Issue - 1 June 2008

EnConTea

A Quarterly Newsletter of the Project -
Energy Conservation in Small Sector Tea Processing Units in South India

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Editorial

Mr. R.D. Nazeem, I.A.S., Executive Director, Tea Board and National Project Director of the Project

Thank you for taking the time to read the first issue of EnConTea.

This quarterly newsletter has been launched as part of the project - **'Energy Conservation in Small Sector Tea processing units in South India'.**

Tea processing is energy intensive, requiring both electrical and thermal energy. In fact, energy costs account to up to 40% of the processing costs. With growing competition from other tea producing countries, it makes perfect sense to try and adopt measures to stay ahead in the market. Energy conservation measures can reduce the production costs considerably; a reduction of up to 20 % of electrical and thermal energy is possible just by adopting energy efficient measures. These measures will help the industry, especially small processing units to grow. Thus the Tea Board of India has initiated the project 'Energy Conservation in Small Sector Tea Processing Units in South India' to promote and implement energy conservation and energy efficiency measures.

The project is being managed by the Tea Board of India and is supported by the United Nations Development Program - Global Environment Facility (UNDP-GEF). The project is being implemented by Technology Informatics Design Endeavour (TIDE), a Bangalore based non-government organisation which has, since 1995, worked in the development and dissemination of energy efficiency technologies in various industrial sectors.

The project activities commenced with a project inception workshop on 6th March 2008 during which the stakeholders of the project provided their inputs and views regarding the project's strategies and implementation plans. Later, during April 2008, a dedicated project team was put together, where the team members were selected specifically for this project based on their qualifications and experience. The members of the project team were trained in energy conservation and energy audit techniques relevant to the tea industry at the Institute of Energy Studies, Anna University, Chennai. The project team has also been trained in Tea processing technologies, at UPASI-KVK. This team is currently undertaking preliminary energy audits in all tea factories, and identifying the areas in which improvements can be made. Subsequent to the preliminary audits, detailed energy audits will be conducted in interested factories.

All information, i.e. the knowledge resources, case studies, innovations, relevant research articles, etc. will be collected and made available in an user-friendly form, so that interested persons can have easy access. The EnConTea quarterly newsletter will also share relevant and up to date information about energy conservation in tea factories. Along with this, a project website will go online very soon, where interested people can participate in forums and discussion boards to discuss energy-related issues and share their views and knowledge.

The Tea Board in its tenth plan period had announced the - Quality upgradation and product diversification scheme. Under this, the Tea Board recognised the need to take up new technologies and the importance of using energy saving devices, and offered subsidies to tea gardens and factories that wanted to apply changes in this direction. This encouragement by the tea board shall continue during the eleventh plan and it is hoped that the industry will respond proactively.

In conclusion, we could say that this is the right time to change, and take forward the tea industry into a more modern, eco friendly and energy conscious era. This project aims to bring about a revolutionary change in the tea Industry by reducing energy consumption and by promoting green energy. We are looking forward to proactive participation from the industry, and hope to create a positive impact through this project.

Viewpoint

Interview with Mr. Basudeb Banerjee, I.A.S.

Chairman, Tea Board, and Chairperson of the Project's Steering Committee

"Energy conservation will bring monetary benefits as well as environmental benefits"

1. What are the avenues that have been identified by the tea board for efficiency improvement in the tea processing sector?

India is a major producer of Tea in the World. However, there is always scope for improvement in the areas of productivity, quality etc. Some of the improvements that could be made in the tea processing sector are; improving the quality of tea leaves used for production, improving the production process itself, thus improving the quality and/or quantity of the tea produced, and improving the efficiency of the production process to reduce time and costs of production.

2. Currently, a lot of importance is being given to energy conservation Worldwide. What is the relevance of energy conservation in the tea processing sector in India?

Energy conservation will bring monetary benefits as well as environmental benefits. With respect to the tea industry, we know that the energy costs are quite high and can go up to 40% of the tea processing costs, and thus, any saving in the energy consumption can translate into savings in costs. By reducing the amount of energy used and by replacing fuel wood and fossil fuels with renewable energy sources, the amount of Green house gas (GHG) emissions can be reduced. One more aspect is that by reducing energy consumption (and GHG emissions), there is a possibility for trading these reductions in terms of Carbon credits.

3. How does energy use in tea factories vary across regions? Do you foresee challenges in enhancing the energy efficiency of tea factories?

