CoSMiLE UPDATE

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A platform for learning and action for small and micro enterprises

Editorial

The year 2009 marked the beginning of a new phase in the ongoing partnership between SDC and TERI. Reflecting the common commitment to promoting energy efficiency, cleaner environment and sustainable development, the two organizations have been working closely in the Indian SME sector since 1994. The collaboration between the two partners helped in the development and demonstration of energy-efficient and environment-friendly technologies in certain energy-intensive MSME (medium, small, and micro) sectors – the foundry, glass, and brick industries. The partnership also enabled the development of biomass gasifiers for thermal applications in a number of end-use sectors such as sweet and savory making, bakeries, and institutional cooking. Furthermore, it supported the development of decentralized systems for power generation through the biomass gasifier route.

During the previous phase, the partnership succeeded in disseminating the energy efficient technologies developed under the project. In the course of the interventions, strong foundations were laid for adoption of the improved technologies through targeted training, capacity building and knowledge sharing initiatives. The interventions have so far led to an energy saving of around 90 000 tonnes of oil equivalent.

TERI and SDC felt the need to strengthen the ongoing interventions in both the MSME and biomass sectors in order to accelerate uptake of the energy-efficient technologies in a sustainable way. Accordingly, the two partners signed an agreement on 7 January 2009 for a new phase of collaboration for the period January 2009 to December 2011. The agreement was signed by Mr Francois Binder, Country Director, SDC and Dr R K Pachauri, Director-General, TERI. In the case of MSME, the overall objective will remain on improving energy efficiency of the sector with a focus on foundry, brick and glass sub-sectors. In case of the foundry sector, TERI will scale up the interventions in different industry clusters, while in the glass sub-sector, it will consolidate the work done in the previous phase. In the case of biomass, one of the specific objectives is to develop a two-stage low-tar gasifier technology for power generation application in remote rural areas. The overall project strategy is built around two major thrust areas; (1) technology development, dissemination and delivery, and (2) linkage with climate change instruments. The focus of the project activities will continue to centre around strategic partnership, knowledge sharing and capacity building.

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TERI marches ahead with DBC campaign

TERI began its campaign to promote energy-efficient technologies among small-scale foundries in India back in 1998 with the DBC (divided blast cupola), developed by the BCIRA (British Cast Iron Research Association). That year, a demonstration DBC was successfully 'test-fired' at a foundry unit in the Howrah foundry cluster, West Bengal. The results were outstanding: not only did the DBC improve profitability through reduced fuel costs; it also delivered molten metal at higher temperatures and substantially reduced other (silicon and manganese) losses, thereby further reducing production costs.

That small step in 1998 has turned out to be a great leap forward! Spurred by the proven success of the DBC, and with technical backup support from TERI, about 34 DBCs of TERI design have been set up by units in different foundry clusters (including Rajkot, Nagpur, Coimbatore, and Howrah). During the last quarter alone, four units in Ahmedabad and one unit in Coimbatore have signed up for installation of TERI-design DBCs. In addition to this, a large number of other units have adopted the energy-efficient DBC design even without the support of the project.

View of DBC at Bogra foundry cluster, Bangladesh

Commissioning of DBC at a foundry unit, Bogra

Even as the DBC has grown in popularity among the Indian foundry industry, TERI has not rested on its laurels. While continuing to promote the DBC in India, TERI has now stepped into the international arena with DBC technology—specifically, into neighbouring Bangladesh. With the support of the International Finance Corporation's South Asia Enterprise Development Facility (SEDF), Dhaka, TERI assisted two small-scale foundry units in the Bogra cluster in Bangladesh in adopting DBCs. The two DBC systems were successfully commissioned in December 2008. The owners of both units are quite satisfied with the performance of the new systems, which have yielded significant improvement in both energy efficiency and product quality. TERI also provided furnace operators with onsite training in BOP (best operating practices) in foundry operation and maintenance through the Foundry Owners Association of Bangladesh.

With this successful debut abroad, more foundry owners from Bangladesh and other countries are expected to opt for the energy-efficient DBC design promoted by TERI.

