EnConTea

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

Issue - 8 March 2010

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 a large energy saving potential in the tea sector. This 4-year project is supported by the United Nations Development Program - Global Environment Facility. The project's objective is to remove barriers and to develop replicable strategies for energy efficiency and energy conservation interventions in the tea processing industry in south India. The 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

INSIDE

EDITORIAL

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

The project is very seriously in the implementation stage now. I am often told by tea factories that we have been overwhelmed by the awareness and that we want to be in the action mode now. This is a sure indication that the awareness has yielded results. Another indication of being in the action mode is the information that we have compiled, which shows that 19 bought leaf factories and 36 estate factories have adopted at least one energy-efficient equipment during the lifespan of the project so far. The project implementation team has analyzed this adoption in terms of energy conservation and I am delighted to learn that the power saving, effected by the energy efficient equipment installed so far during the project period, is estimated to save 1 million units of electricity per year. The estimate of the firewood / biomass saving potential, again based on adoption during the project period, is 2000 tons of firewood per year.

A clear direction has finally emerged for conservation of thermal energy. Studies carried out by Prof Sethumadhavan show that a saving of 25-30% of firewood is possible when the shift is made from the Hot Air Generator to the Hot Water Generator. The energy cost saving is projected to be about Rs. 1.25 per kg of made tea. I am also told that if all tea factories in south India switch over to the usage of HWGs instead of HAGs, the anticipated fuel savings would be a whopping 1,00,000 tons / annum, which in turn corresponds to a CO_2 reduction of 1,50,000 tons / annum.

If we are able to initiate this shift, the tea industry would be the talk of the town.

We have also finally made a small headway in our effort at stimulating the creation of dedicated briquetting units for the tea industry.

Sri Rara Biofuels, the first briquetting unit, has been established in Karamadai, Coimbatore District. The briquettes, which are made of tamarind shell, groundnut husk and saw dust, measure 100mm in diameter and have a calorific value of 3800 - 4000 kcal per kg. This briquetting unit, which will cater to interested tea factories, has an output capacity of 15 metric tons / day. It is currently undergoing trial production, following which it will begin full-fledged commercial operations from 28th April '10 onwards. We are welcoming more such initiatives by the tea industry.

The UPASI Energy Service Facility is also operational now. The services and facilities are all open to the tea factories and I request everyone to visit this centre and inform me whether the facilities meet the felt needs of the sector.

I take this opportunity to welcome Prof Sethumadhavan to the project team for a short period of 6 months. His presence in Coonoor has made a difference to the project implementation and we must continue to maintain a very high momentum in the project.

(For Internal Circulation Only)

VIEW POINT

INTERVIEW WITH MR. DHIRAJ

Chief Manager, Tea Factories, HML

1. **We have been hearing that the HML factories have pioneered the use of Hot Water Generators (HWG) as a substitute to Hot Air Generators (HAG) in the tea industry. What were the factors behind this decision?**

   We were facing multiple problems with meeting our fuel needs. There were issues of procurement – inconsistency in the quality of wood, rising cost of fuel, etc. We realized that in the short term at least, there is no substitute to firewood or biomass briquettes, given the scale of our operations. We knew that HWGs were being used successfully in other industries like textiles, etc. Besides, HWGs, unlike boilers, are easier to operate, with fewer safety requirements. HML being a company that is committed to all aspects of efficiency and being sensitive to the environment, we were searching for options to reduce energy costs and also reduce the cutting of trees for fuel. Simultaneously, we were looking at an equipment change that we could easily shift to, quickly and without any loss in production or getting in the way of our routine. The shift to HWGs did not require much change in the overall operations and did not require too much operator training. Besides that, we also sought to improve the quality of tea while simultaneously decreasing fuel costs. The HWGs appeared to us a good option and we decided to initially go for it in one factory.

2. **What are your future plans regarding the adoption of Hot Water Generators? In how many factories have you installed the Hot Water Generator and what about the remaining ones?**

   We are planning a complete shift to HWGs in all our factories. At present, we have installed HWGs in 4 of our factories. We are convinced about the utility of the equipment and are also very happy with our decision. The HWGs have given us good results. In due course, we will incorporate the usage of HWG systems in all the remaining factories as well.

