BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION,
BIDYUT NIYAMAK BHAWAN.
PLOT No-4, CHUNOKOLI, SHAILASHREE VIHAR, BHUBANESWAR-751021

Case No: 79 of 2023

IN THE MATTER OF: Application for approval of Energy Efficiency Program for Domestic Consumers for promotion of Demand Side Management in the State of Odisha –**Amendment Petition**

And

IN THE MATTER OF: M/s TP Central Odisha Distribution Ltd.(TPCODL), Corporate Office, Power House, Unit 8, Bhubaneswar- 751 012 on behalf of all four Discoms of Odisha viz. TPCODL , TP Western Odisha Distribution Ltd.(TPWODL),TP Southern Odisha Distribution Ltd (TPSODL) and TP Northern Odisha Distribution Ltd (TPNODL) represented by the Chief –Regulatory & Government Affairs of TPCODL.

.... ***Petitioner***

IN THE MATTER OF: M/s GRIDCO, OPTCL, SLDC , Department of Energy, Govt. of Odisha and All Concerned Stakeholders.

.... ***Respondents***

Affidavit

I, Puneet Munjal, aged about 59 son of late Jagdish Lal Munjal residing at Bhubaneswar do hereby solemnly affirm and say as follows:

1. I am the Chief-Regulatory & Government Affairs of TP Central Odisha Distribution Ltd., the Petitioner in the above matter. I am the authorized representative of the above applicants and duly authorized to swear this affidavit on their behalf.
2. The statements made in the submission herein shown to me are based on information provided to me and I believe them to be true.

Bhubaneswar.
Dated: 29.08.2023

Chief-Regulatory & Government Affairs

IDENTIFIED BY ME
ADVOCATE. BBSR

Jagyneswar Acharya
Notary, Govt. Of India
Odisha, BBSR, Dist-Khurda
Regd.No.-7791/2009
Mob:-9861006174

File No TPCODL/Regulatory /2023/ 202
29th August, 2023

Secretary,
Odisha Electricity Regulatory Commission,
Bidyut Niyamak Bhawan
Plot No-4, Chunokoli,
Shailashree Vihar, Bhubaneswar-751021

Subject: Case 79/2023 -Application for approval of Energy Efficiency Program for Domestic Consumers for promotion of Demand Side Management in the State of Odisha –**Amendment Petition**

Dear Sir,

We had earlier submitted a Petition on 18th August 2023 on behalf of all the four Discoms of Odisha for approval of Energy Efficiency Program for Domestic Consumers for promotion of Demand Side Management in the State of Odisha. This petition has been registered as Case 79 /2023.

Subsequent to the filing and in discussion with the Department of Energy, Govt. of Odisha, we are proposing to double the quantum of coverage that had been proposed in the Petition dated 18.08.2023 along with the revised cost of replacement of the appliances in line with the costs intimated by the Office of Engineer in – Chief and Chief Electrical Inspector, Department of Energy. The revised cost of the appliances is also inclusive of cost of removal and installation which had been missed out earlier. Consequently, through this letter, we are herewith filing an Amendment to the above Petition, hereinafter referred to as Amendment Petition.

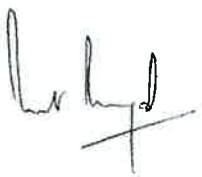
It is requested that the Hon'ble Commission may kindly take this Amendment Petition on record in lieu of the Original Petition for all further reference and proceedings.

We trust the Hon'ble Commission shall find our above submission in order.

We shall be glad to provide any other information as may be required in the matter.

Thanking you,

For **TP Odisha Discoms**



(Puneet Munjal)
Chief -Regulatory & Government Affairs

BEFORE THE ODISHA ELECTRICITY REGULATORY COMMISSION,

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IN THE MATTER OF: M/s TP Central Odisha Distribution Ltd.(TPCODL), Corporate Office, Power House, Unit 8, Bhubaneswar- 751 012 on behalf of all four Discoms of Odisha viz. TPCODL , TP Western Odisha Distribution Ltd.(TPWODL),TP Southern Odisha Distribution Ltd (TPSODL) and TP Northern Odisha Distribution Ltd (TPNODL) represented by the Chief –Regulatory & Government Affairs of TPCODL.

.... Petitioner

IN THE MATTER OF: M/s GRIDCO, OPTCL, SLDC, Department of Energy, Govt. of Odisha and All Concerned Stake Holders.

.... Respondents

1. Background for Submission of the Amendment Petition

The Petitioners are Distribution Licensees under the provisions of the Electricity Act, 2003 (hereinafter "the 2003 Act") having their respective areas of supply in the State of Odisha.

The Electricity Act,2003 and the OERC Demand Side Management Regulations 2011 require the Discoms to take up DSM initiatives in their area of Supply.

In view of the above, the Petitioners have filed a petition before the Hon'ble Commission on 18 August 2023 (Registered as Case 79 /2023) for implementation of Energy Efficiency Program for Domestic Consumers for promotion of Demand Side Management (DSM) in

the State. The Program comprises of (i) Replacement of 5,00,000 energy inefficient conventional Induction Fans with Brush-Less Direct Current (BLDC) Fans (Maximum 2 per Household) and (ii) Replacement of 50,000 Less energy efficient Air Conditioners (less than BEE 5 Star rating) with BEE 5 star rated Air Conditioners (One per Household).

Since filing of the Petition, we have reviewed the proposed rollout of the Scheme, and in discussion with the Department of Energy, it is now proposed to double the quantum of the coverage of the Scheme i.e. (i) Replacement of 10,00,000 energy inefficient conventional Induction Fans with BEE 5 Star rated Brush-Less Direct Current (BLDC) Fans(Maximum 2 per Household) in place of 5,00,000 Fans as proposed in the Petition dated 18.08.2023 and (ii) Replacement of 1,00,000 Less energy efficient Air Conditioners (less than BEE 5 Star rating) with BEE 5 star rated Air Conditioners (One per Household) in place of 50,000 ACs as proposed in the Petition dated 18.08.2023, along with the revised cost of replacement of the appliances in line with the costs intimated by the Office of Engineer in – Chief and Chief Electrical Inspector, Department of Energy. The revised cost of the appliances is also inclusive of cost of removal and installation which had been missed out earlier. The 'Techno-Commercial Proposal for Supply of 5 Star (BLDC) Fans' as submitted by EESL to Govt. of Odisha is enclosed as **Annexue-1** to this submission.

Consequently, this present petition is being filed in amendment to the Original Petition dated 18th August 2023 to include the above increased quantum of scheme and revised estimated cost of installation of BEE 5 Star BLDC Fan and BEE 5 Star AC . Because of this increased scope (double of the original petition) and revised estimated rates, the resultant numbers (estimated Scheme cost and Saving number etc.) have undergone a change which have been considered in this amendment Petition.

In view of the above, we request the Hon'ble Commission to take this submission on record in lieu of the original petition dated 18th August 2023 for all further reference, proceedings and accordingly adjudicate on the matter.

2. Preamble – Objective of Demand Side Management (DSM)

Energy is the lifeblood of modern societies, and the efficient use of energy resources is of paramount importance to ensure sustainable development, reduce carbon emissions, and ensure energy security. Demand Side Management (DSM) represents a holistic approach to energy conservation and efficiency by addressing the consumption side of the energy equation. It encompasses a range of strategies, programs, and initiatives aimed at

optimizing energy consumption, enhancing grid stability, and promoting a greener and more resilient energy future.