The main difference is the type of fuel used for thermal applications. While in the Southern Tea industries, the main source is fuelwood, the tea industries in the North-East mostly use natural gas and coal. The main challenges that we foresee are; there is a lack of awareness about new energy efficient technologies which generally translates into a lack of willingness to change, and even if there is willingness, there might be financial barriers to the adoption of such changes.

4. What are the initiatives/measures taken by the Tea Board of India to promote Energy conservation in the Indian Tea industry?

The Tea Board in its 10th plan had offered subsidies for energy efficient machinery (for both CTC and Orthodox manufacture units) to reduce the economic burden on factory owners who want to adopt such machinery. Along with this, the Tea Board has recently initiated a project called 'Energy Conservation in Small Sector Tea Processing Units in South India' in association with United Nations Development Programme (UNDP), Global Environment Facility (GEF) and Technology Informatics Design Endeavour (TIDE), to promote energy conservation in the industry.

5. What are the activities and initiatives planned in the energy conservation project?

The first step would be to determine the potential for energy conservation is possible in the factories. This shall be done by conducting detailed energy audits in selected factories by technical experts. The project shall encourage the implementation of the recommendations of the energy audits, and the outcome will be monitored carefully. These results will be made available to the sector so that other factories that are interested in making similar changes may have access to it. The project shall also create mechanisms for accessing energy efficient equipment and finance to fund the purchase of the equipment. The measures taken to conserve energy will then be promoted in tea industries all over the country. What we are trying to do is to eliminate knowledge barriers and create awareness in the Indian tea industry about energy conservation and its benefits.

6. What is the project's strategy to encourage adoption of energy conserving technologies by tea factories?

The first strategy is to remove information barriers. Many factories do not have access to technical and commercial information, and thus, there is a lack of awareness about the energy conservation options that are available. Thus, information dissemination is an important part of the project. Apart from the newsletter and the website, many training programmes specially designed for the targeted audience have been planned to increase

awareness levels. The next is to identify areas where energy conservation can be made, and demonstrate selected energy efficient technologies. The project strategy also includes dialogues with commercial lending institutions to negotiate attractive lending terms for energy efficient equipment.

7. As the project has been initiated in South India, will this project be of relevance in case of tea industries in other regions of India as well? If so, how will the concept be introduced to those tea industries?

Energy conservation will be relevant in tea processing industries anywhere. So once the project is implemented in the South Indian tea industry, the project interventions will be suitably modified and replicated in the other Tea processing areas as well. One of the ways that this will be done is by compiling information and knowledge and making it available to everyone who is interested. We are setting up a website for this purpose. This newsletter is also part of the information sharing. Other modes of information sharing will also be develop based upon local conditions.

8. The project has been initiated for energy conservation in the small tea processing units or bought leaf factories. Does the project have plans to extend its scope to the larger corporate factories?

We are exploring the possibility of extending these initiatives to larger factories as well. Meanwhile, any large corporate factory that is interested can always visit the project website to get an idea of the energy efficiency initiatives implemented in bought leaf factories, and consider if they want to do the same.

9. Have there been attempts in the past by any agency to promote energy efficiency in tea factories in South India. If so by whom, and what were the measures taken?

Yes. In fact, the Tea Board had requested the Institute of Energy Studies (IES), Anna University, to carry out energy audits in some of the Tea Factories in South India. In addition, IES conducted detailed energy audits in 14 tea factories of Indcoserve. Various energy efficiency initiatives, in connection with motors, lighting etc. were suggested, and implemented in a few factories. Apart from this, the Planters Energy Network (PEN), Theni, has been actively researching and promoting renewable energy options such as solar air pre-heaters in various tea factories.

10. Have similar programmes been initiated in the tea sector in any other countries?

Yes, with the climate change crisis looming large over us and with fuel prices increasing every day, many programmes have been launched to promote energy conservation. But to be specific to the Tea industry, the United Nations Environment Programme has introduced energy conservation programmes in eight East African countries to promote green energy sources like small hydro.