Contribution by A S Ganguli,
Local Service Provider – Foundry sector

Workshop on barriers to technology transfer of low-carbon technologies

TERI is participating in a UK–India collaborative project to study the barriers to TT (technology transfer) between developed and developing nations (*CoSMiLE Update* **3**(4), December 2008). The study is being carried out jointly by the SPRU (Science and Technology Policy Research Unit); University of Sussex; IDS (Institute of Development Studies), Sussex; and TERI. The project draws upon the results, experiences and lessons from TT case studies in five distinct areas: (1) IGCC (integrated gasification combined cycle) for power generation; (2) energy-efficient technologies for Indian SMEs (specifically, the glass and foundry industries); (3) wind energy; (4) solar photovoltaics; and (5) hybrid vehicles. The ultimate aim of the project is to enlighten policy-makers at the international level on the importance of facilitating TT as a mechanism for the development, transfer and spread of low-carbon energy technologies to reduce greenhouse gas emissions and combat climate change.

On 4 February 2009, TERI with the support of the British High Commission and the DFID (Department for International Development, UK) organized a Consultative Workshop on 'UK–India collaboration to overcome barriers to transfer of low-carbon energy technologies' to present and debate the interim findings of the study project. The participants included representatives from academia; industry in both public and private sectors; government; and R&D establishments.

Workshop in session

In his welcome address, Dr R K Pachauri, Director-General of TERI, observed that TT has not received enough attention despite its vital role in implementing strategies to combat climate change, and that this UK–India collaborative study is the only one to have come to grips with the issue of barriers to TT. There is a general reluctance on the part of governments, industries and financial institutions to invest in R&D on improved/ new low-carbon technologies, particularly in the backdrop of the current global economic crisis. Nevertheless, it is important for nations to move away from the 'fire-fighting' approach in combating climate change, and to invest in development and deployment of low-carbon technologies through TT; for, these technologies serve the global common good. The TT process must be facilitated in two specific ways.

1 It must be equitable (that is, TT must involve and benefit both the suppliers and recipients of technology).
2 The transferred technology must bring about long-term social benefits to ensure its sustainability.

Mr Owen Jenkins, Counsellor and Head, Climate Change and Energy Unit, British High Commission/DFID in his opening remarks placed TT as well as the barriers to the TT process in the context of two worlds: (1) the 'real' world in which TT is a vital idea and vehicle to address climate change; and (2) the more remote and 'sterile' world of international diplomacy and climate change negotiations, in which the issues related to TT receive very little attention. The collaborative study is, in essence, an effort to bring these two worlds together in order to facilitate the TT through international cooperation and collaboration.

Mr Prosanto Pal, TERI, and Dr David Ockwell, University of Sussex, presented the interim findings—both case-specific and generic, with particular focus on issues related to IPRs (intellectual property rights) and

RDD&D (research, development, demonstration and deployment). Overall, the evidence suggests that while IPR access is necessary in some TT cases, such access is by itself not enough to enable the adoption of low-carbon technologies. Examples were cited to show how Indian companies have overcome IPR barriers by acquiring competing overseas firms (for example, wind energy), and how a favourable domestic policy environment can boost the spread of low-carbon technologies (solar photovoltaics). The evidence also makes it clear that the technology selected for RDD&D must be need-based, and that private–public partnerships are necessary for RDD&D programmes to be effective (for example, glass and foundry sectors).

Also presented were a number of policy recommendations that would address the barriers to TT and facilitate the TT process. Capacity building was identified as being the key requirement to ensure the success and sustainability of TT. Dr Ockwell likened the capacity building process to a drop of water (the initial transfer of technological expertise and knowledge) that sets off ever-growing ripples (the spread and continuing development of this transferred technological expertise and knowledge). Collaborative RDD&D offers the best route to build local capacities in technology development and delivery, and to find creative ways to overcome IPR barriers. This requires strengthening of collaborations between academia, industry, government, financial institutions and other stakeholders (both nationally and internationally). In the absence of such collaborations, basic research and inventions often fail to be converted into concrete applications and innovations—the so-called 'valley of death' scenario.

The presentations were followed by a lively panel discussion chaired jointly by Mr Fergus Auld, First Secretary, Climate Change & Energy Unit, British High Commission/DFID and Mr V P Joy, Joint Secretary, Ministry of Power, Government of India. The panelists comprised Prof. Dirk Messner, Director, German Development Institute, Bonn; Prof. Trevor Davies, Pro-Vice Chancellor for Research and Knowledge Transfer, University of East Anglia, United Kingdom; Mr S T H Rizvi, Executive Director (Corporate Engineering), BHEL (Bharat Heavy Electricals Ltd), New Delhi; Mr K Subramanya, Chief Executive Officer, Tata BP Solar Limited, Bangalore; and Dr Suresh P Babu, Chief Executive Officer, TERI Technologies Ltd.

