International Workshop to Promote Best Practices on Consumer Electronics Standards and Labeling Programs in Asia Pacific Partnership Countries

March 10-11, 2011: Le Meridien, New Delhi

CONFERENCE PROCEEDINGS

Day 1 – Friday, March 10th 2011

Introduction

The Bureau of Energy Efficiency (BEE), Collaborative Labeling and Appliance Standards Program (CLASP), and ICF International jointly organized the workshop. The objectives of the event were to obtain a clear understanding of best practices for appliance standards and labeling (S&L) for consumer electronics in Asia Pacific Partnership (APP) member countries,[1] as well as to understand the market for and approach to implementing effective S&L programs for consumer electronic products in India. The workshop provided a platform for policymakers, industry leaders, testing laboratories, and appliance energy efficiency experts to share and discuss experiences and lessons learned from policies and barriers related to the design and implementation of S&L programs for consumer electronic (CE) products.

The conference began with a welcome address by **Mr. Eric Gibbs, Senior Director of Country Programs, CLASP**.

Dr. Junyoung Choi of the APP Buildings and Appliance Task Force (BATF) Secretariat and Senior Researcher at Korea Testing Laboratory gave the audience a general overview of the Asia Pacific Partnership Program for Clean Development and Climate and its various task forces, including projects that have been implemented by the BATF.

Dr. Ajay Mathur, Director General of the BEE began the workshop proceedings by commenting on the importance of standards and labeling in the context of energy efficiency. He acknowledged the contributions of ICF and CLASP in organizing the workshop and thanked the participants for their interest. Dr. Mathur noted the rapid growth in the consumer electronics sector and, consequentially, the rapid growth in overall energy consumption, which is expected to increase by around 5-6% as a result of growth in the overall economy. He highlighted the role of consumer electronics in improving the lives of people but simultaneously emphasized the importance of energy efficiency. He outlined a phased approach towards the labeling of consumer electronics that focus on appliances with the maximum potential for growth, energy consumption and savings. He also noted the importance of raising awareness among consumers and involving them during S&L program implementation, since they are

[1] These include Australia, China, India, Korea, Japan, Canada and the United States of America.

the ultimate beneficiaries of such programs. Additionally, he highlighted the importance of random test checking of appliances and of setting progressively stricter standards to maintain the efficacy of such programs. Dr. Mathur also highlighted the need for harmonization of standards and testing procedures, especially for consumer electronics across various geographies. He provided examples of cases where such harmonization is not feasible – including the case of fans, which are typically produced by local manufacturers in developing countries.. He also underlined differing efficiency levels for appliances in various countries as result of product designs suited to environmental and ambient conditions, as well as consumer usage patterns. One example mentioned was of refrigerators, where the efficiency level varies due to local climatic conditions and usage patterns. These in turn vary by country, and therefore the harmonization of standards for such appliances has become a major challenge. Nevertheless, Dr. Mathur concluded by explaining the merits of harmonizing standards, labeling programs, and testing protocols to the growth of the consumer electronics industry and consumer awareness.

Mr. Eric Gibbs, Senior Director of Country Programs, CLASP presented citations of appreciation to Dr. Sandeep Garg, Energy Economist at BEE, and Dr. Ajay Mathur, Director General of BEE.

Mr. Nitin Zamre, Managing Director of ICF International spoke about the US Energy Star labeling program and the possibility of replicating its success within BEE's labeling program. He thanked Dr. Mathur, Dr. Garg, the APP, CLASP, industrial partners, and all the attendees for their participation in the event.

