

To

The Directors/Directors-in-Charge of
Permanent Institutes/Centres of ICMR.

Subject : Energy Conservation in Building Space Cooling through recommended optimum temperature setting.

Sir/Madam,

Please find enclosed herewith a copy of D.O.No. 11/3/2018-EC dated 6.8.2018 received from Secretary, Ministry of Power, New Delhi alongwith its enclosures on the subject mentioned above for information and necessary action.

Yours faithfully,



(Bharat Bhushan)
Sr. Administrative Officer
for Director General

Encl : As above

Copy to:-

1. PS to DG/PS to Addl. DG/Sr. DDG (A)/Sr. FA
2. All Divisional Heads-for
3. Asstt. Director-General (Admn.) (AX)/(RR)
4. Dr. Chanchal Goyal, Scientist'D' – soft copy of the same has been mailed at your email ID(drcgicmr@gmail.com) for website upload.

अजय भल्ला

सचिव

भारत सरकार

AJAY BHALLA

Secretary

Government of India

D.O. No. 11/3/2018-EC

1017636
9-8-18



सत्यमेव जयते

Ministry of Power
Shram Shakti Bhawan
New Delhi - 110001

विद्युत मंत्रालय

श्रम शक्ति भवन

नई दिल्ली-110001

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E-mail : secy-power@nic.in

August 06, 2018

Dear Secretary,

As you may be aware, the electricity consumption due to space cooling (air-conditioning) accounts for approximately 30 – 40 percent of total consumption of electricity. A substantial amount of energy can be saved, if the temperature setting of Air Conditioners (ACs) done optimally. Technical analysis done by reputed institutions indicates that in order to achieve desired comfort level at steady state, the temperature can be set between 24-25 degree Celsius, with due consideration to the parameters like humidity, air flow etc.

2. Accordingly, managing such optimal temperature through appropriate settings of ACs would not only save considerable energy but also be beneficial to human health. It has been estimated that changing ACs temperature from conventional 20-21 degree to 24-25 degree Celsius can result in approximately 25% of average energy savings. India would be able to reduce the GHG emission of approx. 8.2 million tonne of CO₂ per year. Overall potential for energy conservation through such measures could be to the tune of over 10 billion units (worth Rs.5,000 crores) annually, even if 50% consumers adopt optimum temperature settings.

3. In view of the above mentioned potentials for energy conservations on account of optimal temperatures setting for ACs, the Bureau of Energy Efficiency (BEE), a statutory body set up under the provisions of the Energy Conservation Act, 2001, has issued necessary guidelines recommending the above mentioned optimal temperature settings. A copy of the guidelines along with a concept note in the mater are enclosed

4. Ministries/ Departments of Government of India and their attached offices/ PSUs/Autonomous Institutes/Statutory Bodies are well suited to take a lead in this endeavour by setting an example for public at large towards optimized temperature setting. This would play a vital role in enabling our country to achieve the target of reducing the emission intensity of its GDP by 33 to 35 percent by 2030 from 2005 level, in line with India's commitments under the Paris Agreement on Climate Change.

5. I shall be grateful if your Ministry/Department consider the above mentioned guidelines for implementation and also impress upon the organizations under your Ministry/Department for similar action. We are also undertaking a media campaign for generating awareness in this regard. In case any clarification or further information is required in this regard, you may advise the concerned officer from your organization to contact Shri Abhay Bhakre, Director General, BEE (Tel.No.011 26178316; Email dg-bee@nic.in) .

With regards,

Secy (SR)

As (SR)

Yours sincerely,

(A.K. Bhalla)

Secretaries to the Government of India
(All Ministries/Departments)

Pl. send a copy to
As (SR) in ICD and
As (SR) in DTR to
DO for the approval
of the matter
14/8

for the same

Sr. DDC (A) Office
Dy. No.: 54422



एक कदम स्वच्छता की ओर

Subject: Energy Conservation in Building Space Cooling through optimum temperature setting

