ಹುಬ್ಬಳ್ಳ ವಿದ್ಯುತ್ ಸರಬರಾಜು ಕಂಪನಿ ನಿಯಮಿತ

(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಂಪೂರ್ಣ ಸ್ವಾಮ್ಯಕ್ತೆ ಒಳಪಟ್ಟದೆ.)

ನಿರ್ದೇಶಕರು (ತಾಂತ್ರಿಕ)

iನೇ ಮಹಡಿ, ಕಾರ್ಫೋರೇಟ್ ಆಫೀಸ್, ನವನಗರ, ಪಿ.ಜ.ರೋಡ, ಹುಬ್ಬಳ್ಳ – 580 O25.

HUBLI ELECTRICITY SUPPLY COMPANY LTD

( Govt. of Karnataka undertaking) Director (Technical)

1st Floor, Corporate Office, Navanagar, P.B. Road, Hubballi-580025

Cell: +91 9480881001

E-mail ID: dt.hescom@gmail.com

Corporate Identity Number (CIN): U31401KA2002SGC030437

NO: HESCOM/EE-EMS/AEE-EA/2022-23/ CYS-2953. Dated:

2 0 1111 2022

To.

The Director,

Bureau of Energy Efficiency,

4th Floor, Sewa Bhawan, R.K. Puram.

New Delhi-110066

Respected Sir/Madam,

Sub: Submission of Annual Energy Audit Report of HESCOM for FY- 2020-21- reg

Ref: 1.The Gazette of India, New Delhi, Thursday, October 07.2021/ASVINA 15,

1943.

2. HESCOM Letter to BEE: HESCOM/EE-EMS/AEE-EA/2022-23/cvs-1942 dtd

17.06.2022.

\*\*\*\*\*\*\*\*

With Reference to the above subject, I am herewith submitting Annual Energy Audit Report of HESCOM for FY- 2020-21 carried out by Accredited Energy Auditor as per the clause 4.2(a) of manner and intervals for Conduct of Energy Audit in Electricity Distribution Companies Regulation, 2021 of The Gazette of India notification under ref.-1. HESCOM has already submitted Pro-forma for DISCOM Energy Accounting formats for the year 2020-21 to BEE on 17.06.2022 as per out letter under ref.-2. Hence this is for your kind informtion and needful.

Yours Sincerely,

HESCOM, Corporate Office,

Hubballi

## Copy to:

- 1. Under Secretary to GoK, Energy department, 2nd Floor, Vikasa Saudha, Bengaluru.
- 2. Additional Director, PCKL, Nodal Officer for Energy Audit, 5th Floor, Kaveri Bhavana, Bengaluru.
- Reliable Energy & Allied Services Opp Durgigudi Coop Society Park Extension Shimoga-577201
- 4. T.A to Managing Director ,HESCOM,Hubballi for Placing the information before Hon'ble Managing Director,HESCOM.
- 5. MF/OC

# **Annual Energy Audit Report (FY2020-21)**





# **HUBLI ELECTRICITY SUPPLY COMPANY LTD**

( Govt. of Karnataka undertaking)

Corporate Office, HESCOM, Navanagar, P.B Road, Hubli-580025

# Designated Consumer Conducted by

Reliable Energy & Allied Services Shivamogga.Karnataka-577201 9845705858/7353590989



8-7-21

Bureau of Energy Efficiency Ministry of Power, Government of India 4 th Floor, Sewa Bhawan R. K. Puram, New Delhi- 110066

Dear Sir,

Sub: Annual Energy Audit Report of Hubli Electricity Supply Company Ltd (HESCOM)-(20-21)

Please find herewith the Energy Audit Report of Hubli Electric Supply Company Limited (HESCOM) prepared as per the Bureau of Energy Efficiency regulations for Manner and Intervals for Conduct of Energy Audit in electricity distribution companies (vide Bureau of Energy Efficiency notification dated 6th October 2021). The Energy Audit Report is for the financial year 2020-2021.

Thanking You

Yours truly

Reliable Energy & allied Services Shivamogga.

MAHESH.S.KOTIAN B.TECH, GDMM
Accredited Energy Auditor (AEA-279)
BUREAU OF ENERGY EFFICIENCY(BEE)
Reliable Energy & Allied Services
Shimoga-577201. Mob: 9845705858

HESCOM CORPORATE OFFICE NAVANAGAR HUBLI

General Manager (Tech) Hescom, Hubli-25.



	TABLE OF CONTENTS	3
	ACKNOWLEDGEMENT	
5	STUDY TEAM	6
1.	EXECUTIVE SUMMARY	7
2	2. SUMMARY OF CRITICAL ANALYSIS OF ENERGY AUDITOR MANAGEMENT ANALYSIS	AND8
3.		
	EXTENT REGULATIONS AND ROLE OF BEE	11
	PURPOSE OF AUDIT AND ACCOUNTING REPORT	13
	PERIOD OF ENERGY AUDITING AND ACCOUNTING	13
4.	INTRODUCTION OF DISCOM	14
	NAME AND ADDRESS OF DESIGNATED CONSUMER	14
	NAME AND DETAILS OF ENERGY MANAGER AND AUTHORISED SIGNATORY OF DC	
	SUMMARY PROFILE OF DC	
	ASSETS	
	ENERGY FLOW	
	CONSUMER BASE	
	SALIENT FEATURES	17
	KEY PROJECTS	
5.		
	(i)ENERGY ACCOUNTS FOR PREVIOUS YEARS	
	(ii)ENERGY ACCOUNTS AND PERFORMANCE	20
	(iii)Division-WISE PERFORMANCE	
	(IV)ENERGY CONSERVATION MEASURES ALREADY TAKEN AND PROFOR FUTURE	OPOSED
	(V)CRITICAL ANALYSIS BY ENERGY AUDITOR	25
(V	/I) STRENGTH AND WEAKNESS	27
VI	II) AREAS REQUIRING IMPROVEMENT UNDER O&M	28
(VI	III) RECOMMENDATION FOR IMPRVEMENT W.R.T. REGULATION NO 9	32
IX	C)LIST OF DIVISIONS VISITED	33
	)LIST OF DOCUMENT S VERIFIED	
6	5. NOTES OF THE EA/EM ALONG WITH QUERIES AND REPI	LIES TO



# Annual Energy Audit Report of HESCOM, HUBBALLI

7. ANNEXURES	36
INTRODUCTION OF VERIFICATION FIRM	36
MINUTES OF MEETING WITH THE DISCOM TEAM	37
CHECK LIST PREPARED BY AUDITING FIRM	41
BRIEF APPROACH, SCOPE & METHODOLOGY FOR AUDIT.	43
INFRASTRUCTURE DETAILS	44
ELECTRICAL DISTRIBUTION SYSTEM	
POWER PURCHASE DETAILS	46
CATEGORY WISE SUBSIDY	47
SINGLE LINE DIAGRAM (SLD	48-57
LIST OF DOCUMENTS VERIFIED WITH EACH PARAMETER	59-69



## **ACKNOWLEDGEMENT**

Reliable Energy & Allied Services (REAS) places on records its deep gratitude to the progressive management of Hubli Electric Supply Company Limited (HESCOM) Karnataka for entrusting the task of carrying out Annual Energy Audit for FY 2020-21 as per the BEE Regulations. REAS wishes to thank the following officials for their kind support extended during Annual Energy Audit for FY 2020-21

- Mr Jagadisha Belagali GM(Tech)
- Mr Girish V Executive Engineer( Energy Management Section)
- Mr Hemant Ghodke AEE( Energy Audit)
- Mr Prasad Ghatikar AEE Energy Manager

Also , We gratefully acknowledge and thank EE/AEE/AE 's of Subdivisions and Substations for their cooperation during our site visits.

We are privileged to submit this Annual Audit report to management of HESCOM wish them all success in implementation of schemes as per BEE regulations

Audit Team -Reliable Energy & Allied Services



# STUDY TEAM

## **HESCOM**

SI	Name	Designation	Dept	Contact no
1	Girish V	Exec Engineer	EMS	9448065280
2	Prasad Ghatikar	AEE	TA&QC	8073008739
3	Hemant Ghodke	AEE	EMS-Energy Audit	9480883814

# **Reliable Energy & Allied Services**

SI	Name	Qualification	AEA/E A Registrat ion No.	Experience	Sector
Tea	am Leader/Head				
1	Mahesh S Kotian@ Mahesh Kumar	B.Tech( Elec) GDMM Accredited Energy Auditor	AEA 279	TOTAL 37 YRS ELECTRICAL( 16 YRS ENERGY MGMT & AUDIT)	PAPER,CEMENT,DISCOM,B UILDING,IRON & STEEL, Textile MSME
Sec	ctor Expert				
2	Gopala Krishna Borkar	B.Tech( Elec)	-	35 yrs DISCOM	Rtd -SE -BESCOM
Ce	rtified Energy Auditor				
3	NAGENDRA U	BE ( Mech)	CEA	25 yrs	Chartered Engineer /Valuer/Consultant
Te	am Members				
4	Smitha S	BE ( E&C		5years	Electrical Safety Audits/Documentation
5	Jayprakash S	B.Tech( Elec)		32 yrs	Electrical & Instrumentation -Iron & Steel

### 1 Executive Summary:

**Hubli Electricity Supply Company Limited** was incorporated on 30th April 2002 under the Companies Act, 1956 and commenced its Operations with effect from 1st June 2002. HESCOM is responsible for power distribution in seven districts of Karnataka .Namely Dharwad, Belagavi Gadag Haveri Bagalkote, Vijayapur, Uttara Kannada. HESCOM covers an area of 54513 Sq. Kms. with a population of over 54.58 lakhs. The company has 7 Circles, 26 Divisions, 83 Sub-divisions and 334 Section Offices

Reliable Energy & Allied Services was awarded the job of carrying out an annual energy audit for the financial year 2020-2021 and submit the annual energy audit report of Hubli Electricity Supply Company Limited (HESCOM) to the Bureau of Energy Efficiency and respective State Designated Agency as per the provisions and mandate of Gazette on Energy Accounting and Audit of Distribution Company of Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India. Audit team has conducted energy accounting audit of the Designated Consumer (DC) during 19<sup>th</sup> May – 17<sup>th</sup> June 2022.

The study comprises of preliminary data collection, performance assessment of various parameters. This report is based on verification of documents in corporate offices as well as in subdivisions and data shared by officials.

It comprises of following.

- Present Status of metering infrastructure and prerequisites
- Critical analysis of data provided
- Site visit observations
- Recommendation for improvement.

The proposals recommended for improvement is expected to reduce the Distribution Losses by 1% with negligible investment .Apart from this ,it is going to reduce the down time of the distribution of power drastically.

One percent saving in distribution loss is going to save Rs 60 crores.

## 2 Summary of critical Analysis by Energy Auditor

- Company has full pledged internal energy Audit department, and based on our checks the audit done is adequate.
- Company has appropriate internal control system with regards to collection of data from various sub divisions.
- Division wise Energy audit of HESCOM is being conducted for all the 26 divisions every month to calculate distribution loss.
- Energy audit of 73 major cities/towns are also being conducted every month. Energy
  Audit of 11KV feeder level is also monitored. As on 31.03.2021 there are about 3530
  feeders in HESCOM distribution system.
- All 574 interface points between KPTCL and HESCOM are metered and the energy received at all these points are measured and recorded.
- There is no leakage, theft as such and raids are conducted regularly to detect theft.
- Google sheets are used for energy balancing by subdivisions is adequate till energy accounting software is installed.
- There is procedure for update reconciliation of errors in reporting of meter readings.
- Regular calibration of HT and LT meters are done to keep them in good condition
- The T & D Loss is high compared to BESCOM (in reference to BESCOM Energy Audit Report), because of extent of area, and consumers are spread across vast area.
- Input energy at injection points or manual recordings & not communicative. All meters are functional.