Session 1 – Standards and Labeling Programs for Consumer Electronics

Mr. Noah Horowitz, Senior Scientist, Natural Resources Defense Council (NRDC) opened Session 1 with a presentation on **"The Consumer Electronics Market: Size, Scope, and Importance for Standards and Labeling."** He provided an insightful overview of the CE industry including data on the rise in CE sales, energy consumption and carbon emissions, particularly in the US residential sector. To advance his point on the growth in popularity and similarity of CE products across the globe, Mr. Horowitz conducted a survey among the participants of the workshop in order to demonstrate the extent of the products' popularity in India's market. He detailed trends – such as high definition, larger screen sizes, and TV viewing times – that have led to increasing energy consumption in TVs and associated products, such as set top boxes. He also highlighted a trend wherein battery operated appliances tend to be more efficient compared to those that are directly plugged in. Mr. Horowitz focused on the high energy consumption and inefficiency of set top boxes (STBs) and video game consoles and the potential for reduction in energy consumption through effective S&L programs. He highlighted several critical activities, including developing harmonized test methods that simulate "actual usage" for appliances like TVs, incentive programs for retailers and buyers, and energy efficiency in appliances such as STBs, which are provided directly by service providers. He also underlined the importance of swift action and of subsequently perfecting procedures and protocols.

Dr. Sandeep Garg, Energy Economist at BEE followed Mr. Horowitz with an **"Overview of Standards and Labeling Programs in India."** He provided the participants with insights on consumer psychology and the role that energy efficiency plays while deciding on the purchase of an appliance of a particular brand and model. He also indicated that products with power saver modes could be shipped with those options activated, as consumers often ignore such features as a result of lack of awareness. He called for a stronger legal framework to enforce labeling programs that would include penalty mechanisms for non-compliance. He followed these remarks with an emphasis on the need for harmonization of standards and testing procedures. Dr. Garg urged all stakeholders, including utility companies,

manufacturers, and trade and manufacturing associations to participate in energy efficiency programs akin to the standards and labeling program and demand side management (DSM), and extended BEE's support as a facilitator in such programs. He concluded by highlighting BEE's target to achieve 10,000 MW of avoided capacity by 2012 through all its programs, beyond the present accomplishment of the 2,400 MW already achieved through S&L programs alone.

Mr. Sandeep Tandon of ICF International then presented a case study on the "**Development of Standards and Labeling for Computers in India**." He highlighted several pertinent facts related to desktop and notebook sales in India as well as key trends in energy consumption and efficiency. Mr. Tandon also detailed the approach to compute typical energy consumption (TEC) standards for desktops and notebooks in India, including a draft schedule, and presented a roadmap for the S&L program for computers in India.

The **Questions and Answers (Q&A)** session that followed the presentations revealed some concerns over the increasing prices of appliances in India due to stringent energy efficiency standards, as compared to declining or stable prices in other parts of the world. The panelists, however, noted that on the contrary prices have declined sharply for CE products, citing the example of LCD/LED TVs. There was also talk of utility level programs in the US that provide rebates to consumers for adopting and enrolling in DSM programs. Mr. Horowitz explained that the net cost increase for stakeholders would be zero provided that an energy efficient component obviates the need for other costly interventions, such as procurement or wholesale power or development of additional power generation to meet growing demand. Dr. Garg also remarked that the Directorate General of Supplies and Disposals, Government of India, is promoting the procurement of energy efficient appliances in government purchases as a demonstrative example for utilities to follow. He reiterated the need to bring about harmonized S&L procedures and also to enforce a regulatory framework that incorporates punitive actions for non-compliance.

Additional queries arose relating to the harmonization of S&L programs under an internationally accepted umbrella program for the ease of manufacturers and consumers. Other questions addressed issues of inventory management and consumers' ease of product identification, given that progressively stricter standards and labeling programs will be adopted as new and more efficient technology is commercialized. Mr. Gibbs and Mr. Horowitz shared their knowledge of the US Energy Star program and explained how it has addressed these concerns. Another issue raised questioned S&L programs' efficacy if only the energy consumption during a product's usage is addressed, while its life cycle environmental impact is not considered. Mr. Horowitz explained that only energy usage is currently considered because it constitutes the most significant percentage of energy consumption during the product lifecycle and also that standards could be subsequently revised to incorporate the environmental impacts of these products.

