

Energy Conservation Building Code for Residential Buildings (Part-3)

In order to understand the concept of 'Building Envelope' and how to make an efficient building design, it is necessary to understand ECBC-R (Energy Conservation Building Code for Residential Buildings) notified by the BEE (Bureau of Energy Efficiency), GoI in December 2018. This code is also known as Eco-Niwas Samhita (ENS)-Part I.

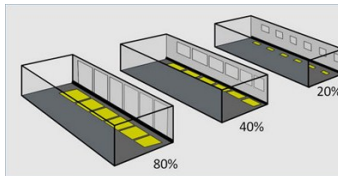
- ENS-Part I deals with the concept of building envelope and ways to properly design and comply with the code provisions for the building to be energy efficient.
- ENS-Part II ([ENS 2021](#)) also subsequently came out in 2021 which deals with [building services](#), indoor electrical end-use and renewable energy systems for new residential buildings.

Applicability of the code: The code is applicable to all residential buildings and residential parts of 'mixed land-use projects', when built on a [plot area of \$\geq 500 m^2\$](#) . However, states and municipal bodies may reduce the plot area based on the actual ground situation in their area of jurisdiction. This provision is kept to take into account the plot sizes and housing types in different states, to promote the inclusion of a greater percentage of new residential buildings within the scope of this code.

Standards for conservation under the code:

There are certain minimum standards set forth by the Eco-Niwas Samhita 2018 for proper building envelope design. Following is an analysis of each standard and its applicability along with the compliance requirements.

[Window-to-Floor Area Ratio](#) (WFR_{op}): The Openable Window-to-Floor Area Ratio indicates the potential of using external air for ventilation. Optimal WFR ensures ventilation, increased thermal comfort and reduced cooling energy. In this regard, the size and



position of windows according to climatic conditions become crucial. [Mindfully placed windows](#) enhance the indoor environment by utilising potential natural light and fresh air from the external environment, thereby reducing the use of lighting and cooling appliances and helping in the reduction of energy bills.

Formula to calculate Openable Window-to-Floor Area Ratio :

A_{openable} = Sum of the openable area of all windows and ventilators, opening directly to the external air, an open balcony, 'verandah', corridor or shaft; and the openable area of the doors opening directly into an open balcony (Doors opening into the corridors and ground-floor external doors are not included).

A_{carpet} = Areas covered by the internal partition walls of the dwelling unit. (It excludes the areas covered by external walls, areas under services shafts, exclusive balcony or verandah area and exclusive open terrace area.

(To be continued)

INSIDE THIS ISSUE:

<i>Editorial</i>	1,2
<i>Tamil Nadu News</i>	3
<i>India News</i>	3
<i>Consumer Focus</i>	4
<i>World News</i>	5
<i>Publications</i>	5
<i>Statistics</i>	5

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

Electricity Consumer Cells (ECCs)

ECC Tiruvallur

No. 118, Fourth Street, Kamaraj Nagar, Avadi, Tiruvallur District. Chennai - 600 071, Phone: 9382828286 Email: ecctiruvallur@gmail.com

ECC Tirunelveli

No.17/1,Shenbagavana Street, Palayamkottai, Tirunelveli - 627 006 Phone: 9443555097 Email: ecctirunelveli@gmail.com

ECC Cuddalore

No.23, Saraswathi Nagar, Thirupapuliur Cuddalore - 607 002 Phone: 8608615621 Email: ecccuddalore@gmail.com

ECC Tiruvannamalai

Avalurpet Road, Tiruvannamalai - 606 604 Phone: 04175 - 298033 Email: ecctiruvannamalai@gmail.com

ECC Salem

31/20, Sree Rangan Street, Gugai, Salem - 636 006 Phone: 9994941050 Email: eccsalem1@gmail.com

ECC Vellore

No: 10, Pillayar Koil Street GribblesPet Arakkonam Vellore District - 631 002 Mobile : +91 98946 32302 Email id: eccvellore@gmail.com