# STATUS OF METERING INFRASTRUCTURE FOR ENERGY ACCOUNTING AND AUDITING-Regulation 5: Pre-requisites for annual energyaudit and periodicenergy accounting

no	Sub regulation	Compliance by HESCOM
a	Identification and mapping of all of the electrical network assets	In RAPDRP Areas 29 towns and in IPDS (Integrated Power Distribution Scheme) 44towns has been covered.
b	Identification and mapping of high tension and low- tension consumers	All the HT and LT consumers have been mapped.
e	Development and implementation of information technology enabled energy accounting and audit system, including associated software	HESCOM has energy accounting and audit system including associated software. HESCOM uses Infosys Software (for RAPDRP) and Nsoft Software (For Non RAPDRP).
d	Electricity distribution company ensures the installation of functional meters for all consumers, transformers and feeders. Meter installation is done in a phased manner within a period of three financial years from the date of the commencement of these regulations in accordance with the trajectory set out in the First Schedule	All feeders up to 11kV have been metered. All consumers have been metered except consumers under agriculture  As of 31st May 2022 of the total 2,52,549 distribution transformers, 65,998 numbers have been metered. Of the balance 1,86,551 nos. of unmetered distribution transformers 16,890 nos. are to be metered, the balance distribution transformers of 1,69,661 are on the exclusive irrigation pump set feeder (segregated Agriculture feeders under Nirnthara Jyothi project) and single water supply installations with exclusive DTCs.
c	All distribution transformers (other than high voltage distribution system up to 25kVA and other distribution system below 25 kVA) is metered with communicable meters.  And existing non communicable distribution transformer meters is replaced with communicable meters and integrated with advanced metering infrastructure.	It is proposed to provide Smart meter for 85000 nos of DTRs excluding Exclusive IP set DTRs under RDSS.

Noted and will be taken care of s Electricity distribution company has established an per the time line stipulated. information technology enabled system to create energy accounting reports without any manual interference and such systems may be within a period of three years from the date of the commencement of these regulations in case of urban and priority area consumers; and within five years from the date of the commencement of these regulations in case of rural consumers The HESCOM has energy audit Electricity distribution company has a centralized department with the following energy accounting and audit cell comprising of-(i) a nodal officer, an energy manager and an staff nodal officerinformation technology manager, having 1. Director (Tech) professional experience of not less than five years; and (ii) a financial manager having professional 2. Designated energy manager who is a qualified Energy experience of not less than five years Manager-AEE 3. A qualified information technology manager- SEE-IT 4. A qualified financial manager-

### A. Timeline for Metering-

- 1) 100%CommunicableFeederMeteringintegrated with AMI, by 31st December 2022 alongwith replacement of existing noncommunicablefeedermeters.
- ii) All Distribution Transformers(other thanHVDS DT up to 25kVA and other DTs below 25kVA)shallbemeteredwithcommunicablemeters.C ommunicableDTMeteringforthefollowingareas/ consumers to be completed by

December 2023 and in balance are as by December 2025

- All Electricity Divisions of 500 AMRUTcities, with AT&CLosses>15%
- AllUnionTerritories(forareaswithtechnical difficulty, non-communicable meters maybe installed)
- AllIndustrialandCommercialconsumers
- All Government offices at Block level andabove.
- Other high loss areas i.e. rural areas withlosses more than 25% and urban areas with lossesmorethan15%

 i)100%ofthefeedersarehavingDLMS(De viceLanguageMessageSpecification-CommunicableMeters).

Controller of Accounts

 It is proposed to provide Smart meter for 85000 nos of DTRs excluding Exclusive IP set DTRs under RDSS.

directly connecte December 2023 in areas:  All Electricity AT&C Los  AllUnionTerm meterstobeins  AllIndustrials  All Governm  Other high lo	y Divisions of 500 AMRUTcities, with sees >15%;	<ul> <li>In RDSS following Smart Consumer Metering is proposed;</li> <li>Domestic-12,13, 500 nos.</li> <li>Commercial - 2,48,000 nos.</li> <li>Industrial -44,000 nos.</li> <li>Government - 1,08,000 nos.</li> <li>Others (Temprary) - 24,000 nos.</li> <li>HT Installations - 2500 nos.</li> <li>Total -16,26,500 nos.</li> </ul>
98% 1	nsumer Metering: by FY 2022-23 yFY2023-24	Will be taken up under RDSS
v). <b>Tar</b> FY22- 98.5% 95%	gets for functional meters—Meter 23 FY23-24 FY24-25 Feeder metering	Will be taken up under RDSS

# 3 Background-

# i) Extant Regulations and role of BEE

The extant regulations relevant or reproduced as under:

Applicable Regulation No	Key points	Status of compliance	Remarks
Regulation – 3	Intervals of time for conduct of annual energy audit :-	In compliance	
Regulation – 4	Intervals of time for conduct of periodic energy accounting:-	In compliance	
Regulation – 5	Pre-requisites for annual energy audit and periodic energy accounting		
a)	the identification and mapping of all of the electrical network assets	Partially done	
b)	identification and mapping of high tension and low- tension consumers;	In compliance	
С	the development and implementation of information technology enabled energy accounting and audit system, including associated software	Partially done	
d)	installation of functional meters for allconsumers, transformers and feeders:	Available in all places except few Transformers and agriculture consumers	
е)	All DTs shall be metered with communicable meters	Will be done according to trajectory	Meters exist but at present not used for communication
f)	information technology enabled system to create energy accounting reports without any manual	Will be done according to trajectory	

	interference		
	centralized energy accounting and auditcell with Nodal officer & finance manager	In compliance	
Regulation no6	1)Reporting requirements for annual energy audit and periodic energy accounting—		
2	energy accounting data is generated from a metering system	Manual recording at present. Will be done according to trajectory	
3	software shall be developed to create monthly, quarterly and yearly energy accounting reports	Will be In compliance in due course	
4	ensures minimal manual intervention in creating the energy accounting reports	Will be done according to trajectory	
Regulation 7	Manner of annual energy audit and periodic energy accounting		
1)	verification of existing pattern of energy distribution across periphery	In compliance	Verified by AEA TEAM
b)	verification of accounted energy flow at all voltage levels	In compliance	Verified by AEA TEAM
2	The accredited energy auditor, in consultation with the nodal a) develop Scope of work b) Agree on best practice c) Collect data	In compliance	In compliance by AEA TEAM
3	The accredited energy auditor shall a)verify accuracy of data b)analyse and process data	In compliance	

Regulation 8	Prioritization& action plan		
ı	Data collection& verification of monthly consumption,Input energy details,boundary meter details,source of energy,review of consumption	In compliance	
11	Data verification, Validation & Correction- Verify & validate system metering through random field visits	In compliance	Field Visits done by AEA team. Have not come across any correction.
Regulation 9	Structure of Annual audit report		
1	As per Second schedule	In compliance	
2	Each category of consumers & rate of subsidy	In compliance	
3a	Input energy & Consumption pattern	In compliance	
b	Leakage, Wastage, Inefficient use	AEA Observations will be In compliance in due course	Observations on inefficient use made by AEA
С	High loss making areas & networks	In compliance	No such areas found
d	Overloaded segments	In compliance	No such areas found
4	Strength & Weakness	In compliance	Observations made by AEA team and listed out
Regulation 10	Report of Bureau	-	

## ii) Purpose of audit and accounting Report

The Audit is an attempt to focus attention on the need for eliminating the flaws in the system. The audit highlights the need for greater emphasis on the measuring and monitoring the distribution of power to consumers and efficient use of power

To analyze the loss calculation methodology, identify some of the causes for the losses, and estimate the proportion of technical and commercial losses in the recorded AT & C losses.

## iii) Period of Energy Auditing and accounting

Quarterly audit report have been submitted by EM of the company & Annual to be submitted by AEA after audit.

#### 4.INTRODUCTION OF DISCOM

#### HUBLI ELECTRICITY SUPPLY COMPANY LIMITED

Established in 2002 is a state owned PSU having corporate office in PB Road, Navanagar, Hubli-580025.

Nodal Officer Name	Jagadeesha. L Belagali
(Designated at DISCOM's)	Director (Technical)
Energy manager	Prasad Mohanrao Ghatikar.
(Designated at DISCOM's)	Asst Exec Engineer(Ele) EA 21489

#### SUMMARY PROFILE OF DC

HESCOM is an independent supply company and had started their business from 01.06.2002. HESCOM came into existence in Seven districts including Dharwad, Haveri, Uttarakannada, Belagavi, Gadag, Vijayapur and Bagalkot. HESCOM comprises of two O & M Zones one each at Hubli and Belagavi headed by Chief Engineer (Ele), Seven number of O & M Circles one each at Hubli, Haveri, Sirsi, Belagavi, Chikkodi, Bagalkot and Vijayapur headed by Superintending Engineer (Ele.), 26 Nos of - O & M Divisions and 83 Nos of - O & M Sub-Divisions and 334 Nos of O&M Sections.

ESCOMS were created as separate independent entities, with special responsibilities for reform and restructuring of programs. This is a net contributor to the state's economy. All the above companies are fully independent government companies operating under the company specification. State Government and Regulatory Authority the Licenses and Orders issued by the Commission are in operation.

### **HESCOM strategies:**

- · Enhancement of Revenue Generation.
- Strengthening and Refurbishing Distribution Network to reduce Losses and Cost of Operation.
- Enhancing Employee Productivity.
- Providing best services to its Consumers.
- Energy Audit at 33 KV / 11 KV DTC level to bring down avoidable Losses.
- Enhancement of Vigilance Activities to reduce Power Theft and pilferage.

### HESCOM's VISION:

- The Company has set the following as its Vision and is committed to work in that direction:
- 100% Rural Electrification.
- Reduce T&D Losses gradually to below 15%.

- 100% Metering at all levels right from feeder end to consumer installations.
- Elimination of Low Voltage Pockets by reorganizing the existing feeders consequent to establishment of new Sub-stations by HESCOM and KPTCL.
- · Reduction in interruption.
- Power Supply on Demand.
- Eliminate Commercial Losses by increased Vigilance Activities.
- Application of Information Technology in more and more Activities.
- Increasing Business Efficiency by reducing AT & C Losses.

## a) ASSETS

Number of circles	7
Number of divisions	26
Number of sub-divisions	83
Number of feeders	3530
Number of DTs	233782
HT line length	90363.63 ckt kms
LT line length	139279.67 ckt kms
Total assets	Rs. 12691.95 Crs

## b) ENERGY FLOW

S.No	Parameter	Value
A.1	Input Energy purchased (MU)	13663.3
A.2	Transmission loss (%)	3%
A.3	Transmission loss (MU)	409.899
A.4	Energy sold outside the periphery(MU)	662.48
A.5	Open access sale (MU)	335.24
A.6	EHT sale	600.798
A.7	Net input energy (received at DISCOM periphery or at distribution point)-(MU)	12650.23
	Total metered sales	5,072.75
	Total un-metered sales	5,901.60
	Total sales	10,974.35
	Distribution losses	1,675.88

# c)CONSUMER BASE

	2020-21		
Category	Installations inNos.	%	
LT1 BJ/KJ	7,59,409	13.89	
LT2 Domestic	29,55,780	54.06	
LT3 Commercial	4,10,957	7.52	
LT4 IP sets	9,76,148	17.85	
LT5 Industrial	1,25,803	2.30	
LT6 W/S & P/L	78,364	1.43	
LT7 Temporary	1,57,530	2.88	
нт	3,971	0.07	
Total	54,67,962	100.00	

S.N o	Type of Consumers	Category of Consumers (EHT/HT/LT/Othe rs)	Voltag e Level	No of Consumers	Total Consumption (In MU)
1	Domestic	LT	240	3715189	1922.849983
2	Commercial	LT	240	410957	462.5121732
3	IP Sets	LT	415	976148	5954.303997
4	Hor. & Nur. & Coffee/Tea & Rubber (Metered)	LT	415	- FERRE	
5	Hor. & Nur. & Coffee/Tea & Rubber (Flat)				
6	Heating and Motive Power			125803	311.1049467
7	Water Supply	LT	LT	52049	335.624314
8	Public Lighting	LT	LT	26315	152.2039145
9	HT Water Supply	HT	11K V	418	331.9876966
10	HT Industrial	HT	11K V	2026	945.4254109
11	Industrial (Small)	LT	LT	so clars)	
12	Industrial (Medium)	THE STATE OF THE STATE OF		EVI HEAD	
13	HT Commercial	HT	11K V	712	101.7087279

	Total			5467962	10974.35
19	Others-1 (if any , specify in remarks)	НТ	11 KV	157614	58.66636773
18	Government offices and department	21.03			
17	Mixed Load	ST. NOT			But I
16	HT Res. Apartments Applicable to all areas	НТ	11 KV	32	16.715295
15	Lift Irrigation Schemes/Lift Irrigation Societies	HT	11 KV	326	321.5767225
14	Applicable to Government Hospitals & Hospitals	НТ	11 KV	373	59.67026428

## d) SALIENT FEATURES

**Power supply position:** HESCOM supplies 24x7 power supply to all category of consumers. (Except for Agricutural Consumers as per GOK guidelines). The highlights of performance of the Company for the financial year 2020-21 is given below:

Sr. No.	Particulars	Unit	Value in FY 2020-2021
1	Peak demand of a day	Mega Watts	2872
2	Maximum consumption of a day	Million Units	55 MU
3	Annual Energy Input during the year	Million Units	12650.23
4	Metered sales during the year	Million Units	5,072.75
5	Agriculture consumption during the year (Metered -Million Units, Unmetered-Million Units)	Million Units	5,901.60
6	Energy losses during the year	Million Units	1,675.88

7	Percentage of Energy losses (Incl. EHT Sales)	%	13.25
8	EHT Sales	Million Units	600.798
9	Percentage of Energy losses (Excl. EHT Sales)	%	13.91

### e) KEY PROJECTS

#### NIRANTHARA JYOTHI SCHEME:

Nirantara Jyothi Yojane is a prestigious project of Govt. of Karnataka and is being implemented in HESCOM with intension to bifurcate feeders into Agricultural loads and non-Agricultural loads to provide 24 Hrs quality power supply to rural Non-Agricultural loads and to provide quality power supply to IP set consumers during a specified period based on the availability of power.