Session 2 – Standards and Labeling Programs for Consumer Electronics in APP Countries

Mr. Frank Klinckenberg, Technical Director at CLASP and Session Chair introduced the panel comprising:

- **Dr. Jun-Young Choi, APP BATF Secretariat and Senior Researcher at Korea Testing Laboratory;**
- **Dr. Jianhong Cheng, APP BATF Representative and Professor at the China National Institute of Standardization;**
- **Mr. Noah Horowitz, Senior Scientist, Natural Resources Defense Council and**
- **Christopher Stone, Director of US Programs and Chief Technical Advisor for Testing at CLASP**

Dr. Jun-Young Choi presented on **"The APP Building and Appliance Task Force: Accomplishments and Looking ahead to the Future."** He broadly outlined BATF projects that are under execution and those that have been completed. These projects include market transformation, building certification, building codes, improvement to existing buildings, and several ongoing projects related to energy efficiency such as electric motors, harmonization of test procedures, utility programs, and smart meters.

This presentation was followed by a **Panel Discussion** on **Minimum Energy Performance Standards (MEPS) and Monitoring, Verification and Enforcement for Consumer Electronics S&L Programs in APP Countries, Best Practices and Challenges.**

Mr. Horowitz spoke at length about the evolution of Energy Star in the US and described how it has developed as a transparent program. The Energy Star program is completely voluntary in nature and brands the top 25% of the most energy efficient products in each class. The program is performance-based and technology-neutral, which implies that the Energy Star label is granted to products purely based on their energy efficiency characteristics and does not take into account the specific technology that has been employed to bring about the resultant efficiency levels. He also talked about the criticisms that the Energy Star program has attracted for not setting stringent standards for qualification. He cited a case wherein over 40% of manufacturers of had outpaced themselves by achieving Energy Star standards within six months of the inception of the standard. He also noted that the Energy Star program could incorporate lifecycle resource consumption, just like dishwashers for which water consumption during operation is also standardized. There could also be an "Energy Super-Star" program to label the most efficient appliances in each category. Mr. Horowitz stressed the importance of random sample testing and suggested that such testing could be collaborative, so that the same product need not be tested in each country. The caveat, however, would be that the same product might be labeled differently by the manufacturers in different countries. He added that, at present, no CE products have minimum energy performance standardsin the US.

Dr. Choi spoke about the energy efficiency labeling program in place in Korea since 1992, which draws from various international benchmarks. He explained that Korea subsequently also implemented a standby mode program that took effect in 1998-1999, as well as a high-energy equipment certification program for energy intensive equipment.

Dr. Jianhong Cheng described lessons learned from China's experience implementing S&L programs in general. He reiterated the importance of starting early and gradually moving towards a broader and more intensive labeling program. He also highlighted MEPS as an essential tool in meeting overarching energy efficiency goals and stressed the importance of willingness on part of manufacturers and consumers alike to see labeling as an opportunity rather than an impediment. On being questioned about harmonization efforts for S&L in China, Dr. Cheng noted that harmonization of testing procedures is beneficial; however, he expressed skepticism on the harmonization of MEPS on the grounds of variances in consumer preference, product design, and performance and use in different operating and environmental conditions. Lastly, Dr. Cheng illustrated how S&L programs could first begin at the basic level of considering only energy usage during operation but could gradually evolve into more complex programs that take the lifecycle cost and overall energy consumption into account.

The panel discussion was followed by a **Question and Answer session** with workshop participants. Several participants were curious about how China ensures that models with a particular rating in one year are not confused with ratings of the same model from subsequent years and how manufacturers deal with such inventory-related issues. Dr. Choi noted that in Korea, the year of the label is clearly

indicated, and that the labels change in color and size every year. The changes are complemented by extensive advertising and market information campaigns for the consumers' benefit. Dr. Cheng mentioned that labels in China also display information about the year of the label. Mr. Horowitz explained that the US Energy Star program, by contrast, differs in that the labels display the year of product's manufacture to differentiate amongst models with varying dates of production. He emphasized the dynamic manufacturing industry that is quick to respond to even the most stringent standards. He also noted that although the criteria in a voluntary labeling program could be somewhat liberal, the criteria in mandatory programs need to be stringent.

