Measuring the Impact of India's Standard and Labeling program

Neha Dhingra, CLASP, New Delhi, India
Archana Walia, CLASP, New Delhi, India
P. K. Mukherjee, CLASP, New Delhi, India

Abstract

Energy efficiency in appliances is emerging as a useful tool in addressing the issue of energy demand. To promote the usage of energy efficient products, India's Energy Conservation Act (EC Act), 2001 identifies Standards & Labeling (S&L) as one of the major thrust area. Launched in 2006 by the Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, in March 2002. The S&L program currently covers 21 product categories, of which 5 are under mandatory phase.

BEE undertakes a periodic assessment to measure the impact of its policy decisions and market transformation for the labeling program. A comprehensive pan India survey covering both urban and rural areas and key stakeholders including consumers, retailers, and manufacturers, was carried out in 2014. The survey aimed to understand the level of awareness of the labeling program, efficacy of communication, attitudes of stakeholders towards labeled products and energy efficiency, as well as the impact on sales and usage of labeled products by manufacturers and consumers.

The success of the program is critically dependent on awareness and acceptability of energy efficient products by consumers. Compared to 2010, this study reveals that the S&L program has made significant progress in consumer awareness, even though energy efficiency is still not a top priority for the consumer for the purchase decision as compared to other factors such as product life, brand name and reputation. Level of consumer awareness, availability of energy efficient products and the consumer's willingness to pay contributes to an increase in the penetration of technologically advanced energy efficient products. Some positive developments are also seen on the supply side with manufacturers and retailers willingness to manufacture and sell energy efficient and labeled products.

Keywords

Introduction

Climate change and energy security have emerged as key global challenges of the 21st century. As the second-fastest growing economy, India's energy consumption is growing at over 7 to 8 percent annually and currently is the third largest energy consumer in the world[1]. The rapid economic growth of the country has been accompanied by commensurate growth in the demand for energy services that is increasing the country's vulnerability to energy supply disruptions. These vulnerabilities are being addressed through diversification of energy imports, the development of indigenous fossil and renewable energy sources, and, reduction of the intensity of energy use of the Indian economy. Meeting the rising energy demand exclusively through increases in supply without effective demand side management is an expensive solution that will result in increase in greenhouse gas (GHG) emissions. Advancing the efficient use of energy is therefore crucial to address the twin challenges of energy security GHG emissions mitigation.

Energy efficiency is recognized as one of the most cost effective ways of improving energy

---

[1] https://yearbook.enerdata.net/

security and shifting towards low-carbon development. Recognizing the fact that efficient use of energy and its conservation are the least-cost options to meet the increasing energy demand, Government of India enacted the Energy Conservation Act, 2001 (EC Act) with the goal of reducing energy intensity of Indian economy[2]. Bureau of Energy Efficiency (BEE) was set up as the statutory body on 1st March 2002 at the central level to facilitate the implementation of the EC Act[3].

BEE launched **Standards and Labeling** (S&L) program in May 2006 as one of the major thrust areas for improving energy efficiency in the residential, commercial, industrial and public sectors in India. The objective of S&L program is to provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the marketed household and other equipment. This is expected to result in significant energy savings in the medium and long run while at the same time it will position domestic industry to compete in such markets where norms for energy efficiency are mandatory[4]. While the labeling defines the energy performance thresholds, the basis of the program is defined by the national or international standard.

BEE's overall strategy is to launch the labeling program on a voluntary basis and transition to a mandatory phase as market preparedness and receptivity increases. The first voluntary comparative energy label under the S&L program was launched for frost free refrigerators, followed by air conditioners, distribution transformers, and tubular fluorescent lamps (TFL). In 2010 all of these four products were brought under mandatory labelling. Today BEE's labeling program has expanded to include five product categories under mandatory phase and 16 under voluntary phase. Labeling program has brought about great degree of market transformation and substantial efficiency improvements which have resulted in national energy savings and reductions in carbon dioxide ($CO2$) emissions. On manufacturing side, it has led to innovation in product development. For example, the labeling program for air conditioner has contributed to an increase in efficiency of about 26 percent as compared to 2010. Minimum energy performance standards for ACs were at 2.3 EER (energy efficiency ratio) in 2010 and has been ratcheted up to 2.9 EER leading to 26% improvement in energy efficiency. There are several co-benefits which include energy security, improved air quality, health benefits and employment creation amongst others.

BEE periodically conducts an assessment of its program on market transformation, consumer awareness and energy savings. The first impact assessment was carried out in 2010[5] followed by another in 2014-both supported by CLASP. In this paper, we will discuss the approach, methodology and results of the assessment carried out in 2014 and wherever relevant, improvements over 2010 will be highlighted.

The key **objective** of the study was to understand consumers' level of awareness, behavior and perception towards the S&L program as well as those of the manufactures and retailers' along with the impact on sales of energy efficient products, energy savings and GHG mitigation.