Background

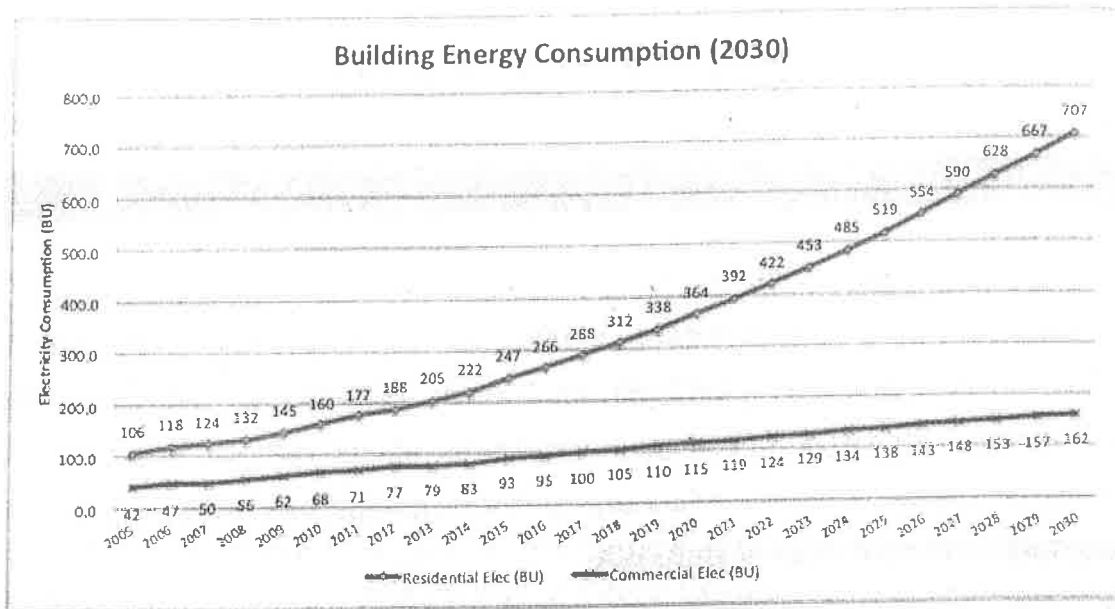
Buildings are being constructed in India at rapid pace and still majority of buildings are to be constructed. If buildings are constructed with built-in inefficiencies, then these inefficiencies will be locked in for more than 50 years. Even for existing buildings, potential for energy savings is more than 30-40%. Hence it is very important to frame energy efficiency policies for residential and commercial Buildings.

The electricity saving potential through the various interventions has been estimated as under:

Commercial Buildings	Saving potential	Instruments
New	25 – 35%	Mandatory implementation of Building Codes (ECBC)
Existing	10 – 15%	Energy efficiency upgrades through retrofits by Star Labelled appliances
Residential Buildings	20%	Through appliance efficiency and passive design features

Based on the data provided in the Interim Report of the Expert Group on Low Carbon Strategies for inclusive Growth, the estimated commercial floor space in 2005 was about 425 million square meter (SQM) with the electricity consumption being 35.965 billion units (based on CEA data). Taking the figures of 2005 as the baseline and assuming a growth rate of 8% for office & retail spaces and 10% for hospitality sectors, the projected growth in floor space for the years 2012 and 2017 has been estimated to 746 million m² in 2012 and 1114 million m² in 2017.

Consequently the corresponding growth in the energy consumption for new & existing floor spaces is accordingly estimated to be 166 BU and 241 BU in 2012 & 2017 respectively, on the Business as Usual (BAU) scenario basis.



From the above graph, electricity consumption will increase (business as usual scenario) for residential sector to about 707 BU from 247 BU in 2015, which approximately 1.86 times of consumption in 2015. In case of commercial buildings, electricity consumption will increase to 162 BU in 2030 from 93 BU, which is about 74% of consumption in 2015. Together these sectors will consume about 850 BU, which is more than 70% of present electricity consumption. With implementation of policies like 24x7 and power for all, this consumption may further increase.

The potential to reduce energy consumption through energy efficient design of new buildings and retrofits in existing buildings would reduce the need for lighting, heating, ventilation and air conditioning.

Introduction

In summers, it is estimated that in a typical building, air conditioning consumes maximum amount of electricity. Air conditioning consumes more than 50% of total electricity in commercial or residential buildings.

As per BEE estimate, total installed air conditioner capacity is about 80 million TR, this will increase to about 250 million TR in 2030. Room air conditioner



market increased from 2.7 million in 2010-11 to 6.4 million in 2016-17. Market has increased by 137% in 6 years, which is equivalent to 23% growth by every year. If this will continue, connected load due to room air conditioner will be 100-140 GW by 2030. Room air conditioners are about 50% of total air conditioning demand, if we consider similar growth in all type of air conditioning, **total connected load in India due to air conditioning will be about 200 GW by 2030**. It may further increase many folds as today only 6% of households are having one or more air conditioners, as purchasing power will increase and atmospheric temperatures will increase, this air conditioning may increase further at very rapid rate.

It is estimated that by increase in temperature of room by 1 degree Celsius ($^{\circ}\text{C}$), we can save about 6% of electricity. Considering the demand of 80 million TR and average performance of 1 kW per TR, we can save about 4.8 million units of electricity every hour of usage in our country. Managing such optimal temperature would not only save electricity but may also be beneficial to human health.

Typically, room temperature is set between 20-21 $^{\circ}\text{C}$ whereas ideal temperature is 24-25 $^{\circ}\text{C}$. Considering change from 20 $^{\circ}\text{C}$ to 24 $^{\circ}\text{C}$, there is potential to increase at least 4 $^{\circ}\text{C}$, which will lead to savings of about 24% of electricity. Hence, **India can save about 23 billion units of electricity only by simple measure of temperature setting to 24 degree Celsius**. Considering, there will be change in behavior of 50% of users, which will translate to energy savings of about 10 billion units of electricity.

