LOOKING FORWARD

LOOKING BACK

ANNUAL YEAR BOOK OF ENERGY CONSERVATION MEASURES IN ASSAM

2016

ANNUAL YEAR BOOK

OF

ENERGY CONSERVATION MEASURES

IN THE STATE OF ASSAM

2016

Published by:

O/o the Chief Electrical Inspector -cum- Adviser, Govt. of Assam
& State Designated Agency, Assam (under EC Act, 2001)

1st Floor, West End Block, HOUSEFED Complex
Basistha Road, Dispur, Guwahati – 781006, Assam.

Pallab Lochan Das
Minister of State (Ind.)
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Assam

सत्यमेव जयते

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MESSAGE

I am delighted to learn that Chief Electrical Inspector -cum- Adviser (CEIA), Assam; the State Designated Agency (SDA) for Energy Conservation in Assam is publishing the Annual Year Book for 2016 on Energy Conservation activities carried out across the State of Assam.

The essence of Energy Conservation "Enjoy more with less Energy'' by adopting measures to improve energy efficiency is an excellent way to maintain a cleaner and greener environment. I appreciate the initiatives taken by the Assam SDA through various effective mechanisms for Energy Conservation in the State.

I am particularly enthused with a hope that this Annual Year Book will reflect the initiatives of the Assam SDA towards Energy Conservation and would generate more interest in various stake holders through peer-to-peer learning.

18/10/16

(Pallab Lochan Das)

Rajiv Kumar Bora, IAS
Additional Chief Secretary

सत्यमेव जयते

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MESSAGE

I am pleased to note that the Chief Electrical Inspector-cum- Adviser (CEIA), Assam which is the State Designated Agency (SDA) for Energy Conservation for the State of Assam is publishing its Annual Year Book 2016 covering various initiatives taken in this State to promote Energy Efficiency & Energy Conservation measures.

Energy being the virtual axis of Civilization, demand for energy has grown substantially with the growth of economy. In such a scenario the efficient use of energy resources and their conservation assume tremendous significance and are essential for curtailment of wasteful consumption and nourishing Sustainable Development. Energy saving is a National cause and all of us will have to join hands and make all our efforts in making India an Energy Efficient Economy. It is hoped that the measures taken up and propagated by Assam SDA will adequately disseminate to our target audiences through the publication of this book.

Rajiv Bora

(Rajiv Kr. Bora)

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Foreword

Md. Nurul Huda, BE, FIE, Chartered Engineer
Chief Electrical Inspector -cum- Adviser to the Govt. of Assam
& CEO, Assam State Designated Agency under EC Act, 2001.

Government of Assam
Inspectorate of Electricity
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Basistha Road, Dispur,
Guwahati – 781 006, Assam.

The Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India has since been funding the State Designated Agencies (SDA) throughout India under its "Strengthening of State Designated Agencies (SDAs) on efficient use of energy and its conservation" program. BEE financed projects address the key drivers of energy conservation through behavioral intervention, awareness and technical project implementations in order to achieve, in the long-term, global environmental benefits as well as avoiding the impacts of climate change on account of fossil fuel burning, through end use efficiency. Accordingly, Assam SDA is assisting BEE to design and implement innovative and scalable program on energy conservation at State level, in consonance with Governmental priorities.

Our journey from ground zero started about a decade and a half ago and it is the overwhelming response and support from all stake holders that brought us this far, which now shows broader and brighter ways ahead, to move forward with active participation of all energy users' right at the apex down to the lowest formation of contemporary social matrix. Our hopes and determinations are brighter and broader than dreams.

We are delighted to share with you our Annual Year Book, 2016 showcasing activities & initiatives taken by Assam SDA for the deliverables under direct fund assistance from the BEE and those adopted under joint funding by BEE and Government of Assam in the Assam State Energy Conservation Fund (ASECF). While highlighting only some projects in this short compilation, a list of implemented projects and those under implementation stage have been mentioned separately.

I would like to thank everyone involved in these projects for their hard works and commitment towards achieving energy conservation benefits and paving the way for Inclusive and Sustainable Growth.

While apologizing for inadvertent typos beforehand, we request you kindly to read this Year Book and look forward for your suggestions for further improvements in future.

(Md. Nurul Huda)

Introduction

"Energy" means any form of energy derived from fossil fuels, nuclear substances or materials, Hydro-electricity and includes electrical energy or electricity generated from renewable sources of energy or biomass connected to the grid.

-Section 2(h) of the Energy Conservation Act, 2001

About Energy Conservation Act, 2001 (EC Act):

In today's economy, supply of quality energy is very much crucial for the economic prosperity of a nation, especially more so in case of a developing economy like India. Demand for electricity and fossil fuels have substantially increased over the time due to growing preference for commercial energy. While efforts are being made to improve availability of various energy sources, there is still a continuing gap between demand and supply of energy. For the purpose of fulfilling the energy requirement, increased generation of energy is a huge capital intensive option. By adopting energy efficiency measures, consumption can be reduced to a great extent that will reduce the need to create new capacity requiring mobilization of huge resources as well as result in substantial environment benefits in terms of reduced Green House Gas (GHG) emissions. To promote conservation of energy and to facilitate its efficient use in various sectors, there is need for certain statutory measures. Accordingly, appreciating the potential and importance of energy efficiency, for bridging the gap between demand and supply, reducing environmental emissions through energy saving, the Government of India enacted the EC Act to provide a legal framework that came into force with effect from 1st March 2002. A waiting period of five years from the date of enactment is provided in the Act, during which, all the institutional infrastructure including formalities of issuing notification of Rules, Regulations and other norms at the Central and State level to be completed besides continued endeavour for creation of awareness for efficient use of energy and its conservation among public.

Bureau of Energy Efficiency (BEE)

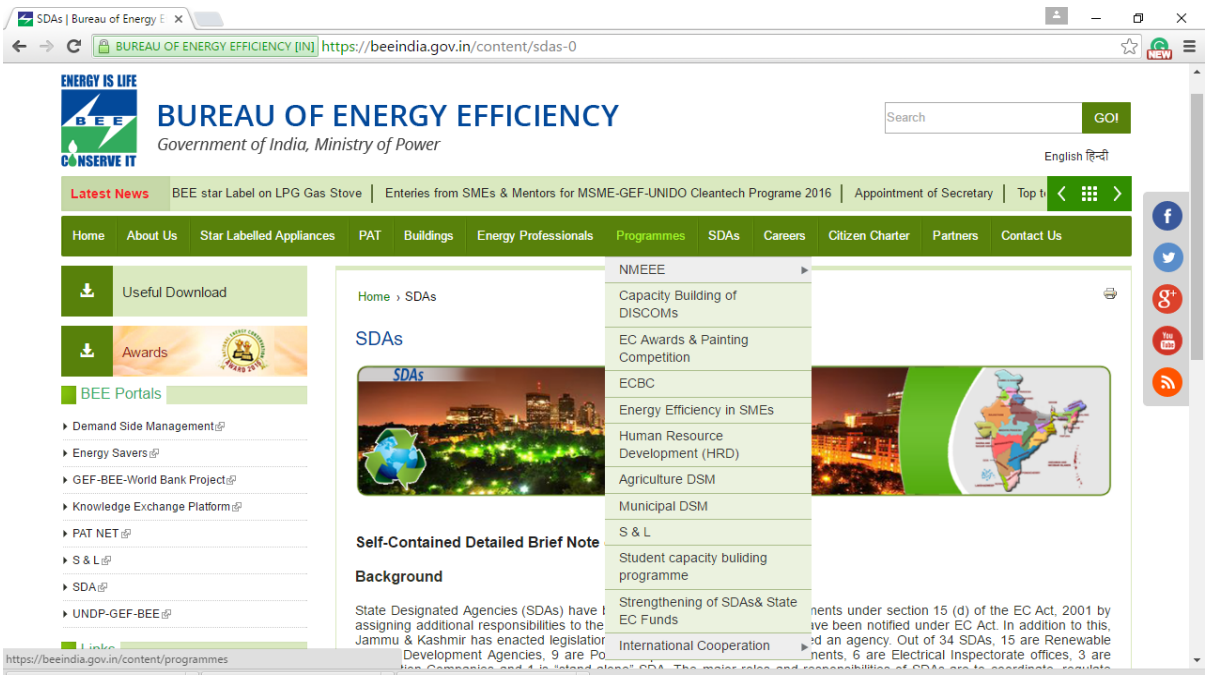
The Govt. of India under Section 3(1) of the EC Act established the statutory body, The Bureau of Energy Efficiency (BEE) under the Ministry of Power, Govt. of India for implementation of policy programs and co-ordination of implementation of energy conservation activities. The BEE is headed by the Director General, BEE with its head quarter situated at New Delhi.