3. **What was the decision making process, and considering your decision to shift to Hot Water Generators in all factories, how did you prioritize the factories in which you would adopt them? On what technical basis did you make your selection for each of the factories?**

   The decision on the scheduling of factories where HWGs would be installed was primarily a technical one. We looked at the HWG capacities and matched it to our process heat requirements. It is very important that the capacity of the equipment installed and the production are in sync. So, in choosing a HWG with a matching capacity, we considered the quantity of tea to be dried (dryer output & number of dryers), the initial and the final moisture content of the tea, as well as ambient air conditions. Other factors include the inlet temperature and the air flow. We matched our data in every factory with the projected HWG capacity and performance. This way we could foresee where the shift would be most beneficial and recommend the factory where we would adopt HWGs. Also, generally it is important that well thought-out, constructive purchase decisions are made for each factory.

4. **Could you tell us about your experiences working with Hot Water Generators? Do you sense its technical superiority over the Hot Air Generator? If so, can you please explain?**

   Yes, indeed. The technical superiority of the HWGs has been both perceived and measured. The first impression of the operators is consistency in the temperatures required and obtained, a cleaner, healthier working environment, no smoke as well as ease and comfort in the feeding of fuel. The equipment is fitted with meters and gauges to measure all the required data like the temperature and pressure. Controlling operations becomes that much easier with these conveniences and operators can make the change easily. Furthermore, we have observed that the equipment is designed for some flexibility in the usage of fuel. This makes the equipment more versatile and decision making on fuel purchase easier. We have also observed that there are no additional maintenance issues. Data collected shows that the fuel costs have decreased considerably. In fact, the quality of tea has improved as well, which is always an important aspect for any tea producer.

5. **Are you satisfied with the economics of operation? If yes, would you recommend this to other tea factories as well, or do you have any reservations?**

   Initially, we could not quantify and precisely define the economics in both technical and financial terms. So there was some hesitation in reporting performance. However, Dr. Sethumadhavan performed extensive research and collected a lot of data very methodically, which he presented to individual factories and at various awareness programs. When we were able to overcome this information gap with the data available to us and the method of data collection well understood, we were further convinced of the superiority and advantages of this new technology. The data collection and its presentation in a manner that we understood, have helped us to take informed decisions and we found this support very useful. We are now experiencing improvements in our tea production that are consistent with the projections made and the data collected.

6. **Can you tell us about any problems or limitations encountered in shifting to Hot Water Generators, as experienced by you?**

   We have not experienced any limitations using this

system. However, considering the cost of the equipment, I would especially recommend it to those factories where tea production is high, as the investment is recovered in a shorter payback period. But I cannot comment on the nature and extent of its utility in any of the other factories, because they will have to see and experience it themselves.

7. Finally, does your factory consider environmental impacts when taking investment decisions?

Yes, that is certainly one of the criteria that we look at. The awareness meetings and personal interactions that we have had with the Tea Board and the project have helped us to think through both environmental and economic impacts. Eventually, a combination of both factors influences our decision making.

ARTICLE

HOT WATER GENERATOR VIS-À-VIS HOT AIR GENERATOR

By Dr. R. Sethumadhavan, Director I&M, EnConTea Project

In order to arrest further fermentation, a Hot Air Generator (HAG) has been traditionally used in south Indian tea factories to dry the wet dhool after its arrival from the Continuous Fermenting Machine.

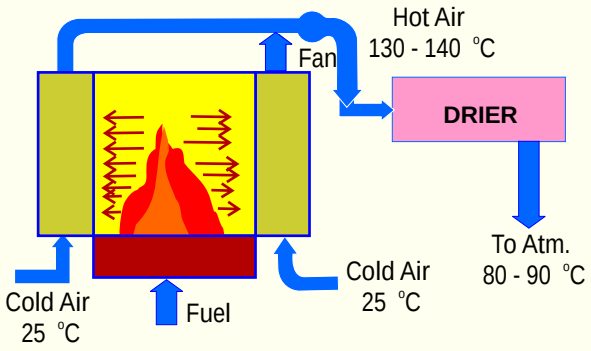


Diagram 1 : The working principle of a HAG

The working principle of a HAG:

In a HAG, the furnace receives air from the draft on both sides. The arch of the furnace gets heated up when the fuel fed inside the furnace is oxidised in the presence of ambient air. The flue gas inside the tube transfers the heat to the cold air in the periphery of the tubes by convection and radiation. The hot air, at a temperature of 130-140°C, is then supplied to the drier, powered by the hot air fan. The exhaust air is let into the atmosphere using an ID fan, which drives the smoke through the chimney.

