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Sustainable Public Procurement

Towards a low-carbon economy

The Energy and Resources Institute (TERI),
India

August 2008

Norad

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International Institute for Sustainable Development
161 Portage Avenue East, 6th Floor
Winnipeg, Manitoba
Canada R3B 0Y4
Tel: +1 (204) 958–7700
Fax: +1 (204) 958–7710
E-mail: info@iisd.ca
Web site: http://www.iisd.org/

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Sustainable Public Procurement: Towards a low carbon economy

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The Energy and Resources Institute

For more information

Project Monitoring Cell
T E R I
Darbari Seth Block
I H C Complex, Lodhi Road
New Delhi – 110 003
India

Tel. 2468 2100 or 2468 2111
E-mail pmc@teri.res.in
Fax 2468 2144 or 2468 2145
Web www.teriin.org
India +91 • Delhi (0) 11

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- Gaining insight into typical practices and processes through which procurement is organized and executed in India
- Introducing SPP and discuss its feasibility in the Indian context
- Assessing awareness, interests and concerns related to SPP
- Investigating ongoing proposed public sector reforms that would impact procurement

Procurement can be, and is becoming, a key instrument of sustainable development through the creation of markets for more sustainable products. The Energy and Resources Institute (TERI) with the International Institute for Sustainable Development (IISD) had conducted a scoping study on the State of Play in Sustainable Public Procurement (SPP) in May 2007. This phase was to review international and national sustainable public procurement (SPP) initiatives, legal and policy frameworks and conditions for implementation at national and international level. Phase II of the study was undertaken to essentially fill in the information gaps identified in Phase I by interacting systematically with the practitioners and stakeholders. The first sub phase of the Phase II of the project aimed at discussing certain key research questions (Box I) around SPP in India. This report is for the first six months of the project.

It was decided to have a working definition of sustainability pegged to any one variable, which would find immediate resonance with the Indian procurement establishment. In view of the findings of Phase I and other studies showing energy efficiency as a key tool for energy security and moving towards a low carbon economy, it was decided to approach the issue of sustainability through the lens of energy efficiency.

Public procurement in India: Policy, practices and processes

The overall institutional framework for public procurement in India comprises the Ministry of Finance, Ministry of Commerce and industry and the Central Vigilance Commission. These ministries and departments of the government provide an overall general framework within which different public institutions operate and carry on their business including procurement. The actual procedure and practices governing procurement is governed by the company level rules and policies, which are designed keeping in mind not only the government guidelines but also the nature of the industry, size and institutional culture of the company.

There are primarily three kinds of procurement, (i) bulk and regular purchases that are overseen by the materials department of the, (ii) project specific procurement by specialized project

teams (iii) procurement that results from a contingency situation. The first kind of procurement, i.e. by materials or stores departments are usually items of regular and common use, not exclusive to any particular unit or project. Engineering products, machineries, tools and most raw materials fall under the second category. The kind of procurement is dependent on a number of factors including the structure and level of decentralization in a company. Normally, goods are procured through a two part or three part bid process. Evaluation of bids is generally carried out based on three key factors – technical requirements/ performance, cost, and timely delivery. Other than these, certain other criteria such as social and environmental, incorporated are directly or indirectly incorporated within the procurement process. The procedure and practices relating to procurement at a procurer level is discussed in chapter II.

Sustainable Public Procurement: Awareness, interests and concerns

While assessing the awareness of the stakeholders with respect to SPP, it was observed that although they were not very familiar with the term 'Sustainable Public Procurement', many of them were aware of sustainable business practices in general and some were indeed following sustainability in one form or another through their procurement process. The stakeholders looked at green procurement as something, which causes public gain but may not be beneficial to the company. However, they distinguished it from energy efficiency, (indicator of sustainability, for the purposes of the project), which is both pubic gain as well as private gain, thereby creating a win-win situation for the companies.