Session 3 – Standards and Labeling Programs for Consumer Electronics in APP Countries, Part II

Christopher Stone, Director of US Programs and Chief Technical Advisor for Testing at CLASP and Session Chair introduced the panel comprising:

- **Dr. Jun-Young Choi**
- **Dr. Jianhong Cheng**
- **Mr. P. K. Mukherjee, Senior Technical Advisor, CLASP**

The **Panel Discussion on Test Methods and Procedures for Consumer Electronics S&L Programs in APP Countries, Best Practices and Challenges** commenced with an overview by Mr. Mukherjee on testing procedures and the evolution of standards in India. He explained that India, being one of the members of the World Trade Organization, must follow standards set by the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) wherever applicable. He noted that although most countries are comfortable with safety and health standards as mandated by the IEC or the ISO, they might have different energy efficiency norms. He also added that there was a proposal to bring all CEs under the Eco Mark, an environmental labeling program operated according to ISO standards 14020 and 14024, which is approximately 5% less stringent in comparison to present Indian standards. He also remarked that energy efficiency is quite important and must be viewed and rated in conjunction with products' performance parameters. Mr. Mukherjee also described how present intellectual copyright mandates a country to seek permission to adopt standards that have been incorporated in another country. Thereafter, he explained how standards for various appliances in India have been either developed indigenously or adopted from other international standards. Additionally, he discussed cases in which these standards have been modified or updated to suit India's specific conditions.

Dr. Choi described the manner in which Korean standards have been developed indigenously where needed and have been adopted from international standards. He spoke about instances in which Korean standards for CE products have been revised based on the feedback received from the program stakeholders including the national standards regulatory agency.

Dr. Cheng cited instances where standards and testing procedures in China have deviated from international protocols. This is due to the fact that, for a few products, the differences across geographies are too large and affect efficiency levels, or sometimes the usage is drastically different. He also highlighted differences in testing procedures if it was determined that international testing procedures were too complex or costly for local implementation; however, he expressed optimism that such challenges can be overcome for global products such as consumer electronics. He also reiterated the importance of including performance testing during testing for product energy efficiency.

Day 2 – Friday, March 11th 2011

Session 1– Standards and Labeling Program on Consumer Electronics: Associations' and Manufacturers' Perspective

Dr. Sandeep Garg opened the session with a comprehensive presentation on **"Orientation to Consumer Electronics in India: Preliminary Standards and Labeling Programs."** Dr. Garg provided an overview of the BEE's policy framework development mechanism before and after a policy is implemented. After initiating a standards and labeling program for large equipment and appliances, BEE is now attempting to comprehend the entire market of consumer electronics products, where, due to a lack of available data, there is no clarity on the growth rate and standards also do not exist. BEE has constituted a technical committee that will work on creating standards. BEE will, with the support of consultants who will provide market related data, work to formulate standards with which manufacturers will have to comply. It is not clear at present which Indian standard the CE products would have to comply with since each product manufacturer follows its own safety, manufacturing and performance standards. Additionally, BEE wants to understand developments on CE products in the global market because it is aiming to harmonize product standards and testing procedures. Dr. Garg referenced a recent study[2] , which states that in the absence of standards for CE products, a large amount of energy is being wasted, and about 470 Terawatt hours of energy can be saved in India by implementing standards.

Dr. Garg's presentation covered CE products such as TVs, printers and office automation products, DVD players, modems, multi function devices, and data centers. TV manufacturers LG, Samsung, Panasonic, and Onida have already enrolled their products in the BEE's color television (CTV) labeling program.[3] CTVs with liquid crystal displays (LCDs) and light emitting diode (LED) panels already capture more than 60% of the market. Both the price and energy consumption numbers of LCDs and LEDs are reducing rapidly; therefore, people are buying more flat panel TVs in place of the older cathode ray tube (CRT) TVs. By 2014, India will shift from analog to digital transmission technology, which is a major change that will dramatically affect the types of products on the market. In view of this, BEE's program with TVs initially focused on limiting the standby mode power consumption levels. As a result, the standby power consumption for TVs is now 1W, which was earlier in the range of 10W to 14W, and the cost involved was less than $1.00 for technology intervention. Dr. Garg also pointed out that BEE's technical committee is studying the correlation of power consumption level in TVs between static signals and dynamic signals. With help of testing laboratories and manufactures, BEE is analyzing the effect of both types of input signals on the TV's power consumption.