- 24/7 power supply to non-agricultural loads in rural areas.
- · Better quality and reliable power.
- · Reduction in transformer failure.
- Reduction in technical losses.
- · Increase in consumption of metered category.
- · Assessment of agricultural energy consumption.
- · Improvement in rural economy.

### Project features:

- · Project implemented in three phases.
- · Number of feeders completed 534
- Year of completion FY2019-2020.
- Project cost 578 Crores.

## INTEGRATED POWER DEVELOPMENT SCHEME (IDPS):

Government of India, Ministry of Power has sanctioned the IDPS for implementation of the scheme for strengthening of Distribution Network in Urban areas in the interest of supplying good quality power to consumers of urban area. The objectives are:

- · Providing reliable and quality power supply in an efficient manner in urban areas.
- Efficient management of distribution sector with adequate metering arrangements inurban areas.
- AT&C loss reduction as per trajectory finalized by MoP.

### Project features:

The project was executed with an estimated cost of Rs 457.16 Crores in 44 towns and was completed in the FY2020-2021. The key achievements are summarized in the table below:

# IPDS IT Phase-II: Different packages Scope of Work:

SI. No	Packages	Scope of work	Awarded firm	Award Date	Contract Period
	DC-DRC Hardware and Software refresh across all ESCOMs of Karnataka	Data Centre (DC): Hardware and Software refresh     Disaster Recovery Centre(DRC)     Facility Management Services(FMS): FMS for DC and DRC for 5 years after completion of implementation     Annual Maintenance Cost (AMC) & Annual Technical Support (ATS)     AMC for hardware infrastructure and ATS for software products for 5 years after the expiry of the warranty/support of 3 years from the date of installation	M/s. Infinite computer solutions. NCR	26.03.2020	24 months from the issue of DWA
2	IPDS towns - GIS survey	Procurement of satellite     Imageryfor base map creation     GPS Based survey & Asset     Mapping	M/s. Cyberswift Infotech Pvt. Ltd Kolkata	26.03.2020	18 months from the issue of DWA
		Consumer Indexing data integration     Asset ID painting     Incremental data capture andupdation till Go-live			
3	IPDS towns - Fixing of Modems	<ul> <li>Supply &amp; installation of Modemsfor DT, HT, Boundary and Feeders</li> <li>Enabling AMR</li> </ul>	M/s Analogics Pvt. Ltd.	30.03.2020	9 Months from the date of intimation to the firm by BESCOM
4	IPDS Town - IT Infrastructure	<ul> <li>Supply &amp; installation of Computers, Printers, SBD, Bar code reader, IP Phones, Switches etc.,</li> <li>Supply of Workstations</li> </ul>	M/s Idea Infinity Pvt. Ltd.	10.09.2020	6 Months from the date of intimation to the firm by BESCOM

## 5 DISCUSSION AND ANALYSIS

# i) ENERGY ACCOUNTS FOR PREVIOUS YEARS19-20 (base line year)

S.No	Parameters	(2019-20)
A.1	Input Energy purchased (MU)	14751.61
A.2	Transmission loss (%)	3.16%
A.3	Transmission loss (MU)	466.45
A.4	Energy sold outside the periphery(MU)	56.12
A.5	Open access sale (MU)	207.45
A.6	EHT sale	669.83
A.7	Net input energy (received at DISCOM periphery or at distribution point, after adjustment)-(MU)	12832.13

The Transmission & distribution losses and aggregate technical & commercial (AT&C) losses for FY 2019-2020are estimated as below.

	T&		
Losses	T&D loss (MU)	T&D loss (%)	AT & C loss
	1808.79	14.10%	17.06

# ii)ENERGY ACCOUNTS AND PERFORMANCE in the current year 2020-21

## a. ENERGY Accounts performance

S.No	Parameter	Value
A.1	Input Energy purchased (MU)	13663.3
A.2	Transmission loss (%)	3%
A.3	Transmission loss (MU)	409.899
A.4	Energy sold outside the periphery(MU)	662.48
A.5	Open access sale (MU)	335.24
A.6	EHT sale	600.798
A.7	Net input energy (received at DISCOM periphery or at distribution point)-(MU)	12650.23

## b) % Losses Aggregate

The Transmission & distribution losses and aggregate technical & commercial (AT&C) losses for FY 2020-2021are estimated as below.

	L	AT & C loss (%)	
Losses	T&D loss (MU)	T&D loss (%)	
	1675.88	13.25	13.99

# c) % Losses Category wise & voltage wise

S.N o	Type of Consumers	Category of Consumers (EHT/HT/LT/Oth ers)	Voltage Level	No of Consum ers	Total Consum ption (In MU)	DISTBN Loss @12.18% Avr in MU
1	Domestic	LT	240	3715189	1922.85	234.20
2	Commercial	LT ·	240	410957	462.5122	56.33
3	IP Sets	LT	415	976148	5954.304	725.23
4	Hor. & Nur. & Coffee/Tea & Rubber (Metered)	LT	415			0.00 0.00 0.00
5	Hor. & Nur. & Coffee/Tea & Rubber (Flat)	Mark State of the	HPS -7	1400		0
6	Heating and Motive Power			125803	311.1049	37.89
7	Water Supply	LT	LT	52049	335.6243	40.88
8	Public Lighting	LT	LT	26315	152.2039	18.54
9	HT Water Supply	HT	11KV	418	331.9877	40.44
10	HT Industrial	HT	11KV	2026	945.4254	115.15
11	Industrial (Small)	LT	LT	19/1-19		
12	Industrial (Medium)		19-5-5		ST TEST	
13	HT Commercial	HT	11KV	712	101.7087	12.39
14	Applicable to Government Hospitals & Hospitals	HT	11 KV	373	59.67026	7.27
15	Lift Irrigation Schemes/Lift Irrigation Societies	HT	11 KV	326	321.5767	39.17
16	HT Res. Apartments Applicable to all areas	HT	11 KV	32	16.7153	2.04
17	Mixed Load	4 - 1			THE E	
18	Government offices and				The first tra	

	Tot	al	1971 - 3 7 7 7	5467962	10974.35	1336.68
19	Others-1 (if any , specify in remarks)	HT	11 KV	157614	58.66637	7.15
	department			- www.o.bare		

## d) DIVISION-WISE PERFORMANCE:

## ANALYSIS ON T&D LOSSES AND AT&C LOSSES

- % Losses Aggerate- The overall Technical Loss (T&D Loss) is 13.25 %and overall AT&C Loss is 13.99% for FY 2020-2021. This reflects an overall collection efficiency of 100.32%.
- % Losses Voltage Wise- HESCOM has distribution to Residential, Industrial
  ,commercial consumers in 11 kV/415V and loss calculation is done only at 11
  kV. The average distribution loss is 12.18 % and overall AT&C Loss is 13.12%
  for FY 2020-2021. Loss calculation at Higher voltage levels is not done at
  present as it comes under the preview of KPTCL
- Division wise% Losses summary The range of T&D losses, collection efficiency and AT&C losses among the divisions is tabulated below:

T&D loss (M U)	T& D loss (%) Av	T& D loss Ran ge	Divis ion With high est T& D loss	Div is ion Wit h low est T& D loss	Collection Efficiency	Collection Efficiency Range	AT & Closs (%) AV	AT & C loss Range	Divisio n With highest AT&C loss	Division Withlowe st AT &C loss
1675	13.25%	4.34 %- 17.8	Mudhol	Dandeli	100.32	97 % - 116 %	13.12%	3.69 % - 19.67 6%	Mudhol	Dandeli

e)Division Wise Loss

SI no	Division	T& D	AT& C	
1	Hubli Urban	9.66	4.14	
2	Hubli Rural	12.42	17.38	
3	Dharwad Urban	10.02	4.39	
4	Dharwad Rural	13.84	15.79 14.77 14.34	
5	Gadag	12.06 15.29		
6	Ron			
7	Haveri	12.49	15.13	
8	Ranebennur	12.29	15.08	
9	Sirsi	10.24	10.43	
10	Dandeli	4.34	3.69	
11	Karwar	12.28	12.34	
12	Honnavar	8.76	8.15	
13	Belgum Urban	11.13	14.2	
14	Belgum Rural	12,47	13.42 16.27	
15	Bailhongal	13.73		
16	Ramdurga	13.81	14.22	
17	Ghataprabha	13.51	14.29	
18	Chikkodi	12.54	13.64	
19	Athani	14.68	17.04	
20	Raibag	13.85	14.1	
21	Bagalakot	15.99	16.2	
22	Jamakandi	13.97	10.5	
23	Mudhol	17.8	19.67	
24	Bijapura	10.98	11.54	
25	Indi	14.22	15.09	
26	Basavana Bagevadi	14.33	14.82	

Note: 1) FEEDER WISE LOSS IS SHOWN IN PROFORMA

2) DTC WISE LOSSES ARE CALCULATED FOR MOST OF THE METERED DTCS AT PRESENT .

5 (IV) ENERGY CONSERVATION MEASURES ALREADY TAKEN AND PROPOSED FOR FUTURE

### a)Hosa Belaku Yojane

Domestic Efficient Lighting Programme (DELP) scheme popularly known as Hosa Belaku scheme implemented in HESCOM through M/s EESL from 04-02-2016 the sales and Energy saveddetails as on August-2021is as below.

SI No	Particulars	Sold Quantity till August-2021	Energy Saving in MU till August -2021
1	LED Bulb	25,11,314	255.56
2	LED Tube lights	32,120	3.17
3	Energy Efficient Fans	6,825	0.75
	То	259.48	

### b) Ring Back Tune (RBT)

Utilizing communication modes for energy savings such as Ring Back Tune (RBT) for HESCOM CUG (Closed User Group) mobile numbers, started from 17.04.2019. The caller tune includes promotion of replacement of conventional bulbs by LED bulbs, Energy, Efficiency methods, toll free number 1912 promotions and Energy conservation messages.

## c)Capacity Building Program for HESCOM

Capacity Building of DISCOMs programme on Demand Side Management (DSM) and Energy Efficiency: MoU signed between BEE, KREDL and HESCOM dated 29th August 2018 regarding capacity building program for HESCOM. In this regard Bureau has engaged M/S Confederation of Indian Industry (CII) for HESCOM. CII has conducted Load Survey.

## d) Solar Rooftop Project:

The Solar Policy 2014-21 has been enacted by the Government of Karnataka for the generation of renewable energy solar power on 22.05.2014. The policy aims to generate 2400MW of Solar Power under the Solar Power Scheme by 2022 and the consumers of Domestic, Industrial, Commercial and Others are eligible to apply under the Net or Gross Metering System.

HESCOM implemented the Solar Policy within its jurisdiction. Customers can sell the electricity generated by the solar rooftop plant to the concerned ESCOM®s as per the tariff rate decided by Hon®ble KERC. Under Net Metering, Solar Power generated has to be consumed for self and excess power can be sold and under the

Gross Metering all the Solar Power generated can be sold. Under this policy, within 7.2yrs with 1678 numbers of independent Solar Rooftop Power Plant, 42.795MW of Solar capacity has been added to the HESCOM®s Grid.

## e)Solar Rooftop Phase-II:

Solar Subsidy Scheme of MNRE for Solar Roof top Plants on Net Metering Base for Residential Consumers (up to 10 kW) and Group Housing Societies (GHS)/ Residential Welfare Association (RWA) (up to 500 kW-10KW per house).

HESCOM has got 20MW allocation from Ministry of New and Renewable Energy, Gol on dated 27.01.2020.