The efficiency of HAGs is usually on the lower side because:

- The fuel (firewood or briquettes) doesn't burn well in the absence of air-supply from the FD fan.
- The cast iron tubes installed do not transfer heat efficiently to the cold, incoming air.
- The heat lost through flue gas is quite substantial.

Almost 99% of tea factories in south India use HAGs for the drying of dhool. This, in turn, leads to firewood consumption in large quantities.

The use of a Hot Water Generator (HWG), with its good heat transfer properties and effective piping, helps to significantly reduce firewood consumption levels. In the case of a HWG, even wood with high moisture content can be efficiently burned, as the incoming air is heated by the outgoing flue gas.

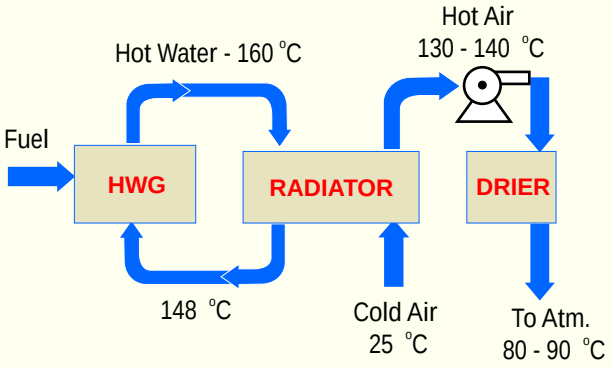


Diagram 2 : The working principle of a HWG

The working principle of a HWG:

The HWG is powered by the same fuel as a HAG. The air for combustion is preheated and supplied to the furnace. However, the fuel is used to heat up the water inside the tube banks. The steam thus generated is supplied to the radiator (heat exchanger) at a temperature of 160°C. The radiator is a shell and tube construction and passes the heat of the steam to the cold ambient air, which is outside the tube .The unused steam returns to the main HWG unit at a temperature of 148°C. The air pumped to the drier has a temperature of 130-140°C.

The operational functions between a HWG and a HAG being similar, the difference between them doesn't lie in the mode of operation by the user, but mainly in the working process. In a HWG system, the fan is slightly colder as it is not in contact with the radiator. Hence, the power required to operate the fan in a HWG is less. The fan of the HAG receives the hot air directly from the furnace and directs it to the drier.

Comparing a HWG to a Boiler

A HWG set-up can be differentiated from a boiler on the basis of its maintenance, inspection and equipment requirements. A boiler demands the presence of a certified boiler operator as well as periodic verifications by a boiler inspectorate for system faults or leakages. Moreover, the feed water has to be treated in a demineralization plant before being supplied to the boiler. Accessories like a steam trap, a condensate collection sump and a condensate transfer pump are

ARTICLE

essential for proper functioning of a boiler. On the contrary, these inspection procedures and equipments are not required in the case of a HWG system.

Energy saving potential of HWGs

In order to understand the energy saving potential in tea factories, a detailed performance study was undertaken in 6 HWG installations in the Nilgiris, Valparai and Vandiperiyar regions, followed by comprehensive data analysis.

List of tea factories, where a study was conducted on the energy saving potential using HWGs

Sl. No.	Tea Factory	Region
1	Waterfall	Valparai
2	Glendale	Coonoor
3	HML	Arapetta
4	HML	Wallardie
5	Parry Agro	Valparai
6	Westberry	Ooty

A similar exercise was carried out on HAGs installed in 13 Bought Leaf Factories (BLF), in order to estimate the firewood consumption. The study revealed a saving of 25-30% of firewood as opposed to the existing design, amounting to Rs. 0.80 to Rs. 1.00 per kg of Drier Mouth Tea (alternatively amounting to Rs. 1.25 to Rs. 1.30 per kg of Made Tea). If all tea factories in south India switched over to the usage of HWGs instead of HAGs, the anticipated fuel saving would be a whopping 1,00,000 tons / annum, which in turn corresponds to a CO_2 reduction of 1,50,000 tons / annum.