It emerged from the first round of consultations that incorporating energy efficiency as a measure within the procurement process was not consciously practised as a matter of policy aimed towards SPP, but actions influenced and driven by several other internal and external factors. External factors include government policy, nature and structure of industry at large, supply choices, including suppliers' capacity, energy pricing, market instruments, and voluntary instruments directed towards promoting energy efficient goods and services. These external factors have a great influence on a procurer's choice of energy efficient options, both in a positive as well as negative manner. Besides, external influence in the form of factors mentioned herein, there are several internal features such as company/ department level policy, environmental commitments/ memberships, institutional culture, nature of the goods to be

procured, level of decentralization in the procurement process etc., which facilitate or restrict an easy adoption of energy efficiency within the procurement process. (*See* chapter III for details). The study also studied the existing and possible influence of certain ongoing public processes with respect to transparency, sustainability, small scale industry promotion. Like other external factors, such processes can have both a positive as well negative implications for internalising energy efficiency in the public procurement process.

There are several challenges to internalising energy efficiency within the procurement process of public sector companies. In terms of regulatory impediment, multiplicity of institutions with roles not clearly defined in terms of their regulatory authority results in overlapping functions and jurisdictions. Different rules and guidelines are not always in harmony with each other. For instance, the stringent guidelines issued by the Central Vigilance Commission (CVC) have had a negative impact on the managers in terms of curtailing their operational freedom to deviate from the guidelines or explore the flexibility provided within the General Finance Rules (GFR) to go for "best value for money" and opt for energy efficient goods. In the absence of a tracking service for nature and scale of procurement, a harmonized policy formulation in incorporating energy in public procurement becomes difficult. Besides audit, compliance with other government directives such as preferences and reservations may cause an impediment to a successful implementation of energy efficiency within the procurement process.

Capacity of suppliers to provide energy efficient options in viable costs is also crucial as it requires a large amount of financial as well as technical capacity. Market based instruments have an important role to play in creating a market for energy efficient products and thus adopting sustainability criteria like energy efficiency within the procurement process. Instruments such as the energy star rating by Bureau of Energy efficiency (BEE) emerged as a good option to explore in this regard. Since often procurer, beneficiary and the supplier are all different agents, it poses serious challenges to the promotion and financing of energy efficiency. An emerging trend in public procurement has been with respect to outsourcing of procurement. While experience in other countries may show outsourcing as a more sustainable option, in the Indian context, it could lead to obstacles in ensuring that energy efficiency or any environmental criterion is adopted within the procurement process. (*See* Chapter III)

As much as suppliers capacity, procurers capacity is also a challenge to incorporating energy efficiency measures within the procurement process. Concerns with respect to capacity and resources required in determining which product is more energy efficient than the others while making procurement decisions were raised by stakeholders. It was suggested that enabling tools, *for example*, in the form of ratings, calculators, codes, guiding documents, can help the procurers meet this capacity deficit. It must be mentioned here that the issue of capacity as a barrier to SPP varied from industry to industry and was normally less of a problem in sectors which have a large energy component and a big turnover such as oil and heavy electrical. Therefore, any analysis with respect to the scope and feasibility of internalising energy efficiency within procurement will have to take into account nature of the industry, nature and quantum of products to be procured, institutional culture and internal company specific policies.

The study highlights the fact that there are not adequate incentives or guidance for the companies to adopt energy efficiency measures in procurement, in fact there are many disincentives for the same (*See* Chapter III and IV). In this regard, adopting a system of life time costs analysis can become a part of the policy system so as to provide a push to SPP. A favourable regulatory environment that promotes energy efficient practices provides the imperative, though in itself this may not be sufficient, (See Table 3.1) for the adoption of energy efficiency measures within the public procurement process. Any policy intervention to this effect will thus have to be at multiple levels and need to target specific (at least in the initial phase) sectors depending on their preparedness in adopting energy efficiency measures within their procurement processes.