Dr Suresh Babu observed that it is really 'market pull' that drives clean coal technologies like IGCC, and that it is therefore essential to develop the markets for low-carbon technologies to ensure their dissemination. Prof. Davies described the initiatives and experiences of the University of East Anglia in developing and promoting low-carbon technologies, and reiterated the importance of strengthening linkages between academia, industry and government. He saw 'green' (low-carbon) technologies assuming increasing importance after the world recovers from its current economic crisis: 'When the green shoots of recovery spring forth, they will be truly *green*!'

Prof. Messner stressed the importance of pushing low-carbon technologies through suitable policy-level measures and frameworks (taxes, subsidies, environmental standards, and so on). Citing examples in Germany, he mooted the concept of '*transformational projects*' to reduce carbon emissions, which would entail not just technological development and innovation but social innovation as well. For instance, a project could aim at reducing the carbon emissions of an entire city—requiring the active involvement of an array of stakeholders ranging from architects and builders to transporters, energy utilities, commercial establishments and householders. Mr Rizvi spoke on a recent initiative by BHEL whereby it has partnered with IIT, Chennai to set up an R&D facility for low-carbon technologies. He also mentioned that BHEL has developed improved coke oven technology (which yields 4%–5% higher efficiency than conventional coke ovens). Mr Subramanya stressed the need for political stability (and consistency in policy measures) to promote the adoption of low-carbon technologies. He stressed on the

need for a long-term perspective while framing and implementing policies in the field of renewables.

It is expected that the project findings will inform and influence policy-makers at the COP-15 (Conference of the Parties) under the United Framework Convention on Climate Change, to be held at Copenhagen from 7–18 December 2009.

Promoting VSBKs in Orissa: workshop in Cuttack

The MSME Development Institute, Cuttack, Orissa, organized a workshop on 25 March 2009 to promote the VSBK as an energy-efficient and environment-friendly option to the traditional clamp kilns which are prevalent in the state. The workshop was held in Cuttack and attended by over 40 kiln owners.

Mr Sachin Kumar, TERI, presented an overview of the VSBK technology, which led to a lively question-and-answer session on the technical capabilities and economic viability of the VSBK in making good quality bricks from the clays prevalent in the region. In order to raise the awareness levels of the local entrepreneurs and increase their confidence in VSBK technology, TERI has proposed the following measures, which were welcomed by the participants.

- Organizing exposure visits for brick entrepreneurs from Orissa to various sites in Tamil Nadu where a few VSBKs are successfully operating.
- Training of firemen and kiln supervisors in efficient operation of the VSBK.
- Facilitating testing of clay, brick quality, and fuel quality for interested enterpreneurs.

Coordination Committee Meeting of BEE on energy efficiency in SMEs

The BEE (Bureau of Energy Efficiency), Government of India is the nodal agency for promoting energy efficiency in India, and is committed to bringing about energy efficiency improvements in the Indian SME sector. BEE has initiated a project to promote energy efficiency in 25 energy-intensive SME clusters such as brass, textiles, glass, ceramics, foundry, dairy, bricks, rice milling, and so on. The project entails preparation of 'situation analysis' of the identified clusters, and formulation of detailed bankable project reports for indentified technologies in these sectors. TERI is the implementing partner in this BEE-initiated project.The meeting was co-chaired by Dr Ajay Mathur, Director-General, BEE, and Mr Devender Singh, Joint Secretary, Ministry of Power, Government of India.

As a related initiative, BEE organized the 1st Coordination Committee Meeting on SMEs on 29 March 2009. Mr Jitender Sood, Energy Economist, BEE, presented the features of the project. Mr Abhay Bakrey, Joint Development Commissioner, Ministry of MSME, described the various interventions undertaken by the ministry with special reference to the ongoing schemes of the National Manufacturing Competitiveness Council.

The participants at the meeting came from different organizations that are involved in promoting improvement in energy efficiency in the SME sector. They included representatives from SDC, UNDP (United Nations Development Program), UNIDO (United Nations Industrial Development Organization), FICCI (Federation of Indian Chambers of Commerce and Industry), CII (Confederation of Indian Industries), Winrock International India Ltd, French Agency for Environment and Energy Management, and TERI. The participants shared best practices being promoted by them in their intervention programmes. Overall, the meeting was useful as an '*experience sharing platform*'. Encouraged by this, BEE is keen on holding such interactions in the future as well.