The mission of the BEE is to assist in developing policies and strategies with a thrust on self-regulation and market principles within the overall framework of the EC Act with the primary objective of reducing energy intensity aspect of the Indian economy. This will be achieved with active participation of all stakeholders in accelerated and sustained adoption of energy efficiency in all sectors.

Role of BEE:

The mission of the BEE is to assist in developing policies and strategies with a thrust on self-regulation and market principles within the overall framework of the EC Act with the primary objective of reducing energy intensity aspect of the Indian economy. This will be achieved with active participation of all stakeholders in accelerated and sustained adoption of energy efficiency in all sectors.

As envisaged in the EC Act, BEE co-ordinates with all stake holders and recognize, identify and utilize the existing resources and infrastructure. The EC Act provides for both regulatory and promotional functions of the BEE -



Promotional functions:

The Major Promotional Functions of BEE include:

- ✓ Create awareness and disseminate information on energy efficiency and Conservation.
- ✓ Arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation.
- ✓ Strengthen consultancy services in the field of energy conservation.
- ✓ Promote research and development.
- ✓ Develop testing and certification procedures and promote testing facilities.
- ✓ Formulate and facilitate implementation of pilot projects and demonstration Projects.
- ✓ Promote use of energy efficient processes, equipment, devices and systems.
- ✓ Take steps to encourage preferential treatment for use of energy efficient
- ✓ equipment or appliances'
- ✓ Promote innovative financing of energy efficiency projects.
- ✓ Give financial assistance to institutions for promoting efficient use of energy and its conservation.
- ✓ Prepare educational curriculum on efficient use of energy and its conservation.
- ✓ Implement international co-operation programs relating to efficient use of energy and its conservation.

Regulatory functions:

The Major Regulatory Functions of BEE include:

- ✓ Develop minimum energy performance standards and labeling design for Equipment and appliances.
- ✓ Develop specific Energy Conservation Building Codes.
- ✓ Activities focusing on designated consumers.
- ✓ Develop specific energy consumption norms.
- ✓ Certify Energy Managers and Energy Auditors.
- ✓ Accredited Energy Auditors.
- ✓ Define the manner and periodicity of Mandatory energy audits.
- ✓ Develop reporting formats on energy Consumption and action taken on the recommendations of the energy Auditors.

State Designated Agency (SDA) – Role and Responsibilities

State Designated Agencies (SDA) are the entities selected and notified from among the State Machinery as State Level nodal agencies under the BEE to coordinate, regulate and enforce the provisions of the EC Act, in the respective State.

Energy Conservation Intervention Mechanism:

- ✓ Prepare Annual Action Plan
- ✓ Organize meetings and workshops
- ✓ Capacity building of various stakeholders
- ✓ Identify and implement demonstration projects with high value activities
- ✓ Support during implementation of Energy Conservation Activities in the States

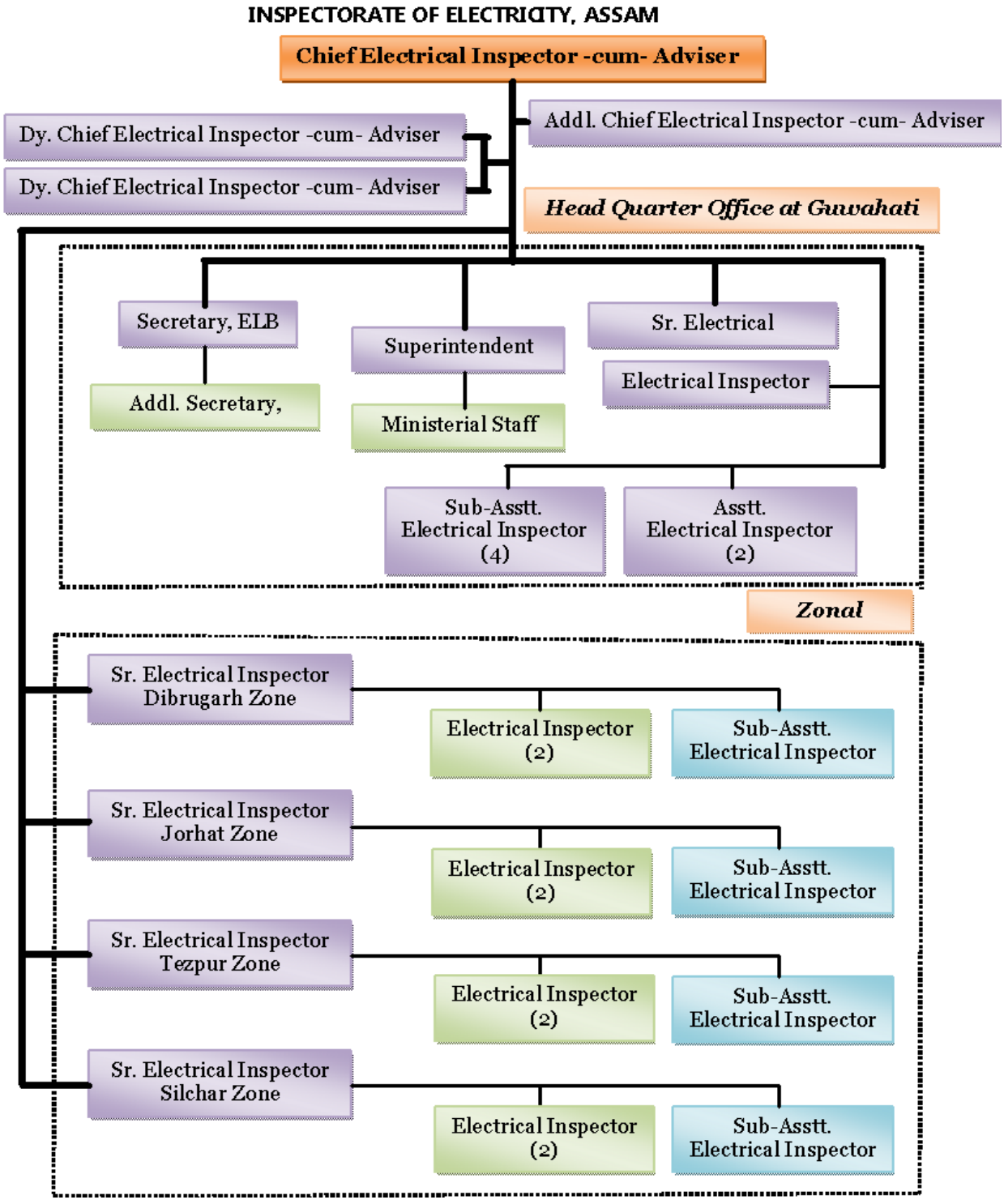
Establishment of SDA in Assam:

The SDA of Assam, i.e. the Chief Electrical Inspector -cum- Adviser is the Head (HoD) of the Inspectorate of Electricity, under the Power (Electricity) Department, Govt. of Assam. The Head Quarter of the Inspectorate is located at Guwahati and it has four Zonal Offices situated at Silchar, Tezpur, Jorhat and Dibrugarh. Each zonal office is headed by a Senior Electrical Inspector. By virtue of nature of works and field activities, the Inspectorate has the advantage of direct and first hand reach to all stake holders in power scenario.

Amongst the North Eastern States of India, energy requirement of Assam is highest and more to it, the State is a power deficit State with lots of energy conservation opportunities. This necessitates a greater role on part of SDA for the State of Assam.

As required under Section 15(d) of the EC Act the Government of Assam vide Notification No.PEL.81/2002/45, Dtd.06.09.2002 issued by the Commissioner and Secretary to the Government of Assam, Power (Electricity) etc. Department designated the Chief Electrical Inspector -cum- Adviser, Assam as the SDA for Assam to coordinate, regulate and enforce the provisions of the EC Act in the State of Assam.

Organizational Structure



Role and Responsibilities of ASDA

The SDA for Assam, i.e. the Chief Electrical Inspector -cum- Adviser is the Head of the Inspectorate of Electricity, Assam, which is a Directorate Level organization under the Power (Electricity) Department, Govt. of Assam. The Head Quarter Office of the Inspectorate is situated at Guwahati and it has four Zonal Offices situated at Silchar, Tezpur, Jorhat and Dibrugarh. Each zonal office is headed by a Senior Electrical Inspector. By virtue of nature of works and field activities, the Inspectorate has the advantage of direct and first hand reach to all stake holders in power scenario of the State.