Agencies like the BEE have their role defined in terms of providing for a enabling and supportive regulatory environment through measures like the adoption and marketing of sector wise good practices in procurement, providing for guidelines and templates for the calculation of energy efficiency between comparative products. Hence, it is of great importance that BEE plays a catalyst in enabling harmonization and policy convergence across sectors and regulatory levels to enable energy efficiency as a measure within the public procurement process.

Chapter I: Introduction

Procurement is an integral part of governance and the financial management system in a country. It is particularly important in developing countries with active infrastructure and social programmes. Public procurement spending accounts for about 15 percent of world's GDP (OECD, 2005) and is often much higher as a proportion of GDP in developing countries. The government is often the largest purchaser of goods and services, especially in the poorer countries. The procurement system of a country can determine the competitiveness of the markets, the national investment rates, and the long term growth rate. Increasingly it can be, and is becoming, a key instrument of sustainable development through creating markets for more sustainable products.

The Energy and Resources Institute (TERI) with the International Institute for Sustainable Development (IISD) had conducted a scoping study on the State of Play in Sustainable Public Procurement (SPP) in May 2007. This was the Phase I of the study wherein we reviewed international and national sustainable public procurement (SPP) initiatives, legal and policy frameworks and conditions for implementation at national and international level.

The rationale to conduct a Phase II of the study essentially lay in the information gaps that were identified in the scoping study in Phase I. The scoping study essentially focussed on an overview of the SPP practices in South Asia, South and Central America, the US and Europe and also in understanding the forces driving and impacting on SPP. The information thus gained was taken primarily from secondary sources and helped in understanding the international and regional institutional framework implementing the SPP agenda worldwide. The information being from secondary sources was also to a large extent anecdotal in nature and therefore despite contributing to the understanding, in itself it is of limited value if not supported by a more sustained and focussed research by way of a case study and also to interact systematically with the practitioners and stakeholders within a geographical territory.

Given the wide variety of nuances, which the definition of sustainability incorporates, it was decided to have a working definition of sustainability pegged to any one variable, which would find immediate resonance with the Indian procurement establishment. While undertaking Phase I of the study, interaction with public agencies in few countries in South America and Asia had revealed that energy efficiency was widely viewed as an important measure of sustainability in procurement. The preliminary survey also revealed that energy efficiency was accepted as a measure of sustainability within the procurement process.[1] Thus procurement of energy efficient products were also written about and referred to as sustainable procurement.

There was also a more pragmatic rationale to use energy efficiency as a measure of sustainable public procurement and that was to provide stakeholders it was important to provide them with a concrete and relatable dimension of sustainable procurement. In that sense energy efficiency is a widely known and adopted criteria which most public sector companies and government departments are striving to achieve. Another lesson learnt from Phase I was that in many cases inter departmental dynamics within ministries and Public Sector Undertakings prevented them from establishing a logical connection between the energy efficiency practices undertaken by the entity and their procurement processes. In this context it was felt that a stakeholder survey would be an important part of Phase II and would help provide insights into the functioning dynamics of the procurement processes and its role in promoting energy efficiency within the entity's larger goal of environmental sustainability. Phase I also highlighted that the nature and dimensions of the climate change problem globally has pushed public sector entities to rethink their functioning strategies and had pushed energy efficiency high on the internal agenda. In this context, it was felt that receptiveness of the idea of achieving energy efficiency through procurement would be high amongst the stakeholders. Thus it emerged that there was a need to enable SPP in emerging and developing economies especially with a view to achieve a low carbon economy. For all these reasons, in the Phase II of the project, we have approached the issue of sustainability through the lens of energy efficiency.