Dr. Garg also mentioned that the popularity of LED TVs is increasing, and the power consumption per screen size is coming down. Nearly 20 million TVs are sold every year in India, and a vast majority of TV sets are switched on around the same time during a day, contributing to an evening peak demand of electricity. Therefore it is important for BEE to define active power consumption levels and also work towards global convergence on testing standards and procedures through a policy framework in different countries.

Dr. Garg additionally provided a status update on BEE's activities with regard to various consumer electronic products. They were as follows:

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[2] http://clasponline.org/clasp.online.whatnew.php?no=782&type=3

[3] The CTV labeling thresholds can downloaded from BEE's website (www.bee-india.nic.in)

Printers: The market sector is shifting from dot matrix printers (DMP) to laser printers. DMP was popular in the past and is still used in a majority of government departments, but it is now giving way to laser printers. BEE is studying the market share of these products before coming up with energy efficiency standards and labeling programs for these products.

Fax Machines: Fax machines, scanners, and photocopiers are currently meeting BEE's compliance requirements, and the market is full of products that have a standby power consumption of 1W. There is an existing market of refurbished or previously owned products, but its size is not well understood. CLASP recently financed a study on office automation products (OAP), and BEE is preparing to cover multiple products under the S&L program in 2011.

Multi-Function Devices (MFD): BEE wants to address the standby power for these products, but the technical committee opined that BEE should work towards harmonizing the standard with that of the US Energy Star program. BEE is currently in the process of conducting the market data analysis for creating the total energy consumption criteria for various types of MFD available in the Indian market...

Laptops: All laptops conform to less than 2W of passive power and all big brands conform to less than1W in off mode. According to a recent study about 180 MW of power can be saved by 2020 through a policy for office laptops. This is an important product for BEE's S&L program policy framework due to significant growth potential.

Monitors- Regarding the computer monitors, BEE will come out with a regulation program before September 2011 in partnership with the Manufacturers Association for Information Technology..

Routers and Modems: Modems consume about 5W power while inactive. The primary issue for BEE is to determine how much power these devices consume when there is no data transmission. This is an important product to regulate as it is becoming a part of network products since the broadband and internet coverage is increasing rapidly in India.

DVD Players: This product will require deliberation after gathering data and would require tweaking of policy based on the inputs received from market survey. The standby power consumption is about 10W in active mode, while in passive mode the standby power consumption is 6W. BEE will need to consider how it would incorporate DVD and Blu-ray ray disc players into the entire policy document of CE standards and labeling.

Data Centers: BEE has already created a technical committee that will work on data centers such as servers, storage devices, and network equipment. In terms of overall energy consumption of a data center, 30% of energy is used by IT products alone. BEE's objective for data centers is to define a benchmark minimum energy performance standard for each type of IT equipment.

Dr. Garg also shared BEE's endorsement label, which clearly displays the version of the product, along with an indication of the period during which it will be in force. This allows the manufacturers enough notice of changing policy frameworks so that they can prepare for the product change and operability according to a forthcoming policy. Dr. Garg concluded by stating that for economic growth and social responsibilities toward resource management go hand in hand with BEE policy developments for appliance check testing.

Following Dr. Garg's presentation a **Panel Discussion on the "Impact of Standards and Labeling on the Consumer Electronics Industry"** took place. The Panel included the following industry representatives:

- **Ashwini Aggarwal, Executive Director, MAIT**
- **Dr Jaijit Bhattacharjee, Director, HP India Amit, Dhaka, Assistant Manager, LG**

Mr. Aggarwal provided some insights and industry perspectives that view S&L programs as an exercise in change management.

Standards labeling programs are working on improving the market by regulating the standard of industry itself – by acting as non-tariff barriers to prevent imports that are sub-standard and allowing domestic industry to build up. The programs thus appeal to both regulators and industry. The key success factors from the industry point of view are inclusions with all the infrastructure needs addresses such as testing etc. Mr. Aggarwal concluded his presentation by stating that according to the IT sector industries, BEE's S&L program is on course.