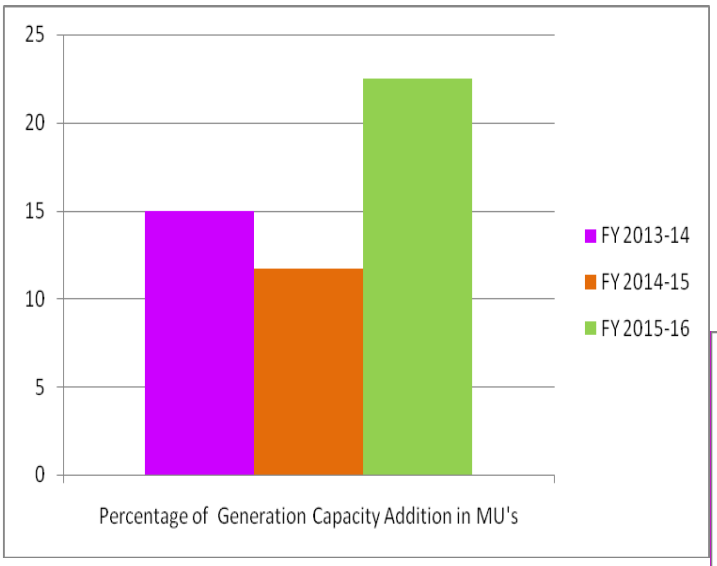
The normal works and objectives of the Inspectorate are to implement and administer the following Acts, Rules and Regulations to ensure safety:

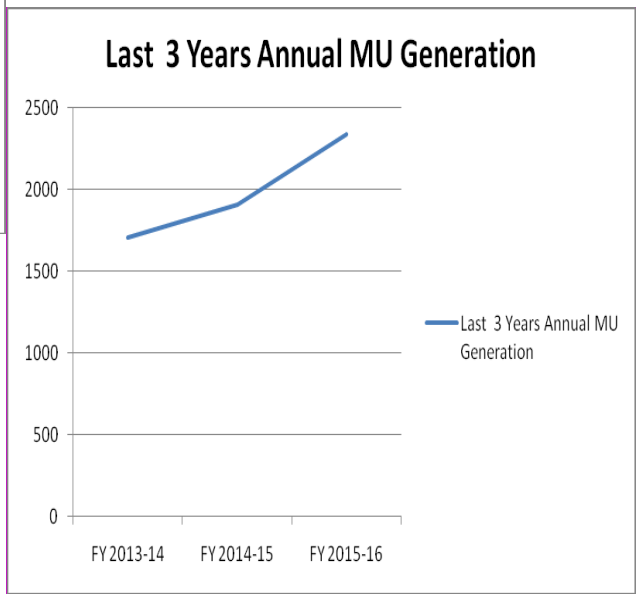
- Certain provisions of the Electricity Act, 2003 and the Rules made there under in force from time to time.
- Certain provisions of the Assam Cinema (Regulation) Rules, 1960.
- The Assam Electrical Licensing Board Regulations, 1992.
- The Assam Lifts and Escalators Act, 2006.
- The Energy Conservation Act, 2001

Profile and Energy Scenario of Assam

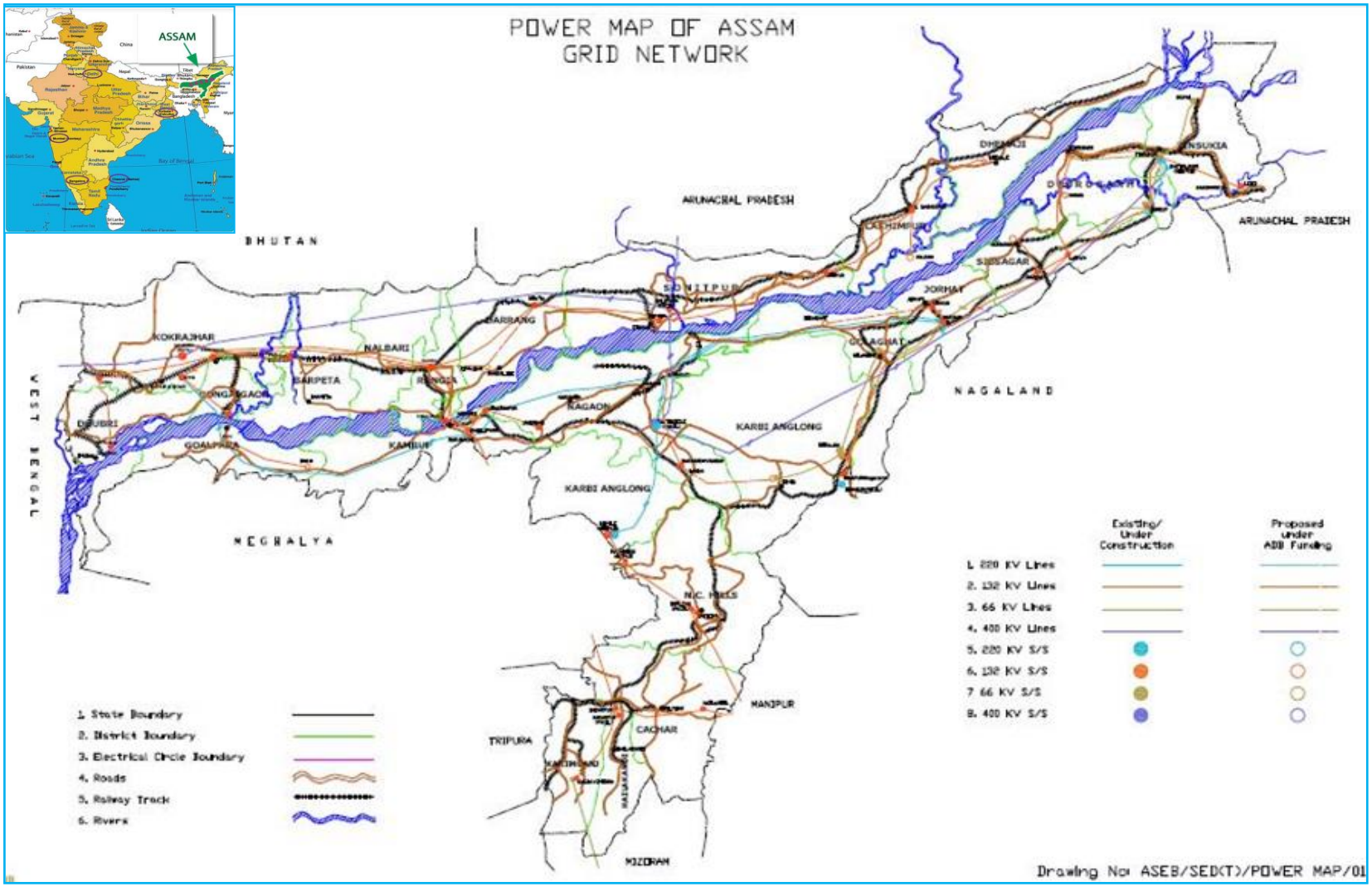
Assam is situated in the northeast region of India with a geographical area of 78,438 Sq. Km. covered by 35 civil districts. Assam shares its boundary with other states of the country i.e. West Bengal, Arunachal, Nagaland, Manipur, Tripura, Mizoram and Meghalaya. It also shares international boundary with Bhutan and Bangladesh. Assam is having a total population 2.66 million (2001 Census) with density of population of 340 per Sq. km.

APGCL's 3 (three) operating power plants namely 119.5 MW (De-rated) Namrup Thermal Power Station (NTPS), 157.2 MW Lakwa Thermal Power Station (LTPS), and 100 MW Karbi Langpi Hydro-electric Power Station (KLHEP). 60 MW Chandrapur Thermal Power Station (CTPS) was closed since June'1999 due to exorbitant cost of generation for steep hikes of fuel oil. However the plant is being revived by using coal as an alternative fuel in JV on Public-Private- Partnership (PPP) mode on B-O-T basis.