DSM recognizes that while the augmentation of energy supply is vital, equal emphasis must be placed on optimizing the consumption pattern of end consumers and thereby moderating demand growth. By engaging the end consumers, DSM endeavours to alter consumption patterns and peak demand behaviour, thereby reducing the strain on existing infrastructure and deferring the need for additional generation and distribution capacity. The objectives of Demand Side Management include, but are not limited to:

- **Energy Conservation:** DSM measures encourage energy users to adopt energy-efficient practices and technologies, thereby reducing overall consumption and dependence on non-renewable energy sources.

- **Load Shifting:** DSM aims to redistribute peak electricity demand by incentivizing consumers to shift energy-intensive activities to off-peak hours. This helps in optimizing grid operations and reducing the need for costly peak-load power generation.

- **Demand Response:** Through DSM programs, consumers are empowered to actively participate in managing their energy usage. They can voluntarily curtail consumption during periods of high demand or in response to price signals, contributing to grid stability.

- **Environmental Benefits:** By promoting energy efficiency, DSM contributes to a reduction in greenhouse gas emissions and mitigates the environmental impact of energy production and consumption.

- **Financial Savings:** Effective DSM implementation can lead to reduced energy bills for consumers, encouraging them to adopt energy-efficient technologies and practices.

3. Submission of the Petitioners

In order to promote Demand Side Management (hereinafter refer to as 'DSM'), the Petitioners are filing the present Petition seeking approval of the Hon'ble Commission for a cumulative funding of **Rs.126 Cr** (in ARR) over five years for all the four Discoms towards following:

A. Partial subsidy/incentive of Rs. 111 Cr for replacement of energy inefficient appliances with Energy Efficient Appliances as mentioned below .

(i) Replacement of 10,00,000 energy inefficient Conventional Induction Fans with BEE 5 Star Brush-Less Direct Current (BLDC) Fans (Maximum 2 per Household)

And

(ii) Replacement of 100,000 Less energy efficient Air Conditioners (less than BEE 5 Star rating) with BEE 5 star rated Air Conditioners (One per Household) .

It is proposed that a Subsidy of 50% of the Cost of Replacement of Conventional Induction Fans with BEE 5 Star BLDC Fans and 25% of Cost of Replacement of energy inefficient Air Conditioners with BEE 5 Star Rated Air Conditioners be provided to House Hold Consumers to encourage transition to Energy Efficient Appliances in line with the decision taken in the meeting of 'Monitoring and Implementation Committee ' held under the chairmanship of the Additional Chief Secretary, Energy Department on 10th Aug 2023. The Department of Energy has communicated its readiness to finance upto 60% of such subsidy. A copy of the letter dated 17th Aug 2023 conveying the minute of the above meeting is attached as **Annexure-2** to this submission. This Petition is being filed for approval of the DSM proposal with recovery of the Balance 40% Subsidy from ARR of the respective Discoms.

It is further submitted that this estimated cost of Rs. 111 Cr is based on the cost of new appliances (including cost of installation, dismantling and transport) and the buyback cost of old appliances which are pure estimate and the actual cost will be discovered only after the bidding process. In this petition, we are seeking in principle approval of the Hon'ble Commission for this estimated amount.

B. Rs. 15 Cr towards Information, Education and Communication (IEC) expenses and other related Expenditures for implementation of the Scheme

In addition, to above amount of **Rs.111 Cr** towards partial subsidy, **Rs. 15** Cr. is sought towards incurrence of Information, Education and Communication (IEC) expenses together with expenditure for implementation of the Scheme

including activities like: (i) design of website for demand aggregation, (ii) TV Spots, (iii) Media Advt. (iv) Standees, etc. at Divisions / Consumer Care Centers, printing on Bills, leaflets, etc. and (v) development and maintenance of mobile application.

The Rs. 15 Cr being sought is for all four Discoms together for five years and effectively works out to approximately 1.8 % of the total Appliances Cost of Rs. 833.6 Cr[1] covered under the proposed Scheme. Further, average annual expenditure per Discom works out to Rs. 75 Lakhs each which is reasonable. It is further submitted that, this expenditure of Rs.15 Cr is an estimated amount and the actual expenditure incurred may kindly be allowed in the ARR of the Discoms.

The total proposed DSM expenditure for which approval is requested is presented in **Table-A** below and the year wise expenditure that is required to allowed in ARR of each Discom is provided as **Annexure-3** to this submission .

The details of the proposed scheme are enclosed as **Appendix** to this petition.

[1] Total Appliances Cost (Rs. 833.6 Cr) = Total No's of BEE 5 Star BLDC Fan (10,00,000) X Cost of One BLDC Fan (Rs. 3416) + Total No's of BEE 5 Star AC (1,00,000) x Cost of One BEE 5 Star AC (Rs. 49200)

Table- A : Estimated DSM Expenditure requested to be allowed in ARR

Sr No	Particular	UoM	Each DISCOM	Total for all 4 Discoms
A	Numbers of BEE 5 Star BLDC Fan Proposed to be installed for a Period of 5 Year (FY 24- FY 28)	No's	250000	1000000
B	Cost of installing One BEE 5 Star BLDC Fan by replacing existing one Induction Fan(incl. GST)	Rs.	3416	3416
C	#Buy Back Cost of one (existing) Induction Fan	Rs.	200	200
D = B-C	Cost of Replacement of one (existing) Induction Fan with BEE 5 Star BLDC Fan	Rs.	3216	3216
E= 50 % X D	Total Proposed Subsidy/Incentive per BEE 5 Star BLDC fan	Rs.	1608	1608
E.1 = 30% X D	Total Proposed Subsidy/Incentive per BEE 5 Star BLDC fan by Govt. of Odisha	Rs.	965	965
E.2= 20% X D	Total Proposed Subsidy/Incentive per BEE 5 Star BLDC fan by of Allowance as DSM Expenditure in ARR	Rs.	643	643
F= (A X E.2) /10^7	**Total Cost of Subsidy/Incentive for BEE 5 Star BLDC Fan in ARR**	**Rs. Cr**	**16**	**64**
G	Numbers of BEE 5 Star Rated to be installed for a Period of 5 Year (FY 24- FY 28)	No's	25000	100000
H	Cost of installation of One BEE 5 Star AC by replacing existing less enegy efficient AC(incl. GST)	Rs.	49200	49200
I	#Buy Back Cost of one (existing) less than BEE 5 Star AC	Rs.	2500	2500
J= H-I	Cost of Replacement of one (existing) less than BEE 5 Star AC with BEE 5 Star AC	Rs.	46700	46700
K = 25% X J	Total Proposed Subsidy /Incentive per BEE 5 Star Rated AC	Rs.	11675	11675
K.1 = 15% X J	Total Proposed Subsidy /Incentive per BEE 5 Star Rated AC by Govt. of Odisha	Rs.	7005	7005
K.2 = 10% X J	Total Proposed Subsidy /Incentive per BEE 5 Star Rated AC by of Allowance as DSM Expenditure in ARR	Rs.	4670	4670
L= (G X K.2)/10^7	**Total Cost of Subsidy / Incentive for BEE 5 Star AC in ARR**	**Rs. Cr**	**12**	**47**
M=F+L	**Total Cost of Subsidy / Incentive forBEE 5 Star BLDC Fan and BEE 5 Star AC in ARR**	**Rs. Cr**	**28**	**111**
N	Expenditure towards Information, Education and Communication (IEC) expenses and other expenses for Implementation of the Scheme as DSM Expenditure in ARR	Rs. Cr	3.75	**15***
O= K+M	**Total 'DSM Expenditure' to be allowed in ARR for a period of Five Year (FY 24 to FY 28)**	**Rs. Cr**	**31.5**	**126**
Total Subsidy / Incentive to be Provided by Govt. of Odisha –>				
P= (A X E.1)/10^7	**Total Cost of Subsidy/Incentive for BEE 5 Star BLDC Fan to be provided by GoO**	Rs. Cr	24.1	96.5
Q= (G X K.1)/10^7	**Total Cost of Subsidy / Incentive for BEE 5 Star AC to be provided by GoO**	Rs.Cr	17.5	70.1
R= P+Q	**Total Cost of Subsidy / Incentive for BEE 5 Star BLDC Fan and BEE 5 Star AC to be provided by Govt. of Odisha**	**Rs. Cr**	**41.63**	**166.5**

Present estimate,shall be detemined through Bidding Process

* Note: Estimated Amount , will be claimed as per Actuals

A broad Break up of the cost of replacement of a less Energy Efficient Fan and AC with a BEE 5 Star BLDC Fan and a BEE 5 Star Rated AC is provided in tables B & C below.