Approach and Methodology for impact assessment

The study included a pan India market survey over a period of 6 months using both quantitative and qualitative research methods. The study covered all the key stakeholders namely, consumers of household appliances, retailers, manufacturers and importers. A summary of survey method and sample size for each category of stakeholder can be seen in **Table 1** below.

---

2 http://www.powermin.nic.in/whats_new/pdf/Ministers_artical.pdf

3 http://powermin.nic.in/Energy-Efficiency

4 https://beestarlabel.com/

5 Impact Assessment of the Standard and Labeling program in India, July, 2011

Table 1: Survey method and sample size

Stakeholders	Qualitative	Quantitative
Consumers	16 focus groups	5000
Retailers	-	642
Manufacturers	45	-

Product scope

The scope of the research included eight product types, mostly of residential use due to their mass consumption. The products are air conditioners, frost free and direct cool refrigerators, tubular fluorescent lamps (TFL), color televisions (TV), storage water heater (SWH), ceiling fans, distribution transformers and pumps. Of these air conditioner, frost free refrigerator, TFLs and distribution transformers are under mandatory phase while rest of the products are under voluntary phase.

The data collection included both primary and secondary research.

Primary research

Consumers- *Quantitative interviews* were conducted with residential consumers spread across urban and rural regions. Face to face survey was carried out with consumers at their home. Through a series of questions, it was established if the respondent was a recent buyer or an intending buyer of the appliances surveyed. Systematic random sampling procedure was followed to select the households. **Table 2** below shows cities where the survey was carried out and sample size in each of the cities. Cities were distributed based on climatic zones.

Table 2: Sample construct for quantitative survey of consumers

Category & Sub Category	Number of consumers surveyed in each city																						
	NORTH REGION						EAST REGION					WEST REGION					SOUTH REGION					
	Delhi	Lucknow	Hisar	Amritsar	Dehradun	Tier-4 cities	Kolkata	Bhubaneswar	Guwahati	Raipur	Tier-4 cities	Mumbai	Ahmedabad	Surat	Indore	Tier-4 cities	Bangalore	Chennai	Hyderabad	Vishakhapatnam	Trivandrum	Tier-4 cities
AC, Refrigerator, ceiling fans	150	125	125	125	125	100	150	125	125	125	100	150	125	125	125	100	150	150	150	125	125	125
TFL, SWH, color Television	75	40	40	40	40	50	75	40	40	40	50	75	40	40	40	50	75	75	75	40	40	40
Pumps and other equip	75	35	35	35	35	50	75	35	35	35	50	75	35	35	35	50	75	75	75	35	35	35
Total 5000 consumer face to face interviews																						

In order to arrive at the sample of consumers, a systematic random sampling procedure was followed with the total sample size of 5000.

Qualitative interviews which included sixteen focus group discussions were conducted with consumers across the four climatic zones. Focus groups provide more natural setting than one-to-one

interviews, as it allows participants to share their views and stories and through discussion can enable new strands of thought to emerge. Also, it is a qualitative tool and can generate indicators which can then be verified by quantitative research.

Table 3: Selected Cities and Demographic Profile for Focus Group Discussions

Zone	Group No.	Age	Socio Economic Classification[6]	Consumer Group	Location
North	1	21 – 35	A	Young Couples	Delhi
	2	36 – 55	B2/C	Men	Delhi
	3	21 – 35	B2/C	Men	Lucknow
	4	36 – 55	D	Women	Lucknow
	5	36 – 55	B1	Men	Hisar
East	6	36 – 55	D	Women	Kolkata
	7	21 – 35	A	Men	Raipur
	8	36 – 55	B2/C	Men	Bhubaneshwar
	9	21 – 35	B2/C	Young Couples	Guwahati
West	10	21 – 35	D	Men	Mumbai
	11	36 – 55	A	Men	Mumbai
	12	36 – 55	B1	Young Couples	Ahmedabad
South	13	21 – 35	B1	Women	Bangalore
	14	21 – 35	C	Men	Chennai
	15	21 – 35	A	Men	Hyderabad
	16	36 – 55	B2/C	Men	Trivandrum

Both quantitative and qualitative survey included respondents in the age band of 21 to 55 years. The respondents were either decision makers or influencing decision and represented all segments of socio economic strata i.e., low, medium and high income segment. The survey included both rural and urban respondents. The consumer survey focused on following issues:

- Level of awareness of the energy label;
- Importance given to the energy label;
- Consumers' understanding of the label;
- Consumers' perception of label usefulness;
- Factors that increase trust in the label and
- Priority given to energy efficiency in the buyer's choice of the appliance

Manufacturers- In depth interviews with 45 manufacturers and also the manufacturing associations of the product categories under consideration were carried out. The survey with manufacturers focused on following issues-

- Perception and opinion about the labeling program
- Motivations and barriers towards the program
- Impact of the program on production process and investments

---

6 The socioeconomic classification (SEC) groups urban Indian households on the basis of education and occupation of the chief wage earner (CWE: the person who contributes the most to the household expenses) of the household into five segments (SEC A, SEC B, SEC C, SEC D and SEC E households in that order)

Retailers- A total of 642 retailer interviews were conducted. The retailers that have been associated with the trade for over five years were interviewed. **Table 4** shows a sample construct for retailer survey.

