

The Solar Cooking (Part-1)

Solar cooking is an effective method of utilizing solar thermal energy for meeting a considerable demand for cooking energy and hence protecting the environment. Cooking with solar cookers is an energy efficient, pollution free way to fight global warming and take advantage of nature's free, inexhaustible energy.

Functioning of Solar Cookers

Solar cooker is a device which uses the direct heat energy from sunlight and retains it for cooking. Sunlight is the fuel for solar cookers. When sun rays strike matter, whether solid or liquid, all of this energy causes the molecules in that matter to vibrate. They get excited and start jumping around. This activity generates heat.

Solar cooker needs an outdoor spot that is sunny for several hours and protected from strong winds. It doesn't work at night or on cloudy days. Generally dark surfaces get very hot in sunlight, whereas light surfaces don't. Food cooks best in dark, shallow, thin metal pots with dark, tight-fitting lids to hold in heat and moisture. A transparent heat trap can be used around the dark pot to prevent the heat from escaping. Generally a heat resistant bag or large inverted glass bowl (Fig.3) or an insulated box with a glass or plastic window is used. The light passes through the heat resistant bag or glass cover as a short wavelength and it gets reflected back as a long wavelength which can not pass back, thus acts as a heat trap (greenhouse effect). Instead of using glass cover one or more reflective surfaces (Fig.4) can be used to focus the sunlight directly onto the cooking pot. Generally mirrors, aluminium foil, mylar, mirror-finish metals, chrome sign vinyl, and other shiny materials have all been used successfully for solar cooking, depending on the type of cooker.

Solar Cooker Types

Three types of solar cookers are available generally, box cookers, curved concentrators (parabolics) and panel cookers. For the needs of institutions now-a-days large scale solar coking systems have been developed.

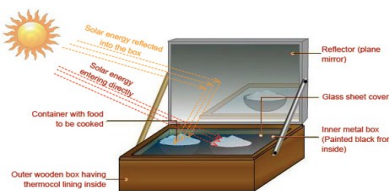


Fig. 5

Box Type Solar Cooker

The incoming solar radiation falls onto the double glass lid and passes through it to strike the blackened cooking pot/cooking tray. In addition, a plane reflecting mirror of about the equal size as that the aperture area of the box is used to focus the solar radiation on the cooking pot. The cooking pot is insulated on the sides and bottom. The heat is absorbed by the blackened surface and gets transferred to the food inside the pot to facilitate cooking. Usually four black cooking pots can be placed inside

the cooker as cooking vessels and the cooking load is usually kept as 8 lit/m². This type of cooker takes about 90-120 minutes to cook items such as rice, lentils and vegetables. The cooker can also be used to prepare cakes, cashew nuts, dry grapes etc. A maximum of 150° C can be achieved in this type of cooker, hence best suited for boiling kind of cooking. A family size solar cooker is sufficient for 4 to 5 members and saves about 3-4 cylinders of LPG every year, while the life of this cooker is 10 to 20 years.

(TO BE CONTINUED...)



Fig. 1

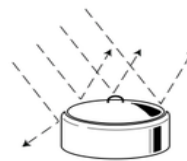


Fig. 2

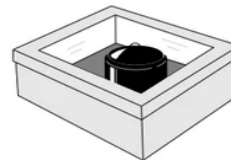


Fig. 3

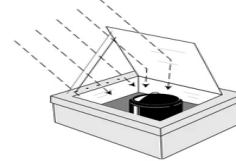


Fig. 4

Electricity Contacts

- Call center—1912
- Fuse Off Call Centre:
Tamil Nadu and Chennai
- RTI—**TANGEDCO**
- TNERC & Ombudsman: 044-28411376, 28411378, 28411379
- CGRF: **Addresses**
- Pay online: **TNEBNET**

Please send your feedback to ecc@cag.org.in

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No. 9, Kulapirai Street, Tirunelveli Town, Tirunelveli - 627 006 Phone: 0462-2338544 Email: ecctirunelveli@gmail.com

Southern Consumer Organisation for Protection & Empowerment - (SCOPE)
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Tamil Nadu News

TNERC draft norms make forecasting of wind, solar power mandatory

State regulator Tamil Nadu Electricity and Regulatory Commission (TNERC) has issued draft guidelines which make scheduling and forecasting of wind and solar energy mandatory for connecting to grid and levy of penalty for deviation. The move follows similar regulation in states like Andhra Pradesh, Karnataka and Rajasthan and is as a part of direction from Central Electricity Regulatory Commission.