The investment required by each BLF would be around Rs. 25 lakh (with 6 lakh kg / annum production), whereby the savings would add up to Rs. 6 lakh / annum. The simple payback period is 4 years. However, for higher capacity production factories (>10 lakh kg / annum), the simple payback period would be shorter than 3 years. This will be one of the path-breaking implementations for the tea sector of south India.

HWG systems being a robust technology, they are commonplace in dyeing units of the textile sector as well as in marine and naval industries. They are further often used for room heating applications in cold regions. A HWG system can be accommodated in a 600sq.ft area and only requires the support of two additional installations, i.e. a water circulation pump and an air pre-heater. Most users find that the HWG helps to maintain a uniform temperature in the drier, thereby enabling uninterrupted production of good quality tea dust. This cannot be expected of a HAG system, where temperature variations are frequently observed.

The Tea Board offers a 25% subsidy to tea factories, in order to facilitate the implementation of HWG systems.

UPASI ESF AWAITS YOU

We are pleased to announce that the UPASI Energy Service Facility (ESF), Coonoor, is now fully functional and available for use by tea factories. Below is a list of facilities and services available at the lab, along with corresponding charges and procedures to be followed, in order to avail the same.

The following measuring devices can be hired at the UPASI KVK Laboratory:

- Energy Manager: Measures electrical parameters (KVA, KW, PF, frequency, ampoules, voltage, etc.).
- Flue Gas Analyser: Measures flue gas temperature, CO_2 and oxygen content.

- Instant Digital Wood Moisture Meter: Measures the moisture level of firewood.
- Thermo Anemometer: Measures air velocity, volume and temperature.
- Digital Tachometer: Measures the speed of the motor.
- Infrared & Digital Thermometers: Measure the temperature of dhool, flue gas and hot air.

Detailed Wood Analysis for Fuel Efficiency

Parameter	Measuring Device	Duration of Analysis	Cost of Analysis (taxes extra)
Calorific Value (cal / gram)	Bomb Calorimeter	30 – 60 min	Rs. 250
Moisture %	Hot Air Oven @ 105°C	16 – 24 hours	Rs. 80
Total Ash %	Muffle Furnace @ 550°C	24 – 40 hours	Rs. 180

Note: Ideal wood samples have more than 3000 cal/gm, and less than 20% moisture.

Tea factories may analyze quality parameters of their fuel samples by the following procedure:

1. Fill up the application form which is available at the UPASI KVK Office, and choose therein which type of sample you wish to analyse.
2. When providing a wood sample for analysis, also specify its code number and name.
3. Please pay the respective analysis cost when giving the sample for testing.
4. Analysed sample results will be sent to you within 10 working days.
5. Test samples are analysed as per ISO standards.

The following energy saving equipments are displayed for demonstration at the UPASI KVK Laboratory:

Withering:

- Aluminium Blade Fan (Dia 48", 27 Kgs) – For study and demonstration.
- Nylon Blade Fan (Dia 48", 16 Kgs) – For study, demonstration and saving electrical energy.
- FRP Blade Fan (Dia 48", 21 Kgs) - For study, demonstration and saving electrical energy.

Rolling (CTC):

- EFF1 Motor (Energy Efficient Motor 1): 15Hp, 1440 Rpm; 20Hp, 1440 Rpm; (92.5% Efficiency) - For study, demonstration and saving electrical energy.
- EFF2 Motor (Energy Efficient Motor 2): 15Hp, 1440 Rpm; 20Hp, 1440 Rpm; (89.2% Efficiency) - For study, demonstration and saving electrical energy.

Heater:

- ID FD Fan Controller: To control and maintain inlet & flue gas temperature (3Hp / 5Hp Motor) – For study, demonstration and saving thermal energy.