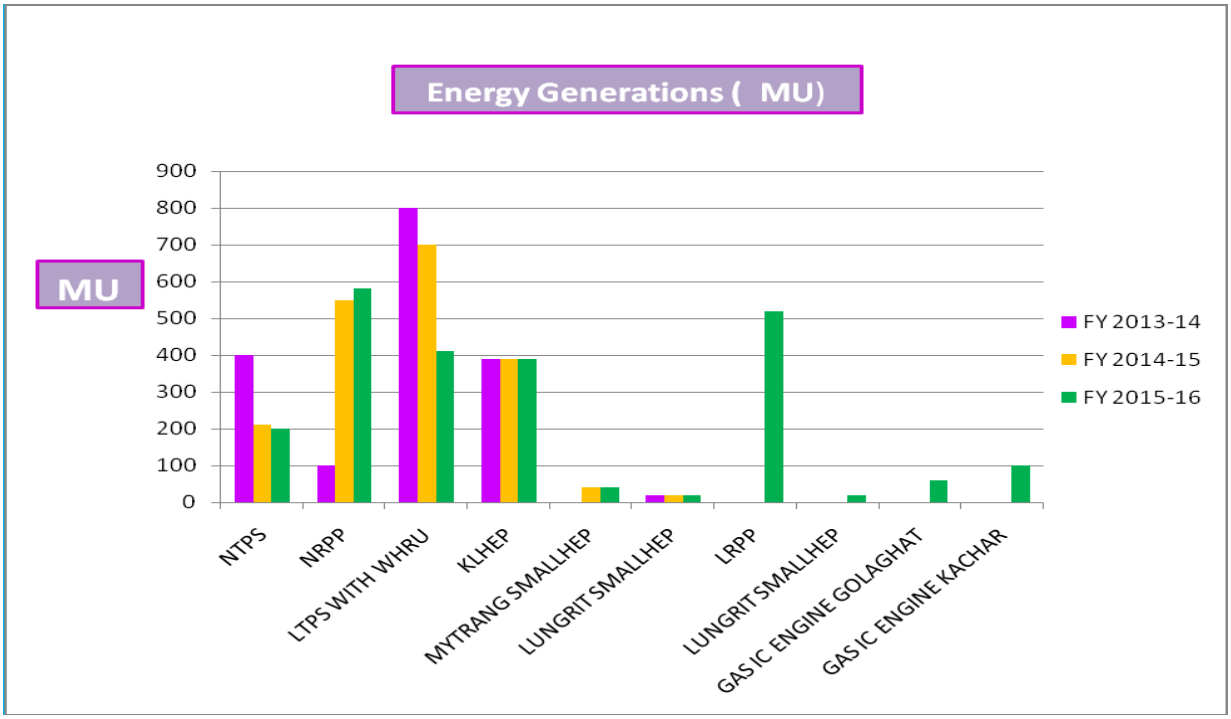




Power Distribution Network Map of Assam



Energy Generation Scenario in Assam



Anticipated All India Power Supply Position for the year 2015-16 including NE Region

Area	Energy				Peak			
	Requirement (MU)	Availability (MU)	Deficit (-)		Requirement (MW)	Availability (MW)	Deficit (-)	
			(MU)	(%)			(MW)	(%)
India	1162423	1138346	-24077	-2.1	156862	152754	-4108	-2.6
NE Region	15703	13934	-1769	-11.3	2650	2544	-106	-4
Assam	**9115**	**6937**	**-2178**	**-23.9**	**1500**	**1197**	**-303**	**-20.2**

http://www.cea.nic.in/reports/annual/lgbr/lgbr-2016.pdf

Assam Power Distribution Company Ltd. (APDCL) under Government of Assam provides essential service of the supply of power to people of Assam. In carrying out the works of supplying power, APDCL reaches every part of the state. The company is serving the people of Assam with a consumer base of more than 29 lakhs and exhibits a growing trend year by year.

Since its formation, the APDCL has been striving to improve its efficiency and performance and to give quality services to the consumers. The APDCL is continuing the reform process by reducing the transmission and distribution losses (T&D Loss), providing Information Technology solutions and improving overall performance.

The distribution network is spread over all the 35 districts of Assam, of which three are hill districts. The total number of existing 66/33 kV and 33/11 kV sub-stations are 256 of which 7 are 66/33 kV. Constructions of some 33/11kV sub-stations are going on under various schemes.

(http://www.apdrp.gov.in/Tenders/ITC_RfP/Assam%20State%20Electicity%20Board%20(ASEB).pdf)

Activities under Energy Conservation Action Plan

PART-A

1.0 Establishment of internet Platform for communication with SDA
1.1 Design of Database/ website linkage with other SDA/ BEE
1.2 Status of compliance/ non compliance of DCs & Notified Buildings
1.3 Status of availability of notified equipments in the state
2.0 Preparation of list of certified energy managers and accredited energy auditors which work or reside in the State
2.1 Prepare Energy Managers' & Auditors' list
2.2 Prepare Energy audit firms list with industry specialization
2.3 Prepare ESCO list
3.0 Preparation of list of designated consumers and their energy consumption
3.1 Prepare designated consumers list
3.2 Collect energy consumption data from designated consumers
4.0 Preparation of set of forms concerning communication of data and other information with BEE
5.0 Half yearly State level meeting with certified energy managers and accredited energy auditors to discuss duties and responsibilities
6.0 Annual State level conference of energy intensive industry, as well as certified energy managers and accredited energy auditors with award for all categories
6.1 Annual state level conference
6.2 Constitution of State Level EC Awards
6.3 State Level EC Day Celebration
7.0 Half yearly regional meeting for exchange of information about lessons learned on state level implementation EC Act,
8.0 Annual meeting of all SDA's to discuss progress and next year's action plan with BEE
9.0 Design and printing of promotional material to be distributed to all four stakeholders: certified energy managers, accredited energy auditors, designated consumers and general public
9.1 Preparation of promotional materials like pamphlets, brochures, posters etc.
9.2 Organizing Awareness campaigns on EE products and services
9.3 Propagation of EE through school education
9.4 Provide DCs with the relevant standards developed by BEE from time to time (Maintaining a Library of Information)
9.5 Promotion of new technologies for EE improvement
9.6 List of EE technologies/ Standards
10.0 Conduct mandatory refresher course for certified energy auditors and energy managers
10.1 Conduct Mandatory Refresher Course for certified EM/ EA
10.2 Training of prospective EM/ EA

11.0 Implementation and conduct of Life Long Learning (3L) Program of BEE for certified energy auditors, accredited energy auditors and other interested parties
12.0 Training of designated consumers for annual reporting energy data
12.1 Trainers database list (industry-wise, subject-wise)
12.2 Training of SDA personnel as trainers (through TOT)
12.3 Training of Designated consumers in the State
12.4 Training of Designated consumers on e-data filling/ analysis of energy data
13.0 Collection of data concerning manufacturing as well as sales of house hold appliances and other equipment at state level falling under the Energy Conservation Act,
14.0 Annual Report about state wise sales of labeled household appliances and other energy intensive equipments
15.0 Annual survey and analysis of impact of EC Act, based on reports of accredited energy auditors as well as energy managers as well as other source of information in the state
15.1 Impact of EC Act,
15.2 Conduct demo projects (Govt. buildings, water pumping station, sewage pumping station, municipality, Street lighting system, traffic lighting system, etc.)
15.3 DSM demo projects (CFL, peak load management programs, etc.)
15.4 CDM projects
15.5 Dissemination of the demo project results
15.6 Development of SMEs clusters
15.7 EE in Agriculture pumping system
16.0 Preparation and publishing of annual year book of energy conservation measures at state level
17.0 Survey of buildings at state level which fall under the EC Act,
17.1 Amend ECBC
17.2 Prepare commercial building list as designated consumers
18.0 Preparation of report and analysis of State level incentive as well as disincentive policies concerning energy conservation measures in energy intensive industries including power sector
18.1 Publication of State Level Annual Book of Energy Conservation Measures.
19.0 Preparation of recommendation for streamlining state level policies concerning energy conservation
19.1 Formulation of State policy and action plan/operational plan

PART-B

20.0 Suggest State Government to establish State Energy Conservation Fund

21.0 Ensure implementation of EC Act in the State

21.1 Prepare list of DC industry-wise for notification (Repetitive)

21.2 Prepare list of commercial building for notification (Repetitive)

21.3 Ensure appointment of certified energy managers by DCs (Repetitive)

21.4 Ensure mandatory energy audit by DCs (Repetitive)

21.5 Establish systems and procedures for mandatory energy audit reports/action taken reports

21.6 Implement ECBC in State under the overall guidance of BEE/GoI on voluntary basis

21.7 Implement S&L Program under the overall guidance of BEE/GoI on voluntary basis

21.8 Prepare draft rules and regulations under EC Act (Section 57) (consistent with the rules and regulations framed by Central Government)

22.0 Co-ordination with State Government and other stakeholders

22.1 Provide list of DCs and Commercial buildings for notification

22.2 Notify by State Govt. for State Level EC day

22.3 Notify by State Govt. for S & L

22.4 Notify by State Govt. for ECBC

22.5 Report on impact of EC Act in State

22.6 Report on action taken on non-compliance in the state

22.7 Status of EC Fund utilization and the corresponding results achieved

Formation of ECAT

As required under EU-EISEEI project for the purpose of enforcing the provisions of the EC Act in a meaningful and effective manner, the Assam SDA had formed the Energy Conservation Action Team (ECAT) to plan; design and draft the Energy Conservation Action Plan (ECAP) for this State vide Notification No.CEIA/EC-10/101, Dtd.12.06.2008. The list of ECAT members is as below:

Sl. No.	Name	Designation	Organization
1	*Sri M.K. Choudhury*	*Addl. Director*	*Assam Energy Development Agency*
2	*Sri Hangsa Dhar Sarma*	*Manager Technical*	*Assam Industrial Development Corporation*
3	*Sri M. Gopal*	*Dy. Chief Engineer (PS)*	*NF Railways*
4	----------	*The SE*	*Directorate of Municipal Administration*
5	*Smti Utpala Sarma*	*Dy. General Manager*	*Assam State Electricity Board*
6	*Sri S. K. Mitra*	*Chief Engg. Service Manager*	*Indian Oil Corporation Limit*
7	*Sri Mukut Das*	*Sr. Manager (Elect.)*	*Assam State Electricity Board*
8	*Sri B. K. Dash*	*Sr. Plant manager*	*Hindusthan Paper Corporation, Jagiroad*
9	*Smti N. H. Borbora*	*Asstt. Executive. Engineer, IRCA-I*	*Lower Assam Electricity Distribution Company Ltd*
10	*Sri A. Goswami,*	*Executive Engineer*	*Indian Institute of Technology, Guwahati*
11	*Sri R.S. Singh*	*Asstt. Manager (E)*	*Cement Corporation of India, Bokajan*
12	*Sri Dhiraj Kakati*	*Secretary*	*Assam Branch of Indian Tea Association*
13	*Sri Dipanjol Deka*	*Secretary*	*Tea Association of India*
14	*Sri P.C. Sarma*	*CEIA (Retd.)*	*Individual*
15	*Sri Tapan Mahanta*	*Manager (Elect.)*	*Assam Power Generation Company Limited*

Activities undertaken by Assam State Designated Agency during 2012-2016

State Designated Agency of Assam (O/o the Chief Electrical Inspector -cum- Advisor) Initiated for Conserving Energy in last 5 (Five) years (2012 to 2016) with funding support from Bureau of Energy Efficiency and with Support from Govt. of Assam across the state of Assam.

A) ***LED Village Campaigning:*** Distributed 4,700 nos. of LED bulb in different district of Assam to penetrate the use of LED for Energy Conservation in domestic sector in phase manner and achieved 0.55 MU Energy Savings per year. Also distributed 50 nos. of LED based Street Light to replace the old and energy inefficient Street Lighting System towards reducing energy consumption in phase manner and achieved 0.007 MU Energy Savings per year.

B) ***Demonstration Project:*** Conducted Energy Audit in ASDA office building & Implemented Energy Efficient equipments along with post implementation Audit report and estimated energy savings is 0.008 MU per year.

Conducted Detailed Energy Audit in 4 (four) Tea Estates (TE) and Implemented Energy Efficiency Measures in 2 (Two) Tea Estates namely Basmatia TE and Chinnamara TE. Basmatia TE has achieved 26.10 % saving in terms of Electricity and Cinnamara achieved 20.40 % savings in terms of Electricity and 44.05 % Natural Gas.

C) ***National Workshop for SDAs':*** The National Workshop emphasised on "Strengthening of State Designated Agencies (SDAs) on efficient use of energy and its conservation". Apart from that, the workshop also focused on Energy Conservation Building Codes (ECBC), Standard & Labeling Program, Perform, Achieve and Trade (PAT) schemes of BEE under which SDAs are required to play an important role during the 12th Five year plan. In this regard ASDA has facilitated BEE to organize a 2 (two) days (6th & 7th June 2016) National Workshop at Guwahati, Assam.

D) ***Perform Achieve and Trade (PAT) Scheme:*** Checked consistency and authenticity of Monitoring and Verification report, Mandatory Energy Audit Report, Form A, Form B, Form I, Form II, and Form Sh. Under PAT rules.

E) ***MuDSM Program:*** To improve overall energy efficiency of the 8 (eight) number of ULBs (Urban Local bodies), a detailed study were carried out for identifying Energy Saving Opportunities which may lead to substantial savings in energy consumption through Implementation of all stated ECMs, thereby resulting in cost reduction / savings for the ULBs.

F) ***Energy Conservation Building Code:*** Prepared draft ECBC (State specific) and sent it to BEE for their necessary approval. BEE's final comments & clearance on the draft ECBC has been received and now it is in the process of Gazette notifying by Govt. of Assam.

G) Technical Manpower Support: As per EC Act, the SDAs are supposed to perform the role of a coordinating agency, regulator and enforcement agency in the State to promote the efficient use of energy and its conservation. Existing manpower in its normal cadre does not suffice further activities beyond usual mandate of SDA and as such correspondingly experienced additional Technical manpower support is required to enable the SDA to coordinate, regulate and enforce various provisions of the EC Act, namely managing State Energy Conservation Fund (SECF), implementing Perform, Achieve and Trade (PAT) and other BEE schemes.

H) Impact Assessment Studies: The study was conducted to assess the impact of different components of programs implemented by ASDA for 2012-13 and 2013-14, with a aim that those can be used as support material by the Government in formulating strategies and efforts to meet commitments regarding Energy Efficiency & Climate change by assisting in increase of efficient use of energy in different sectors, as well as for implementation of regulatory provisions.

I) Student Capacity Building Program: Student community is the future of Nation and a prime deciding factor of present day's social mood as well as practices. It is well known fact that large part of our ideas, knowledge and our adult behavior are super-built over our education during childhood. Education obtained during childhood does mould our individual attitudes by exposing ourselves to new ideas and concepts that we readily didn't know. It is also true that by virtue of propensity, children and youth accept and adapt to new ideas or change faster than the adults.

Considering the above, BEE has been taking various innovative initiatives through the ASDA for creating the Energy Conservation Awareness among students. ASDA approached various schools within the State and briefed them about the importance & necessity of the Energy Conservations and also requested them to conduct various program such as publishing Energy e-Book and arranging Energy Q-Quiz, Energy X-change, Essay Competition, Carbon Edu X-change, Power Kids League Workshop, Energy Champions & Mentors Meet, Energy Carnival, Painting Competition on Energy Conservation, Model Competition on Energy Conservation, Street Play, etc. on Energy Conservation.

On receipt of financial assistance from ASDA, the school's children have been taking wide range of initiatives towards Energy Conservation. Following seven schools formed Energy Club towards joining their hands with us in the move towards contributing ongoing National Goal on Energy Conservation:

I. Govt. Boys' H.S. School, Nagaon
II. Konwerpur H.S. School, Sivasagar
III. Matia Refugee M.E. School, Goalpara
IV. Joktali H.S. School, Sivasagar
V. Bhaskar Bidyapith Higher Secondary School, Guwahati,
VI. Rashtrabhasa Vidyalaya, Tezpur,
VII. Dawson Higher Secondary & Multi-Purpose School, Nagaon

From proactive initiatives taken by the Students under guidance and leadership of their respective Teachers, it has been observed that the Students and their Teachers are taking more interest towards the

National Mission towards incremental use of Energy in efficient way in all walks of life. The striking aspect of the activities is manifestation of their eagerness to know methods of Energy Conservation through Energy Efficiency and judicious use of energy in day to day life.

They let us know that they have realized the importance of Energy Conservation and showed concern about uncharted and uncared use of Energy in their day-to-day life. The students are really concerned on conservation of more energy to make our State **Sustainably Developing** for their tomorrow. Most of the students pledged to switch off lights when day light is available and to put off electrical item in their classes when not required. They also showed keen interest to convey the merits of Energy Conservations among their family and society members through their street play and booklets etc.

We are delighted to mention here that among those schools, two schools, namely **Konwerpur H.S. School, Sivasagar** and **Joktali H.S. School, Sivasagar** are performing exceptionally well. The students of these two schools performed more than that was expected. They not only proved themselves to become truly aware about energy conservation but also showed having clear idea about the demerits of using Energy in non-judicious ways. The students themselves prepared booklet where they included their views and also expressed their apprehension about negative effect in future if Energy is not conserved from now itself. They fairly expressed those thoughts, ideas, views, apprehensions etc. through pictures they drew. They also exhibited project work on energy conservation which was really appreciable initiatives.

Thus, the first stage of ASDA's initiative had been encouraged by the Students as well as Teachers through their prompt and excellent response. The interest and motivation in respect of Energy Conservation shown by them can be example or otherwise inspiration to others.

I. ***Student Interaction with Shri Piyush Goyal, the Hon'ble Minister of State (Independent Charge) for Power, Coal and New & Renewable Energy on National Energy Conservation Day, 2015:*** The National Energy Conservation Day 2015 was celebrated on 14th December 2015 at NIC Conference Hall, Assam Secretariat, Dispur through a video conference organized by the **Bureau of Energy Efficiency (BEE)**, where a few selected students of **Sanskriti the**

Gurukul School, **Guwahati**, Assam interacted with the Hon'ble Minister at the National Energy Conservation Day function, in New Delhi on December 14, 2015. Shri Md. N. Huda, Chief Electrical Inspector-cum-Adviser & CEO, Assam State Designated Agency (ASDA) attended the function as a Chief Guest along with Shri. A. C Khataniar & Shri. Utpal Konwar, Dy. Chief Electrical Inspectors, Govt. of Assam.