11. In relation to energy conservation, what can the tea processing sector adopt from other Industrial sectors in India?

Many energy intensive industries such as foundries, glass and cement plants have implemented plans to emerge energy efficient. The activities of the Bureau of Energy Efficiency have resulted in energy conservation emerging as a mandatory requirement in many industries. In small industries, the need for energy efficiency is being increasingly felt to emerge competitive. Surely, the small tea sector can identify best practices in other industries and assess ways to reduce energy consumption. This is definitely possible since the energy-consuming equipment (motors, fans etc) in tea factories are quite similar to those found in other industries. Some of the enterprising tea factories have, on their own, made attempts to become energy efficient with mixed results. This project shall attempt to identify those technologies/practices that have reduced energy consumption in other industries, and assess their suitability for tea factories.

About this Newsletter

Tea processing requires large amount of thermal and electrical energy. In an effort to reduce energy consumption, and thus energy costs, the Tea Board of India has launched a project 'Energy Conservation in Small Sector Tea Processing Units in South India' aimed at promoting energy efficiency and renewable energy in the industry. A main objective of this project is creating awareness in the tea industry about energy efficiency and renewable energy and their relation to profitability, gathering data and information, and sharing knowledge. This newsletter has been released to meet this objective.

Article

Scope for Energy Conservation by NRC Tea Manufacture

Mr. G. Ramamoorthy
Scientist (Ag. Engg.), UPASI - KVK, Coonoor
and Technical Advisor of the Project

Addition of broken teas to withered leaf has been a common practice in South India for more that 15 years. The primary objective of this practice commonly called RC manufacture is to produce grainy teas of high density and to minimize the quantity of secondary grades. However this type of tea caters to only a limited section of the domestic market.

Generally, factories in South India have high capacity i.e. high HP motors in the rolling section and consequently the power consumption is higher in South Indian factories when compared to factories in North India. This is mainly due to medium standard green leaf and also high rate of broken tea addition. This article shows the results of an experiment on the electrical power consumption in tea manufacture and the cost analysis in relation to power consumption in different stages of RC and Non-RC (NRC) manufacture.

The Study

A study was conducted to determine the difference in electrical power consumption between RC and NRC manufacture using different ratio of RC to the made tea. Following were the treatments. 1) NRC manufacture, 2) RC addition 50%, 3) RC addition 100%, 4) RC addition 150%.

Power Consumption

Normally, more than 60% of power consumption occurs in the rolling section. As expected electrical power consumption for CTC in RC is higher in all the treatments when compared to the CTC process for NRC. Power consumption during CTC increased by 9% due to 50% RC addition, by 23% due to 100% RC addition, and by 45% due to 150% RC addition.

Working Hours

If the number of working hours are taken into consideration it can be seen that the number of hours required for NRC is lower than the hours required for RC manufacture. Taking 14000 Kgs Greenleaf as the basis with 300 Kgs MT/hour output, 12 hours were required for processing NRC, 15 hours were required for 50% RC, and 23 hours were required for 100% RC.

Detailed Cost Analysis

A detailed cost analysis for each stage of manufacture was conducted for RC process and NRC process. This again was conducted for 14000 Kgs of green leaf and for 100% RC addition. The power consumption for Withering, Pre-conditioning (Shredder and Rotorvane), Rolling, Fermentation, Drying, and Grading processes were determined and based on a cost of Rs.3.70 and 4.70 per unit, the cost difference due to power consumption between RC manufacturing and NRC manufacturing was established. The cost of electricity for RC manufacture was between Rs.4.50 and Rs.5.60 per kilogram of made tea, whereas for NRC tea manufacture, it was between Rs.2.20 and Rs.2.80. Therefore, by switching over to NRC manufacture, there can be a saving of Rs.2.20 to Rs.2.80 per kilogram of made tea.

Conclusion

With the changing situation in the tea industry, it is necessary to improve the quality of tea and curtail the cost of production. This study indicates that there is reduction in the hours required for processing NRC when compared to RC. It can also be seen that there is a significant reduction in the amount of electricity consumed and thus a reduction in energy costs with NRC manufacture when compared to RC manufacture. Thus, NRC manufacture, in addition to improving the quality, will bring down the cost of electricity for every kilogram of made tea.