Table – B: Cost of installation of one BEE 5 Star BLDC Fan replacing one existing Induction Fan

Sr No	Particular	Amount (Rs.)	Cost Reference
1	Basic Price of One BEE 5 Star BLDC Fan	2405	'Techno-Commercial Proposal for Supply of 5 Star (BLDC) Fans' submitted by EESL to Govt. of Odisha ,enclosed as Annexue-1
2 = 1 x 18%	GST @ 18%	432.9	
3 =1+2	Total Price of One BEE 5 Star BLDC Fan incl. GST	2837.9	
4	Dismantling and Installation Charges	250	
5 = 1x 10%	Transportation Chages	240	
6 =(4+5) x 18%	GST @ 18% on Dismantling , Installation & Transportation Chages	88	
7 =3+4+5+6	Total Cost of Installation of one BEE 5 Star BLDC Fan (Supply and Service Cost including Transport)	**3416**	

Table – C: Cost of installation of one BEE 5 Star AC replacing one existing less energy efficient AC

Sr No	Particular	Amount (Rs.)	Cost Reference
1	Total Price of One BEE 5 Star AC incl. GST	42000	Based on Current Market Rates
2	Dismantling and Installation Charges incl. GST	3000	
3 =1 x10%	Transportation Chages incl. GST	4200	
4=1+2+3	Total Cost of Installation of one BEE 5 Star AC (Supply and Service Cost including Transport)	**49200**	

Prayers

TPCODL prays that the Hon'ble Commission may kindly be pleased to:

1. Admit the above petition, detailed proposed scheme for which is provided as **Appendix** to this submission.

2. Approve the Petitioners' Proposal for replacing (a) 10,00,000 Energy Inefficient Conventional Induction Fan with BEE 5 Star BLDC Fan (i.e. 2,50,000 by each Discom) and (b) Replacement of 1,00,000 Less Energy efficient AC (less than BEE 5 Star rated) with BEE 5 Star rated AC (i.e. 25,000 by each Discom) over a period of five years i.e. FY 24 to FY 28 in their respective license area of individual Discoms.

3. Approve the estimated cumulative expenditure of Rs. 111 Cr. for all four Discoms over five years (FY 24 to FY 28) together with Rs. 15 Cr. towards Information, Education and Communication (IEC) and other related expenses for implementation of the Scheme as DSM Expenditure including any other amount incurred additionally, in the Annual Revenue Requirement (ARR) of the Petitioners.

   The Year wise break up of expenditure that may kindly be approved as part of Business Plan for each Discom towards DSM expenditure is provided at **Annexure-3** to this submission. It is further submitted that based on each year's actual performance in terms of adoption of the Scheme by the Domestic Consumers, the Petitioners shall file in their respective ARR Petitions, true-up of actual DSM expenditure for the previous year, revised estimate for the current year and a budget estimate for the ensuing year which may kindly be allowed in the respective year's ARRs.

4. Permit making additional submission required in this matter.

5. Grant any other relief as deemed fit and proper in the facts and circumstances of the case.

6. Any other direction as the Hon'ble Commission may think appropriate

Appendix

1. This Petition is being filed as per enabling provisions defined under Section 42(1), 61, 86(2) of the Electricity Act 2003, clause 5.9.2, 5.9.4 and 5.9.6 of the National Electricity Policy and in accordance with the Regulation 10 of OERC (Demand Side Management) Regulations, 2011 and Provisions of OERC (Conduct of Business) Regulations, 2004.

2. The proposal is for introduction of a five year Scheme from FY 24-FY 28, for replacing (i) 10,00,000 Nos. of energy inefficient Conventional Induction Fans with BEE 5 Star BLDC Fans and (ii) 1,00,000 Nos. of Non / Less than BEE 5 Star Rated ACs with BEE 5 Star Rated Air Conditioners by the four Discoms over the period of five year.

3. While these Energy Efficient Home Equipment, are relatively more expensive than the conventional energy inefficient equipment, their capital cost is easily recoverable from Energy Savings over 2-5 years (depending on intensity of usage and capital cost).

4. In-order to promote residential households to transition to such Energy Efficient Home Appliances, a subsidy/incentive of 50% of Cost of Replacement of Conventional Induction Fans by BEE 5 Star BLDC Fans and 25% of Cost of Replacement of Energy Inefficient Air Conditioners by BEE 5 Star Rated Air Conditioners is proposed. 60% of the Subsidy/ Incentive shall be financed by the Government of Odisha from its Energy Efficiency Scheme and the balance 40% shall be financed by the Petitioners from the DSM Expenditure to be allowed as per this Petition, to the Petitioners in their respective ARRs. The relevant extract of the Department of Energy's decision in this regard is reproduced below and the Minutes of the Meeting dated 10.08.2023 in this regard are enclosed as **Annexure-2** to this submission.

    3. *Some subsidy/ incentive shall also be provided under the scheme for Demand Side Management (DSM) program of DISCOMs approved by OERC for* ***residential households only****. It could be as follows:*

        a. *DSM Incentive may cover 50% of the cost of replacement of maximum 2 conventional fans with 2 energy efficient BLDC fans. Out of this ,30% cost shall be met through this scheme and the rest 20% shall be provided in ARR of the DISCOM by OERC.*
        b. *Incentive may cover 25% of the cost of replacement of 1 conventional AC with 1 energy efficient AC. Out of this ,15% cost shall be met through this scheme and the rest 10% shall be provided in ARR of the DISCOM by OERC.*

c. *DISCOM may approach OERC in this regard citing the DSM Regulations approved by other State Regulatory Commission. OERC may direct any modification to the incentive structure mentioned at (a) and (b) above as deemed fit.*

5. The Petitioners submit that the two energy efficient appliances identified for coverage under the proposed 'Energy Efficiency Scheme for Domestic Consumers', viz, BEE 5 Star BLDC Fans and BEE 5 Star Rated Air Conditioners, are based on the extent of usage, energy savings potential and ease of consumer acceptance for a lower payback period.

6. Further, for the initial rollout of the DSM scheme, a limited quantum of Energy Efficient Appliances are proposed in this Petition (i.e. total 10,00,000 BEE 5 Star BLDC fan (2,50,000 by each Discom) and 1,00,000 BEE 5 Star AC (25,000 by each Discom) , depending upon the response to the scheme additional quantum will be requested before the Hon'ble Commission.

7. The Energy Savings potential for BLDC Fans as well as for 5 Star Air Conditioners is provided below:

a. BLDC Fans:

i. Fans are virtually available in each household, and unlike tube lights which are used only during late evening / night hours, fans are used virtually throughout the 24 hour day and hence have a significant energy savings potential

ii. BLDC fan reduces power consumption by up to 63% and in fact, it is more cost-efficient. One of the primary reasons is that these fans use less energy consumption but still generate the same amount of airflow.

iii. A typical conventional induction based fan consumes around 75 watts while a BEE 5 Star BLDC fan consumes about 28 watts. If a fan runs for more than 15 hours on a daily basis, at an average electricity cost of Rs. 5.5 per unit[2] and an average price of installation of BLDC fan at Rs. 3416 per fan (Please refer to Table-B for cost details) , its full cost can be recovered in less than three years (Rs. 3416/Rs.1415=2.4 years) in the form of energy-savings with BEE 5 Star BLDC fans.

iv. The computation of Annual Savings from installation of BEE 5 Star BLDC vis-a vis conventional induction fans is provided in table below.