EB Power Supply:

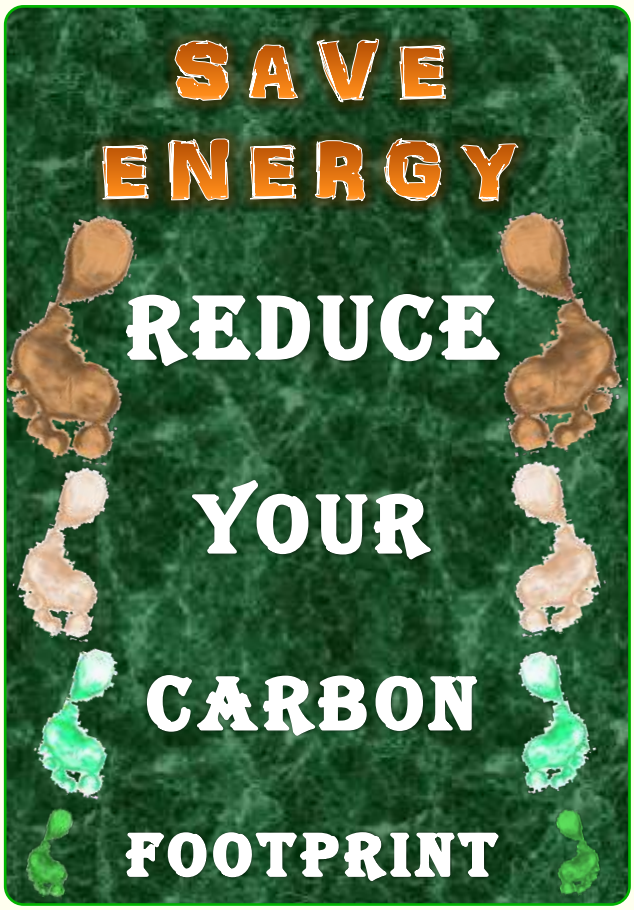
- APFC (Automatic Power Factor Controller): 50 KVAR & 100 KVAR – To maintain the power factor at 0.99.

Tea factories may avail the study and demonstration facilities as follows:

1. Tea factories that have conducted a detailed energy audit can send a letter of request to avail the demonstration facility to the Programme Coordinator (please refer the address below).
2. After the study and demonstration, a detailed energy saving report will be sent to the factory.
3. All tea factories can make use of the energy measuring instruments to check parameters of energy, quality and efficiency.

For further details, please contact:

The Programme Coordinator & Head
UPASI Krishi Vigyan Kendra
Glenview, Coonoor - 643 101
The Nilgiris District, Tamil Nadu
Phone: (0423) 223 0772, 222 1972
E-Mail: oty_kvkvnr@sancharnet.in
upasikvk@rediffmail.com



ARTICLE

DEMYSTIFYING CARBON CREDITS

By Mr. S. Rajha Gopalan, Founder & CEO, RENCO Technologies Pvt. Ltd., Chennai

What is the Greenhouse Gas (GHG) Effect?

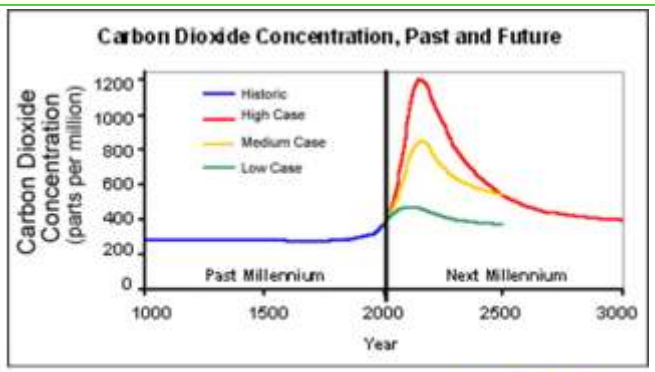
Industrial, commercial and other activities emit GHGs, such as CO_2, into the atmosphere. The greenhouse effect is caused by the absorption and emission of infrared radiation by these gases. Earth's surface and lower atmosphere are warmed by part of the heat energy that is radiated downward by these gases, making life on earth possible. The presence of too many GHGs, in turn, leads to over-heating of the earth's surface and atmosphere.