Table 4: Sample construct for quantitative survey of consumers

Category & Sub Category	Overall Sample Construct- Retailers																					
	Number of consumers surveyed in each city																					
	NORTH REGION						EAST REGION				WEST REGION						SOUTH REGION					
	Delhi	Lucknow	Hisar	Amritsar	Dehradun	Tier-4 cities	Kolkata	Bhubaneswar	Raipur	Tier-4 cities	Mumbai	Ahmedabad	Pune	Surat	Indore	Tier-4 cities	Bangalore	Chennai	Hyderabad	Vishakhapatnam	Trivandrum	Tier-4 cities
Retailer																						
AC, Refrigerator, ceiling fans	25	25	25	25	25	10	20		10	10	20	15		10		5	25	25	25		15	5
TFL, SWH, color Television	15	15	15	15	15	10	3		3	5	15	10		5		5	15	15	15		10	5
Pumps and other equip	10	5	10	5	10	10	3		3	5	5	5		5		10	10	10	10		5	10
Total 642 retailer's interaction																						

In order to draw the sample of retailers, first the areas were selected using judgmental sampling by the research team, ensuring that the samples selected were spread across cities. Second, only those retailers selling labeled product categories were covered in the study. Thereafter, the main market areas in each city were selected and interviews were conducted in those areas.

The survey with retailers focused on the following issues-
•   Perceptions and opinions about the S&L program;
•   Recommendations of such products;
•   Training and orientation;
•   Impact of label on consumer behavior at the point of product sales and
•   Overall impact of the S&L program on manufactures

Secondary Research

Secondary data was also used to supplement information gathered from primary sources. Information was collected from various secondary sources such as published reports, relevant industry associations, articles from leading trade journals, literature review, past reports, industry database and reports etc.

Analyzing the policy impact on energy savings

In addition, the study estimated the energy savings resulting from the policies under the S&L program.

For the purpose of energy saving calculation, product capacities with highest market share had been chosen. The energy saving has been calculated based on the steps below-

- Identify the representative product capacity with highest market share and calculate energy consumption for single unit
- Energy savings = (Representative capacity energy consumption-baseline energy consumption) * number of units registered with BEE * annual operating hours
- Annual operating hours were calculated by multiplying number of hours a product is used daily (assumed based on consumer feedback and BEE's reports) with number of days of operation in a year. Operating hours and number of days of operation in a year for different products are given in **Table 5.**
- GHG reduction = Energy savings * National Emission factor

Table 5: Basis for Calculating Energy Saving

S. No.	Name of the Product	Annual no. of days of operation	Annual Operating Hours	Baseline
1	Direct Cool Refrigerators	365	8760	1 star
2	Frost Free Refrigerators	365	8760	1 star
3	Room Air Conditioners	150	1200	0 star
4	Color Television sets	365	6570	3 star
5	Ceiling Fans	300	3600	1 star
6	Storage water heater	-	250	1 star
7	Tubular Fluorescent Lamps	300	1200	40 watt TFL
8	Distribution Transformers	365	8760	1 star
9	Pumps	250	2000	1 star

Survey Findings and discussion

In India, the appliance ownership is on rise and this increase could be attributed to rising income, speed of urbanization, population's desire of improving quality of life. It emerged from the survey that income has a direct relationship with appliance ownership therefore, appliances which are considered necessary like ceiling fans, color television and linear fluorescent lamps are owned by most classes of the consumers while expensive appliances like air conditioner, washing machine, SWH are limited to higher socio economic class but they are also slowly making inroads across all consumers.

Consumers' survey findings

Key findings of the survey are mentioned below-

Factors influencing purchase decision- The Indian market is price sensitive so saving money is one of the prime considerations influencing purchase decisions. Along with price other factors such as brand, product life and technology play a significant role. Energy efficiency is not 'top-of-mind' factor, however, it is an important parameter influencing purchase decisions for high energy consuming appliances and equipment such as air conditioners, refrigerators, SWH.

Awareness and knowledge of labeling program- 63 percent of all respondents are aware or have seen energy labels, as compared to 33 percent reported in 2010. **Figure 1** below shows awareness levels of consumers across zones as well as rural and urban areas. The awareness levels have almost doubled as compared to last survey but is yet to reach a significant proportion of people. The awareness levels are higher amongst urban consumers as compared to rural consumers. The campaigns though not targeted at urban populations necessarily but they have more impact on urban population due to their greater exposure and access to print and visual media. A significant percentage of consumers, especially those that belong to lower socio-economic groups and those in rural areas, remain unaware of energy label and its associated benefits. ACs, followed by SWH and TFLs feature as the top three appliances that consumers associate with the labeling program.