[2] Marginal units are assumed to be saved

Table-1: Annual Savings : BEE 5 Star BLDC Fan vs Conventional Induction Fans

Type of fan	Watt	Hourly consumption (Units)	Daily Consumption (Units)	Yearly Consumption (Units)	Yearly Cost at Average Electricity Charges of Rs.5.5 per unit (Rs.)
A	B	C	D=Cx15 hrs	E=Dx365	F=E x Rs. 5.5
Induction based Fan	75	0.075	1.125	411	2258
BEE 5 Star BLDC Fan	28	0.028	0.42	153	843
Annual Savings				257	1415

b. BEE Five Star Rated Air Conditioners :

i. With economic upliftment of society and rapid change in life styles, Air Conditioning Loads are increasing significantly.

ii. As per India Cooling Action Plan 2019, it has been estimated that room air conditioner sales will grow at a CAGR of 11% in the next 10 years and 8% in the following 10 years in a low growth scenario, the relevant extract of which is enclosed as **Annexure-4** to this submission.

iii. The average daily operating hours for air conditioning appliances has increased with maximum usage of air conditioning appliances occurring during late-night hours, i.e. from 22:00 to 04:00 Hrs which signifies increase in average daily operating hours to 8 hours a day (including day time use).

iv. For the purpose of analysis of Savings from replacement of existing ACs by BEE 5 Star Rated Air Conditioners, we have assumed the existing BEE 3 Star Rated Air Conditioners. While a typical BEE 3 Star Rated Air conditioner (1.5 T, Split) would consume around 1600 watts , a 5 Star BEE Rated Air Conditioner (1.5T Split) would consumes about 900 watts. If an AC run for around 8 hours on a daily basis, at an average electricity cost of Rs. 5.5 per unit[3] and an average price of installation of one 5 Star Rated Air conditioners at Rs. 49,200 (Please refer to Table-C for Cost details) , its full cost can be recovered in around five years (Rs. 49,200 /Rs.9240= 5.3 years) in the form of energy-savings with BEE 5 Star rated AC.

v. The computation of Annual Savings from installation of BEE 5 Star Rated Air Conditioner vis-à-vis 3 Star Air Conditioner is provided in the Table below.

[3] Marginal Units are assumed to be saved

Table-2 : Annual Savings : BEE 5 Star rated AC vs BEE 3 Star rated AC

Type of AC	Watt	Hourly consumption (Units)	Daily Consumption (Units)	Yearly Consumption (Units)	Yearly Cost at Average Electricity Charges of Rs.5.5 per unit (Rs.)
A	B	C	D=Cx8 hrs	E=Dx300	F=Ex5.5
BEE 3 Star Rated AC	1600	1.6	12.8	3840	21120
BEE 5 Star Rated AC	900	0.9	7.2	2160	11880
Annual Savings				1680	9240

8. As specified in Table-1 and Table-2 above, the estimated annual energy savings due to use of BEE 5 Star BLDC Fans and Energy Efficient Air Conditioners over conventional induction fans and inefficient air conditioners (assuming avg. 3 Star Rated ACs) is estimated at 257 units and 1,680 units respectively with an annual monetary saving per Fan of Rs. 1415 and Rs. 9240 per AC.

9. As a result, estimated cumulative annual energy saving for consumers participating in this DSM program for a total of 10,00,000 Fans shall be 257 MUs per year and annual monetary saving at consumers end would be Rs. 142 Crore. Similarly, estimated cumulative annual energy saving for a total of 1,00,000 ACs shall be 168 MUs per year and annual monetary saving at consumers end would be Rs. 92 crore.

10. Based on the above, the Total Savings in terms of MUs and monetary Savings to Consumers for the above referred DSM Program works out to 425 Mus (257 MU + 168 MU) with a monetary value of Rs. 234 crore (Rs. 142 Cr + Rs.92 Cr).

11. With savings in terms of consumption, the power requirement to meet demand shall also correspondingly reduce. Based on the target T&D Loss for FY 23-24, the expected annual avoidable power purchase for GRIDCO works out to 533 MUs which translate into saving in Power Purchase Cost of Rs. 166 Cr for GRIDCO (at average power purchase Cost of Rs.3.1 per unit as approved in GRIDCO BSP Order for FY 2023-24).

    The computation of Savings in terms of Power Purchase MUs and its corresponding marginal cost is provided at **Annexure-5** to this Petition.

12. It is further submitted that ,the annual energy saving of 425 MU after implementation of the scheme will cause reduction of CO2 emission of about 3.48 Lakhs ton per annum[4]. The year wise CO2 emission reduction is provided at **Annexure-6** to this submission.

13. The Petitioners respectfully submit below, the salient features of proposal:

(a) **Scope of the Scheme:** The Scheme is applicable for Domestic Consumers

Under this proposal, the Petitioners would collectively target to replace over a period of five years (FY 24 to FY 28)

(i) 10,00,000 Nos. of Conventional Induction Fans with BEE 5 Star BLDC Fans over Five year period by all the four Discoms (i.e. 2,50,000 Nos. Fans by each Discom over 5 years)

(ii) 1,00,000 Nos of less energy efficient Air Conditioners (less than BEE 5 Star rated) with BEE 5 Star rated Energy Efficient Air Conditioner over Five year period by all the four Discoms (i.e. 25,000 No. ACs by each Discom over 5 years)

(b) **Eligibility :**

i. The Consumer must be a Domestic Consumer.
ii. The Consumer should have a valid consumer connection / CA number.
iii. There shall be no outstanding dues as on date of application.
iv. Replacement of maximum 2 conventional Induction Fan with 2 BEE 5 Star BLDC Fan per Consumer (CA number).
v. Replacement of one energy inefficient AC (less than BEE 5 Star rated) with BEE 5 Star rated AC per consumer (CA number).
vi. The Scheme shall be applicable on first come first serve basis for the eligible consumers.

[4] Conversion factor of 0.82 kg/kwh for CO2 taken based on 'Techno- Commercial proposal for Supply of EESL 5 Star (BLDC) Fans to Odisha Government' as submitted by EESL to GoO which is enclosed as Annexure-1

(c) **Tenure / Validity of the Scheme :** The Scheme will be implemented over 5 Year period i.e. FY 24 to FY 28

Considering the balance months available in FY'24 for approval and rolling out of the Scheme, the Discom wise schedule for replacement is proposed as follows:

Table -3: Schedule for Roll out (Installation of BLDC Fan and BEE 5 Star AC)

Expected approval from the Hon'ble Commission	Sept-23
Tendering and onboarding of Fans / AC OEMs	Dec-23
Launch of AC Replacement Program	Jan-24

Table -4: Discom wise Schedule

Discoms	Equipment	TPCODL	TPSODL	TPWODL	TPNODL	Total
FY 23-24	BEE 5 Star BLDC Fans	10,000	10,000	10,000	10,000	40,000
	5 Star BEE Rated ACs	1000	1000	1000	1000	4,000
FY 24-25	BEE 5 Star BLDC Fans	60,000	60,000	60,000	60,000	240,000
	5 Star BEE Rated ACs	6,000	6,000	6,000	6,000	24,000
FY 25-26	BEE 5 Star BLDC Fans	60,000	60,000	60,000	60,000	240,000
	5 Star BEE Rated ACs	6,000	6,000	6,000	6,000	24,000
FY 27-28	BEE 5 Star BLDC Fans	60,000	60,000	60,000	60,000	240,000
	5 Star BEE Rated ACs	6,000	6,000	6,000	6,000	24,000
FY 28-29	BEE 5 Star BLDC Fans	60,000	60,000	60,000	60,000	240,000
	5 Star BEE Rated ACs	6,000	6,000	6,000	6,000	24,000
Total	BEE 5 Star BLDC Fans	**250,000**	**250,000**	**250,000**	**250,000**	**10,00,000**
	5 Star BEE Rated ACs	**25,000**	**25,000**	**25,000**	**25,000**	**100,000**

(d) **Buy Back Arrangement :**

The scheme shall be operated under 100% buy back arrangement so that the inefficient ACs and Fans must be taken out of the Grid and disposed-off in an environmental friendly manner.