Dr. Jaijit Bhattacharjee discussed the impact of S&L programs on computer manufacturers and industries at large. In his presentation Dr. Bhattacharjee mentioned that an amalgamation of functions and features are creating challenges in having clear definitions of various devices that are becoming available in the global market. For example, there is no clear definition of various devices such as tablets or touch screen computers.

One of the issues present in the Indian market is how do we resolve the issue of a "grey market" – a market which does not pay taxes. There could be resistance from vested interest groups to protect the grey market. He highlighted other issues that concerns manufacturers such as complying with specific standards and labeling schemes that vary by country and thus pose production and compliance challenges for product manufacturers.

Mr. Amit Dhaka mentioned that standby power consumption levels in LG's TVs have reduced by 70% from 10 W levels. LG has made modifications which helped to reduce active mode power consumption by 10%. LG globally has a corporate social responsibility target of reducing CO2 emissions by 75 Kilo tons by 2012 and 150 Kilo tons by 2020.

LG is committed to technological advancement globally to stay ahead of the competition. In FY 2009-10 alone, LGs products such as TVs, ACs, refrigerators which follow BEE's S&L program have helped to reduce 1500 million units of electricity in India.

Session 2 – Monitoring, Verification and Enforcement of Standards and Labels for Consumer Electronics in India

Session 2 was chaired by Mr. Eric Gibbs, Senior Director of Country Programs at CLASP, who was joined by two subject expert on the topic: and.

Mr. Eric Gibbs, Senior Director of Country Programs at CLASP and Session Chair introduced the panel comprising:

- **Mr. Venkatachalam- Vice President and General Manager, Underwriters Laboratories, India;**
- **Mr. Chris Stone Chief Technical Advisor, CLASP**

Mr. R.A. Venkitachalam gave a presentation on the "**Role of Laboratories in Standards and Labeling Programs."** He shared his perspective on standards and labeling as "growth accelerators" rather than regulatory obstacles. He described how standards and labels can help markets to grow and evolve in the long run and highlighted the role of testing labs in the S&L program design and implementation and

review stages. He also cited BEE's labeling program to illustrate the role of stakeholders – BEE, manufacturers, consumers, etc. in the S&L program. Later, Mr. Venkitachalam shared his opinion on the evolving role of labs in S&L programs as independent Certification Bodies that issue Certificates of Compliance (CoC) for issue of labels by BEE and also contribute towards compliance through check testing of the products. To conclude, he urged ministerial bodies to consider granting tax breaks to testing labs, and not just research and development laboratories and also demanded further subsidies for the industry to encourage investments in lab facilities. He called for "industry cluster approach" to make test facilities available for all and also stressed on mechanisms that would ensure "Independence, Reliability and Repeatability". Lastly, he talked about building capacity and capability as a collaborative approach in investments as well as operations.

Mr. Chris Stone shared his thoughts on **laboratory capacity development** to support monitoring, verification and enforcement of standards and labels for consumer electronics in India. He initiated the discussion by sketching the roles of all stakeholders in S&L programs in India including government energy efficiency regulators, national standards development organizations, national accreditation agencies, laboratories, manufacturers. He presented on how labs should first prepare a feasible business model that takes factors such as Return on investment (ROI), laboratory utilization, testing fees and laboratory access into account. He also talked about the need to understand and suitably implement test standards and test methods and also pointed towards key issues related to test procedures, including a lack of details required to perform tests in the same way across multiple laboratories, uncertainty and repeatability of test results, costs of testing. Mr. Stone also highlighted other issues including adequate training of staff, laboratory accreditation, and quite importantly the need to move early instead of trying to perfect test procedures, doing which, could potentially slow the regulatory process.