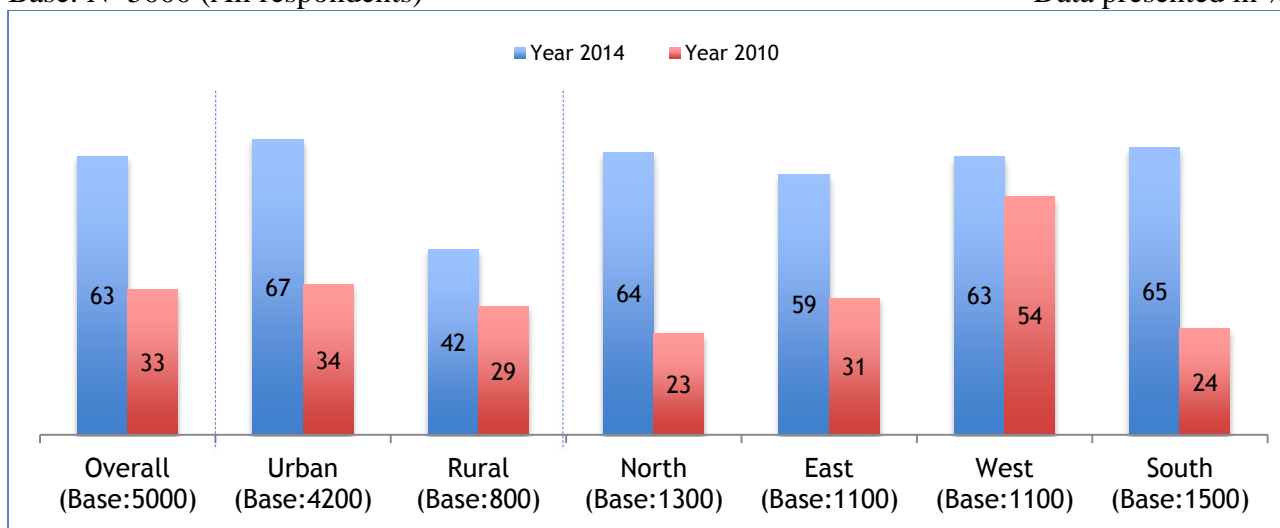Base: N=5000 (All respondents)   Data presented in %

Figure 1: Level of awareness of the BEE Labeling Program

There is low awareness among consumers about BEE being the **implementing agency** of the labeling program. There is a general perception that either leading brands or some government organization runs the program. Thus it becomes imperative that BEE establishes its own brand and credibility for increasing trust of consumers.

The majority of people are not aware of the products under mandatory and voluntary scheme as can be seen in **Figure 2.** It is important for consumers to understand the distinction between the products under these two phases as it would help in increasing market surveillance. If the product is under mandatory phase but is not labelled or mislabelled, it needs to be reported to the relevant organization.
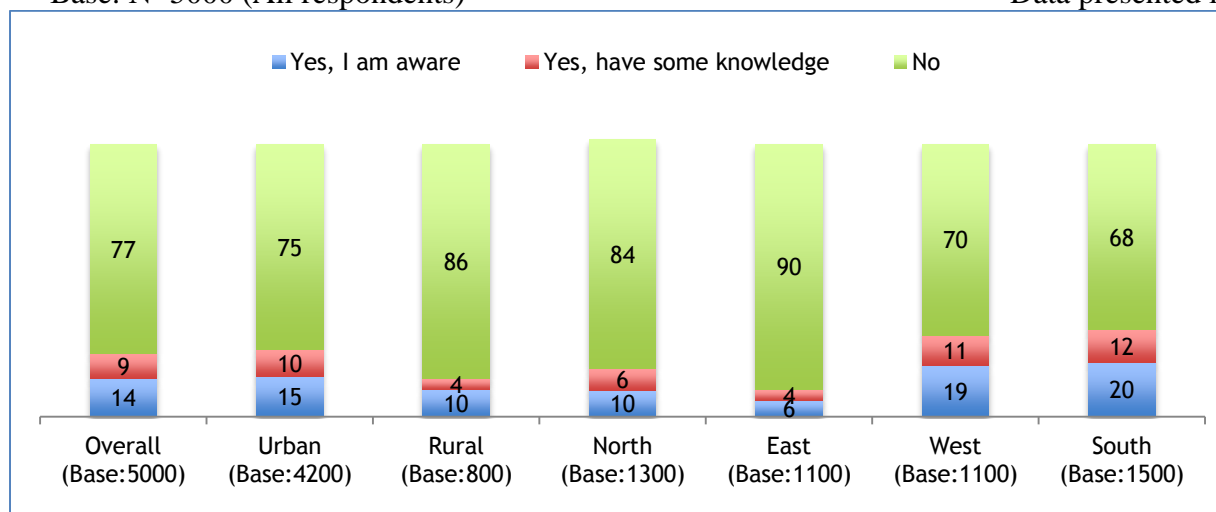
Figure 2: Awareness of Voluntary and Mandatory products of BEE

Primary sources of awareness- The primary or the major source of awareness is television, followed by retailers and word of mouth as can be seen in **Table 6**. Consumers mentioned that in recent times, communication about BEE labeling has been low though many brands and media articles have highlighted the importance of labels. Following the findings of the survey BEE started an awareness and communication campaign and published several advertisements in both print and electronic media.