"Forecasting and scheduling of solar and wind generating stations are essential to maintain grid stability and security, load generation balance considering their infirm nature. The state has large renewable energy generation in both sources, wind and solar. Seamless large scale integration of renewable energy sources, specifically wind and solar is possible through forecasting and scheduling of the wind and solar generation sources," TNERC said in the draft regulation. The norms shall apply to all wind and solar energy generators (excluding rooftop PV solar power projects) in Tamil Nadu connected to the Intra-State Transmission System or Distribution System, including those connected through Pooling Sub-Stations, and using the power generated for self-consumption or sale within or outside Tamil Nadu.

The regulations also put the onus on the solar and wind power producers to appoint a qualified co-ordinating agency for the purpose of scheduling and forecasting the solar and wind power and providing the details with State Load Despatch Centre. The regulation allows for an error rate of 10% beyond which a penalty in the form of deviation charge would be levied. The draft regulations come at a time when both wind and solar power generators in the state have faced curtailment and back down issues. Some solar power producers have moved the Madras High Court over the issue. The draft regulations also made it clear that the State Load Despatch Centre should communicate the curtailment plans through an IT-enabled system and no deviation charges is payable for any consequent deviations if it fails to do so.

In Tamil Nadu the generation and distribution feeders are mixed up and needs a customised deviation settlement mechanism and we would be presenting our constructive suggestions to TNERC on the draft regulations," K. Kasturirangan, Chairman of Indian Wind Power Association told The Hindu.

Source: [The Hindu](#), December 31, 2017 (*edited*).

India News

Government Plans to Allow Consumers to Switch Power Service Companies

Consumers will be able to change their power suppliers just like telecom services, after proposed amendment to the existing Electricity Act is approved, Union minister R K Singh said. The power ministry will push Electricity Amendment Bill in the forthcoming Budget session, which provides for segregating the distribution network business and the electricity supply business. The power and new & renewable energy minister told there will be a lot of amendment in the Electricity Act which provides for separation of carriage and content business. The separation will pave the way for introducing a new system where consumers will have option to choose from multiple electricity service providers in their areas, similar to that of telecom services.

Elaborating further Singh said, "Once the Act is amended, we would prepare a roadmap in consultation with states to segregate distribution and supply wings of the discoms. After that monopoly will be eliminated in supply wing by giving franchise to more than one players in an electricity supply area". He also told that the amendments would also provide for stricter enforcement of Renewable Purchase Obligation (RPO). Besides, the bill will also provide for making tariff policy mandatory to keep cross subsidy below 20 per cent. It means that difference between highest and lowest tariff rates should not be more than 20 per cent. The minister said that it will help to make industrial tariff reasonable which is unsustainable at present. The bill would also provide direct benefit transfer of subsidy to farmers to improve efficiency in power consumption. It also seeks service obligation on part discoms to ensure reliable power supply service by March, 2019.

"Power demand growth rate will be good because of two reason. Firstly, we are adding 40 million more consumer under Saubhagya Scheme by December 2018. Besides, industrial growth would create more demand for power consumption," Singh said. The minister was of the view that per capital consumption in the country will also increase in future. It is 1,075 units in India as against 5,000-6,000 units in Europe and around 1,1000 units in the US. "Future increase in energy consumption is going to happen here in India and electricity will be leading it because of change in energy mix. I see that electricity is edging out the fossil fuel. It is easier to transport. Mobility and cooking would become electrical," he said.

The power ministry has identified some states where leakages or losses are more than 21 per cent and written a letter to them for reduction of these losses. Aggregate technical and commercial (AT&C) losses should not be more than 5 to 7 per cent otherwise it can be construed that there is theft of power, Singh said. In order to deal with this issue, the government is promoting pre-paid and smart meters. The minister further said that the power ministry has asked the states to reduce their AT&C losses below 15 per cent by 2019.