In this video conference, the students of Sanskriti the Gurukul School, Guwahati shared their thoughts on energy conservation activities with the Hon'ble Minister. Shri Piyush Goyal, Hon'ble Union Minister appreciated the inspiring ideas from students on how to conserve energy in an effective way. The Hon'ble Minister also highlighted few tips on energy savings for homes and schools and took commitment from the students to ensure that they will help in conserving energy at home and school. In this process, these young school children had developed early attitudes towards the frugal use of energy, the necessity for energy conservation and the adoption of renewable sources of energy. The following students participated in the video conference:

i. Devahuti Talukdar : Class IX
ii. Debargha Roy : Class IX
iii. Kriti Jain : Class VIII
iv. Nishanka Khaund : Class VIII
v. Priyanshi Bhartiya : Class VIII
vi. Manashi Deka : Class VII
vii. Ojal Jain : Class VII
viii. Saptarshi Adhikari : Class VII
ix. Subhrajay Chengkakoti : Class VII
x. Ryna Himatsingka : Class VI

J) ***Publicity and Awareness Program:*** Conducted various Awareness Program to create responsiveness among the people through hoarding, leaflet, booklets, Social Outreach Program, Mobile van theatre etc.

K) ***Workshop and Training Program:*** Conducted Workshop and Training Program to increase the understanding on energy conservation and method of E-filing, ECBC, IGEA, MuDSM and Stake holder consultation.

L) Formation of Energy Club: Establishment / Strengthening of Energy Club in School has been initiated by Assam SDA in the year of 2014 for first-hand realization of the Energy Awareness & Conservation under direct fund assistance of from BEE in that behalf. The focus of the Energy Clubs is to convey the messages and develop interest about energy conservation in the minds of all, keeping the school children in prime role of the social pedagogic endeavor.

Snap Shots of Energy Club Activities

Joktali H.S. School

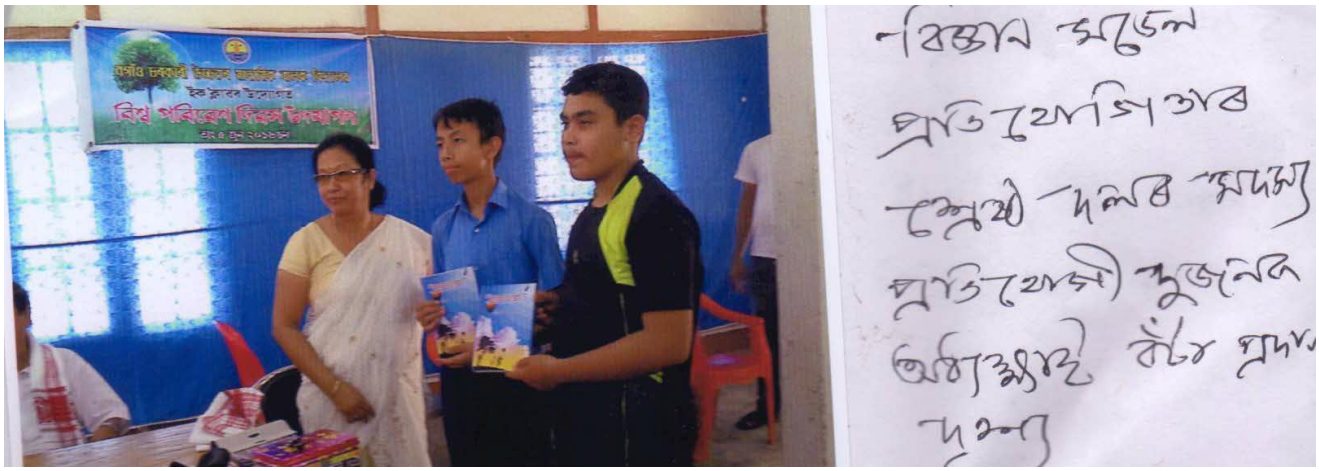

Energy Club
জোকতলি উচ্চতৰ মাধ্যমিক বিদ্যালয়ৰ সৌজন্যত
'শক্তি সংৰক্ষণৰ শোভাযাত্রা'
তাৰিখ ঃ ১৩-০৮-২০১৬ (শনিবাৰ)


Energy Club


Energy Club
জোকতলি উচ্চতৰ মাধ্যমিক বিদ্যালয়ৰ সৌজন্যত
'স্বচ্ছ ভাৰত অভিযান'
তাৰিখ ঃ ১৩-০৮-২০১৬ (শনিবাৰ)

Snap Shots of Energy Club Activities

Nagaon Govt. Boys Higher Secondary School

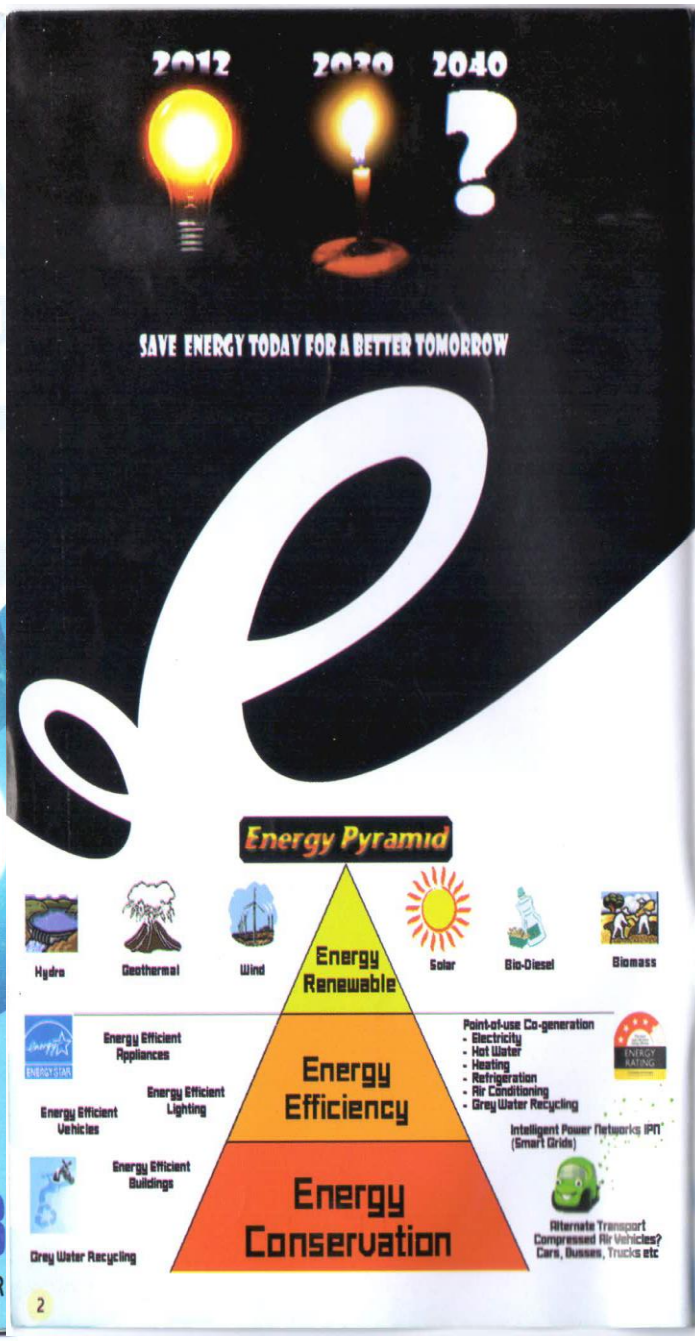


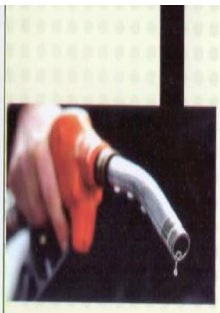
ENERGY CLUB ৰ
দ্বৌজন্যত বিদ্যালয়ত
ৰহণ প্ৰতিযোগিতাৰ
অনুষ্ঠিত কৰাৰ -
দৃশ্য

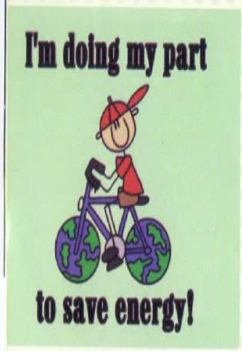
-বিজ্ঞানৰ Model
প্ৰতিযোগিতাৰ
-বিচাৰক শিক্ষয়িত্রী;
তত্ত্বাবধায়ক ৰেৰ RMSA
ৰ -বিষয়ৰ -