(e) **Implementing Agency :**

The Petitioners' shall engage implementing agencies discovered through competitive bidding process or as decided by the Hon'ble Commission. The price to be quoted by the implementing agency in the bid process shall be net of the quoted price of new Appliance minus the salvage value of the old Appliance , which shall be indicated separately as part of the bid. The implementing agency shall be responsible for the safe disposal of old Appliances.

(f) **Proper and Safe Disposal of Old replaced Appliances (Fans and ACs) :**

Petitioners shall ensure proper and environment friendly disposal of old replaced Air-Conditioners and Fans by the implementation agency to avoid misuse as well as safety hazards.

The disposal certificate shall also be issued by such agency.

(g) **Maintenance of Records :**

The Petitioners shall keep all the records related to this scheme separately. The Petitioner will submit following details related to the implementation of the scheme:

(i) Final price discovered through competitive bidding for the specified Appliances;

(ii) Saving of energy due to implementation of this scheme;

(iii) Administrative cost incurred under this scheme; and

(iv) Any other record relevant to the scheme.

14. In view of the evident benefits for the consumers including the future benefits , it is requested that the Hon'ble Commission may kindly allow the present proposal as explained above and may :

(a) Permit replacement of 10,00,000 Nos. inefficient conventional induction fans by BEE 5 Star BLDC fans over a period of five years

(b) Permit replacement of 1,00,000 Nos. inefficient ACs by BEE 5 Star Rated Air Conditioners over a period of five years

(c) Permit Inclusion of Window and Split type Air Conditioners with rating 1T, 1.5T and 2T in the scheme so that the positive impact on the load curve of the Petitioners can be maximized.

(d) Approve as part of Petitioners' ARRs over a period of five years, DSM Expenditure of **Rs. 111 Cr.** towards Partial Subsidy / Incentive to Consumers for replacement of aforementioned Energy Inefficient Appliances with Energy Efficient Appliances over a period of five years. Additionally, expenditure of Rs. 15 Cr. for all four Petitioners towards meeting information/ communication/ demand aggregation through development and deployment of applications may kindly be approved. A tentative annual breakup of the same from FY 24 to FY 28 is provided in **Annexure-3**.

(e) It may kindly be noted that the present BEE star rating of air conditioners is valid till December, 2024. If the Star rating of air conditioners undergo a change then the Petitioner will seek for quotation for new 5 Star rated Air conditioner models and revised price (if any) of the Air Conditioners will be notified to the Hon'ble Commission.

ANNEXURE-I

TECHNO-COMMERCIAL PROPOSAL

For

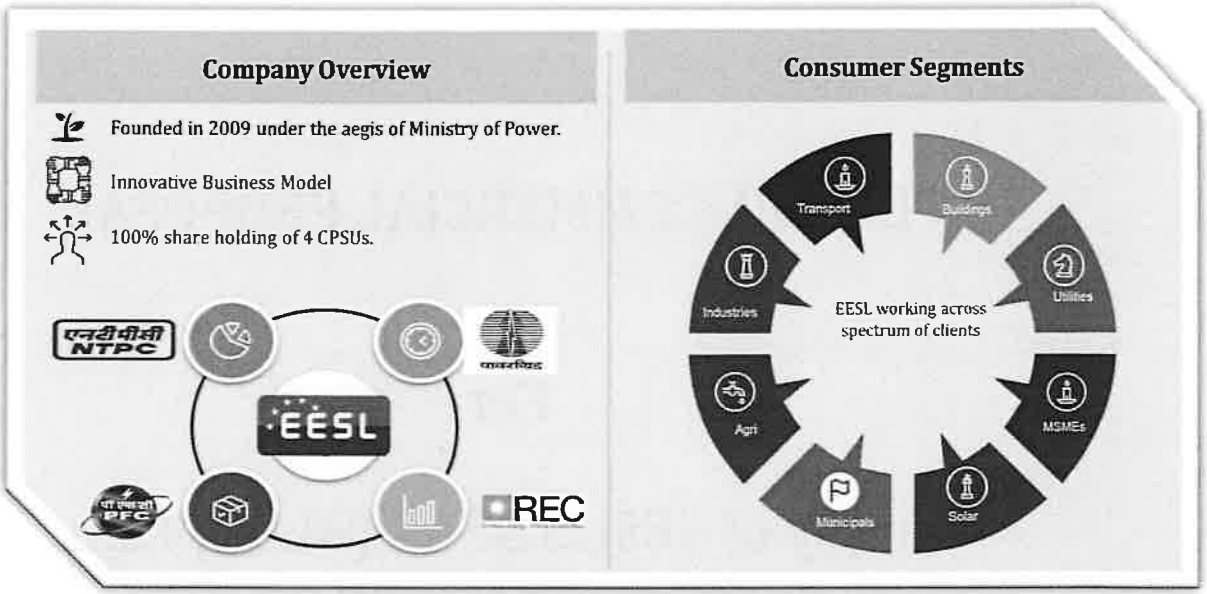
Supply of EESL 5 STAR (BLDC) Fans

To

Odisha Government

1. Energy Efficiency Services Limited (EESL)

Energy Efficiency Services Limited (EESL) was setup by Ministry of Power (MOP), Government of India, as a joint venture of 4 Central Public Sector Undertakings (CPSUs), namely NTPC Limited, Power Grid Corporation of India Limited (PGCIL), Power Finance Corporation Limited (PFC Limited) and Rural Electrification Corporation (REC) in 2009. Its objective is to lead the market related actions to create and sustain markets for energy efficiency in India.



Program	Milestones	Program	Milestones
Energy Efficiency Business		**Clean Energy Business**	
Residential: **UJALA** *Unnat Jyoti by Affordable LEDs for All*	**36.86 crore** LED bulbs, **72.18 lakh** LED Tube lights and **23.59 lakh** Energy efficient fans distributed	**AJAY** *Atal Jyoti Yojana*	**2.72 lakh Solar LED** Street Lights installed
Public Infrastructure: **SLNP** *Street Lighting National program*	**1.32 crore** LED street lights installed with CCMS	Decentralized Solar	**200 MWp of solar power Projects** installed/ Commissioned
		Solar Study Lamps	**61.01 lakh solar study lamps** distributed
Buildings: **BEEP** *Building Energy Efficiency Program*	Retrofitting work in **12,000+ Government Buildings** has been completed	Trigeneration	Project under implementation with M&M, Ready pipeline of more **than 40 MW.**
SEAC *Super Efficient AC Program*	**3,146 nos. ACs sold**	**Green Transportation**	
Agricultural & Municipal: **AgDSM** *Agricultural Demand Side Management*	**81,180 Agriculture pumps** replaced with efficient BEE star rated Pumps.	National e-Mobility Program (e-Vehicles & Charging Infrastructure)	**1,956 e-cars** deployed/under deployment; **470 AC & DC Captive chargers installed**
MEEP *Municipal Energy Efficiency program*	Agreement for **IGEA with 25 States/UTs.** IGEA report submitted for 390 cities		**441 public charging stations installed**

2. Product Brief:

When it comes to saving energy, most of us generally overlook ceiling fans. We see big appliances like air conditioners or heaters with suspicion for surreptitiously piling up the electricity bill. What we fail to understand though is that the ceiling fans are all-weather appliance—which keeps running all through the day (and even night)—thus cumulatively consume more electricity than we assume it to be.