## f) Electric Vehicle Charging Stations:

- 46 locations in smart city Hubli-Dharwad (34-Private, 12-Government Locations). Have been identified
- 28 locations in smart city Belagavi (All locations are private). Have been identified

g) PM-KUSUM Project: 111 Nos applications received, out of which 45 Nos of solar IP set Commissioned in HESCOM.

5(v) CRITICAL ANALYSIS BY ENERGY AUDITOR

The document and data maintained by HESCOM is up to date and adequate.

HESCOM had received 9.76Cr incentive from KERC (Annexure -1) for achieving the target of AT& C reduction for the year 20-21.

Demand- Collection-Balance records are maintained in all circles /divisions/ subdivision which has been verified and found accurate.

The inputs from all subdivisions are made in Google sheet by all subdivision Engineers. This unique system is exclusively developed by the engineers of Energy Audit section of HESCOM. This is noteworthy and can be emulated by other Discoms for better energy accounting.

Energy balance done at each sub divisions using the google sheets and Data is entered with in the stipulated time by various sub divisions.

Ay correction, reconciliation is done in time before finalising the monthly accounting and AT & C loosed are arrived.

The major consumer is agriculture where the consumption is not metered due to GOVT policies. There is several UN authorized connection and they are regularized upon detection by a payment of Rs.50.

Unmetered connection is highest in Haveri Circle it depends on geographical location where agriculture is pre dominant and IP sets or UN metered.

### Critical analysis - Base line:

Hubli Circle 264.20 MU unmetered Agriculture consumption is the highest.

In Hubli circle 15.33MU Residential UN metered consumption is recorded .It is NJY connection yet to be provided with meter.

Commercial / Industrial is fully metered. T&D Losses in the circle is 7.58 % lowest in Dandeli and Highest in HAVERI division with 18.97%.

Haveri Circle unmetered agriculture is highest – 518MU. Out of this, Ranebennur ranks among the highest with 281.6MU.

## Critical analysis - Audited year 2020-21

Total Unmetered consumption in Hubbli circle is 270.8MU where highest is GADAG division with -97.7MU unmetered. Lowest is Dharwad urban allotment to agriculture with 1.10 MU.

Total energy consumption of Hubli circle is highest 1,436MU second is Belgavi at 1143 MU HESCOM purchased 13663 MU and Billed 10974.3 MU with a distribution loss 1675 MU. The

## Division wise losses:

T & D Loss is highest in 17.80 Bagalkot (Mudhol) having 47445 Agriculture consumers.

Reason is unmetered agriculture consumers.

T&D Loss is 13.25% which is 0.85% Less than base year 19-20.

Lowest T & D Loss in Dandeli Sirsi Circle 4.34 % ( with10999 Agriculture consumers)

Transmission loss of 3% is considered for input energy

Malaprabha (114) water works has the highest T&D loss 28.8%.

Shirawada (927) has lowest T&D loss .15%

5 (vi) Strength and weakness of HESCOM (Regulation 9 -4)

## Strength

a)Scada system: Most of the substations are connected and monitored /controlled at Corporate office through VSAT .

b)Energy balance: Demand- Collection-Balance records are maintained in all circles /divisions/ subdivision through google sheets

## c)Calibration of Meters:

HESCOM has state of the art calibration centre in each division where consumer meters are calibrated upon request from consumers or in doubt full cases of under recording of meters. Also new meters are tested upon procurement before installation. 40 Meter can be tested at a time.

d) Billing Software: NSoft app is used for rural area for billing. Infosys software app is used for billing in city area by meter readers using mobile.

### Weakness

## a) Calibration of input Meters, Station Meters at injection Points:

This is done by KPTCL RT division. The frequency of testing is 1Year -2Years. However in some stations, it is found that the meter was having calibration stickers of 2018 (Athani). And also station does not have calibration records.

When Hescom is paying for the Power supplied, it is the bounden duty of the HESCOM to check whether all injection meters are calibrated up-to-date.

It is suggested that HESCOM takes up this matter with KPTCL and Maintain calibration records in the station as well as stickers for all meters after calibration is done.

All in put meters have been changed to DLMS meters recently with communicating features.

Some errors are creeping in to the system when meters are changed and readings are not updated immediately in the Google sheets. Care must be taken to avoid errors after replacement of meters. Also when there is a faulty meter assessment is to be done properly.

DT's are provided with communicative meters but it is not functional and the readings are recorded manually by meter readers.

Substation meter readings are taken manually. Optical method was tried but failed.

## b) Operation & maintenance of Distribution lines

Even though the O & M is excellent in HESCOM certain drawbacks were noticed in maintenance.

One Major aspect which auditors came across during inspection of distribution lines and visit to Subdivisions -DT and consumer premises is that of **Electrical Safety** 

It is recommend to get a Safety Audit of Distribution lines in the city Limit is done by BEE certified Energy auditors ( Electrical). This aspect is with reference to

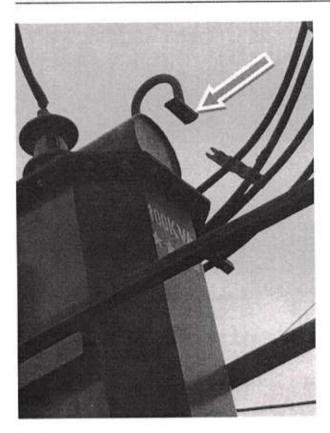
# Regulation no 9 (3) (b) identify areas of energy leakage, wastage or inefficient use

Considering that BEE energy Audit regulations is an opportunity to get things right, it is recommend to get a Electrical Safety Audit Done. There are many aspects which O&M department has to look in to or has not taken seriously. (Pictures provided below)

- 5 (vii)Areas requires improvement under O& M
- a) Distribution transformers (DT): Another aspect is the condition monitoring of distribution transformers (DT) and allied connections is not done /done visually. We recommend IR thermography once in a month by the meter readers.

DT's – many DTs do not have breathers and the vent is kept open leading to absorptions of moisture and subsequent failure of transformers or determination of oil. (Fig 01)

HESCOM reported 12% failure of transformers in 20-21  $\,$  ie 2800 numbers. One of the reason may be attributed to missing of breathers.



Hence we recommend breathers for all DT's , which will reduce breakdown of DT's in the long run

b)Earthing: The DT's Earthing is done by GI Wire of 8 Gauge. In many places it is found to be loosely connected to the earthing pipe or transformer body. (Fig 02) & (Fig 03)

A loosely connected neutral Grounding will result in surge not passing to the ground and damage in the installations of residences in case of a lightning surge. This is common during rainy season.

It is recommended that all DT's may be provided with 25\*3Mm GI flat as earthing instead of GI wires.

Measurement of Earth resistance is done by few divisions. It should be strictly followed by all divisions.

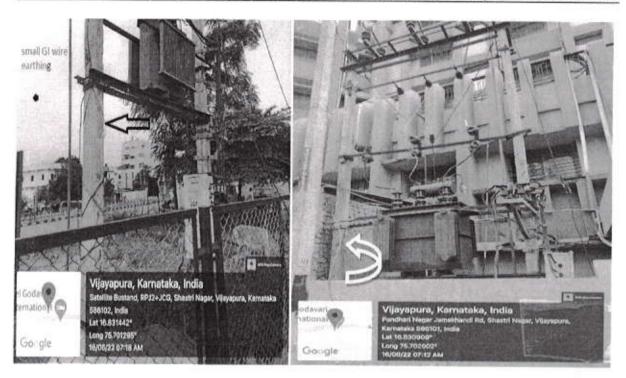


Fig 02

Fig 03

#### C) Fuses in DT's

It is found that fuses in the DT's were installed at a very low level within the reach of human beings or animals. It is life threat and needs to be lifted up.





- d) Danger Board: It is also found that many places danger boards of 11KV do not exist or missing.
- e) Street light Switching point: Some High mast and Minimast switching cubicles were found to be badly maintained. There were no covers, componants hanging ,open to rain and poses danger to passers nearby. (fig 04)Though it is under the purview of Corporation/ULB,it is recommended that HESCOM takes up the matter with ULBs.

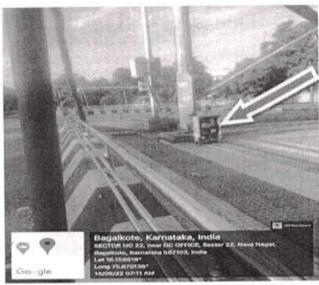
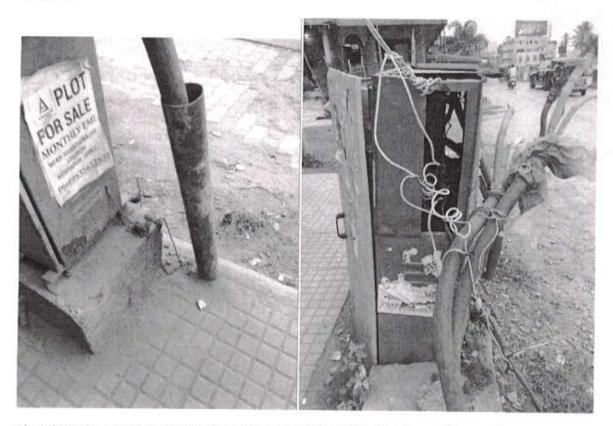


Fig 04

f) Feeder Pillar Box:

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Some feeder pillar boxes are badly maintained and posing danger to the public. This needs to be addressed. Also earthing of feeder pillars not proper.GI strip should be used instead of GI wires.



5( Viii)Recommendation for Improvement with respect to Regulation no9:

Regulation 9 -3b states that Accredited energy auditors have to check the inefficient use of energy. Lack of safety in distribution system leads to is inefficient use and increased breakdowns.

#### **Electrical Safety Audit**

It s recommended that an Electrical Safety Audit of the HESCOM CSD's be conducted by Certified Energy auditors of Electrical Background through out the circles and rectification is carried out with in a year. The Safety audit may be conducted once in 2 years.

Scope of Electrical Safety audit shall cover the following

- DT breather availability
- Neutral & body earthing
- Fuses in TC above 8 ft

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- HT lines close to buildings & LT lines close to buildings without insulation
- Open Street light, Highmast, Minimast switch point boxes and earthing
- Median light poles without earthing & without junction box covers
- · Inclined poles in Village limits.

#### Fixing Breathers for DT's

The breathers absorb moisture from the oil and maintains Dielectric strength of Oil.

Contamination of oil results in failure of transformer winding. Each failure is associated with a flashover and power loss

#### Proper Earthing of DTs

It is recommended that for Earthing GI strip with bolt& nuts be used instead of GI wires as wirses are subject to cut or loose connection.

#### IR Thermography

In manufacturing sectors ,thermography is widely used for preventive maintenance and breakdowns are reduced drastically.

So it is recommended that HESCOM may provide small portable IR thermgraphy Instruments to meter readers who read meters of DT's. They can check the DT and associated componants onece in a month while taking readings.

It is estimated that 1% distribution loss can be reduced ,10% breakdowns will be reduced if these recommendation are adapted which amounts to 120 MU or Rs 60 Crores@ Rs 5 /unit.

5 (ix) LIST OF DIVISIONS VISITED

SI no	Division	SI no	Division
1	Hubli Urban	8	Athani
2	Hubli Rural	9	Raibag
3	Dharwad Urban	10	Bagalakot
4	Dharwad Rural	11	Jamakandi
5	Haveri	12	Mudhol
6	Ranebennur	13	Bijapura

7	Chikkodi	14	Indi
		15	Basavana Bagevadi

# 5(x) LIST OF DOCUMENT S VERIFIED

## Documents verified by AEA Team

SI no.	IN Corporate Office	SI no	In Sub-Division/Injection Points
1.	Purchase / Sold /open access energy Records	1.	In put Energy Meters Readings, from log Book
2.	Input energy of circles, un metered energy etc	2.	Net import , export Readings
3	DCB records	3	IP set/NJY feeder wise readings
		4	Maintenance Records
		5	Calibration Records
		6	DT visual inspections
		7	Distribution line visual inspections

# 6 .NOTES OF THE EA/EM ALONG WITH QUERIES AND REPLIES TO DATA GAPS

SI	Queries	Reply by Hescom
1	In one of the service station the capacitor bank PF was 1 (Navanagar 110KV Bagalkot) with 75% Load. It is likely to cross when 100 % Load is given. What is the method of adopted to avoid crossing 1 is there any provision to cut of capacitors in stages?	Based on the reactive power load the capacitor banks are switched on and off by the station staff.
2	There are no capacitor banks in all substations. Is there any plans to install capacitor banks by KPTCL. For instance, in Chikodi 110 Kv station PF was 0 .88 & 0.87 in some feeders	All new substations which are coming up are included with capacitor banks.
<u>3</u>	In one of the 110KV SS visited by the team, It was observed that 220KV SS was just few KM away. But the T&D losses recorded by the meter was	Yes. 0.2 S class C.T , P.T and Meters are replaced in substions in stages.