ECC Trichy

No: 4/74, Sangililyandapuram Pettavaithalai & Post Tiruchirappalli District - 639 112 Landline : 0431-2612597 Mobile : +91 9788203997 Email id : ecctiruchirappalli@gmail.com

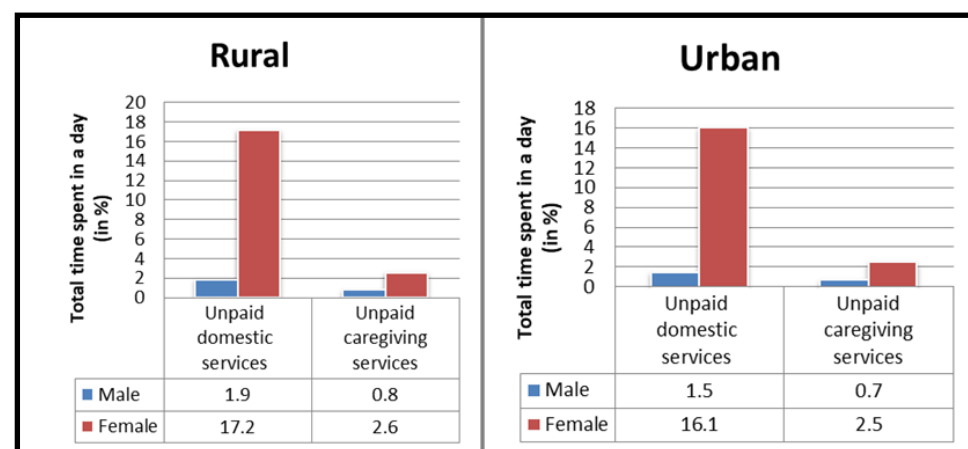
Role of electricity in the lives of Indian women & girls (Part-2)

The [previous](#) issue explained the importance of equitable electricity access in India; and the correlation between energy and time poverty. This issue aims to explain energy poverty with specific reference to Indian women and girls.

Energy poverty - Indian scenario:

[Sustainable Development Goal](#) (SDG) 7 i.e. “ensure access to affordable, reliable and sustainable energy for all” and SDG 5 i.e. “achieve gender equality and empower all women and girls” are [interconnected](#), and pivotal for a country’s development. However, among the significant population of energy poor in India, women and girls are the [poorest](#).

In India, females spend more time in unpaid domestic and caregiving services than males, according to the findings of India’s first [Time Use Survey](#) conducted by the National Statistical Office during January - December 2019. A recent [report](#) of the Indian Institute of Management Ahmedabad (IIMA) reiterates the same; Indian women in the working age category of 15 to 60 years, spend 7.2 hrs on unpaid work



compared to 2.8 hrs spent by men.

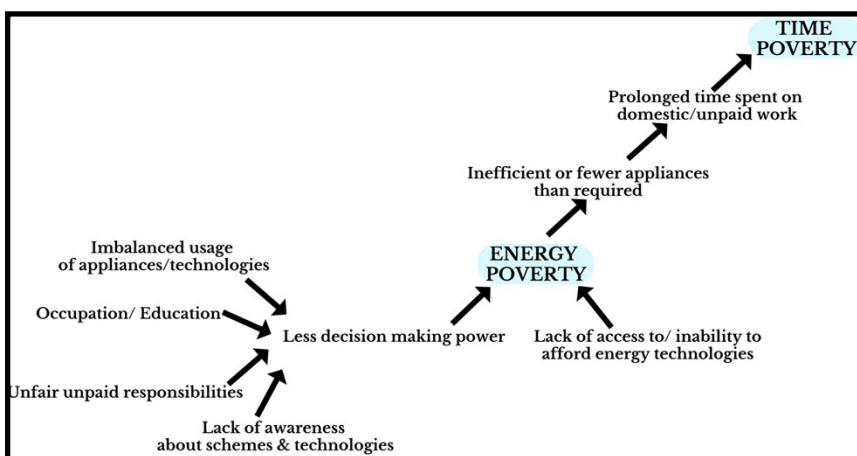
In the majority of Indian homes, [female members](#) (irrespective of their education, employment and age) hold the [responsibility](#) to collect water, fuel and carry out other household chores by reason of traditional gender roles. These tasks are