For years, ceiling fans used to come with the same hardware of induction motor which typically consumed 70-80 watts for a standard ceiling fan. But in the last few years, a new technology called 5 STAR (BLDC) is being used to make fans consume a lesser amount of energy, without compromising on the air delivery. BLDC stands for brush-less direct current (DC) motor, a special type of motor which has permanent magnet instead of electromagnets found in a conventional induction motor. BLDC motor has important advantages over induction motor like low electricity consumption, lesser noise generation and better lifespan.

Technical Specification of EESL's BEE 5 star rated BLDC Fan

Parameter	***Specification***
Brand	*EESL, A JV of PSUs of Ministry*
Type of Fan	*Ceiling Fan*
Color	*White, Brown*
Wattage	*<=32 Watt*
Sweep Size	*1200 mm*
No. of blades	*3 (Three)*
Air Delivery	*≥ 220 Cubic meter per minute*
Operating voltage	*140 VAC-285 VAC*
Power Factor	*0.9 at rated voltage and at full load*
Surge Protection	*4kV with 8/20 uS pulse*
THD	*<20%*
Blade material	*1 mm thick Aluminum*
Speed Control	*5 step speed control with hand heldremote control unit*
Accessories	• *Down-rod 300 mm, Canopies, Shackles, Nut Bolt*
Warranty	***2.5 years' warranty against technical defects from the date of Invoice***

Benefit of EESL BEE 5 Star BLDC Fans Over Conventional Fan

S. No	Description	Conventional Fan	BEE 5 Star Fan	Savings p.a. (2 fans per house hold)	25 lakh Rural Grid Connected Consumer Savings p.a.
1	Quantity	1	1	2	50 Lac
2	Wattage	75	28		
3	Hourly Consumption(kWh)	0.075	0.028		
4	Daily Consumption (kWh)	1.125	0.42		
5	Electricity Consumption per annum (kWh)	337.5	126	423 Units	1057.5 Million kWh
6	Electricity Cost INR per unit	6	6		
7	Electricity Consumption per annum (INR)	2025	756	2,538 INR	634.5Cr
8	Electricity Consumption in 3 years (INR)	6075	2268	7,614 INR	1903.5Cr
9	CO_2 Emission Reduction			346.86 Kg	8,67,150 tCO_2

**Assumptions: 15 hours, 300 days of operation.*

Although, it may be seen initially that, upfront procurement cost of 5 STAR (BLDC) fan is higher than conventional fan however by the end of third year the ***total cost of ownership will be less than the conventional fan***. Eventually savings will increase with the consecutive years of usage.

The Advantages of EESL's 5 STAR (BLDC) ceiling fans as compared to other 5 STAR (BLDC) fans available in the retail market:

- **Three Tier Quality Check-** All the manufactured fans are first quality checked internally by the manufacturer and then thoroughly quality checked by EESL or EESL appointed agencies before the dispatch to maintain the quality standard.

  #Fans available in the retail market are one-time quality checked only by the manufacturers.
- **7 Year Warranty on Card Controller.**
- **2.5 years' warranty** as compared to 2 years' warranty available in retail market.

3. Price

S. No.	Product Description	Quantity	Rate (Excl. GST)	Amount (INR)
1	BEE 5 Star Ceiling Fan	1	2405.00/-	2405.00/-

4. **Terms and Conditions:**

   a) Product price is tentative and is subjected to vary as per latest tender rate discovered.

   b) **Payment Terms:** 100% advance payment before the dispatch of consignment

   c) **Warranty**: 2.5 years against the technical defects will be provided from the date of EESL invoice.

   d) **Packing Charges:** Nil

   e) **Minimum Deliverable Quantity at Single Location:** 2000 nos.

      Note: EESL's scope of work would be limited to supply of Minimum 2000 nos. 5 -star rated Ceiling fans with to the designated warehouse/storage locations of Odisha Govt. or any other nominated Nodal Agency.

   f) **Freight charges:** Nil for minimum deliverable quantity of 2000 nos.

      Note: Nodal Agency/Client shall raise their requirement to EESL for supply at designated offices/storage locations. EESL in coordination with the manufacturer(s), will ensure the supply of the required number of fans to the designated locations in the schedule delivery period. ***Further distribution/installation of fans is not in EESL's scope.***

   g) **Taxes:** As per applicable rate at the time of billing

   h) **Delivery Period:** 90 – 180 days

   i) **Mode of Dispatch:** By Rail/Road

   j) **Product Branding:** Chargeable as per actual.

ANNEXURE-2

GOVERNMENT OF ODISHA
ENERGY DEPARTMENT
****

No. 8496 /En., dated, 17/08/2023
ENG-ESIEC-EC-0001-2023

From

Shri Sambit Parija, OFS,
FA-cum-Additional Secretary to Govt.

To

State Project Director, OSEPA, Bhubaneswar/
Director, ICDS &Social Welfare/
Director, Health Services/
EIC (Elecy)-cum-PCEI, Odisha/
CMD, OPTCL, Bhubaneswar/
MD, GRIDCO, Bhubaneswar/
CEOs, All DISCOMs

Sub: Minutes of the Monitoring and Implementation Committee meeting held under chairmanship of Additional Chief Secretary, Energy Department on 10.08.2023 at 10.30 AM in the 2nd Floor Conference Hall of Kharvel Bhawan for the implementation of the CMECP-Household Energy Efficiency Program.

Sir,

I am directed to enclose herewith approved minutes of the Monitoring and Implementation Committee meeting held under chairmanship of Additional Chief Secretary, Energy Department on 10.08.2023 at 10.30 AM in the 2nd Floor Conference Hall of Kharvel Bhawan for the implementation of the CMECP-Household Energy Efficiency Program for your kind information and taking necessary action.

Yours faithfully,

FA-cum-Additional Secretary to Govt.

Memo No. 8497/En dated. 17/08/2023

Copy forwarded to PS to Additional Chief Secretary, Energy Deptt. for kind information of ACS.

FA-cum-Additional Secretary to Govt.

Minutes of the Meeting held under the Chairmanship of Additional Chief Secretary, Dept. of Energy to discuss about implementation of CMECP-Household Energy Efficiency Program (CMECP-HEEP) on 10.08.2023 at 10.30 AM in the 2nd Floor Conference Hall of Kharvel Bhawan.

****

A meeting was convened under the Chairmanship of Additional Chief Secretary, Energy Department on 10.08.2023 at 10.30 AM to examine and discuss the implementation of CMECP-Household Energy Efficiency Program (CMECP-HEEP).

The list of participants is placed at Annexure-A

At the outset, Additional Chief Secretary, Energy Department explained the background of the said program, i.e. Chief Minister's Energy Conservation Program-Household Energy Efficiency Program (CMECP-HEEP) and highlighted that Energy Efficiency is essential for achieving energy transition as we can not afford adding on huge capacity to meet the growing demand in the "AS IS" scenario. Energy consumption need to be decoupled from economic growth in a gradual manner. Hence use of energy efficient appliances need to be encouraged in Government buildings and residential households.

EIC (Elecy)-cum-PCEI was called upon to make a presentation on the proposed scheme and explain the modalities of the same.

After detailed deliberations, the following decisions were taken.