Table 6: Primary sources of awareness for consumers

	All		Urban		Rural	
	2010	2014	2010	2014	2010	2014
Television	81	76	82	76	73	77
Retail	45	30	47	32	27	19
Word of mouth – Friends, relatives etc.	51	53	54	58	52	28
Print/Magazines	19	14	20	14	11	15
POS in shops	14	12	15	10	4	23
Newspapers	13	47	14	49	7	33
Banners	5	9	6	9	1	9
Radio	3	12	4	13	1	7
Cinema/theaters	-	2	-	1	-	9
Websites/Online	-	8	-	9	-	5

Influence of Labels - The comparative labels have influenced the consumer's decision making process in the last few years as energy efficiency and presence of label is one of the top criteria for purchase decision making for high energy consuming appliances.

In the case of ACs, refrigerators and washing machines, which are high power consuming appliances, labels serve as a guide for the energy efficiency of the product. Labels are also highly desired in SWH as along with energy efficiency, consumers perceive that it gives them an additional assurance of safety and quality. Saving on energy bills and the desire to use high quality and technologically advanced products are the reasons for consumers to opt for labeled products.

Label comprehension- Respondents who were aware of the labeling program exhibited a partial understanding of the information provided on comparative labels. Consumers across various income groups comprehended that the labels with more stars are more efficient resulting in more saving. The **Figure 3** below shows respondents' interpretation from comparative labels:
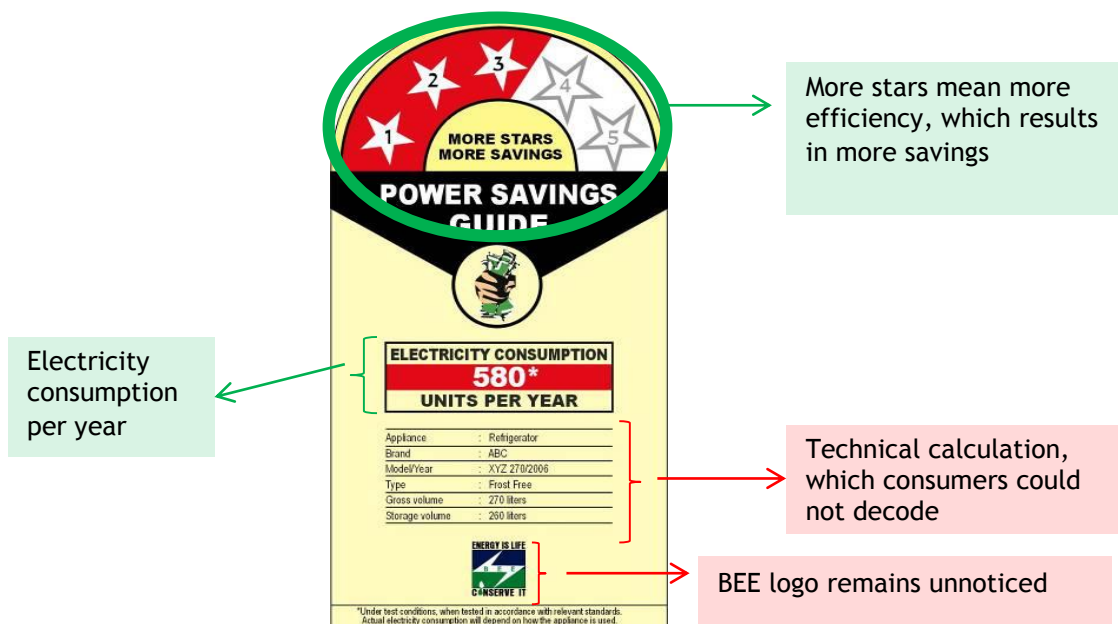
Figure 3: Label comprehension

Most of the respondents could not decode the energy performance values printed on the comparative label. They were of the opinion that it is too technical for them to understand. Further, consumers across locations said that they noticed the information on the label only at the time of purchase.

Consumers suggested that additional information such as energy and monetary saving from labeled appliances, simpler saving calculations should be easily accessible at the point of purchase, but should not be specified on the label. They also suggested that information on the label should be presented in a way that it draws the consumer's attention, raises their awareness level, and then helps them to make an informed decision.