\_\_\_

	2.00% .why there is so much difference. Is it because of different CT Classes of the meter?	
4	Is there any formula used in calculations ? please provide	Distribution Loss: Input Energy- Sale of Energy)/Input Energy x100
<u>5</u>	How can the collection efficiency go above 100%. Does it indicate collection of arrears	Yes . If arrears is collected the the collection efficieny goes above 100%.

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#### **ANNEXURES**

#### (i) INTRODUCTION OF VERIFICATION FIRM

We would like to introduce about our firm Reliable Energy & Allied Services Shimoga Karnataka as the first Energy & Safety Auditing Firm in the Malnad Region. We undertake Energy Audit , Fire Safety Audit , Consultancy and Electrical contracts & other Services . We have experienced Engineers in the field of Electrical Engineering and Energy Conservation & Management.

Being **BEE Accredited Energy auditor**, Our main focus is in to Energy Audits, Power quality Analysis, Thermography, Flue Gas analysis, Performance audit of Air conditioners, Compressed air Leakage assessment. Condition Monitoring etc.

Our CEO Mr Mahesh S Kotian is trained in Japan & Germany on Energy Conservation, Condition Monitoring Techniques and Renewable Energy.

#### Experience in Energy Audit includes

Iron & Steel	IT companies	
Paper	Hotels & resorts	
Cement	Apartments	
Commercial Buildings	MSME	
Textiles	STP/ETP	

#### Electrical fires safety Audit includes

Canara Bank Electrical & Fire Safety Audit of 425	Hotels & resorts
Branches (Manipal & Bengalur circles)	Commercial Buildings.
Paint Warehouses (PAN India)	IT companies.

#### Reliable Energy offers range of services that includes

- · Electrical Fire Safety Audits for Banks & Industrial Safety audits.
- Mandatory Energy audits of Industries ,DISCOMS, commercial buildings ,hospitals
- PAT,M&V Audits of Industries , commercial buildings ,DISCOMS etc
- Electrical Contracts ,Automation projects ,Solar installations & AMC
- Erection and commissioning of HT & LT Transformers, substations etc.

#### On Going projects

 Shimoga City corporation Street Light LED (PPP) & HDSCL Hubli Streetlight -Independent chartered engineering agency (ICEA) 1year implementation & 7 year O&M

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Mangalore SEZ Discom audit

#### MINUTES OF MEETING WITH THE DISCOM TEAM

#### Reliable Energy & Allied Services

Opp . Durgigudi Cooperative Society Park Extension Shimoga-577201

RE/HS/003

19-5-22

#### SUB: Minutes of the meeting in connection with engaging services of AEA for Energy Accounting

Members present

#### Reliable Energy & Allied Services (here after referred to as 'REAS')

- 1) Mahesh s kotian AEA
- 2) U.Nagendra Rao CEA
- 3) Gopala Krishna .Sector expert
- 4) Jayapraksh S Co Auditor
- 5) Mrs Smitha Co Auditor

### Hubli Electricity Supply Company Limited (here after referred to as HESCOM)

- Girish .V Executive Engineer
- 2) Hemant Ghodke .- AEE
- 3) Prasad Ghatikar. AEE

Reliable Energy representatives arrived at HESCOM on 19 may 22 for initial meeting on conducting the Annual energy audit.

#### Following points were discussed

- A. Reliable Energy & Allied Services ( REAS) submitted the audit plan and checklist of the proposed audit. It was accepted by HESCOM officials.
- B. AEE Energy audit explained the entries made in the BEE format's prepared by them for the year 20-21.
- C. HESCOM requires the 20-21 formats to be verified and signed at the earliest as they were getting notices from SDA & BEE for the delay in filing.

- D. REAS requested to provide Google locations of the Distribution points for verification on random basis, which HESCOM agreed to provide.
- E. REAS plans to visit all 26 division (randomly) for verification in three independent teams.
- F. One 110 KV Interface Receiving station and one 33KV Distribution point was visited jointly by HESCOM and REAS teams. Check for the Voltage status.
- G. HESCOM will collect all the data of 20-21and send it to REAS within a week to go ahead with verification work.
- H. HESCOM is also to share the soft copy of the feeder data for planning visits as required.

#### Signatures:

Reliable Energy & Allied Services

**HESCOM Officials** 

1. It was a series of the seri

#### Reliable Energy & Allied Services

Opp . Durgigudi Cooperative Society Park Extension Shimoga-577201

RE/HS/004

17-6-22

#### SUB: Minutes of the meeting in connection with completing 201-21 AEA auditof Energy Accounting

Members present

#### Reliable Energy & Allied Services (here after referred to as 'REAS')

- Mahesh s Kotian AEA
- 7) U.Nagendra Rao CEA
- 8) Gopala Krishna .Sector expert
- 9) Jayapraksh S Co Auditor
- 10) Mrs Smitha Co Auditor

#### Hubli Electricity Supply Company Limited (here after referred to as HESCOM)

- 4) Girish .V Executive Engineer
- 5) Hemant Ghodke.- AEE
- 6) Prasad Ghatikar.- AEE

Reliable Energy representatives arrived at HESCOM on 17 June 22 for final meeting on conducting the Annual energy audit.

#### Following points were discussed

- The audit team started the site visits to various substations and subdivisions from 1<sup>st</sup> june 22 as per the schedule submitted.
- The verifications of data provided Circle wise and Feeder wise were verified by the team and found to be accurate.
- 3) The Power DCB, Purchase of energy, Subsidy details were verified in the corporate office.
- 4) The checklist were prepared and collected from all sites visited
- 5) City Sub divisions DT's were also visited randomly and O&M activities documents were verified.
- 6) Calibration records of meters were collected and verified from KPTCL

- LT meter calibration center was visited at Hubli and consumer meter calibration records were checked and verified. All sample records will be attached in the report.
  - 8) The BEE regulations were discussed in detail and compliance points were noted.
- Audit team requested HESCOM to follow the trajectory of communicating meter replacement as per the BEE guidelines to avoid penalty
- The 20-21 proforma was jointly signed by AEA and the HESCOM nodal officer and was mailed to BEE and KREDLE.
- 11) The detailed report would be sent with in a fortnight. A request to BEE and KREDLE were made in this regard

Signatures:

# (iii)CHECK LIST PREPARED BY AUDITING FIRM

## Check List -Annual energy Audit of HESCOM - 2022

#### A. Basic Information:

.No	Details	Remarks
1.	Name of the Circle /Division	
2.	Name of Executive Engineer	
3.	Contact Number	
4.	Name of Energy Auditor	
5.	Date of Visit of auditor	
6.	No. of Metering Location	
7.	No.of Unmetered Location	
8.	Whether Meter are Communicative (Y/N)	
9.	Number of Non Communicating Meters	
10.	Is Meters Calibrated? (If so provide Details with copies of Calibration Certificate )	
11.	Preventive Maintains records available (Y/N)	
12.	No.Of breakedown in the year 2020-21	
13.	Is there condition monitoring of feeders /Lines/DT- (Y/N) If Yes give details	
14.	No.of Consumers – Agriculture,residential,commericial,industrial	
15.	Energy conservation measures adopted if any (Provide Details)	
16.	Any high Loss areas/ Pilferage areas (Give the Details)	
17.	Corrective action taken /Proposed for high loss/pilferage	
18.	Do you conduct energy audit at DT level	
19.	Do you calculate AT & C loss of your circle /divn	
20.	Is there any defective meters	
21.	Identification &Mapping of all Elec network, HT LT consumers done (Y/N)	
22	Is there any overloaded segment for capacity addition	

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## B. Present Meter Readings: At the time of Audit

1	2	3	4	5	6

Bank Remarks				*
. Other Findings a	nd Recommer	ndations		

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(iv)BRIEF APPROACH, SCOPE & METHODOLOGY FOR AUDIT

#### Objective of the Audit

The objective of this audit is to study the performance of HESCOM as per BEE regulation in order to reduce the AT&C losses and improve the efficiency of power distribution.

#### Scope of the audit

- Verification of existing pattern of energy distribution across periphery ofelectricity distribution company
- Verification of accounted energy flow submitted by electricity distributioncompany at all applicable voltage levels of the distribution network
- Collection of data on energy received, and distributed, covered within the scope of energy audit
- Analyse the consistency of data monitoring compared to the collected data
- Recommendations to facilitate energy accounting and improve energyefficiency
- Analyse the data with respect to the purpose of energy accounting in reducinglosses for the electricity distribution company
- Field studies and measurements on sample feeder

#### Methodology adopted by the Team

The Energy manager will collect & submit all the details as per the BEE format to AEA team .The team will verify all the data provided against the documents available at corporate office as well as in subdivisions covering all circles.

The team will visit injection point/circle/division total 26 numbers on random basis. The team will also visit CSD's , DT 's, consumers on random basis.

(v)INFRASTRUCTURE DETAILS

i dilika		Form-Details of Inp	ut Infrastructu	re	
1	Parameters	Total	Covered during in audit	Verified by Auditor in Sample Check	Remarks (Source of data)
i	Number of circles	7	7	7	
ii	Number of divisions	26	26	15	
iii	Number of sub- divisions	83	83	62	
iv	Number of feeders	3530	3530	135	
٧	Number of DTs	233782	233782	53	
vi	Number of consumers	5467962	5467962	77	
2	Parameters	66kV and above	33kV	11/22kV	LT
a. i.	Number of conventional metered consumers	54	102	3815	4645498
ii	Number of consumers with 'smart' meters	0	0	0	0
iii	Number of consumers with 'smart prepaid' meters	0	0	0	0
iv	Number of consumers with 'AMR' meters	0	0	0	0
v	Number of consumers with 'non-smart prepaid' meters	0	0	0	0
vi	Number of unmetered consumers	0	0	0	818493
vii	Number of total consumers	54	102	3815	5463991
o.i.	Number of conventionally metered Distribution Transformers			64732	
ii	Number of DTs				

----

	with communicable meters		
iii	Number of unmetered DTs	169050	
iv	Number of total Transformers	233782	
c.i.	Number of metered feeders	3530	
ii	Number of feeders with communicable meters	3530	
iii	Number of unmetered feeders	0	
iv	Number of total feeders	3530	
d.	Line length (ct km)	3213.07 90363.63	139279.66
e.	Length of Aerial Bunched Cables		
f.	Length of Underground Cables	2503.11	

#### (vi)ELECTRICAL DISTRIBUTION SYSTEM

Hubli Electricity Supply Company Limited was incorporated on 30th April 2002 under the Companies Act, 1956 and commenced its Operations with effect from 1st June 2002. HESCOM is responsible for power distribution in seven districts of Karnataka .Namely Dharwad,Belagavi Gadag Haveri Bagalkote,Vijayapur,Uttara Kannada. HESCOM covers an area of 54513 Sq. Kms. with a population of over 54.58 lakhs. The company has 7 Circles, 26 Divisions, 83 Sub-divisions and Section Offices

The sources are Hydro. Thermol, Wind, Solar and Cogen from various places in state as well as interstate

#### Profile



	Area	54513 sq.km
	Districts	7
	Population	1.48 Crs
	Consumers	54.68 Lakhs
	No. of 33 S/S	180
	No. of DTCs	233782
	HT line length	90363.63 ckt kms
	LT line length	139279.67 ckt kms
	Employee Strength	
	<ul> <li>Sanctioned</li> </ul>	16933 nos.
	<ul><li>Working</li></ul>	9567 nos.
	<ul><li>Vacant</li></ul>	7366 nos.
	Total Assets	Rs. 12691.95 Crs

#### POWER PURCHASE DETAILS

# DETAILS OF POWER PURCHASE BY HESCOM FROM APRIL-2020 TO MARCH-2021 FROM ALLSOURCES

DETAILS OF POWER PURCHASED BY HESCOM for 2020-21								
SL No	Name of the Company	Energy In MUs	Cost of Power Purchase in Crores	Cost Power Purchase Rs./Unit				
1	Central Generating Stations (CGS)	3,490.39	1,800.57	5.16				
2	KPCL-HYDEL	2,836.79	309.75	1.09				
3	KPCL-SOLAR	1.79	1.04	5.80				
4	KPCL-THERMAL	1,266.18	880.17	6.95				
5	RPCL	536.58	393.50	7.33				
6	UPCL	258.77	222.70	8.61				
7	MINI HYDEL	80.26	27.33	3.41				
8	WIND MILL	2,150.12	879.58	4.09				