1. The tenure of the scheme shall be 5 years.
2. **Brush Less DC (BLDC) fans** shall be provided to all Medical Colleges, District Head Quarter Hospitals (DHHs) and SDHs, CHCs, PHCs, health sub-centres, High Schools, Upper Primary and Primary schools and AWCs in the State **as replacement against existing conventional fans which are more than 5 years old.** New fans may also be provided in schools and AWCs where it is not available. All **energy inefficient AC units** installed in important government offices, all Medical Colleges, District Head Quarter Hospitals (DHHs) and SDHs which are **more than five years old, shall be replaced** with energy efficient AC units in a phased manner. No new ACs shall be provided under this scheme.
3. Some subsidy/incentives shall also be provided under the scheme for the Demand Side Management (DSM) program of the DISCOMs approved by OERC **for residential households only**. It could be as follows:
    a. DSM Incentive may cover 50% of the cost of replacement of maximum 2 conventional fans with 2 energy efficient BLDC fans. Out of this, 30% cost shall be met through this scheme and the rest 20% shall be provided in the ARR of the DISCOM by the OERC.

b. Incentive may cover 25% of the cost of replacement of 1 conventional AC with 1 energy-efficient AC. Out of this, 15% cost shall be met through this scheme and the rest 10% shall be provided in the ARR of the DISCOM by the OERC.
c. DISCOMs may approach OERC in this regard citing the DSM Regulations approved by other State Regulatory Commissions. OERC may direct any modifications to the incentive structure mentioned at (a) and (b) above as deemed fit.

4. The name of the scheme may be changed to Energy Efficiency Program by dropping the word "household" as it is proposed to cover government buildings apart from residential households.
5. The procurement of energy efficient fans and ACs could be made through EESL/OPTCL/any other agency preferably from the OEMs as decided by the Government on the recommendation of EFC. Installation charges shall also be covered.
6. The scheme shall be implemented through the DISCOMs in a transparent manner. For tracking the receipt of appliances by the beneficiaries, TPCODL shall develop a mobile application. GPS of the site of installation of the energy efficient appliance, time and date stamping among other things shall be captured through the application. The data shall be stored in OPTCL Data Center for at least 3 years.
7. The Monitoring and Implementation Committee headed by SPD (OSEPA) shall redesign the scheme accordingly.

The meeting ended with a vote of thanks to the Chair and the participants.

16/8/23

Additional Chief Secretary,
Energy Department

Annexure – A

List of Participants

Sl. No.	Name	Designation/Department
1	Sri. Nikunja Bihari Dhal, IAS	Additional Chief Secretary, Energy Department
2	Sri Anupam Saha, IAS	State Project Director, OSEPA
3	Sri Lingaraj Panda, IAS	Director, ICDS&Social Welfare
4	Sri Suresh Chandra Maharana	EIC (Electy.)-cum-PCEI, Odisha
5	Sri Aravind Singh	CEO, TPCODL
6	Sri. Gagan Bihari Swain	Director (F&CA), GRIDCO
7.	Sri Sambit Parija, OFS	FA-cum-Additional Secretary to Govt., Energy Department
8	Sri B.C. Padhihary	CGM(F) GRIDCO
9	Sri Chandan Singh	Head (Customer Services) TPCODL
10	Sri. Sanjay Kumar Dutt	CGM (CPC) OPTCL

Annexure-3: Year wise Allowance of DSM Expenditure in ARR of each DISCOMs

Sr No	Particular	UoM	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	Total
A	Numbers of BEE 5 Star BLDC Fan Proposed to be installed (replacing existing Induction fans)by **each DISCOM**	No's	10000	60000	60000	60000	60000	250000
B	Cost of installing One BEE 5 Star BLDC Fan by replacing existing one Induction Fan(incl. GST)	Rs.	3416	3416	3416	3416	3416	3416
C	#Buy Back Cost of one (existing) Induction Fan	Rs.	200	200	200	200	200	200
D= (B-C)	Cost of Replacement of one (existing) Induction Fan with BEE 5 Star BLDC Fan	Rs.	3216	3216	3216	3216	3216	3216
E= 20 % X D	Subsidy / Incentive per BEE 5 Star BLDC fan by **each DISCOM** by of Allowance as DSM Expenditure in ARR	Rs.	643	643	643	643	643	643
F= 4 X(A X E) /10^7	Total Cost of Subsidy/Incentive for BEE 5 Star BLDC Fan in ARR of **all Four Discoms**	**Rs. Cr**	**2.57**	**15.44**	**15.44**	**15.44**	**15.44**	**64.32**
G	Numbers of BEE 5 Star Rated to be installed (replacing existing less than 5 Star rated AC) by **each DISCOM**	No's	1000	6000	6000	6000	6000	25000
H	Cost of installation of One BEE 5 Star AC by replacing existing less enegy efficient AC(incl. GST)	Rs.	49200	49200	49200	49200	49200	49200
I	#Buy Back Cost of one (existing) less than BEE 5 Star AC	Rs.	2500	2500	2500	2500	2500	2500
J=H-I	Cost of Replacement of one (existing) less than BEE 5 Star AC with BEE 5 Star AC	Rs.	46700	46700	46700	46700	46700	46700
K= 10% XJ	Subsidy/Incentive per BEE 5 Star Rated AC by **each DISCOM** by of Allowance as DSM Expenditure in ARR	Rs.	4670	4670	4670	4670	4670	4670
L= 4 x (G X K)/10^7	Total Cost of Subsidy/Incentive for BEE 5 Star AC in ARR of **all Four Discoms**	**Rs. Cr**	**1.87**	**11.21**	**11.21**	**11.21**	**11.21**	**46.70**
M= F + L	Total Subsidy/Inecentive Cost towards BEE 5 Star BLDC Fan and BEE 5 Star AC in ARR of **all Four DISCOM**	Rs. Cr	**4.4**	**26.6**	**26.6**	**26.6**	**26.6**	**111**
N	*Expenditure towards Information, Education and Communication (IEC) expenses and other expenses for Implementation of the Scheme as DSM Expenditure in ARR	**Rs. Cr**	**3**	**3**	**3**	**3**	**3**	**15**
O= M+N	**Total 'DSM Expenditure' to be allowed in ARR of all Four DISCOMs**	**Rs. Cr**	**7**	**30**	**30**	**30**	**30**	**126**
P= O/4	**Total 'DSM Expenditure' to be allowed in ARR each DISCOM**	**Rs. Cr**	**1.9**	**7.4**	**7.4**	**7.4**	**7.4**	**31.5**

Present estimate,shall be detemined through Bidding Process

* Note: Estimated Amount , will be claimed as per Actuals

ANNEXURE-4

3.3.2. Inputs and Assumptions

Overarching growth drivers: The following growth drivers will have a significant bearing on the sales of new comfort cooling equipment, especially room air conditioners, in the following decades:

- Growth in per-capita income: Per IESS, per capita income is like to double between 2017 (INR 90,922) and 2027 (INR 178,634) (over the 2017 baseline) and then again double between 2027 and 2037 (INR 361,195) (over the 2027 baseline).
- Purchasing power of urban and rural population: There is a considerable gap in the per capita income or rural and urban population; the per capita income in 2011-12 was INR 1,01,313 and INR 40,772 respectively for urban and rural population[26]
- Rate of Urbanisation: Per IESS, India is presently 33% urbanised and will be 39% and 45% urbanised in 2027 and 2037, respectively.