Impact of Labeled Appliances on Electricity Bill- Out of the respondents who own labeled appliances, 89 percent see merit in owning such products and have experienced minor reduction in their power consumption bills even though the actual billing might remain the same which could be due to rebound effect caused by an increase in the number of appliances. **Figure 4** below shows the perceived reduction in electricity bill from the labeled product.
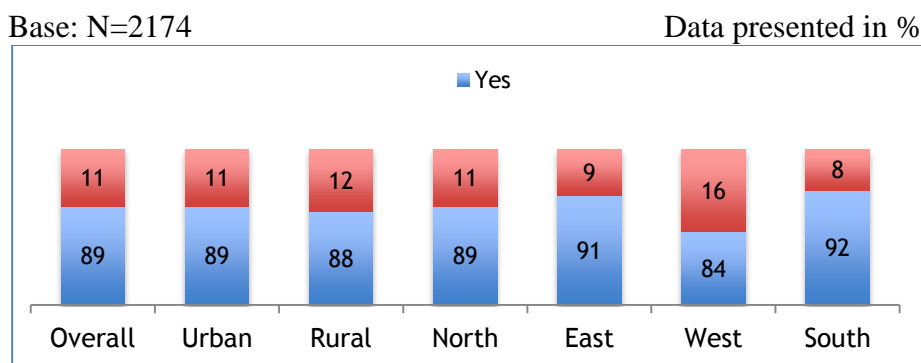

Figure 4: Perceived Reduction in Electricity Bills from Labeled Appliances

Willingness to pay- Consumers of higher socio economic strata expressed willingness to pay extra for an efficiency level of three stars, however they consider four and five stars to be too

expensive. For most of the products, three star is the most preferred category and consumers are willing to pay a premium of around 10 percent extra to buy labeled appliances as can be seen in **Figure 5** below.
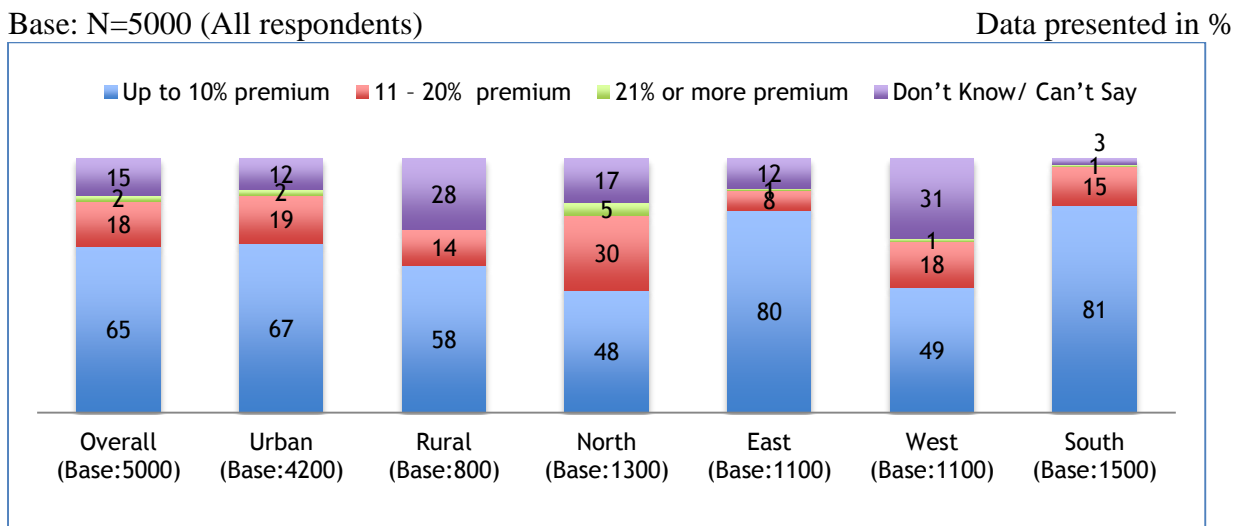
Figure 5: Willingness to Pay Premium for Star Rated Appliances

Influence of retailers-The majority of consumers say they are pre-disposed to buying labeled appliances. However, a significant number of respondents, both in rural and urban areas and in all zones, stated that their decision to buy labeled appliances was mostly influenced by the retailers. The retailer, thus, has a responsible role in influencing the consumer to opt for labeled products.
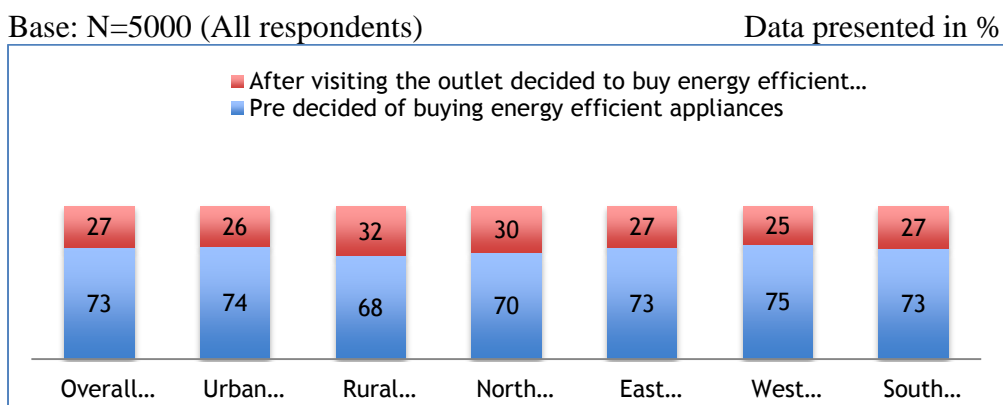
Figure 6: Importance of Retailers in Purchase labelled Appliances

Barriers in Accepting Energy Efficient Products- A large proportion of respondents indicate the inadequate awareness and understanding of the benefits from these products are the key barriers. This indicates the role and importance of an outreach program to effectively communicate the message of the star label on a product. The other factors that act as barriers in accepting labeled products are higher price, lack of incentives or replacement/exchange programs for labeled products.