Source: [The Times of India](#), December 03, 2017.

Consumer Focus

FACTS

The consumer has two solar connections and he is exporting the energy to the grid. This was not visible in the consumer portal despite complaint being made in the consumer portal. To seek remedy, the petitioner approached the CGRF to ensure that TANGEDCO records in the consumer portal—the gross consumption, exported power due to solar roof and net meter reading (Gross Consumption — Exported Power).

CONTESTATIONS

Appellant: The petitioner has stated that he has two nos. solar connections of Low Tension Accounts each. In the consumer portal of TNEB, only Gross meter reading and units used has been shown in the portal without recording the number of units exported during the period. Unless all the readings, gross, export and net units recorded in the portal, correctness of the calculation made cannot be ensured. Hence he requested to make proper provision in the portal.

Respondent: The respondent has stated that the details of Export, Import, Gross reading particulars of solar services are incorporated in the LT billing module for billing calculation and competent authorities will be addressed to incorporate the details in online portal.

OBSERVATIONS AND JUDGMENT

The Petitioner did not turn up for hearing to discuss the issue raised by the petitioner. The request of the petitioner is to incorporate the details of Import, Export, Gross & Net energy details of their Solar services in the Consumer Online portal so as to ensure the billing calculation. The respondent has stated that the export, import, energy details of solar services are incorporated in the LT billing module and action will be taken to incorporate the same in the Consumer Online Portal as shown in the LT billing module. At this juncture, Forum concluded that the respondent has to take early action to incorporate the solar services reading details in online portal as shown in the LT billing module.

ECC Voice

மின் காப்பீட்டுத் தொகை கணக்கீடு

ஒரு நுகர்வோரின் வீட்டிற்கு மின் இணைப்பு பெறப்படும் பொழுது மின் காப்பீட்டுத் தொகையாக ரூ.200/- மின் வாரியத்திற்கு செலுத்த வேண்டும். மின் இணைப்பு பெறப்பட்ட முதல் ஒரு வருடம் முடிந்த பின் வரும் ஏப்ரல் மாதத்தில் 6 முறை தொடர்ச்சியாக பயன்படுத்தப்பட்ட மின் கட்டணத்தின் கூட்டுத் தொகையில் சராசரி தொகையை கணக்கில் எடுத்து, அந்த தொகைக்கு குறைவாக, நுகர்வோரின் மின் இணைப்பு கணக்கில் காப்பீட்டுத் தொகை இருக்குமானால் 30 நாட்களுக்குள் கூடுதல் காப்பீட்டுத் தொகையை செலுத்துமாறு நுகர்வோருக்கு அந்த ஏப்ரல் மாதம் மின் வாரியம் தெரியப்படுத்தும். உதாரணமாக, ஒரு வருட காலத்தில், இரண்டு மாதங்களுக்கு ஒரு முறை செலுத்திய கட்டணம் -

04 / 2014 -	Rs.4773
06 / 2014 -	Rs.5463
08 / 2014 -	Rs.3910
10 / 2014 -	Rs.5003
12 / 2014 -	Rs.3821
02 / 2015 -	Rs.3714

Total (A) -	Rs.26684

(2) இந்த ஒரு வருடத்திற்கு தேவைப்படும் காப்பு வைப்புத் தொகை மாத சராசரியின் 3 மடங்கு (B) $(B) = (A/12) \times 3$ $[(Rs.26684/12) \times 3] = Rs.6671/-$ (3) ஏற்கனவே இருப்பிலுள்ள காப்பு வைப்புத் தொகை (9% வட்டி சேர்த்து மற்றும் TDS பொருந்தும் இடங்களில் கழிக்கப்பட்டு) (C) = Rs.5908/- ஆகும். ஆகவே, தற்போது செலுத்தக் கோரும் கூடுதல் காப்பு வைப்புத் தொகை, (B)-(C) $Rs.6671 - Rs.5908 = Rs.770/-$ ஆகும். [இரண்டு மாதங்களுக்கு ஒரு முறை பணம் செலுத்தும் நுகர்வோர் 3 தவணைகளில் இந்த கூடுதல் வைப்பு தொகையினை (இரண்டு மாதங்களுக்கொரு முறை) செலுத்தும் வசதியுள்ளது].