Session 3 – International Collaboration

In the post lunch session, **Mr. Sandeep Tandon of ICF International** presented on **"Energy Efficiency Standards and Labeling in Asia." He** shared key highlights from the various standards and labeling programs in several Asian countries including Brunei Darussalam, Hong Kong, Indonesia, Japan, Korea, Malaysia, Singapore, Chinese Taipei, Thailand, Philippines and Vietnam. He detailed the standards programs with emphasis on nodal agencies, program applicability, stages of program implementation and the range of appliances covered. He also talked about lessons from countries that have adopted mandatory and voluntary approaches to standards and labeling programs for energy efficiency across various product categories. Thereafter, he proceeded to talk about efforts towards harmonization of standards and labeling for electrical appliances and issues that impede complete harmonization of test procedures, product scope and definition, key performance characteristics, and energy levels. Mr. Tandon stressed that for most products identified during the research (ACs, refrigerators, televisions, computers, lightings, water heaters, and clothes washers), there was minimum convergence among all these factors, and often energy levels were not comparable because of different product scope or key performance characteristics. Lastly, he mentioned regulatory support, language and cultural barriers, policy inertia and lack of project teams with technical, management and international expertise as key issues that have decelerated harmonization efforts so far.

In the same session, **Mr. Frank Klinckenberg, Technical Director at CLASP,** delivered a presentation to update participants on the Super-Efficient Equipment and Appliance Deployment (SEAD) Initiative. He provided an overview on the Clean Energy Ministerial and the SEAD Initiative, including its principles,

goals, partner countries and administrative structure. He also discussed progress of the various working groups incorporated under SEAD.

Conclusion

The two day workshop concluded with closing remarks from Noah Horowitz and Dr. Sandeep Garg.

Mr. Horowitz complimented CLASP and ICF for organizing the workshop which provided a forum for information exchange. While there has been a general awareness about the initiatives and S&L programs of India, the workshop provided a status update and he felt that, under Dr. Garg's leadership BEE is poised to move ahead rapidly in expanding its standards and labeling program. He made suggestions that as the reach of the program expand; it becomes important that the products be differentiated based on the functions as the scope for driving down the energy consumption varies. In case of some products, the savings potential exists in active mode while in other products the saving potential is in passive mode. Further, the requirement for a particular product to power down to 1W level needs to be mandated to ensure that it automatically switches to low power stand-by mode when no activity is happening. He quoted examples of products such as cable modems and digital video recorder that are gaining usage by the day but do not have auto power down mode. Consequently annual power consumption level of each device adds up to few hundreds of kilowatts. He urged BEE to take such factors into account in its future S&L programs and closed by saying the BEE's plans to pursue power saving in TV in both active and stand- by mode are well on track.

Dr Sandeep Garg thanked CLASP for organizing the workshop. He also thanked the presenters for their participation. He mentioned such forums have provided BEE opportunities for sharing information and to set benchmarks for future activities to be taken up in the program. Such workshops provide an agenda which helps BEE to formulate goals and target for the year. He mentioned that SEAD partnership has opened avenues for both US and Indian government to work together and collaborate. He acknowledged the support from CLASP which is working in several countries and provides a platform to BEE for sharing information on country and product specific program. Products are now becoming globalized therefore standards and performance index should also be made uniform among countries. However, process of information sharing in the present form is not very efficient and takes away resources and time which could be used for effective collaboration. The CE market is poised for a big change. Global forums such as Clean Energy Ministerial and SEAD are the kind of initiatives that are creating partnerships for exchanging information and learning for all the participating countries. In India, the manufacturers are supportive of the initiatives taken by BEE for the S&L program as BEE's proactive approach helps to resolve the issues. So, broadly the industry is receptive to the changes being proposed in the labeling program.

Dr. Garg acknowledged the technical support provided by CLASP over the past many years has helped to build BEE's capacity and provided technical support to industry for harmonization of standards and test procedures. He announced that BEE will proceed with building the capacity of test laboratories as the budget for the same has been sanction by the Government of India. He expressed the need for having a workshop on the topic of Laboratory Capacity Building. BEE envisages Indian becoming the hub for product testing and is moving ahead to create the infrastructure towards it and also creating awareness among South-Asian and select African countries. Already many south Asian countries are sourcing appliances and products from India which confirm to Indian standards and labeling program. This is creating the need for inter-regional collaboration for harmonization of standards and procedures, just as

India integrates its program with other countries which are part of global initiatives to enhance energy efficiency.

Eric Gibbs concluded the workshop by thanking everyone for participating in a highly productive two-day event. He agreed with BEE that there should be more of such workshops at regular interval for exchanging information.