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9	CO-GENERATION	890.74	383.47	4.31
10	SOLAR	1,831.82	829.60	4.53
	TOTAL	13,343.45	5,727.72	4.29
11	KPTCL Transmission Charges	5.0	749.28	
12	PGCIL Transmission Charges	9 165	485.97	Ξ,
13	SLDC O&M Expenses	(6)	3.95	7.0
14	POSOCO Charges	-	0.63	*
15	Open Access Charges	-	4.85	- 25
16	TANTRANSCO	(-)	0.24	
17	LC Charges Related to Purchase of Power		2.51	-
18	PCKL O&M Expenses (Seed Money)	2	0.95	2

13,343.45

344.87

(336.18)

326.30

13.352.14

13,025.84

6,976.10

195.05

(111.23)

7,059.92

188.01

36.41

6.835.50

5.23

5.66

3.31

5.29

5.76

5.25

#### CATEGORY WISE SUBSIDY

Less: Rebate from Power Generators

Less: Hukkeri Society (HRECS)

TOTAL

Inter-ESCOM Energy Exchange (Payable)

GRAND TOTAL

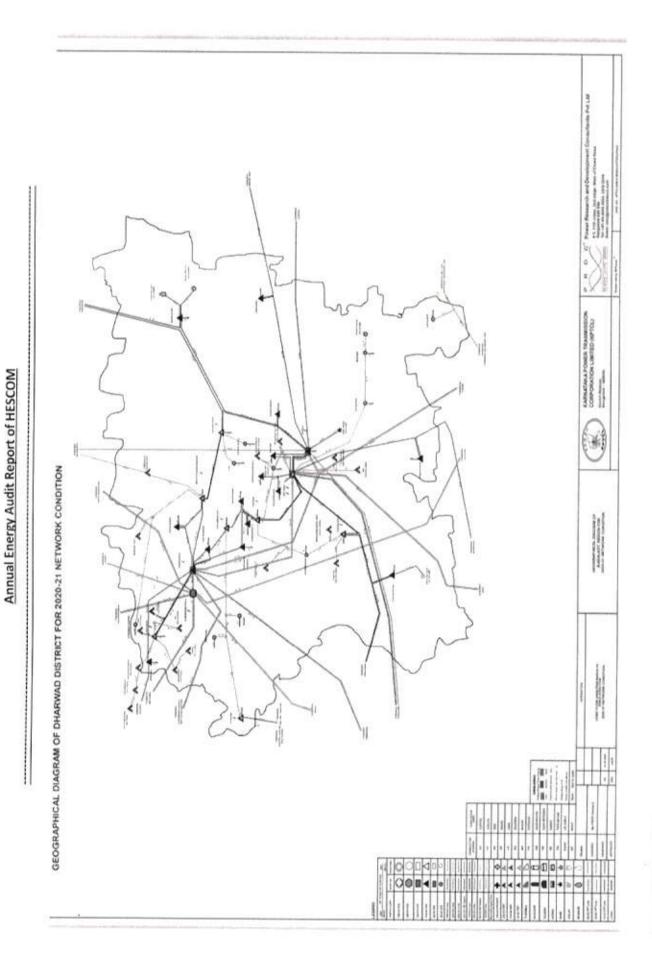
NET TOTAL

Sale of Power through Exchange

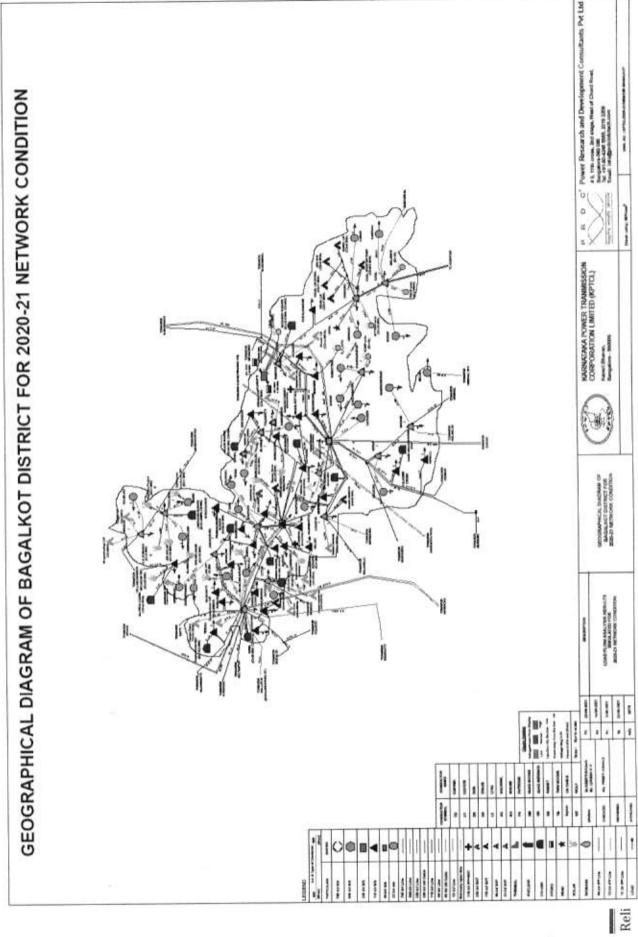
The HESCOM receives subsidy from Government of Karnataka for energy supplied to Irrigation pump sets (up-to 10HP) and small households (Kutirjyothi and Bhagyajyothi upto 40 units/month). In the year 2020-21, the DISCOM subsidy receipt vis-à-vis demand is presented below

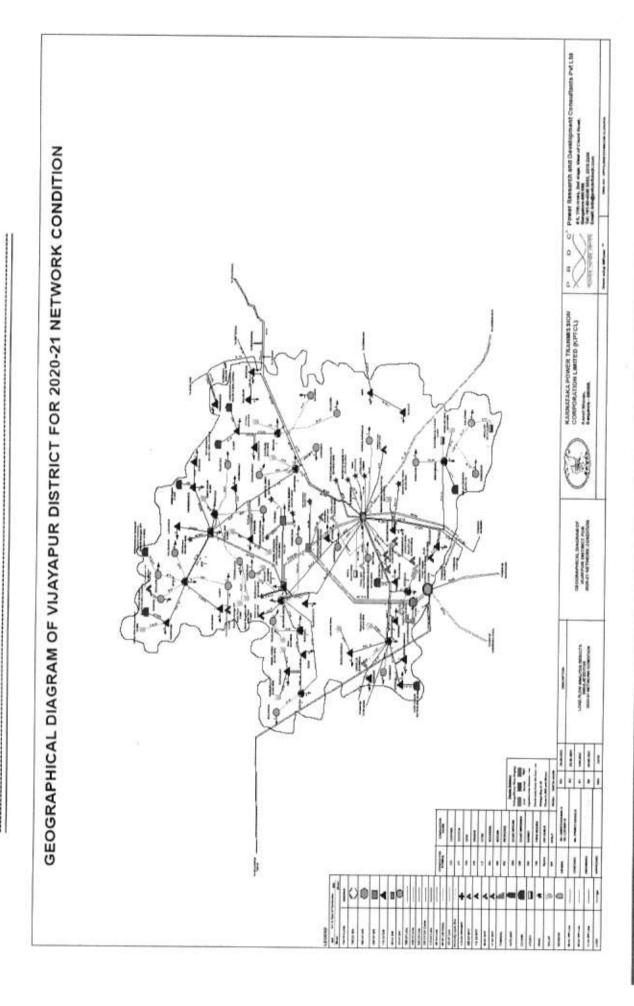
Particulars	Noof installation		Total	Consumption (MU)		Total	Demand(Rs Crore)	Subsidy released(Rs
	metered	unmeter ed		metered	unmetered			Crores)
IP sets up- to 10 HP	1,69,462	8,05,358	9,74,820	84.83	5,853.98	5,938.82	3,974.43	3,997.88
BJ/KJ upto40 units	6,99,175	13,110	7,12,295	152.08	45.90	198.98	136.90	136.90
Total	8,68,637	8,18,458	16,87,105	236.91	5,900.88	6,137.80	4,111.33	4,134.75
	IP sets up- to 10 HP BJ/KJ upto40 units	installation metered  IP sets up- to 10 HP  BJ/KJ upto40 6,99,175 units	installation metered unmeter ed  IP sets up- to 10 HP  BJ/KJ upto40 6,99,175 13,110 units	installation   metered   unmeter   ed	installation (MU)  metered unmeter ed  IP sets upto 1,69,462 8,05,358 9,74,820 84.83  BJ/KJ upto 40 6,99,175 13,110 7,12,295 152.08  units	installation   n(MU)   metered   unmetered   unmeter	IP sets up- to 10 HP   Is   In   In   In   In   In   In   In	IP sets up- to 10 HP   Installation   Installatio

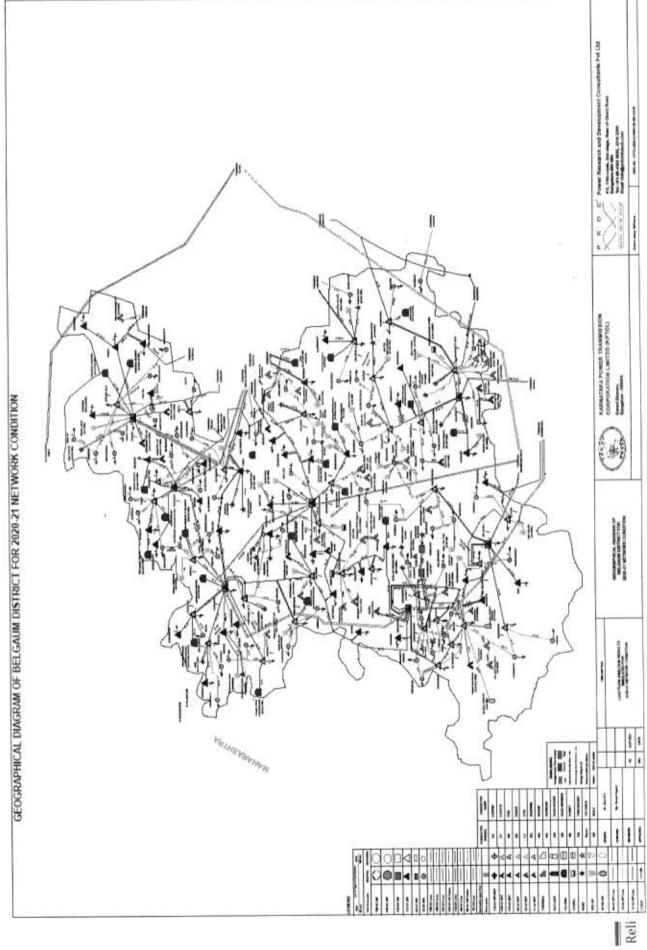
SINGLE LINE DIAGRAM (SLD)