Snap Shots of Energy Club Activities

Konwerpur Higher Secondary School







১০) কম দূৰত্ব ভ্ৰমণ কৰিবলৈ খোজ কঢ়া বা চাইকেল চলোৱাৰ অভ্যাস কৰিব লাগে।

১১) বেছি মাইলেজ দিয়া বাহন ব্যৱহাৰ কৰিব লাগে।

১২) গাড়ী চলাওঁতে সঘনাই ৰখোৱা কাৰ্য কৰিব নালাগে।

১৩) গাড়ী চলাওতে গাড়ীৰ দ্ৰুতি 50-60 $^{km}/_{h}$ ভিতৰত থাকিলে যথেষ্টখিনি ইন্ধনৰ ৰাহি হয়।

১৪) ট্ৰেফিক পইন্টত ১ মিনিটতকৈ বেছি সময় ৰব লগীয়া হ'লে গাড়ীৰ ষ্টাৰ্ট বন্ধ কৰি দিব লাগে।

১৫) ক্লাচ ধৰাৰ সময়ত এক্সেলেটৰ ব্যৱহাৰ কৰিব নালাগে আৰু ক্লাচ ধৰি গাড়ী চলাব নালাগে।

১৬) গা ধোৱা, বাচন বৰ্তন ধুওঁতে পানীৰ ব্যৱহাৰ সঠিকভাৱে কৰি পানীৰ অপচয় ৰোধ কৰিব লাগে।

১৭) বাৰিষাৰ সময়ত বৰষুণৰ পানী সংৰক্ষণৰ ব্যৱস্থা কৰিব লাগে।

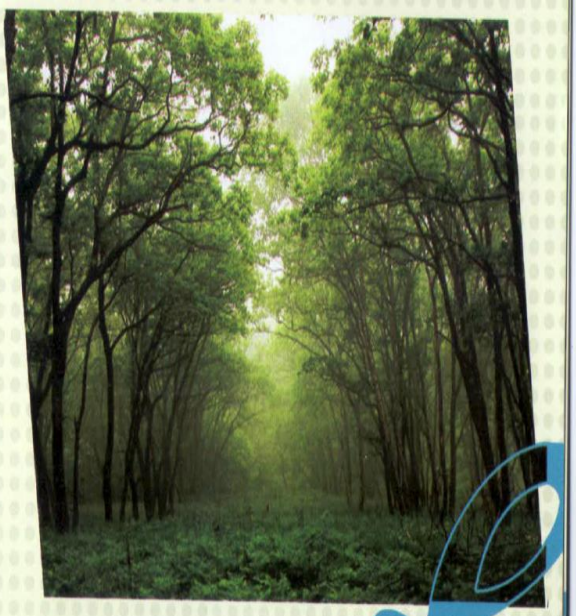
১৮) ঠাণ্ডা দিনত পানী গৰম কৰিবলৈ সূৰ্যৰ তাপ ব্যৱহাৰ কৰিবৰ কাৰণে সু-ব্যৱস্থা কৰি ল'ব লাগে।

18 bright ideas

শক্তি প্ৰকল্প (Energy Plantation) ঃ-

আমাৰ বিশ্বব্ৰহ্মাণ্ডৰ এক প্ৰধান অংগ হৈছে শক্তি। এই শক্তিৰ ওপৰতে বৰ্তমান যুগত এখন দেশৰ উন্নতি, অৰ্থনীতি, ক্ষমতা এই সকলোবোৰ নিৰ্ভৰ কৰে। শক্তিৰ অবিহনে কোনোধৰণৰ উন্নয়নমূলক কামৰ কথা চিন্তা কৰাটো অসম্ভৱ হৈ পৰিছে। এখন দেশৰ বেপাৰ-বাণিজ্যৰ প্ৰসাৰণ, বিভিন্ন ধৰণৰ উদ্যোগ গঢ় দিয়া আদি, সকলোৰ বাবে প্ৰযুক্তি আৰু শক্তিৰ প্ৰয়োজন। কিন্তু এই শক্তি আমি ক'ৰ পৰা পাম? শক্তি প্ৰধান উৎস হিচাপে কয়লা, লিগনাইট, খাৰুৱা তেল, প্ৰাকৃতিক গেছ আদিকে ব্যৱহাৰ কৰা হয়। প্ৰাকৃতিক সম্পদ হিচাপে এইখিনি শক্তি মজুত আছে যদিও এটা সময়ত শেষ হৈ যাব। গতিকে শক্তিৰ বিকল্প উৎস পাবলৈ হ'লে আমি কিছুমান শক্তি প্ৰকল্প গঢ় দিব লাগিব।

শক্তি প্ৰকল্প বুলি ক'বলৈ গ'লে, সাধাৰণতে কিছুমান বিশেষধৰণৰ উদ্ভিদৰ খেতি কৰা হয় যাতে সিহঁতক ইন্ধনৰ হিচাপে ব্যৱহাৰ কৰিব পাৰি। সাধাৰণতে যিবিলাক উদ্ভিদ অতি কম সময়ৰ ভিতৰতে পৈণত অৱস্থা পায় তেনে উদ্ভিদ নিৰ্বাচন কৰি সিহঁতক ৰোপন কৰা হয়। এই উদ্ভিদবোৰক পোনপটিয়াকৈ ইন্ধন হিচাপে ব্যৱহাৰ কৰিব পাৰি বা চাৰ্কল, গেছ, জলীয় ইন্ধন যেনে মিথানল, ইথানল, ইছাইল, এককহল আদিলৈ ৰূপান্তৰ কৰিও ব্যৱহাৰ কৰিব পাৰি। এনেধৰণৰ শক্তি প্ৰকল্পৰ বাবে সাধাৰণতে অন্য প্ৰয়োজনীয় খেতি-বাতিৰ বাবে ব্যৱহাৰ নোহোৱা ঠাই নিৰ্বাচন কৰি লোৱা হয়। এই শক্তিপ্ৰকল্পৰ বাবে নিম গছ এবিধ ভাল উদাহৰণ।



M) State level Painting competition for school children

BEE arranged for State level painting competitions through Power Grid in Assam with active participation of Assam SDA in organizing the same, as a part of National Painting Competition for school children for creating awareness on energy efficiency.

It is very encouraging to see that there was phenomenal rise in the number participants in the competition each year in Assam, e.g. 4000 students participated in the first year (2005) and this number shoot up to 17,85,803 in 2015.

Number of participants from **Assam** in the **Painting Competitions** for school children, organized by the **Bureau of Energy Efficiency (BEE)** through nodal agency **Power Grid Corporation of India** and with due active support from **Assam SDA**.

Year	No. of Participants
2005	4000
2006	23320
2007	25083
2008	49198
2009	91586
2010	273000
2011	344761
2012	353663
2013	511619
2014	1003382
2015	1785803

Increase of student's participation exceeding 440 folds over a decade is very encouraging and indicates deeper than imagined degree of penetration of Energy Efficiency concepts among upcoming Citizens of coming days.

Earlier activities of Assam State Designated Agency

1. Activities carried out during 2011-2012

An amount of Rs. 11.00 lakhs was received by Assam SDA from BEE for the year 2011-12 under action plan and Rs. 22.17 lakhs being 2nd installment for carrying out of Annual Energy Savings Plan. The following works were carried out:

A) ***Workshop/ Training Program:*** One day workshop cum seminar organized on amendment of Energy Conservation Building Code (ECBC) to suit local climatic condition of Assam at Guwahati on 11.05.2012. Review meeting with SDAs of NE and Eastern region with BEE on 2.11.2012 at Guwahati.

B) ***Publicity/ Awareness Program:*** Audio jingle on energy conservation broadcasted through FM radio channels to spread the message of energy conservation.

C) Energy Efficiency Services Limited (EESL), a joint venture company of PSUs of Ministry of Power, Govt. of India, entrusted the works of preparation of the sector specific Annual Energy Savings Plan for Assam.

D) Publication of Annual Book on Energy Conservation Measures in Assam-2012.

2. Activities carried out during 2009-2010

An amount of Rs.25.00 lakhs was received by the Assam SDA from the BEE for the year 2009-10 for carrying out of certain priority activities from the list of activities under the 19 deliverables. The following works were carried out:

A) ***Workshop/ Training Programs:*** A one day training program for the Designated Consumers in Assam was organized on 19th August 2009 at Guwahati. An interactive session on "Women in Energy Conservation" was organized with Indian Chamber of Commerce, NE Initiatives, Guwahati on 25th August 2009. A meeting with the building owners and ESCOs regarding implementation of the IGEA DPRs organized on 29th August 2009. A two days workshop on 'Energy Efficiency, Codes and Ratings in Buildings' was organized at Guwahati with SEEM, Thiruvananthapuram on 29th and 30th April 2010. Besides a workshop on MuDSM was organized by BEE and TUV SUD South Asia at Guwahati on 16th February 2010.