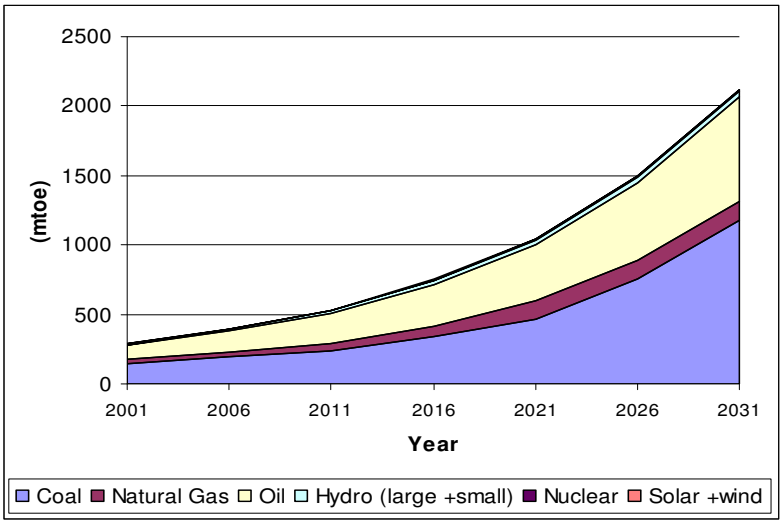
[1] Such practices were seen in UK, Austria, Mexico and many other member states. See Perera et al, State of Play in Sustainable Public Procurement, IISD-TERI, 2007, 6-9.

SPP, Energy Efficiency and a Low Carbon Economy

In Phase I of the study, the research team had reflected on the definition of sustainability. We had highlighted the international lack of consensus both academically and in international policy issues on the definitional aspects of the term "sustainable." This however has not prevented its widespread usage in policy making. In fact the very malleability of the term has enabled it to be applied to a wide variety of circumstances and policy areas. Specifically in the case of international trade discussions, given that government procurement has featured in the negotiations sustainability would be assumed to be referring to principles of non-discrimination and transparency in public procurement. Thus in this case sustainability in terms of energy efficiency represents only one aspect and maybe a lowest common denominator approach to the definition of the term.

Energy Efficiency refers to the reduced use of energy to achieve a given output or services, and thereby a reduced environmental or carbon footprint associated with the activity. In the Indian case, studies done by the Planning Commission (2006) and ongoing studies by TERI suggest that energy efficiency is the key tool for energy security and to move towards a low carbon economy. It also improves industry profitability and competitiveness. TERI's projections (TERI, 2006) indicate that in a business as usual scenario, where growth rates are assumed to remain at around 8 percent, India's commercial energy consumption to 2031 will rise steeply.

Figure 1.1 Commercial energy consumption in a BAU scenario



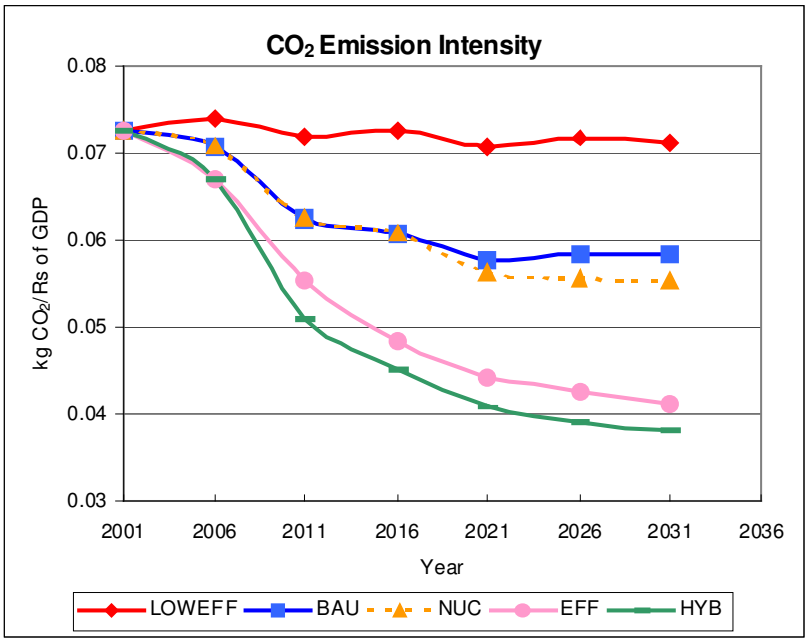
Source: PSA/2006/3, National Energy Map for India, Technology; Vision 2030, Office of the Principal Scientific Adviser to the Government of India, TERI

The National Energy Map prepared by TERI in 2006 for the Government of India , provides various scenarios (See Box 1) which India's energy path could take to 2036, and is given in figure 1.2 . It is evident that after the hybrid scenario (where energy efficiency initiatives are coupled with renewable energy options), the next best path to a low carbon economy is the energy efficiency path.