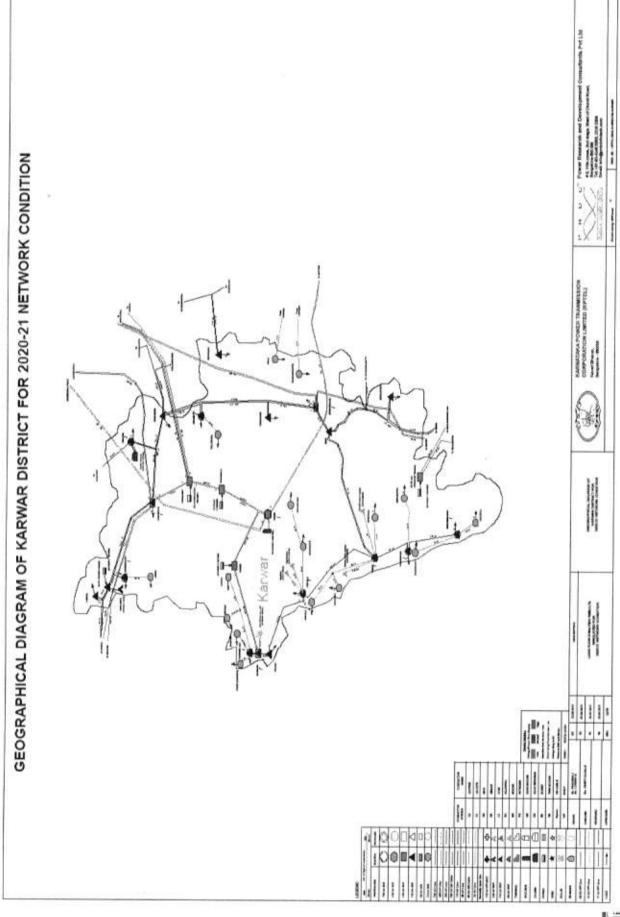
Reliable Energy & Allied Services

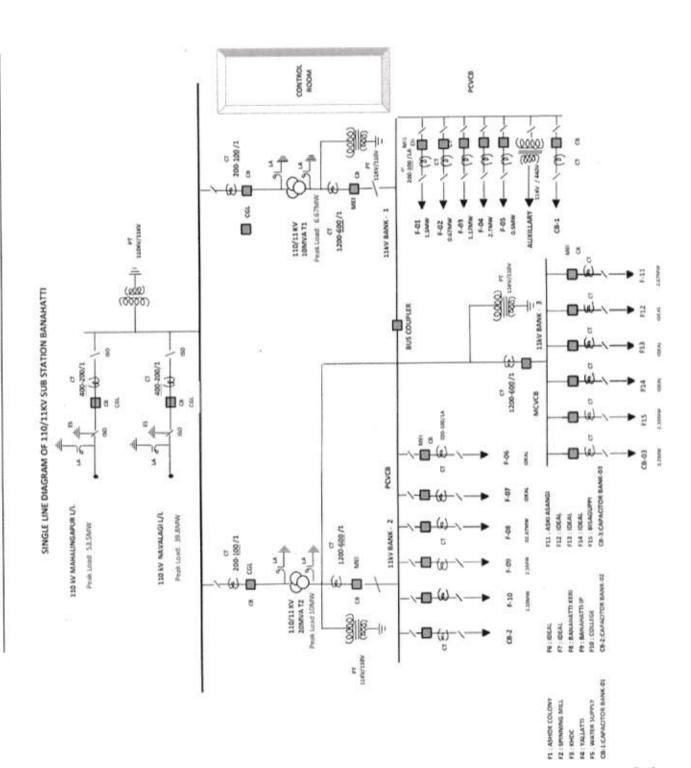






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#### LIST OF DOCUMENTS VERIFIED WITH EACH PARAMETER

- 1. Consumption details extract from DCB-verified
- 2. Category wise sales extract from annual report- verified
- 3. Incentives from KERC for reduction of distribution of Loss
- 4. Sample check list from the sites visited
  - a. Haveri
- 5. Calibration Report of
  - a)100KV Vijaypura Sub Station
  - b) Industrial Consumer 3ph4 wire
  - c) Residential consumer 1ph 2wire

Andreas are a	-0.50 O 200 Kings	No. of		CC	NSUMPTIC	)N	
Sub-Divisions/Section	No. of Live Installations	Installations -			(Pestel	Tan Exempted	finish
		Actually Billed	Metered	Assessed	W.000.00	14.29 161 90	39.12.07.058.4
Hydi Jiban	2,68,178	1,44,571	36,12,05,407.41	2171.00		3.35.53 122 95	12,17,24,441.25
Hubbi Rorel	1.34,367	1,34,818	E-57.59.303.70	2,49,86,207.00	1,15,60,000,00	82 40 338 10	16.72.93,747.2
D'e wat Udar	1,18,338	1,13,018	15.48,34.652.27	10.98,893.00	-	10.25 67 858 53	30 49 65 800 11
20stwell-Hurst	1,27,410	1,27 810	10,0160,428.15	H.14,62,612.00	13,22,750.00	11,43,67,490,17	14.00 AN 628 A
Gazag Division	2.35,851	2,57,756	22,77.94,512.57	10.22,52 016 03	-		11.58 Se 580 Z
Fon Division	1,15,100	1,17,668	8 58,34,498.20	4,654,082.00		1,91,11,642.90	43 73 33 207 5
Haven Derster.	1,92,458	1,83,468	19 67, 26 27 0, 41	20,74 A5,007.38	20.30,008.00		
Karaberrur Division	2 50,501	2,50,559	20,25,97,600,32	26.36,25,439.40	23,34,612.31	29 27 68 775 92	49 95 53 554 3
Bris: Distance	1,24,741	1,89,842	*5,60,18.671.18	3 14,52 563 90		8,88,68 100 WS	19.70.01.254
Dancel dysion	76 686	78 477	5,58,40 025 15	4,48,60,674.02	- 1		11,17,00,797 *
Kanyar Dryakon	1,10,118	1,06,888	15/58 90,014.44	38,70,661.49			15,47,50,165,6
Homewor Division	1.84,192	1,83,084	19:09:65,687.04	1.40,32 007.55	9,63,000,50	2,55 61 797.03	25,50 81 494 s
Beigaum Division Urban	1,16,481	2,14,491	37.49,00,331.05		2 02.94,830,00		#I 02 36 -61 0
Begaum Division Rural	2,42,685	2,49,684	27,22,77,560.70	17,98 51,089,09	12.45 00.222 00	5.26 1/0.90	12.67.00 444.7
Stathenge Division	2,27,009	2,24,283	19,5235,641.05	95,15,57,704.00		37.35.71 011.00	55 97 95 149 0
Samadurg	87,212	87,212	4.4031 469.00	22.72,42,921.00			27.13.34 (41.5
Cherametra Divolon	1,89.619	1,99,689	17 47,52,710.32	42,45,63,657.05	3,44,65,000.00		53.4+ 576 3
Orléande Division	2.54,199	2,54,396	18,69,00,300 83	35,34 99,554.00			54.13.97 945 (
After Useen	1,93,366	1,01,835	18,88,95,548,81	43.31.35.049.00	+	44,15,24 679 54	60-20-30 59K 1
Rahag Syston	1,31,012	1,31,012	6.60,70 005.40	to 63,96 R14 31		56,14,50,088,00	61,72,89,821.5
Begainst Division	3,03,090	2,96,602	31,87,90,551 62	33,79,00,407.00	51,19,105.00	66,20 638.00	08.21 12.119.4
Jaminard Dwaren	1,92,598	1,63,826	17,75.56,164.00	52,21.95,090.00	1.00		99.07.53.230
Muther Dryllian	1.35,647	1,34,781	10,19 78,138.60	32,14,52,548.9	-	13.179.00	52 44 30 do 1
PARKET SHEET	2,67 134	263,181	26.99,97,223.89	60 716 93,19,19		341 962 90	86.22.33.56° 5
PD Street	2,64,856	1,41,419	10.02,70.044.02	49,25.11,514.00			42 2" F" 158 S
Henevaria Supposed:	1,09,508	1,99,050	26,38,98,236 81	21,75 21,345.00		-	40.54 (0.54.)
HES/200	60,15,424	49.61,167	4,65,81,17,676	5,90,15,88,681	21,42,83,566	1.04, 42,14, 255	10.97.42,49.21

2. Category wise sales extract from annual report- verified
 Tariff Order 2022

HESCOM

Karnataka Electricity Regulatory Commission

Tariff Order 2022

TABLE – 4.4
Approved category-wise Sales under APR for FY21

	Coergy in Mil
Calegory	Actuals
LE   8J/X   above 40 units/month	70.49
that Demostra Labina	1638.55
LT-26 Pvt. Edcl. Instins.	14.83
LT-3 Commercial	462.51
LI-4b IP sets Above 10 HP	14.64
LT-4c Pvt. Plantations. Coffee & Toa plantations	0.85
L1-5 L1 Industries	311.10
L1-6 LT Water Supply	335.62
LT-6 Street Lights	152.20
LT-7 LT Temporary Supply	31.73
HT-1 HT Water Supply	331.99
HI-2a HT Industries	945.43
HT-2b HT Commercial	101.71
HI-2c Aided Edcl. Instris. & Pvt. Hospitals	59.67
HI-3a & b HT Irrigation	321.58
HT-4 Residential Apartments	16.72
HI-5 HT Temporary Supply	26.93
Sub Iolal	4836.55
BJ/KJ less than or equal to 40 units/month	198.98
IP sets up to 10 HP	5938.82
Sub total	6137.80
Grand total**	10974.35

\*\*Excludes sale to HRECS.

# 4.2.2 Distribution Losses for FY21:

#### HESCOM's Submission:

HESCOM, in its filling has reported the distribution losses for FY21 as 13.25% as against the distribution losses of 14% as per Tariff Order 2020 and the revised target of 13.75% as per fariff Order 2021 dated 9th June, 2021 for FY21 approved by the Commission. HESCOM has computed the distribution losses by considering the energy at interface points and sales, as detailed below:

Energy at Interface Points in Mil	2650.21
Total Sales in MU	10974.36
Distribution Loss (%)	13.25%

SAMPLE CHECKLIST OF HAVERI DIVISION

# Reliable Energy and Allied Services

# opp.Durgigudi Co-operative Society, Park Extension Shivamogga -577201. Ph no.9845705858,7353590989, E-mail:maheshskotian62@gmail.com

# Check List -Annual energy Audit of HESCOM - 2022

#### A. Basic Information:

S.No	Details	Remark
1.	Name of the Circle / Division	daws
2.	Name of Executive Engineer	
3.	Contact Number	autic 35,2132
4	Name of Energy Auditor	MAHUSH . S. ICOTION
5.	Date of Visit of auditor	13 6 2022
6.	No. of Metering Location	575465
7.	No. of Unmetered Location	
8.	Whether Meter are Communicative (Y/N)	1203 No
9.	Number of Non Communicating Meters	All
10.	Is Meters Calibrated? (If so provide Details with copies of Calibration Certificate.)	only Input meters
11.	Preventive Maintains records available (Y/N)	YES
12.	No.Of breakedown in the year 2020-21	123804 M. 163834 Mm
13.	Is there condition monitoring of feeders.  /Lines/DT-(Y/N) If Yes give details.	resulting from order 1.16 15
14.	No. of Consumers Agriculture, residential, commercial, industrial	11 1 A 1 3 U
15.	Energy conservation measures adopted if any (Provide Details)	LED BULLS deporteded
16.	Any high Loss areas/ Pilferage areas (Give the Details)	-
17.	Corrective action taken / Proposed for high loss/pilferage	
18.	Do you conduct energy audit at DT level	155.
19.	Do you calculate AT & C loss of your circle / divn	455
0.	Is there any defective meters	selection metric air

# Reliable Energy and Allied Services

# opp.Durgigudi Co-operative Society,
Park Extension Shivamogga -577201.
Ph no.9845705858,7353590989, E-mail:maheshskotlan62@gmail.com

#### B. Present Meter Readings: At the time of Audit

S.No	1	2	3	4	5	6
Location	220/1104	V. Harv	w - nea	BH colle	ge.	
Meter const.						
Imp/Exp	13/12 801	. GM&u	gar. 110	κv.		
Boundary						
Bank	90470215	188	233	- 9025477	9 979	8025468
	33100.	33	33	Bankl	11KV	It led'
Remarks	News	News Var. Costa.	News.	Nev	News	xien

#### E. Cother Fileding Fand Recommendations Andie

F6 Dwihosm readys on find. as M 13-6-12

IMPORTORP from GHSHEL HOV direct to Bus. from Gogen.

From Asian Fab. Tech. Salar porm is conneted Basquan Kalh-110.