B) ***Publicity/ Awareness programs****:* Several activities were taken up during the year for carrying out activities under publicity and awareness program. Jingles on Energy Efficiency messages were broadcasted through FM radio channels. As mobile theaters are very popular in Assam and have a good penetration in both urban and rural areas, some publicity activities were carried through mobile theater to spread the messages of Energy Efficiency and Conservation among general public.

C) ***BEE's Nationwide 'LED Village Scheme':*** LED Village scheme launched by BEE throughout the country was taken up in Assam. **Assam SDA has adopted this scheme in 2009 (first time in India, who has adopted this scheme)**. Makumpathar No. 4 village at Tinsukia district of Assam was selected for the project. 100 LED street lights of 20 W were fitted in the village street and as per the scheme about 950 LED lamps of 6W will be distributed among the electricity consumers in the village.

D) ***Demo Projects:***

i. Demo project on LED street lighting at Dibrugarh town from Phulbagan to the Deputy Commissioners office, replacing 70 nos. existing street lights with 50W LED street lights.

ii. A Demo project on LED street lighting is undertaken at Guwahati from Bharalumukh to Panbazar, replacing about 100 nos. existing 250 HPSV lamps with 100W LED street lights.

iii. Another demo project on Energy Audit at Lakwa Thermal Power Station is also taken up and is expected to be completed by October 2010.

3. Activities carried out during 2008-2009

An amount of Rs.28.00 lakhs was received by the Assam SDA from the BEE out of the total sanctioned amount of Rs.40.00 lakhs for the year 2008-09 for carrying out of certain priority activities from the list of activities under the 19 deliverables. The works were carried out:

A. Under IT Support design of database/ website linkage with other SDAs/ BEE carried out and database management software for maintaining database of EA & EMs, ESCOs, Buildings, and Designated Consumers procured. The activity on status of availability of notified equipments in the State was not carried out as the equipments have not been notified yet by the competent authority.

B. No activities carried out under Technical Assistance/ Consultancy/ survey during the year, as the same was carried out in 2007-08.

C. Under Workshop/ Training Programs seven seminars/ workshop/ training programs organised viz. an All India Seminar with Institution of Engineer (India), Assam State Centre, Workshop at Guwahati under EU program, Workshop for Tea sectors at Jorhat, awareness workshops at Bongaigaon and Tezpur, training program for designated consumers at Guwahati and a review meeting by BEE with SDAs

.

D. Under Publicity/ Awareness large hoardings placed at Guwahati and other five places in the State, preparation of promotional materials like brochures, posters, banners, flex banners, leaflets, campaign through FM radio channel were taken up. National EC day celebrated on 14th December 2008 at Shilpgram with organizing an essay writing competition among 6th to 8th standard school children.

E. Activity on dissemination of demo project result was not undertaken as no demo project on Energy Efficiency taken up during the year.

F. Investment Grade Energy Audit (IGEA), a scheme introduced by Bureau of Energy Efficiency (BEE), New Delhi, were carried out in 15 Government buildings in the state of Assam during the year 2008-09 under fund assistance received from BEE in phase manner.

An amount of Rs. 5.25 lakh out of total sanctioned amount of Rs. 7.50 lakhs was received by SDA Assam from BEE for carrying out of Investment Grade Energy Audits (IGEA) in Government buildings. Accordingly, IGEA in 15 Government buildings were carried out. PCRA, Kolkata carried out IGEA of five buildings and M/S Blue Star, Kolkata carried out IGEA of ten buildings.

An amount of Rs. 1.00 lakh was received from BEE for organizing an essay writing competition among 6th to 8th standard school students in the State. The State level essay writing competition was held on 14th December 2008 at Shilpgram, Guwahati and prizes to the winning students distributed in the evening at a function held on the occasion of the National Energy Conservation Day.

4. Activities carried out during 2007-2008

Financial assistance was provided by the BEE for strengthening and capacity building of the State Designated Agencies of India for achieving the purpose and objectives of the EC Act. In case of SDA of Assam, a total amount of Rs.26.40 lakhs was received in November 2007 for the year 2007-08 for carrying out certain activities on priority basis from the list of 19 deliverables set by the BEE. A current bank account in the name of 'State Energy Works Fund' was opened at Allahabad bank as per approval of the Government vide letter No.PEL.81/02/Pt/168, Dtd.24.12.2007 to deposit the fund received from BEE for carrying out of works. Accordingly, the following activities were carried out as per the said action plan covered by 19 deliverables set by the BEE:

A. IT equipments and software procured for establishment of Internet platform. A new website in the name of SDA Assam **www.asda.gov.in** launched in March 2008.

B. Necessary Hardware & Software were procured and established Internet Platform having five (5) user points covering HQ office and one Zonal office of the Inspectorate. Besides, necessary Multimedia projection devices to cover seminar, workshop and training programs under action plan have been procured.

C. NPC, Guwahati was entrusted with the works of carrying out survey for preparation of list of certified energy managers and accredited energy auditors residing in the State, preparation of list of designated consumers in the State, collection of data concerning manufacturing as well as sales of household appliances and other equipment at the State level falling under the EC Act, annual survey and analysis of impact of EC Act, survey of buildings at State level which fall under the EC Act.

D. Under Workshops/ Training Programs, four programs were conducted viz. Workshop on EC awareness, Conference of EM & EA residing in the State, Regional Meeting with SDAs and BEE, conference of BEE on action plan.

E. Under Publicity/ Awareness program, promotional materials like folders, banners, leaflets, flex banner displaying EC messages made for display and distribution among public/ energy users. News paper advertisements and promotional audio messages through FM radio channel published/ broadcasted.

F. Under Technical Assistance for preparation of consultants report on Demo projects (Govt. buildings, water pumping stations, sewage pumping stations, Municipality street lighting system etc, DSM demo projects such CFL, peak load management program carried out through National Productivity Council, Guwahati.

Initiatives undertaken by ASDA on Energy Conservation in Tea Industry

The State of Assam is the world's largest tea growing region and situated in the North eastern corner of India.

It is grown in both the Brahmaputra and Barak plains in Assam. Tea gardens are mostly found in Dibrugarh, Tinsukia, Sibsagar, Jorhat, Golaghat Darrang and Sonitpur districts of Assam. About 17% of the workers of Assam are engaged in the tea industry.

The total area under tea cultivation in Assam is accounting for more than half of the country's total area under tea. In addition to existing big & large tea gardens owned by reputed both Indian and multinational Companies, the profession of tea plantation in the State has taken up by common man as business venture at present, especially by unemployed youths. Assam alone produces more than half of India's tea production.

Considering the importance of this Industry, Assam SDA select four Tea Estate to conduct the study on Energy Consumption and to find out the opportunities to reduce the cost of Energy as well as cost of Production.

As per the initiative of State Level Steering Committee on Energy Conservation, an Agreement was signed between ASDA and Energy Efficiency Services Limited (EESL, under Ministry of Power, Government of India) for Preparation of DPR, Implementation of ECRMs, Monitoring and Verification of Demonstration Projects in the following Tea Gardens;

- ✓ *Basmatia Tea Estate*
- ✓ *Cinnamara Tea Estate*
- ✓ *Hoolungooree Tea Estate*
- ✓ *Neghereting Tea Estate*

After preparation of detailed project report, initially Basmatia and Cinnamara Tea Estates (TEs) were selected for implementation of ECRMs.

Basmatia Tea Estate Synopsis

Baseline	Intervention	Inference
Production range (DMT): **8, 42, 690 kg.** per Year approximately. Power Purchased from ASEB: **4, 89, 251 kWh** Per Year approximately. Fuel (High Speed Diesel) Consumption: **49, 239 Litters** Per Year approximately. Annual Energy Cost Before Implementation of Energy Conservation Measures: **INR. 48, 85,182** approximately. Energy Cost per Kg Production Per Year : **INR. 5.797** approximately.	CTC Line 1: (22, 18.65 and 15 kW replaced by 15, 15 and 11 kW Motor respectively) CTC Line 2: (18.65, 15 and 15 kW replaced by 15, 11 and 11 kW Motor respectively) Rotorvane Motors: (2 Nos. of 15 kW replaced by 11 kW)	Pre Installation, Installed Power was 171.3 kW considering the aforesaid 3 distinguished areas, which has been come down to **129.74 kW.** In Terms of Energy, **26.10 % i.e. 1,27,694.5 kWh** savings has been achieved annually. Annual Energy Cost After Implementation of Energy Conservation Measures considering remaining : **INR. 41, 11, 353** approximately. Energy Cost per Kg Production Per Year : **INR. 4.88** approximately.

Basmatia Tea Estate Synopsis

Achievements at Basmatia TE at a Glance;

- ✓ Connected Load has been reduced to **129.74 kW in place of 171.3 kW** after Implementation of ECMs.
- ✓ In terms of Energy, **26.10 %** savings has been achieved annually.