Box .1: Brief Description of Major Scenarios

1. **Business-As-Usual (BAU):** This scenario assumes 8 percent GDP growth rate over the entire modelling period with unrestricted availability of imported coal or oil.
2. **Low-growth (LG):** This scenario assumes a lower GDP growth rate of 6.7 percent and accordingly, energy demands are not expected to increase as rapidly as in the BAU.
3. **High-growth (HG):** This scenario assumes a GDP growth rate of 10 percent. Higher economic growth is expected to be achieved with a higher growth of the industry and services sectors as compared to the BAU.
4. **High-efficiency (EFF):** GDP is assumed to grow at 8 percent but incorporates efficiencies improvements across supply and demand side options.
5. **High nuclear capacity (NUC):** An aggressive pursuit of nuclear-based power generation is considered; the capacity increasing to 40 GW by 2021 and 70 GW by 2031 driven by the assumption that the country is able to import nuclear fuel (enriched uranium). All other assumptions are similar to those in the BAU scenario.
6. **Aggressive renewable energy (REN):** This scenario assumes a high penetration of renewable energy forms as shown below. All other assumptions are similar to those in the BAU scenario.
7. **Hybrid (HYB) scenario:** This scenario is a combination of the BAU, High-efficiency, aggressive renewable energy and high nuclear-capacity scenarios
8. **High growth hybrid scenario (HHYB):** This scenario represents the most optimistic scenario and couples high economic growth with rapid technological progress. It combines the high GDP growth (10 percent) scenario with the high efficiency, high nuclear capacity and aggressive renewables scenario.

Figure 1.2: Possible Energy Paths and CO2 emission intensity



Source: TERI / Ministry of Environment and Forests 2006,Energy-Economic-Environemtn Modelling to support climate change assessment and policy making in India. Report No. 2004EM22

The more detailed sectoral assessment suggests that the best potential to reduce carbon emissions through energy efficiency are found in the following sectors: transport, residential & commercial sectors, and in industrial and end use efficiency.

A brief highlight of the energy savings potential in the buildings sector which may be of relevance to this study is given in the table below.

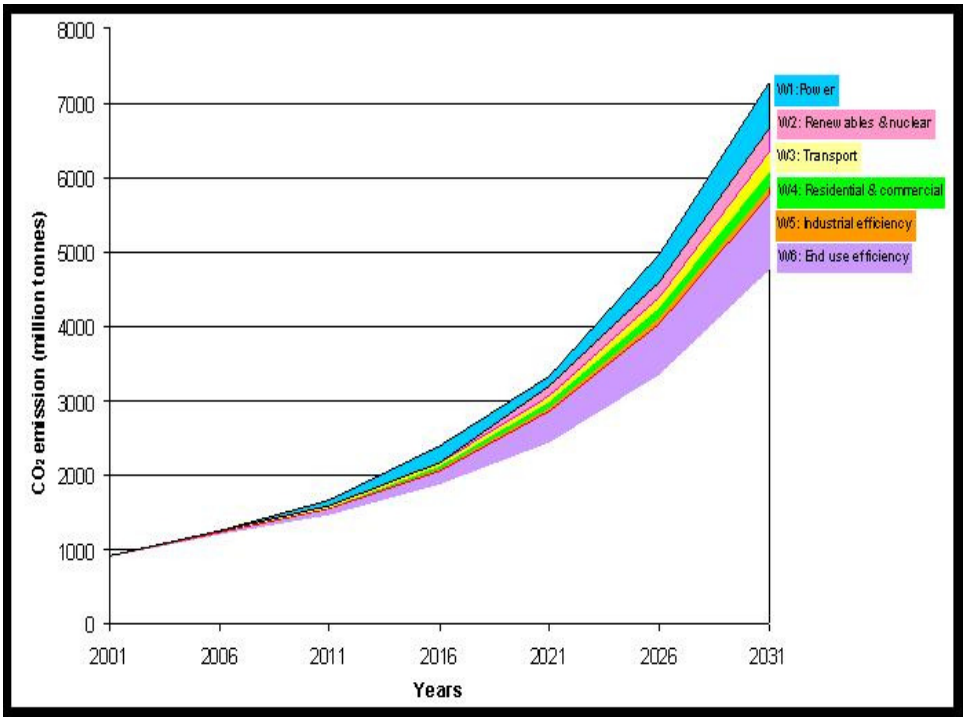
Table 1.1 : **Energy efficient measures and associated energy saving potential for a new residential and commercial building in India**