Data Source - Table 3: Percentage share of total time in different activities in a day per person of age 6 years and above, [PIB](#)

likely to become more labor intensive with the impacts of [climate change](#)

and the resulting warming temperatures, drying water bodies and dying vegetation. It should be noted that these responsibilities diminish the time and energy at a multiplier level, restricting women’s access to jobs and educational [opportunities](#).

Indian females as managers of household responsibilities and members spending [more time at home](#), are the primary users and beneficiaries of household energy. Ironically, the [one-sided demarcation](#) of unpaid and domestic responsibilities, and certain other factors inhibit their influence on energy related decisions. The [other factors](#) include occupation/education; intra household power dynamics and gender imbalances in awareness about existing energy schemes and



Household level energy poverty & its consequent time poverty faced by Indian females | Author’s interpretation

technologies and its usage. Their poor bargaining power means that decisions about electricity usage and purchase of adequate appliances are not within their ambit.

(To be continued)

Tamil Nadu News

Tangedco plans to tap solar power for agricultural feeders

To cut down its losses owing to the free power supply to agricultural consumers, Tangedco has planned to solarise 1,685 segregated agricultural feeders in the next three years. The solarisation of agricultural feeders has the benefit of energising the feeders through solar power, which is a cheaper source of renewable energy resulting in cost optimisation of the subsidised agriculture sector and as solar plants are to be developed at the distribution level, the voltage profile will be improved and line loss will be reduced, said the Energy Department policy note for 2023-24. Tangedco has planned to install 20,000 MW of solar power panels and 10,000 MW of battery storage system across the State in the next 10 years. "The distributed solar plants would be connected to the grid locally to avoid line loss and improve voltage," the official said, adding that in the first phase, it planned to set up a 6,000 MW solar power plant and 2,000 MW battery storage system. "On the request of the Tangedco, the district collectors have identified 4,014.69 acres of land for the establishment of solar power plants in various districts and land acquisition are under process," the official added. AD Thirumoorthy, member of the State-level Renewable Energy Committee said that on paper, the solarisation of the agricultural feeders looks good as it would help the utility financially. A senior Tangedco official said that for every unit supplied to the agricultural consumer, Tangedco incurs a loss of Rs 3.89 even after the government subsidy. "However, we will be able to avoid or reduce the gap between the actual cost of supply (Rs 8.35 per unit) and actual billing rate (Rs 4.46 per unit) for agriculture connections with distributed solar generations which would be much less," the official added

Source : [DTNEXT](#), April 17, 2023

India News

Government declares plan to add 50 GW of renewable energy capacity annually for next 5 years to achieve the target of 500 GW by 2030

The Government has decided to invite bids for 50 GW of renewable energy capacity annually for the next five years i.e., from Financial Year 2023-24 till Financial Year 2027-28. These annual bids of ISTS (Inter-State Transmission) connected renewable energy capacity will also include setting up of wind power capacity of at least 10 GW per annum. The plan finalized by Ministry of New & Renewable Energy (MNRE) at a meeting chaired by Union Minister for Power & NRE Shri R. K. Singh last week, is in accordance with Prime Minister's announcement at COP26, of achieving 500 GW of installed electricity capacity from non-fossil fuel (Renewable Energy + Nuclear) sources by 2030. India currently has a total renewable energy capacity of 168.96 GW (as on 28th February 2023) with about 82 GW at various stages of implementation and about 41 GW under tendering stage. This includes 64.38 GW Solar Power, 51.79 GW Hydro Power, 42.02 GW Wind Power and 10.77 GW Bio Power. Considering the fact that Renewable Energy (RE) projects take around 18-24 months for commissioning, the bid plan will add 250 GW of renewable energy and ensure 500 GW of installed capacity by 2030. The Ministry of Power is already working on upgrading and adding the transmission system capacity for evacuating 500 GW of electricity from non-fossil fuel.