Progress Report

Project Activities during the Period February 2008 to June 2008

Project Inception Workshop

Location: UPASI, Glenview, Coonoor,

Date: 6th March 2008

A section of the audience at the Project Inception Workshop

The project activities commenced with the project inception workshop on March 6th 2008. The workshop was attended by the various stakeholders involved. The objective of this workshop was to share information about the project with the stakeholders of the project and obtaining their inputs and support. Representatives from the various stakeholders of this project, i.e. the UNDP-GEF, Tea Board of India, TIDE, UPASI-KVK, Anna University, Tea Factory owners and Tea processing equipment firms attended this workshop. The workshop began with a welcome address and an introduction to the project by Mr. R.D. Nazeem, I.A.S., Executive Director, Tea Board, Coonoor. This was followed by a note on the UNDP's perspective on this project by Dr. Preeti Soni, Head, Energy and Environment Unit, UNDP, New Delhi. Ms. Svati Bhogle and Mr. Ashwini Kumar B.J. of TIDE gave an introduction to TIDE and its initiatives for energy conservation, and also presented the implementation plan of the project. A presentation on the opportunities for energy efficiency interventions in tea factories was given by Mr. G. Ramamoorthy, from UPASI-KVK, Coonoor. The presidential address was delivered by Mr. Basudeb Banerjee, I.A.S., Chairman, Tea Board, Calcutta. The perspective of the tea industry was also expressed during this workshop. Mr. D.P. Maheshwari, President, UPASI, spoke about the perspective from the large sector industries point of view, while Mr. Bhojarajan, Chairman of Hittakkal group of companies represented the small sector industries. A discussion with inputs from the audience brought out various issues and opportunities with regard to energy conservation in the tea industry.

Mr. Basudeb Banerjee, I.A.S. delivering the Presidential address

Mr. R.D. Nazeem, I.A.S. addressing the audience

A detailed report on this workshop has been published and an online version of it is available in the resources section of the EnConTea website.

Training programme on Energy Conservation and Energy Auditing in Tea Factories

Location: Institute for Energy Studies, Anna University, Chennai

Dates : 25th April to 28th April 2008

12 members consisting of the project team and two members from UPASI-KVK were trained at Anna University by qualified faculty on the principles & methods of energy conservation & audits in tea factories. The training imparted detailed knowledge about the equipment used in tea industry and the methods of estimating their energy efficiencies. This was done by theoretical instruction, as well as practical laboratory demonstrations.

The trainees and faculty at the Institute for Energy Studies, Anna University, Chennai

The programme consisted of four days of intensive training in energy auditing techniques with specific relevance to tea industries. Demonstrations of energy efficient lighting and methods to test the operating efficiency of commonly used tea processing equipment were also conducted. The training also included a segment to train the members to use measuring equipment commonly used in auditing. Presentation by technical experts in the areas of fans / blowers, luminaires, measuring equipments & capacitors were organized as part of the programme. Dr. Sethumadhavan, Director, IES, led the team which conducted the training programme.

A training session by Dr. R. Sethumadhavan in progress

Opening of the Project Office in Coonoor

Location : Tea Board, Coonoor

Date: 1st May 2008

The Project office is operational in the premises of the Tea Board Zonal office campus, Coonoor. Project staff (five member team consisting of technical & extension personnel) would be based in this office. The office is fully equipped with computers, a broadband internet connection, and general office infrastructure.

Training Programme on Tea Processing Technology

Location : UPASI-KVK, Coonoor

Date: 9th May 2008

The members of the project team were taught the various processes and procedures involved in the manufacture of tea by Mr. G. Ramamoorthy and Mr. Satish Kumar of UPASI-KVK. Energy consumption in tea factories were related to the production practices as adopted in tea factories & opportunities for energy conservation discussed.

Training in Preliminary Energy Audits

Location: Coonoor, Kotagiri

Dates: 10th and 11th May 2008

Dr.R. Sethumadhavan and two of his assistants, Mr. Aravind and Mr.Vijay Raj, from Anna University, Chennai conducted intensive practical training sessions on conducting Preliminary Energy Audits in tea factories. This training included visits to two tea factories where the project staff tried their newly acquired skills in preliminary energy auditing under the supervision of the trainers.

Preliminary Energy Audits (PEA) at Bought Leaf Tea Factories

Location: Nilgiris District

Date: 12th May to 15th June 2008

The project team has begun conducting preliminary energy audits of bought leaf tea factories. The team is using data sheets to collect energy-related information from each of the factories. The data from these audits will be used to select factories that will benefit the most from a Detailed Energy Audit, and other project activities. As

part of the audits, data on tea production, wood consumption, electricity usage, cost of energy, quality & price of made tea were collected. The findings of these audits would be presented shortly to the industry. As of 30th June, preliminary energy audits have been undertaken in 118 bought leaf tea factories.