Manufacturers' survey findings

Manufacturers across all product categories show a high level of concern towards environmental issues and energy conservation. Most manufacturers narrate it to be a part of their philosophy and corporate social responsibility. Manufacturers express a high level of awareness and

willingness for participation for S&L program. Some of them feel that BEE's S&L program has positively impacted the overall market conditions for efficient products. The introduction of voluntary labeling as a precursor to mandatory schemes seems to have been an important influence on manufacturers, preparing them to improve their products in advance of the introduction of the policy. Manufacturers are of the opinion that voluntary labeling as a precursor to mandatory labeling is important as it enables them to comply with increased efficiency requirements by integrating design and manufacturing changes.

Motivators and Barriers- Demand push and technological advancements are the key motivators for manufacturers to adopt BEE's S&L program. Further, multinational brands also view the BEE star label as differentiator that separates technologically advanced and more efficient products from low quality, inefficient products. There is a general perception among manufacturers that sales for efficient appliances have increased due to the S&L program, which is the biggest motivator for developing efficient products.

Manufacturers also believed price is the key barrier for the consumer to purchase efficient products. For manufacturers, high investments and low return on investments is the barrier towards producing more efficient products. Additionally, frequent revision in efficiency thresholds is considered to be a barrier by the manufacturers. In IT products, low consumer awareness is the key barrier. Manufacturers see the process of product registration as complex and slow due to a lot of documentation involved.

Impact of the Program on Investments- Manufacturers gave mixed reaction when asked about the investments required to produce energy efficient products. Most manufacturers of IT products believe that their products are already energy efficient. Manufacturers of ACs express high concern about the additional investments required to produce efficient products. Also, most expressed dissatisfaction on BEE's frequent changes of efficiency thresholds particularly in the case of AC, which require frequent investment.

Impact of the Program on Sales- In urban areas, people are shifting towards star labeled products which has increased the demand for these labeled products. The uptake of efficient products and fast changing preferences lead to quicker replacement cycles which work in the interest of the manufacturer.

Retailers' survey findings

Most retailers find the star labeling program useful as it highlights the energy efficiency of products. Sixty three percent feel the labeling program has fueled growth in sales of labeled appliances, however it is also attributed to mandatory labeling on certain product categories. Retailers currently have a sufficient awareness level of the BEE star labeling program (as shown in **Figure 7** below) but there has not been significant improvement in their awareness level from 2010.
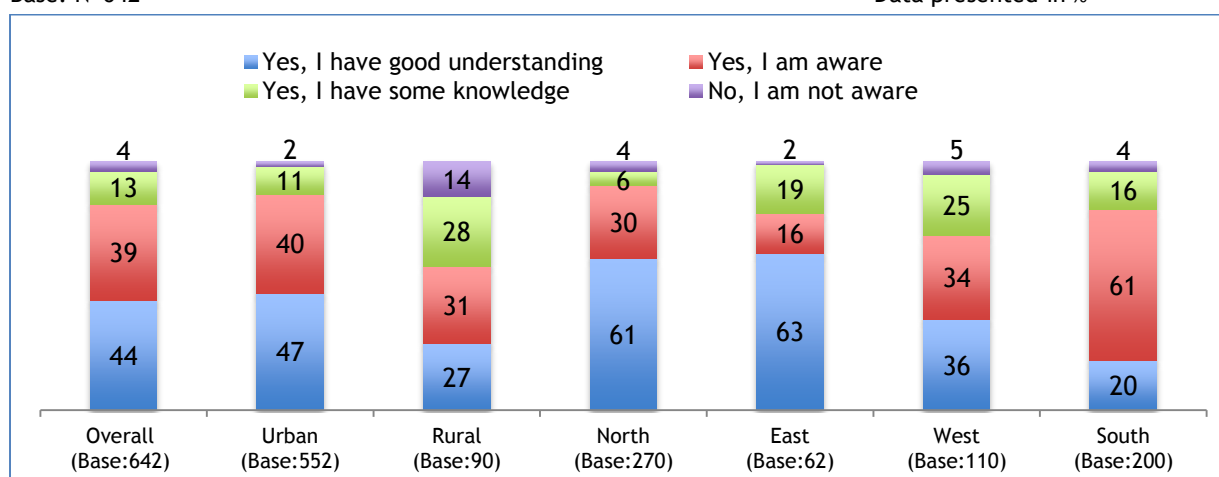
Figure 7: Awareness of the BEE Star Labeling Program

Observations from retailer surveys resonate with findings from consumer surveys. Retailers are also of the opinion that for high power consumption products such as ACs and SWH, energy efficiency is of high priority.