Workshop on project opportunities in building materials

A workshop on 'Project opportunities in building materials' was organized by the

MSME Development Institute (MSME-DI), Chennai at Chennai on 19 February 2009. Around 80 entrepreneurs drawn from various districts of Tamil Nadu, Andhra Pradesh and Karnataka participated in the workshop. The basic objective of the workshop was to provide a platform for dissemination of project information and technological innovations in the field of building materials and their commercialization methodologies for the benefit of prospective entrepreneurs. The topics covered in the workshop included project identification, sourcing of new technologies, sourcing of machinery and equipment, and technology transfer methodologies.

Mr G Santhanam, Industries Commissioner & Director of Industries and Commerce, Government of Tamil Nadu presided over the function. Mr S Sivagnanam, Director, MSME-DI, welcomed the guests and participants, following which Professor M Lakshmipathy, Head of Department of Civil Engineering, SRM Institute of Science and Technology, Chennai delivered the key note address. Chief Guest Dr Shailesh Kumar Agrawal, Executive Director, BMTPC (Building Material Technology Promotion Council), New Delhi, spoke on the technically feasible and commercially viable processes that have been developed by BMTPC which are available for commercial exploitation.

Three technical sessions followed the inaugural session. Mr N Vasudevan, Fellow, TERI, presented the possibilities and potential for technology upgradation, especially in the area of production of resource-efficient bricks such as perforated bricks, hollow blocks and fly ash bricks. Dr K G K Warrier, Scientist, NIIST (National Institute for Interdisciplinary Science and Technology, a constituent laboratory of the Council for Scientific and Industrial Research), Thiruvananthapuram, described the process of developing novel building material components and the possibilities for commercialization. Dr Sukhdeo R Karade, Senior Scientist, CBRI (Central Building Research Institute), Roorkee presented the entrepreneurial prospects in building material technologies developed by the institute. Mr J A Desai, Managing Director, J A Desai Ferrocements, highlighted the potential to use ferro cement as an alternative building material.

MSME-DI Chennai workshop

Dr Swapan Kumar Das, Scientist, CGCRI (Central Glass and Ceramic Research Institute), Kolkata, presented technologies to manufacture cost-effective building materials utilizing industrial solid wastes, and the recent R&D initiatives undertaken by CGCRI. Professor R Malathi, Head of Department of Civil Engineering, Kongu Engineering College, Erode, spoke on 'paper-crete bricks'. Dr Manu Santhanam, Assistant Professor, IIT (Indian Institute of Technology), Chennai focused on special concretes for modern construction. Mr P Krishna Pillai, Scientist, NIIST presented developments in red clay-based building materials. The technical sessions were followed by a panel discussion chaired by the Director MSME-DI, Chennai. The event provided a platform for the participants to obtain and share information on developments in the building materials sector.