Room Air conditioners: According to the manufacturing data of star labelled appliances published by BEE[27], three important trends have been observed:

- Since 2010, manufacturing of room air conditioners has grown at a CAGR of 13%.
- There has been a sharp rise in the adoption of inverter room air conditioners since 2015 alongside a significant decline in the uptake of fixed-speed room air conditioners. Considering the trends in the uptake of fixed-speed and inverter room air conditioners observed in the past few years, it is anticipated that the share of fixed-speed room air conditioners in the future room air conditioners stock will decline rapidly.
- Growth in room air conditioner manufacturing tends to show a sharp rise every alternate year followed by almost constant or very small rise in subsequent year. Room air conditioner production peaked in 2012-13, 2014-15 and 2016-17 showing around 20-30% growth over the preceding year; the alternate years saw only 1-7% growth.

The current and future room air conditioner stock were estimated using BEE data described above along with the following underlying assumptions:

- BEE data can be used as a proxy for room air conditioner sales
- Room air conditioner life = 10 years[28]
- Room air conditioner sales will grow at a CAGR of 11% in the next 10 years and 8% in the following 10 years in a low growth scenario; and at a CAGR of 15% in the next 10 years and 12% in the following 10 years in a high growth scenario.
- A non-trivial share of room air conditioners is used in commercial spaces; it is possible that such commercial spaces and apartment complexes might transition to central air-conditioning, which might have a bearing on the room air conditioner stock – however, this has not been incorporated in this analysis.

Per a recent AEEE survey of approximately 1000 households using air conditioning, room air conditioner of 1.5 TR is the most popular consumer choice, 61% of the data-set. Previous studies by LBNL[29] and CEEW[30] also mention similar value for a typical room air conditioner. The average consumer preference for different star-rated fixed-speed and inverter room air conditioner is skewed towards 3 stars. Per inputs from room air conditioner manufacturers, responses from room air conditioner distributors and retailers, the point of deployment of room air conditioner is shifting towards the residential sector – from a share of 60-70% currently to 80-90% in 2037-38. There will be variations in room air conditioner usage depending on the climate and type of use.

BEE revises the efficiency level of room air conditioner every 3 years. If these revisions in room air conditioner efficiency level is annualised, a steady growth of 3% p.a. in room air conditioner efficiency levels (previously EER, now ISEER) can be observed.

Annexure-5: Computation of Saving in Power Purchase

Sr No	Dsecription	UoM	TPCODL	TPSODL	TPWODL	TPNODL	Total	Remark /Refrence
A	BLDC Fans	Nos.	250,000	250,000	250,000	250,000	1,000,000	Table-4
B	Savings in Energy Consumption	Units/Fan	257	257	257	257	257	Table-1
C=A*B/1E^6	**Total Savings in Energy Consumption**	**MUS**	**64.33**	**64.33**	**64.33**	**64.33**	**257.33**	
D	**Average Electricity Cost (Assuming Marginal Units are Saved)**	**Rs./ Unit**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	
E=C/10*D	**Total Savings at Consumer end**	**Rs. Cr.**	**35.38**	**35.38**	**35.38**	**35.38**	**141.53**	
F	**5 Star ACs**	Nos.	25,000	25,000	25,000	25,000	100,000	Table-4
G	Savings in Energy Consumption	Units/AC	1680	1680	1680	1680	1,680	Table-2
H=F*G/1E^6	**Total Savings in Energy Consumption**	**MUs**	**42.00**	**42.00**	**42.00**	**42.00**	**168.00**	
I=D	**Average Electricity Cost (Assuming Marginal Units are Saved)**	**Rs./ Unit**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	
J=H*I	**Total Savings at Consumer end**	**Rs. Cr.**	**23.10**	**23.10**	**23.10**	**23.10**	**92.40**	
K=C+H	**Total Savings in Energy Consumption**	**MUs**	106.33	106.33	106.33	106.33	425.33	
L=E+J	**Total Savings at Consumer end**	**Rs. Cr.**	**58.48**	**58.48**	**58.48**	**58.48**	**233.93**	
M	**T&D Losses (FY 23-24)**	**%**	21.21%	25.00%	18.08%	16.25%		Approved in FY-24 Tariff Order
N=K/(1-M)	**Marginal Power Purchase Saving**	**MUs**	**134.96**	**141.78**	**129.80**	**126.96**	**533.49**	
O	**Average Power Purchase cost for GRIDCO**	Rs./ Unit	3.1034	3.1034	3.1034	3.1034	3.1034	As Appoved for FY-24
P=N/10*O	**Savings in Power Purchase Cost for GRIDCO**	**Rs.Cr**	**41.88**	**44.00**	**40.28**	**39.40**	**165.56**	

Annexure-6 : Year wise Reduction in CO2 emission

Particular	*Saving in Electrical Energy in (MU)						#Reduction in CO 2 emmission (Ton) due to saving in electrical Energy Consumption					
	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	For each year beyond FY 2027-28	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	For each year beyond FY 2027-28
40,000 BLDC Fans installed in FY-24 (replacing existing Induction Fans)	1.3	10.293	10.293	10.293	10.293	10.293	1055.0325	8440.26	8440.26	8440.26	8440.26	8440.26
2,40,000 BLDC Fans installed in FY-25 (replacing existing Induction Fans)		30.879	61.758	61.758	61.758	61.758	0	25320.78	50641.56	50641.56	50641.56	50641.56
2,40,000 BLDC Fans installed in FY-26 (replacing existing Induction Fans)			30.879	61.758	61.758	61.758	0	0	25320.78	50641.56	50641.56	50641.56
2,40,000 BLDC Fans installed in FY-27(replacing existing Induction Fans)				30.879	61.758	61.758	0	0	0	25320.78	50641.56	50641.56
2,40,000 BLDC Fans installed in FY-28 (replacing existing Induction Fans)					30.879	61.758	0	0	0	0	25320.78	50641.56
Sub Total (A)	**1.3**	**41.2**	**102.9**	**164.7**	**226.4**	**257.3**	**1055.0325**	**33761.04**	**84402.6**	**135044.16**	**185685.72**	**211006.5**
4000 BEE 5 Star AC installed in FY-24 (replacing existing less than BEE 5 Star AC)	0.84	6.72	6.72	6.72	6.72	6.72	688.8	5510.4	5510.4	5510.4	5510.4	5510.4
24000 BEE 5 Star AC installed in FY-25(replacing existing less than BEE 5 Star AC)		20.16	40.32	40.32	40.32	40.32	0	16531.2	33062.4	33062.4	33062.4	33062.4
24000 BEE 5 Star AC installed in FY-26(replacing existing less than BEE 5 Star AC)			20.16	40.32	40.32	40.32	0	0	16531.2	33062.4	33062.4	33062.4
24000 BEE 5 Star AC installed in FY-27 (replacing existing less than BEE 5 Star AC)				20.16	40.32	40.32	0	0	0	16531.2	33062.4	33062.4
24000 BEE 5 Star AC installed in FY-28 (replacing existing less than BEE 5 Star AC)					20.16	40.32	0	0	0	0	16531.2	33062.4
Sub Total (B)	**0.84**	**26.88**	**67.2**	**107.52**	**147.84**	**168**	**688.8**	**22041.6**	**55104**	**88166.4**	**121228.8**	**137760**
Total (A+B)	**2.1**	**68.1**	**170.1**	**272.2**	**374.3**	**425**	**1743.8325**	**55802.64**	**139506.6**	**223210.56**	**306914.52**	**348766.5**

* Note: Basis of Computation: Average Annual Saving for BLDC Fan (257 Units), BEE 5 Star AC (1680 Unit)
For Year of Implementation ,the period of usage taken at midpoint (i.e. for FY-24 mid point of 3 months (0.125 Year) and for FY 25 onwards mid point of 12 Months (0.5 Year)

Conversion factor of 0.82 kg/kwh for CO2 taken based on 'Techno- Commercial proposal for Supply of EESL 5 Star (BLDC) Fans to Odisha Government' as submitted by EESL to GoO which is enclosed as Annexure-1