Training Programme for Technicians of Bought Leaf Tea Factories

Location: UPASI-KVK, Coonoor

Date: 26th May 2008

A one day training programme on good operational practices was organised for air heater operators. Since it is the operators who are actually involved with the operation and maintenance of the air heating equipment, it is important that they are educated in energy efficient methods that could be adopted with respect to the energy-consuming equipments. The programme was conducted in Tamil.

Training Programme for Owners of Bought Leaf Tea Factories

Location: UPASI-KVK, Coonoor

Date: 27th May 2008

A training programme specifically aimed at the owners of tea factories was conducted at Coonoor. This programme aimed at creating awareness among the owners about energy efficiency, and its benefits to their factories. The trainees were given an overview of the different kinds of energy audits, the areas in tea factories where energy conservation is possible, and methods of evaluating efficiencies of tea processing equipment.

Dr.R Sethumadhavan from Anna University, Chennai, making a presentation to factory owners

Briquettes being used as a substitute to fuelwood in a Tea factory

Experiments on the Use of High Calorific Value, Agricultural Residue Briquettes in Tea Factories

The project is conducting a series of experiments to ascertain the impact of using briquettes instead of wood to meet thermal energy needs of tea factories. Initial results show that it is possible to reduce the cost of tea processing by 5%-7% by the use of briquettes. Briquettes have low moisture content, low ash percentage & higher calorific value as compared to wood that is currently being used in most bought leaf tea factories. However, the quality of the briquettes is ascertained before purchasing from briquette manufacturing units. The results of the experiments are being analyzed in detail and will be shared with the industry at the earliest.

Project in Brief

The project - Energy Conservation in Small Sector Tea Processing Units in South India, has been initiated by the Tea Board to remove barriers to energy conservation and energy efficiency that inhibit the realization of large energy saving potential in the tea sector. This 4-year project is supported by the United Nations Development Programme - Global Environment Facility. This project has the objective of removing barriers and developing replicability strategies for energy efficiency and energy conservation interventions in the tea processing industry in South India. This objective would be achieved by:

a. Awareness creation among the target sector about energy efficiency / renewable energy technologies and their relation to profitability

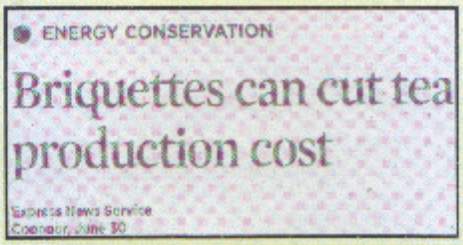
b. Elimination of financial barriers that inhibit investment in energy conservation equipment

c. Adoption and procurement of energy efficiency / renewable energy equipment / practice

d. Learning, knowledge sharing and replication

Project in the News

THINA THANTHI
30-06-2008



INDIAN EXPRESS
30-06-2008

Did You Know ?

- That one HP is equivalent to 0.746 kilowatt?
- That if it could be properly harnessed, enough sunlight falls on the earth in just one hour to meet world energy demands for a whole year! (Source- The Independent)
- That Tamil Nadu is No. 1 in India in terms of wind energy with an installed capacity of 3475 MW as on 31.3.2007, which is about 50% of the total installed wind energy capacity in India

Achievements

We are delighted to inform you that TIDE has won the 'Energy Champion' Award from the Ashden Awards for Sustainable Energy. This award was won by TIDE for its efforts in promoting competitiveness of small and tiny industries through the use of energy efficient technologies and renewable energy. Ms. Svati Bhogle, Secretary, TIDE, received this global award at a glittering ceremony on 19th June 2008 at London.

For further details, please visit: **www.ashdenawards.org**

Announcements

Website Launch

The project website 'EnConTea' will be launched during the first week of July 2008. The website would contain information on project progress and, in due course of time, would be developed into a knowledge portal on energy for the tea sector. The website can be accessed at www.encontea.org

Exposure Programme

The next exposure programme on Energy Conservation and Management in Tea Factories will be held at Gudalur during the Third Week of July 2008. Stakeholders interested in participating in this program may please confirm with the project office.

Preliminary Energy Audits

A meeting will be organized during the Third week of July 2008 to share the findings of preliminary energy audits conducted by the project.

Stakeholder Consultation

A stakeholder meeting will be held during August 2008 to finalize the project strategy.

Call for Innovators

Have you used or are you aware of an innovative idea to improve the energy efficiency in tea factories? Share it with us and it could be featured in the next issue of EnConTea

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