Retailers emphasized the fact that the sensitivity towards the price of the product in the market and lack of awareness amongst the consumer also act as barriers for uptake of labeled products. Retailers mentioned that no formal training has been imparted to them. Communication flow from manufacturers, in advertising and communication campaigns undertaken by BEE and manufacturers has given retailers basic awareness about the advantages of BEE labeled products. A training and communication program on usage and interpretation of labels, benefits of labeled appliances amongst other things was highly recommended.

Table 7: Cumulative Energy Saving, Avoided Generation Capacity and GHG Reduction

Sr.no.	Name of the Product	Annual Productions/sales (2012)	Savings in MWh (2012)	Avoided Capacity (MW)	GHG Reduction (million tonnes CO2)
1	Direct Cool Refrigerators	7,586,935	2,641,604	529	2.46
2	Frost Free Refrigerators	2,673,786	973,314	195	0.91
3	Room Air Conditioners	2,701,390	1,281,183	1,872	1.19
4	Tubular Fluorescent Lamps (36 Watts)	125,496,044	602,381	880	0.56
5	Color Television Sets	975,104	16,532	4	0.02
6	Ceiling Fans	903,815	41,995	20	0.04
7	Geysers	1,162,163	185,264	1,300	0.17

8	Distribution Transformers	264,584	210,996	32	0.20
9	Pumps	783	803	15	0.00
10	**Total**	**141,764,604**	**5,954,072**	**4,847**	**5.55**

The total energy saving for 2012 alone was estimated at over 5,954 Gigawatt Hour (GWh) leading to a total avoided capacity of 4,847 megawatts (MW) and a GHG reduction of 5.5 million tons of CO_2 from eight product categories.[7]

Conclusion

A sustained S&L program and the potential to increase the number of products in the S&L list can be expected to make a significant contribution in achieving energy saving and reduction in the emission of greenhouse gases.

The introduction of voluntary labeling as a precursor to mandatory schemes seems to have been an important influence on manufacturers, preparing them to improve their products in advance of the introduction of the policy.

BEE's labeling program has had a high impact on consumer behavior with respect to purchase of appliances. As observed from the survey results, energy efficiency is one of the top priorities for energy intensive products like AC, refrigerator influencing their purchase decisions. It is not yet a high priority for products such as TV, fans etc. There is substantial increase in level of awareness of consumers since the last impact assessment conducted in 2010. Improving awareness amongst lower socio economic classes and making efficient products more affordable to consumers are important measures for increasing the market penetration.

The penetration of labeled products will be higher when consumers are educated about the star label and are able to relate the use of appliances and equipment with energy consumption, lower energy bills. Therefore, an increased level of consumer awareness, availability of energy efficient products, and the consumer's willingness to pay has contributed to an increase in the penetration of technologically advanced energy efficient products. This is substantiated by the estimated energy savings resulting from the use of efficient home appliances.

The study shows that positive developments are also taking place on the supply side. It indicates that many manufacturers and retailers are willing to gradually, but steadily, shift to energy efficient products. However, some manufacturers mentioned that there is a high investment and a low return on investment for the energy efficient products. Stakeholders believe specific measures can overcome these limitations and threats. More than two-thirds of consumers report that a cost/price reduction and/or subsidization of energy efficient products can significantly contribute to the removal of these barriers. In addition, stakeholders also suggest providing simple saving calculations and exchange rebates for old appliances. These initiatives, however, need to be coupled with others that increase awareness and understanding of stakeholders about labeled appliances.

To increase awareness, different communication channels should be adopted to influence a wider audience. It is equally important to communicate the exact value proposition to the consumer and point out the cost benefit in simple terms. The current spate of communication is said to be sporadic; hence, to obtain sustained results, the communication should be continuous and varied. BEE's communication campaign has done impressively well in creating awareness of labels and the benefits that the S&L program offers (energy saving). Based on the findings of the study, BEE started

---

7 Impact assessment of BEE's standard and labeling program in India, January, 2015

print and media communication to increase awareness of stakeholders.

Overall, generating awareness amongst lower socio-economic classes and making labeled products more affordable to consumers are two important measures for increasing the market penetration of these products. Additionally, incentivizing consumers for labeled product usage, and communicating value proposition of efficient products, will enhance the program's impacts. The estimation of energy and GHG savings reveals that the labeling program can serve as a flagship program for India leading to avoided capacity generation and reduction of CO2 emissions.

References

Bureau of Energy Efficiency, Ministry of Power, Government of India. https://beestarlabel.com/

CLASP 2011. "Impact Assessment of the Standards and Labeling Program in India"

CLASP 2015. "Impact Assessment of BEE's Standards and Labeling Program in India"

Enerdata. "Global Energy Statistical Yearbook 2015"

Ministry of Power, Government of India. http://powermin.nic.in/Energy-Efficiency"