இவ்வாறாக, ஒவ்வொரு வருடமும் மின்சார வாரியம், நுகர்வோரால் பயன்படுத்தப்பட்ட மின்சாரத்தின் அளவிற்கு தகுந்தாற்போல் கூடுதல் காப்பீட்டுத் தொகையினை கணக்கீடு செய்து, நுகர்வோரிடமிருந்து அதனை வசூலித்து மின் நுகர்வோரின் மின் இணைப்பு கணக்கில் சேர்க்கும். மின் கணக்கீட்டாளர்கள், நுகர்வோரின் மின் கணக்கீட்டை உரிய நேரத்தில் செய்ய வேண்டியது அவசியம். தமிழகத்தில் Sலாப் (slab) திட்டம் நடைமுறையில் இருப்பதால், கணக்கீட்டாளர்கள் உரிய சமயத்தில் மின் அளவை கணக்கிடாவிடில், நுகர்வோர் அதிக மின் கட்டணம் செலுத்த வேண்டியதோடு மட்டுமல்லாமல், காப்பீட்டுத் தொகையையும் கூடுதலாக கட்ட வேண்டிய சூழ்நிலைக்குத் தள்ளப்படுவார்கள்.

நுகர்வோரின் இந்த பிரச்சனைக்கு மின் வாரியம் தக்க நடவடிக்கையினை மேற்கொள்ளும் என்று நம்புகிறோம்.

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Initiative of



Citizen consumer and civic Action Group (CAG) is a non-profit, non-political and professional organization that works towards protecting citizen's rights in consumer and environmental issues and promoting good governance processes including transparency, accountability and participatory decision making.

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World News

Fusion power plants could provide energy for homes in just 20 years

Fusion power could provide energy to our homes in just over 20 years, according to scientists who are halfway towards proving the technology's commercial potential.

Thirty-five nations are contributing to the International Thermonuclear Experimental Reactor (Iter) being built at Saint-Paul-les-Durance in southern France.

In December the Iter team announced that the £16bn reactor, said to be the world's most complex machine, is now 50 per cent complete. The scientists and engineers are on course to begin generating "first plasma" - a cloud of electrically charged gas as hot as the sun - in the machine's core in December 2025.

Atomic fusion is what powers the sun and other stars, and is responsible for the enormous destructive force of nuclear bombs.

It has the potential to provide the world with almost limitless amounts of clean energy using hydrogen as fuel.

However the technical challenges are far greater than they are for conventional nuclear power plants which rely on atoms splitting apart instead of fusing together.

Iter director general Dr. Bernard Bigot said: "The stakes are very high for Iter. When we prove that fusion is a viable energy source, it will eventually replace burning fossil fuels, which are non-renewable and non-sustainable.

In their latest release, the Iter scientists predicted that fusion plants will start to come on line as early as 2040. The exact timing is expected to depend on levels of public support, political will, and financial investment. Iter is described as "the most complex science project in human history". Within the machine, hydrogen plasma will ultimately be heated to 150,000,000C - 10 times hotter than the centre of the sun - to trigger a fusion reaction.

One of the biggest challenges is keeping the electrically charged inferno away from the walls of the donut-shaped "tokamak" reactor using giant magnets. To operate efficiently, the superconducting magnets must be cooled to minus 269°C - the same temperature as interstellar space.

The European Union is paying 45 per cent of the cost of Iter. China, India, Japan, Korea, Russia and the US each contribute 9 per cent equally.

Source: [Independent](#), December 30, 2017.

Publications/Regulations

- Developing Renewable Energy Mini-Grids in Myanmar: A Guide Book, December 2017, [Click here](#)
- IRENA Cost and Competitiveness Indicators : Rooftop Solar PV, December 2017, [Click here](#)

World Energy Outlook—2017

[Global average annual net capacity additions by type](#)