Signature of Auditor

ಕಾರ್ಯ ವ್ಯಕ್ತಿ ಪಾಲನ ವಿಭಾಗ. ಹಂ. ವಿ. ಸ. ಕಂ. ನಿ. ಹಾರ್ಪಂ ವಿಶೇ 110

5 Calibration Report of 100KV Vijaypura Sub Station

5ub-Station:110KV Vijayapur

Calibration Report of ETV Meters of RT Sub-Division, KPTCL, Vijayapur . Calibrated on: 05-08-2021

Office of the Assistant Executive Engineer (EI) R.T Sub-Ohlston, RPTCL, Vijayapur

No.	Fanel	Connecte	Connected		-				Meter Details				Profes	ma-1
		d CT Ratio	PT Ratio	Make	Type	Class	Si.No	CT#.	PTR	Ray/ Linit	1/14	Res	ding	(4)
1	110KV I/C Line	400/1	110KV/110V	CAT	3ph, 4W	0.71	Marian Carl	200 100			1,00	CKWH +	CKWH	
4	10AFVA 110/11KV	100/1A	110KV/110V	ABB	3ph, 3W	0.21	01999623	200-/1A	110KV-/110V	1/4	7002	00580254	900000	2000
2	2004VA 110/11EV	100/1A	110KV/110V	157	3ph, 4W	-	02208396	100-/1A	110KV-/110V	0.12	1001	Not Dr	played	1000
4	10MVA 210/13KV frft-2	450.614	1000		apri, 4W	1.0	01996093	-/1A	-/110V	50000	7001	004420.80	0000000	10000
		100/1A	1106A\110A	LET	3ph, 4W	0.21	02994760	100-/16	110KV-/110V	0.5	2002			
2	11kV Bank-1	800/1	115V/110V	Secure	3ph, 4W	0.2s	Deserta-				1007	00478128	00.0000	1000
	TINV Sank-2	800/1	110V/110V	Secure	3ph, 4W	0.21	Q0255537	-/LA	-/110V/-/1	256000	7020	00842180	00000	8000
1	111V Bank-S	800/1	116V/110V	Secure	Jun. 4W	0.21	Q0235346	-/1A	-/310V/-/3	756000	7020	0202.3395	000000.0	8000
A.	119V Bank 4	800/1	116V/11DV	Secure	APEX150		Q0255527	-/1A	/110V/-/1	256000	2020	02668942	-000 000	8000
9	F-7 Centrial Infl	300/1	1100/1109	Secure	PRE	0.24	Q0255633	-/1A	-/110V/-/3	256000	5050	9001	-0299 592	8000
10	F-8 Watertank	300/1	110V/110V	Secure	PSE	0.21	00255350	-/1A	/110V/-/3	256000	2020	Not Do	grayed	10000
11	7-9 Akashradi	200/1	110V/110V	Secure	The latest and the la	0.2s	Q0255523	-/1A	-/110V/-/3	256000	2020	0000,0000	6104.9046	1000
17	F-10 VSeycologe	200/1	1389/130V	Secure	PSE	0.21	Q0255575	-/1A	-/110V/-/3	256000	2020	0000,0000	0782154	2000
13	f-11 Siddeshwar	100/1	1189/110V		PH	0.2s	00255442	-/1A	-/110V/-/3	256000	7020	0000,0000	-0164 8289	2000
14	F-12 Julymagar	200/1	1189/1109	Secure	PRE	0.25	Q0255424	-/1A	-/110V/-/1	256000	2020	00000.00000	-0166.5386	-
15	F-13 Ganeshouse	200/1	The second second second	Secure	P3E	0.21	09255494	-/1A	-/110V/-/1	256000	2020	05965225	0000,0006	3000
T-Pole	f-14 Indepnague	200/1	11EV/110V	Secure	P3E	0.21	Q0255295	-/1A	-/110V/-/1	256000	2020	03394315	A STATE OF THE PARTY OF THE PAR	20000
7	F-15 Hitshaff	and the second second	11KV/110V	Secure	PME	0.2s	Q0255536	-/1A	/110v/-/1	254000	2020	0509.4851	0000.0000	2000
	F-16 Auxiliary	200/1	1144/1104	Secure	134	0.21	Q0255506	/1A	/110v/-/3	256000	2020	Balance Street, Street, St.	0000 0000	20000
-	The state of the s	100/1	11KY/110V	Secure	P36	0.21	00255301	-/1A	-/110v/-/3	The State of		01556539	0000 0000	2000
9	F-17 Chalulryanagar	200/1	11KV/110V	Secure	P3E	0.2s	00255439	-/1A	THE PERSON NAMED IN COLUMN TWO	256000	2020	2.1866	0000 5000	10000
							100	747	/110V/-/1	256000	2020	000000	00746844	2000

3,446

No.	Pane	£3 here	nde's Curer	discount.		1 Secondary	Velta	1	Photo Angles		24.0	1115	The state of	1
7			.0	18	VWY	VYR	VNR	0.1	5.7	3.1	**	*100	26 Error	Remarks
1	110my Ut the	279		279	108	108	1604				2.795		0.01	
	TOMPY A TIRCTIFY	195		190	111.5	111.6	111.1				5.438		0.03	
4	20M/VA 110/11KV	735.5	0	734.6	1116	110 /	111.4	1				1	100000	-
ð	Title Rent 1	0.054	0.523	0.051	514.2	115.7	111.6	11 16	15.51	9.91	2411	200	0.09	
ð.	1100 Sent J	0.7380	0.249	0.2875	109	109	109	1757	14.72		2.172	#6	794	
8	318V Bent-8	0.2953	0.307	0 3001	111.7	111.2	111.2	19 19	20 20	15.48	231	20	3.01	
4	316V Sank 4	0.7454	0.224	0.7308	112.1	111.73	112.56	26.84	27 16	71.87	0.9400	10	0.01	
	1-) Central set	4		4-3-4-5		4 444 44 1	****	23.64	41.10	25.71	2.63	36	3.54	
	The second second					Sine	Sault Condict	isper .						Not
ġ.	F-6 Westerbank	0 1049	0.1124	0.109	112.1	112.1	113.56	23.53	22.35					Telefold
i k	F-9 Attechnique	0.2219	0.216	0.218	113.1	112.1	113.56	30.23		25 58	3.9295	20	3.22	
3	F-16 V§mycoRegy	0.2953	0.307	0.306	111.2	111.7	111.2	16.5	22.52	23 57	2.9355	36	3.01	
3	F-E3 Sinteglinage	0.2300	0.2290	0.2200	111.2	111.2	111.7	17.9	16.33	17.5	0.9617	36	0.33	
4	F-13 Internages	0.3603	0.3547	0.3470	111.2	111.73	112.56		21.12	19.16	0.9490	20	4.12	
5	f-13 Genedenger	0.2750	0.2506	0.2502	111.2	111.73		19.18	20.41	19.58	2 5326	56	0.08	
ŧ	7-14 indiranagur	0.2807	0.2413	0.2554	112.1	111.73	112.56	38.31	38.47	33.69	0.806	50	0.02	
3	P-15 Hitmall	0 4761	0.4701	0.4871	111.1	111.73	112.56	19.21	51.31	13.10	0.9706	20	4.06	
	1-16 Auxiliary	-	611	and the second	ord	331.73	112.56	35.00	30.65	31.65	2.8600	26	2.01	
	A. A. S. Albertal, Advanced in Section	O. A better		The second second second	Commencial Commen			ALCOHOL: N	856	Control of				
5	9-37 Chalulty magar	0.1306	0 1267	0.1272	511.2	111.2	112.56	24.45	26.78	21.60	0.9345			

Karrier Geneer (III). RT Sub-Devision, EPTCL, Vijayapur Assistant Executes Engineer (TS). RT Sub-Division, IPTCL, Yipyapur



# BUBLI ELECTRICITY SUPPLY COMPANY LIMITED

CALIBRATION REPORT b) Industrial Cold inger 3ph4 wire

alphone No: 0836-2202867 email-ID : acesslhbl1@gmail.com



Office of the

Asst. Executive Engineer (Ele). 551 Sun Davision HESCOM Hubit

# Corporate Identity Number (CIN):1131401KA20025GC030437

#### METER ACCURACY TEST REPORT

No. AEE/SSL/HBL/2022-23/F-9/TS No-65/78/TETV No-67/ 2 2 4 9

Date 04/06/2022

Consumer Information

M 's Shubham Packaging Solutions

Prop : Udyayaraj S Hulamani

Belut L.A. Dharwad

Reason for Test: Fixing For Consumer side Consumption Months Test Duration Regin 03/06/2022 11 33 47

End 03/06/2022 13 34 24

Date 03/06/22

Seal Details

HESCOM Seal No

Mfg. Seal No.

B1205315 H270578

Meter Data

Make:

: ZERA, EPZ303-08

050041202

Ref.Standard Details

:±0.02

1.84 3P 4W

Ibasic/Imax 5A-19A

Configuration Class SL.No/Year

0.55

: 16505815 / Dec-2016

Voltage.

Limitis of Errors:

Model

SLNo

Class

% Imax	PF1	Mode	Error	Result
100	1	+P	0.006%	Pass
100	0.5	* P	0.007%	Pass
100	0.8	+P	0.013%	Pass
%Ib				
100	1	+P	0.031%	Pass
100	0.5	+P	0.118%	Pass
100	0.8	+P	-0.005%	Pass
50	1	. (2	0.047%	Pass
50	0.5	+P	0.092%	Pass
50	0.8	+P	0.040%	Pass
10	1	• P	0.054%	Pass
10	0.5	+P	0.137%	Pass
10	0.8	(P	0.047%	Pass
7.4				

Import inti Read

C016047 T2kWh

ImportFinal Read

C01604830kWh

Testing fees of Rs.1180/- has been collected vide Rt.No = 202200007785 7786-7787 01 06 22

DWD(R)/EEE/AEE(O)/TA-1/21-22/8480-81-Dtd : 19-02-22 Test Results: The meter beraring St. No.

: 16505815 is tested for the accuracy and found all

the errors are within the permissible limits as per 48 1469?.

Note: The test report confirms only the arcuracy of the meter. All the necessary approvals, field conditions are to be verified before commissioning

Approved by

Asst Executive Engineer (Fle) SSL Sub-Division, HESCOM. Hubball:

Asst Engineer (Ele) SSL Sub-Division HESCOM Hubballi

Registered office: Corporate Office, Navanagar, P.B.Road, Hubballi, SB0025, Karnataka Wobsite www.hescom.com

CALIBRATION REPORT RESIDENTIAL Consumer 1ph2wire

# HUBLI ELECTRICITY SUPPLY COMPANY LIMITED

Telphone No: 0836-2202867

Email-ID: aeesslhbl1@Gmail.com



Office of the Asst Executive Engineer (Ele). SSL Suh-Division, HESCOM, Hubli,

Corporate Identity Number (CIN): U31401KA2002SGC030437

# METER ACCURACY TEST REPORT

No: AEE/SSL/HBL/2022-23/F-9/TS No:2175/ TSM-97/ 24-20

Date: 16/06/2022

Consumer Information

Smt R K Kutti, Raghavendra Colony Nea Shanti Nagar, Sulla Road, Hubballi Reason for Test; Fixing For Installation

Test Duration: Start: 16-06-2022-02-16-45 PM

End: 16:06:2022 03:26:36 PM

Date: 16-06-2022

Seal Details

Meter Data

Mfg Seal No N7310279/N7310472

HESCOM Seal No B4748164

Ref.Standard Details

Model ZERA,EPZ103-03 SL.No. 050041016

Class : ±0.02

Make : Genus Pluse Rate : 3200 imp/kWh Configuration : 1P 2Wire Ibasic/Imax: 5-30A Class

: 1.0 Voltage : 240 V SL.No/Year :920194 /May-2022

Active Import Mode: Type 01 B(Bi-Directional) % Imax PF1 Mode % of Error 100% Result 1 -0.160% + P 100% Pass 0.5 +P 100% -0.180% Pass 0.8 +P 0.366% % Ib Pass 100% 1 +P 10% 0.043% Pass 1 ·P 54 -0.14605 Pass 1 +19 0.208 100%

Pass 0.5 \*P 20% -0.213%s Pass 0.5 . 1 10% -0219% Pass 0.5 + P 100% -0.219% Pass 0.8 20% +P 0.236% Pass OH 10% +11 -0.066% Pass 0.8 0.207% Pass

Active Export Mode : % Imax 100% 100% 100% 100%			1 0.5 0.8	*P *P *P	-0.175% -0.159% -0.182%	Pass Pass Pass
% lb 100% 10% 5% 100% 20% 10% 20% 10% 20% 10%		н	1 1 0.5 0.5 0.5 0.8 0.8	+P +P +P +P +P +P +P +P	0.065% -0.135% -0.188% 0.105% -0.206% -0.198% -0.182% -0.187% -0.184%	Pass Pass Pass Pass Pass Pass Pass Pass
Import init Read Export init Read Import Fina Read	000000 0kWh 000000 0kWh 000001 2kWh					

Testing fees of Rs.236/- has been collected vide Rt No =

0000000 153331

041408804794/16.06.22

**Test Results**: The meter bearing 5L = 20194 is tested for the accuracy and found all the errors are within the permissible limits as per 15.1379.

Note: The test report confirms only the accuracy of the meter. All the necessary approvals/field conditions are to be verified before commissioning.

Approved by

**Export FinalRead** 

Asst Executive Engineer (Ele) SSL Sub-Division, HESCOM, Hubballi

Menly 12/6/22

St. - ye.

Asst Engineer (Ele)
SSL Sub-Division, HESCOM, Hubballi

Registered office: Corporate Office, Navanagar, P.B.Road, Hubballi-580025, Karnataka

Website: www.hescom.co.in

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FEEDRWISE ENERGY BALANCE REPORT OF HAVERI DIVISION-VERIFIED AT SITE

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# FEEDERWISE READINGS OF MUDHOL DIVISION - VERIFIED AT SITE

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#### HUBLI ELECTRICITY SUPPLY COMPANY LIMITED

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FEEDER WISE ENERGY READINGS OF RAIBAGH DIVISION -VERIFIED

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