Energy management manual prepared for Ugandan tea industry

TERI was recently involved in a study-cum-assessment project in Uganda by GTZ

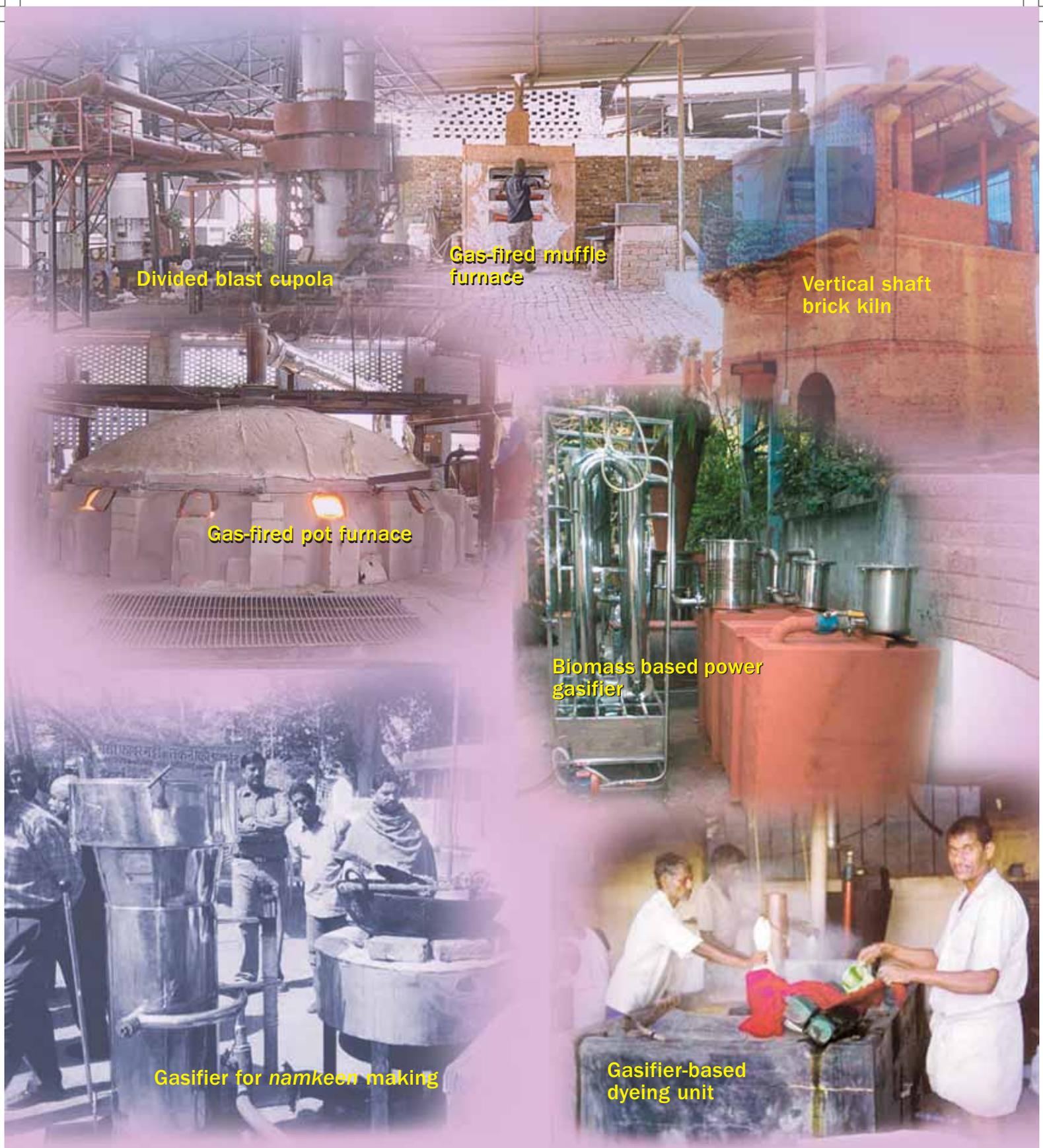
View of Ugandan tea estate

(German Technical Cooperation), in association with MEMD (Ministry of Energy and Mineral Development), Uganda, to identify industry sectors that show potential for energy saving and to promote energy conservation and energy efficiency measures. This project is of great importance because Uganda, like most other developing countries, faces a serious crisis in energy supply.

Among the sectors severely affected by energy shortages is the Ugandan tea industry. There are 22 tea processing units, of which four are managed by the tea-growers. The tea industry is largely export-oriented, with 90% of production being exported. While exposure to international markets has encouraged improvements in the Ugandan tea processing units in the areas of hygiene, machinery and skilled labour, the units are faced with the challenge to reduce their production costs so as to improve their competitiveness in the international market. Hence there is a clear need for units to adopt energy saving measures to reduce the production costs.

Electricity is required at almost all stages of tea manufacture and accounts for over 75% of the total energy costs. The study by TERI revealed significant potential for conserving energy; particularly in the drying processes (withering and post-fermentation drying) which together account for over 80% of the total energy consumed during the tea manufacturing process. The specific energy consumption of the tea factories in Uganda was found to be very high, ranging from 0.43 to 0.77 kWh per kg tea as against the norm of 0.21–0.50 kWh per kg tea.

In order to promote energy efficiency in the tea industry, TERI prepared a manual titled 'Energy management manual for tea industry' for MEMD. Intended for use by both plant managers and technicians, the manual describes various management practices such as energy audits, waste minimization, power factor control, peak load management, and maintenance and operations control that would help tea processing units in cutting down energy consumption while maintaining production levels, product quality, safety of workers and environmental standards. The specific areas identified in the manual include boilers, steam distribution and utilization, driers, motors, fans, blowers, and lighting.



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