What is the effect of CO_2?

During the natural evolution of our planet, the CO_2 concentration in the atmosphere settled at around 300 parts per million (ppm), before the industrial revolution. Without this CO_2 in the atmosphere, earth would freeze into a ball of ice. Similarly, as this concentration gradually increases, earth could turn into a ball of fire.

What would an enhanced Greenhouse Gas Effect lead to?

Such an effect would lead to one or more of the following consequences: (i) A rise in average global temperatures, (ii) Changes in precipitation quantity and pattern, (iii) Changes in vegetation, (iv) Increased storm surges and (v) A rise in sea level



Courtesy: Environmental Defense Fund (www.edf.org)

What is Carbon Credit?

Carbon Credit is a financing mechanism, expressed in units of tCO_2e (tons of carbon dioxide emission). Carbon Credits (Certified Emission Reductions – CERs, or Voluntary Emission Reductions – VERs) can be earned by generating electricity, either through Renewable Energy (RE) sources (such as wind, biomass, solar and mini hydro) or by reducing energy consumption through various Energy Efficiency (EE) programs.

Who buys & sells Carbon Credit, why and what is the conditionality for trading?

Corporate and oil companies from industrialised countries buy Carbon Credits from developing countries because of their 'statutory commitments' to reduce CO_2 emissions under the UN Kyoto Protocol, further avoiding a penalty of Euros 100 (appx. Rs. 6,600) / tCO_2e annually. Carbon Credits behave as fully 'fungible commodities' and hence can be bought, sold, traded and (in certain cases) be banked for future use.

An established Carbon Credit scheme:

Kyoto Protocol Emission Trading / Joint Implementation / Clean Development Mechanism

The Inter-Governmental Treaty of Global Climate Change (IGCC) was signed in Bonn in July 2001, following which the Kyoto Protocol (KP) was launched in 2005. This is mandatory for 37 developed countries (Europe & Japan), excluding the USA, which has not ratified the pact so far. The protocol covers six main GHGs viz. Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Sulphur Hexafluoride (SF_6), Perfluorocarbons (PFCs) and Hydrofluorocarbons (HFCs). Its target is the reduction of GHG emissions by an average of 5.2% per annum from the 1990 level to 2012 (1st Kyoto Period).

How does it work?

Rich countries either reduce the emission of GHGs at home or buy emission rights from each other - if one developed country stays within its target, it can then sell the extra reduction to another country which exceeds the agreed level of GHG emissions. Alternatively, they can buy CER certificates from Green Energy Projects (RE & EE) established in developing countries under the KP's Clean Development Mechanism (CDM).

The present round of Kyoto Protocol expires in 2012; As per the Copenhagen Accord, the world has committed to sign a new legally binding pact in Mexico by the end of December 2010.

In addition, the market for VERs exists in developed countries, wherein the buyers are corporate individuals, companies, government ministries & institutions and not-for-profit organizations. These undertake to reduce their carbon emissions (otherwise known as 'carbon footprints') on a voluntary basis, by buying VERs and thereby demonstrating their social responsibility and environmental commitment to their community.

What is the current global scenario for Carbon Credits?

The current world market for Carbon Credits (CERs) is to the tune of US $130 billion / year (2009) and is likely to increase over the years. The price for Carbon Credits is a function of the risks associated with international legislations, domestic policies & taxation, technologies, projects & countries, besides risks due to sustainability and social impacts of the proposed projects. Hence, there remains the unpredictability of future prices and the market development for Carbon Credits.

To conclude, it is noteworthy that buyers of Carbon Credits are very specific about the project type and the sustainability criteria viz. the local community involvement and the adoption of green energy technologies.

ENERGY DAY (TECHNOLOGY WEEK CELEBRATION)

Coonoor

From the 15th to the 19th March 2010, UPASI KVK and the Tea Board, in association with TIDE and Jain Irrigation, organized a Technology Week in Coonoor. The event was inaugurated on the 15th March '10, at the UPASI KVK premises, in the presence of several tea factory owners and managers, visitors and dignitaries.

