nationwide. MNRE/ Government of India has done a pivotal role for this incredible achievement as far as the State of Kerala is concerned in achieving the target set. All measures are placed in position by KSEBL to meet the expectation of consumers in the solar roof top domain.