In Japan, after 2011 Tōhoku earthquake and tsunami, there were electricity shortages. To reduce this gap in electricity requirements, then-Minister Yuriko Koike under the cabinet of Prime Minister Junichirō Koizumi, initiated proposal for **changing the standard office air conditioner temperature to 28 $^{\circ}\text{C}$ and introducing a liberal summer dress code** in the bureaucracy of the Japanese government so staff could work in the warmer temperatures. The campaign then spread to the private sector.



Proposal

Bureau of Energy Efficiency (BEE) under the aegis of Ministry of Power (MoP) is implementing various energy efficiency and conservation schemes stipulated under Energy Conservation Act 2001. For the improvement in building space cooling, BEE initiated Standards & Labeling (Star Rating) of air conditioners, where efficiency of Air conditioners is increased through technology interventions. Apart from this, BEE developed Energy Conservation Building Codes (ECBC) for commercial buildings to reduce demand of air conditioning by improvements in building design. BEE is also encouraging on retrofitting of energy efficient devices to reduce demands of electricity in buildings.

Bureau of Energy Efficiency, (Ministry of Power) has issued guidelines for all Commercial and Public Buildings to optimize temperature setting at 24 - 25 °C. (Copy enclosed)

It is requested that these guidelines may be circulated to all commercial buildings like Airports, Hotels, Shopping Malls, Offices, Government Buildings and Public Sector Undertakings.

These instructions may be passed/clarified to operators of air conditioning plant so that they can adopt such instructions. Any deviation to such guidelines may be conducted only with the approval of head of the organization.

Further, it may be noted that Bureau of Energy Efficiency, is initiating National level campaign to recommend setting of Air conditioner temperatures around 24 – 25 °C. It is requested that all the organizations, commercial buildings like Airports, Hotels, Shopping Malls, Offices, Government Buildings and Public Sector Undertakings may also involve/participate in the campaign.

Recommended Guidelines

Subject: Energy Conservation in Building Space Cooling through recommended optimum temperature setting

Bureau of Energy Efficiency (BEE) under the aegis of Ministry of Power (MoP) implementing various energy efficiency and conservation schemes stipulated under Energy Conservation Act 2001, with the primary objective of reducing the energy intensity of Indian economy. Bureau in consultation with Ministry of Power, also develops policies and strategies that emphasize self-regulation and market principles to achieve objectives of energy conservation and energy savings. As per clause 14 (t) of the EC Act 2001, Central Govt. shall take "all measures necessary to create awareness and disseminate information for efficient use of energy and its conservation".

With the objective to reduce energy intensity, in the area of space cooling, BEE initiated Star Labeling of Air Conditioners to improve efficiency in commercial and residential buildings. Thereafter, the Energy Conservation Building Code (ECBC) was published to reduce demand for space cooling. It is estimated that by increase in temperature of room by 1 degree Celsius ($^{\circ}\text{C}$), we can save about 6% of electricity. Typically, room temperature is set between 20-21 $^{\circ}\text{C}$ whereas, as per the comfort chart, it is suggested that ideal temperature could be maintained around 24-25 $^{\circ}\text{C}$. Considering change from 20 $^{\circ}\text{C}$ to 24 $^{\circ}\text{C}$, there exists potential to increase at least 4 degree Celsius, which may lead to savings of about 24% of electricity consumption. Annually, this may translate to saving potential of about 20 billion units of electricity, by taking simple measures like adjusting the temperature setting of AC system to 24 $^{\circ}\text{C}$.

In this context, Bureau of Energy Efficiency, Ministry of Power recommends following to the consumers:

1. All consumers of commercial buildings are suggested to maintain the internal temperature between 24-25 $^{\circ}\text{C}$ with appropriate humidity and airflow to conserve energy and for the health benefits of occupants, subject to operational and functional requirement.
2. These guidelines are mostly applicable for large premises such as Airports, Hotels, Shopping Malls, Offices and Government Buildings (Ministries & attached offices, State Government, and Public Sector Undertakings), having huge potential for savings.
3. Personnel responsible for operation and maintenance of air conditioning/cooling system may be suitably counseled to maintain such parameters without adversely affecting the comfort conditions.
4. Above guidelines may not be applicable for premises where specific ambient conditions are required e.g. health care facilities/operation theatre/Food processing installations/Data Centers, etc.
5. The consumers may also take any other appropriate measures to save energy.
6. Any deviation of such Guidelines should normally be considered with the approval of head of the organization.
7. The above suggestions are not applicable for winter climatic conditions.

Director General
Bureau of Energy Efficiency

New Delhi
June 25, 2018