For the first time, this annual event included the celebration of an Energy Day on the 16th March '10, revolving around the theme "Energy Conservation in Tea Post Harvest Technology". The auditorium was filled with participants, interested in knowing more about the latest developments in the fields of technology and energy conservation. The occasion was graced by the presence of Mr. R.D. Nazeem IAS, Dr. P. Kumaravadivelu, Dr. R. Sethumadhavan, Mr. J.K. Thomas, Mr. G. Ramamoorthy and Ms. Svati Bhogle.

Mr. R.D. Nazeem, Executive Director of the Tea Board, inaugurated the Energy Day celebrations. He set the context for the event by reminding the participants of the global climate crisis and the duty of the tea industry to contribute to the national efforts in mitigating climate change. He said that the tea industry, located in the hills, has been systematically experiencing the effects of climate change, especially because of the amount of fuel that is being burnt every year for tea making. He recollected his tenure in Himachal Pradesh, where he observed the receding of glaciers. He warned that if we continue to seek comfort, adopting the business as a usual scenario, we would be endangering life for the next generation. He exhorted the tea sector to adopt energy efficient technologies of international standard. He further said that just as it is important to improve the quality of our produce, it is equally important to remain responsible citizens, who continuously seek to reduce their carbon footprint. When discussing the comprehensive energy audit reports provided to tea factories, he said that detailed elaboration, on how much energy can be saved and what changes need to be made, has been done. Further, every individual process and machinery has been carefully examined with regard to production capacity, climate aspects and other factors relating to the respective tea factories. Hence, he wondered why implementation was not happening when even subsidies were being offered. Mr. R.D. Nazeem made a special mention of the Kaikatty Tea Factory, which was able to cut down electricity and firewood consumption by 20%, just by following certain energy conservation measures that had been recommended.

Mr. Swaminathan being felicitated for being a pioneer in the adoption of energy audit recommendations

Ms. Svati Bhogle, CEO of TIDE, addressed the attendees with her thoughts on the state of the project and her vision for future greening of the sector. She said that the project objective evolved from the direction of the Chairman of the Tea Board, who envisioned that the approach adopted was to reform a sector rather than to implement a project. Ms. Svati Bhogle also emphasized that the sector required reform, which would happen through collective resolve and strong and passionate leadership as provided by the Tea Board. She discussed the processes of environmental movements and argued that it may not be possible to induce an environmental movement along the lines of Chipko in the tea industry. The project had to be delivered through convergence of ideas, knowledge and experiences and through the elimination of constraining barriers. She said that the creation of competency to address energy issues was the key to sustained energy reform.

Mr. J.K. Thomas, Managing Director of the Karimtharuvy Tea Factory in Vandiperiyar, offered insight into financial aspects of tea production. He remarked that it is only 2 years since tea prices are remunerative. He also cautioned that alternatives for the reduction of fuel consumption would have to be adopted, should oil prices continue to rise.

Mr. G. Ramamoorthy, Subject Matter Specialist of UPASI KVK, offered a presentation on the various services and facilities that can be availed at UPASI ESF. He also explained the utility of the various equipment and the fees applicable for having materials and equipments measured.

Dr. R. Sethumadhavan interacted with the audience and gave them another opportunity to clear all doubts and queries. He made a presentation on various aspects of tea making and energy consumption. An analysis of the current situation was presented and followed by an assessment of the scope for improvement and the next steps. Further, he briefly touched upon the subject of replacing Hot Air Generators with Hot Water Generators. With his strong expertise and experience in the field of energy conservation, Dr. Sethumadhavan continues to be of much help to the tea project with regard to awareness creation and consultancy to individual tea factories.

Mr. Rajha Gopalan, CEO and founder of Renco Technologies Pvt. Ltd., offered a presentation on the Esco business model, also explaining the concept of carbon financing and giving more insight into the present global scenario and opportunities of financial schemes that support environmental sustainability.

Mr. Swaminathan of Kaikatty INDCO, was felicitated on the occasion, for being the pioneer in the adoption of energy audit recommendations. The post lunch session comprised of a visit to the UPASI energy lab and one on one interactions between the experts and participants.