Speaking during the meeting, Shri R. K. Singh, Union Minister for Power & NRE said that the declaration of trajectory of short-term and long-term RE capacity addition by the Government is a significant step towards achieving the goal of 500 GW of non-fossil fuel capacity by 2030 and towards a faster energy transition. "India has emerged as one of the world leaders in Energy Transition and this is evident in the growth that we have achieved in the area of Renewable Energy. We are committed to achieve 500 GW of Target by 2030 and the bidding trajectory will provide a further stimulus towards this. Shri B. S. Bhalla, Secretary, MNRE said that the bidding trajectory will also enable the power procurers, The targeted bid capacity for FY 2023-24 would be allocated among the four REIAs. The REIAs would be permitted to bring out the bids for solar, wind, solar-wind hybrid, RTC RE power, etc. - all with/without storage, as per their assessment of the RE market or as per directions of the Government.

Source: [PIB](#), April 05, 2023

Consumer Focus

Ombudsman Case:

The appellant (consumer) submitted that he had applied for a name and category change of his service connection (from paying category to agriculture free service connection) on 04.02.2015. This request was made because the appellant had just come into ownership of a piece of land with an existing electrical connection under the previous owner's name and in a different category. The appellant submitted the application with the required documents and payment. On following up regarding the request, he was informed that the service connection category had been changed to 'Agriculture Free Category'. Following the change, the appellant noticed that no bill was being raised. Clarifying this, the lineman explained that in the "Agricultural Free Category" bills were not raised every month. The appellant believed this and made no further enquiries.

In October 2021, the appellant was informed that there were bill arrears to the tune of Rs. 98,000/-. He came to know then that following his original request in Feb 2015, only a name change had occurred, not a category change. Furthermore, the utility officials had not informed the appellant of arrears until 2021. The appellant demanded that charges be dropped, writing to the Assistant Engineer (AE) incharge on 10.01.2021. Meanwhile, the appellant again applied for change of subcategory from 'paying' to 'agriculture free service', which was approved and implemented from 12.05.2022.

However, the AE did not act on the complaint and demand for dropping charges. The appellant therefore approached the Consumer Grievance Redressal Forum (CGRF). The CGRF passed an order on 13.12.2022 holding that the appellant was liable to pay the arrear bill up to 28.02.2022. The DISCOM authorities were instructed to withdraw the bills raised under 'paying category' from March '2022 till 12.05.2022. Aggrieved by the Order of the CGRF, the complainant filed an appeal before the Electricity Ombudsman.

The appellant argued that he had applied for a change in category in 2015, was told this had been changed and had never received any bills for the consumption charges until October, 2021. Appellant stated that they even enquired with the lineman as to why they did not receive any bills. They were informed that since it was a free connection, they would not receive any bills. The appellant believed this information to be true and did not pursue any further enquiry. The appellant argued that they were honestly unaware of these bills, hence they could not be made liable to pay the same.

The respondents (utility) argued that they have been placing the bills on their website, and it is for the consumers to routinely check if the bills were generated by the outsourcing agency and pay the same. The respondents further argued that they never received any change in category request in 2015 and the documentation shows only the request for change in name. They submitted that there was no evidence to prove the appellant's purported application for change of category. They insisted that the appellant had also failed to submit any proof in this regard.

The Ombudsman observed that there is no obligation under the Electricity Act or any other regulations for the lineman or other departmental officials to appraise the consumers as regards the arrears payable. It is not the duty of utility officials to collect arrears from the consumer when the bills are already given. Considering the facts of the case, arguments put forth, and the statutes relied upon, the Ombudsman passed the following order:

- The appeal is rejected.
- The appellant is directed to pay the pending arrears .