COMMERCIAL PROPOSAL

COMMERCIAL PROPOSAL FROM RENCO

www.rencotech.com

The ESCO Business Model

It is generally found that many industrial clients want to save energy, but are hesitant to invest in capital equipments. Hence, the concept of an Energy Services Company (ESCO) Business Model was introduced in the market. This offers both the technology provider as well as the end user a win-win situation. They may simultaneously benefit from revenues generated by Carbon Credits, which in turn will help to reduce the financial liability of a project.

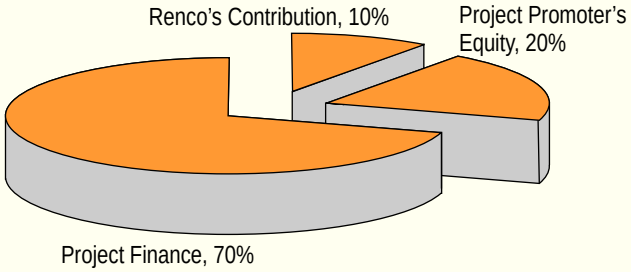
An ESCO is an organization thus formed and which designs, implements and finances 'green energy' or 'energy efficiency' projects on behalf of its clients, on a guaranteed performance basis and within a mutually agreed time frame. It guarantees the amount of energy savings through an 'energy performance contract' and ties up its remuneration / returns to the quantum of 'energy savings' achieved. It also finances or arranges finance for the operation.

Advantages of ESCO BIZ:

- Reduction of fossil fuel consumption
- Potential for generating Carbon Credits (CERs or VERs and / or ESCs)
- Increases process industries' profitability and their share value
- Offers a win-win-win proposition for the process industry, the technology provider and the ESCO service provider
- This Biz Model is tried, tested and well-proven in industrialized countries and has been newly introduced in India, as a result of enormous increases in fossil fuel prices and prevailing power outages

Highlight of RENCO's ESCO Business Model

On the basis of equity contribution from the project developer (viz. 20% of the total project cost, excluding any cost of land), RENCO will invest 10% of the total project cost and arrange for the balance 70% of the project cost either from a local financial institution or from an overseas financier. The Special Purpose Vehicle (a new company) will be formed specifically for the 'green energy' or 'energy efficiency' project (as described in above diagram).



Revenues generated by the sale of power and Carbon Credits, will pay off all outstanding financial liabilities of the project, including the project developer's and the ESCO investor's equity. The project will be handed over to the project developer at the end of a mutually agreed period, depending on the cash-flow generation of the project.

Services provided by the ESCO Biz Model are:

- Feasibility study, design engineering, arrange of finance, project construction & management, procurement & installation of capital equipment, manpower training, operation & maintenance of equipment, project performance monitoring and administration services.

In short, Renco's ESCO Biz Model provides a one-stop solution for project promoters to establish 'green energy' projects and / or realize energy efficiency in their process industry, by assuming both the financial and performance risks, while at the same time providing guaranteed savings to its clients.

For further information please feel free to visit us at www.rencotech.com or contact us at rencoindia@hotmail.com or **Mr. Rajha Gopalan** *(Founder & CEO, Renco Technologies Pvt. Ltd.)* at rajha.gopalan@rencotech.com , with a copy to the **EnConTea project** at encontea@bsnl.in

Editorial Team

Chief Editor

Mr. R.D. Nazeem, I.A.S.,
Executive Director
Tea Board, Coonoor

Assistant Editors

Mrs. Svati Bhogle, TIDE
Ms. Asha Ramaswami, TIDE

Design & Print

Mrs. Poulomi Deb, GRAPHICSHAPES
www.graphicshapes.com

Contact

TIDE Project Office
Tea Board Zonal Office
Shelwood, Coonoor Club Road
Post Box No. 6
Coonoor - 643101
Phone: 0423 2222090
e-mail: encontea@bsnl.in

TIDE
#19, 9th Cross Road, 6th Main Road
Malleswaram
Bangalore 560003
Phone: 080 23315656
Fax: 080 23344555
e-mail: tide@vsnl.com