Source: Ombudsman Case, [Vidyut Ombudsman, Telangana State](#)

Note: It is the duty of the consumer to regularly check and pay bills raised by the utility. Furthermore, it is important for the consumer to re-check the details filled in any form before submitting it to the utility.

Citizen consumer and civic Action Group (CAG)

No. 103(First Floor), Eldams Road, Chennai 600 018
INDIA

Phone: 91-44-2435 4458,
91-44-2435 0387
Email: ecc@cag.org.in

www.cag.org.in

Initiative of

Citizen consumer and civic Action Group

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.

Editorial Team

K. Vishnu Mohan Rao

Bharath Ram G N

Akshaya S

Vanathi B

Prabhuram S

World News

Renewables: main source of energy production in 2021

The production of energy in the EU is spread across a range of different energy sources: solid fuels, natural gas, crude oil, nuclear energy and renewable energy (such as biomass, hydro, wind and solar energy). In 2021, the largest contributing source to primary energy production in the EU was renewable energy (41% of total EU energy production). This has been the case since 2016, when renewables surpassed nuclear for the first time. Nuclear energy (31%) was the second-largest source, followed by solid fuels (18%), natural gas (6%), crude oil (3%) and other (0.2%).

Energy production in the EU countries: The production of energy was very different from one EU member to another. In 2021, renewable energy was the exclusive source of primary production in Malta (in other words, this country did not produce any other type of energy). Renewable energy also represented the main source in a number of EU countries, with shares over 95% in Latvia (close to 100%), Portugal (98%) and Cyprus (96%). Solid fuels were the main source of energy produced in Poland (72%), Estonia (56%) and Czechia (45%). Natural gas had the largest shares in the Netherlands (58%) and Ireland (42%; its main source of energy production was renewables and biofuels with 49%). Meanwhile, the share of crude oil was largest in Denmark (35%; its main source was renewables and biofuels with 48%).

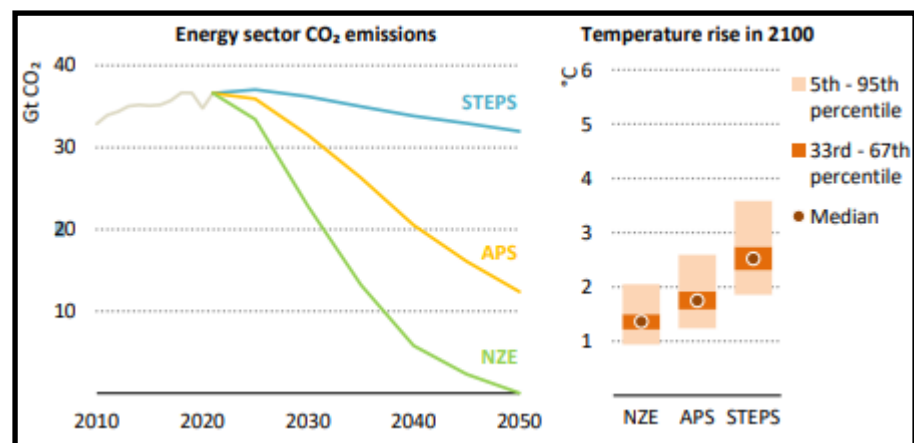
Energy produced in EU only covered 42% of consumption: In 2021, the main imported energy product was petroleum products (including crude oil, which is the main component), accounting for almost two-thirds of energy imports into the EU (64%), followed by natural gas (25%) and solid fossil fuels (6%).

Source: [Eurostat](https://ec.europa.eu/eurostat), April 03, 2023.

Publications / Regulations

- The evolution of energy efficiency policy to support clean energy transitions, April 2023, [IEA](#)
- World Energy Pulse April 2023, [WEC](#)
- Guidebook for Improved Electricity Access Statistics, April 2023, [IEA](#)

Energy sector CO₂ emissions by scenario, 2010 - 2050, and temperature rise by scenario, 2100



Source: [IEA](#)