Residential building	
Measure	Savings potential
Proper orientation, fenestration and shading, roof and wall insulation (wall insulation for air conditioned buildings only)	15%
Energy efficient lighting for internal application	5%
Solar water heating system	10%
Commercial building	
Measure	Savings potential
Proper orientation, fenestration and shading, Roof and wall insulation (wall insulation for air conditioned buildings only), efficient glazing system	10%
Energy efficient lighting for internal application	15%
Efficient space conditioning system	15%

Source – TERI Compilation, 2007

The figure below summarises opportunities to reduce carbon dioxide emissions from 7209 to 4715 million tonnes by 2031. Of this decrease, a large proportion (2/3) is due to improved energy efficiency in the above sectors. (TERI Analysis, 2007)

Figure 1.3: CO2 Emission reduction potential in India by sectors (2001-2031)



Source: TERI 2007 Analysis

It is important, therefore, that any SPP initiative targets those sectors when the potential to move to a low carbon economy is highest. In this study, the choice of companies to consult with, sought to reflect this need.

Actual reductions in energy use however, can be far smaller than those projected by top down models and this can be due to many factors _ including market failures, high discounting of future energy prices, insufficient information, poor decision making abilities of consumers, rational risk aversion to situations of future uncertainty and the difference between a technically optimum choice and an economically efficient choice. [2] This issue has been discussed in the literature[3] and we believe are relevant to understanding SPP choices that seek to reflect energy efficiency as a measure of sustainability.

To assess how SPP choices are actually made related to energy efficient products, it is thus important to understand the larger context within which energy efficiency choices are made in the country, which requires us to examine the institutional environment within which these are undertaken in particular with respect to (i) market and technical assessments (ii) financing and (iii) incentives with regard to relative gains and costs of transactions involved.[4]

Efforts at promoting energy efficiency in India go back to the mid 1970s when efforts were initiated with a view to conserve oil. This was followed by the energy audits through National Productivity Council, TERI and other organizations in the 1980s. Institutional support in the form of financing was introduced in 1987 by way of IREDA and extended to energy efficiency in 2001. The real impetus, however, has come with the Energy Conservation Act of 2001, which has created both a regulatory and an enabling environment for greater efforts at energy conservation. In 2003, the Bureau of Energy Efficiency was set up to systematically address the barriers to energy efficiency and to create the right environment to promote this strategy in the country. The bureau has been working towards promoting energy efficiency in various sectors and sections of the economy.

[2] TERI, 2007. Building An Energy Secure Future for India. [TERI Report 2006RS22], Chapter 1.
[3] Koopmans and te Velde. 2001. Bridging the energy efficiency gap: using bottom-up information in a top-down energy demand model. Energy Economics 23 (2001). pp 57-75.
[4] Taylor Robert P. et al (2008) Financing Energy Efficiency: Lessons from Brazil, China, India and Beyond The International Bank for Reconstruction and Development, Washington, p 68

Terms of reference

As per the Terms of Reference of the project the following tasks were required to be undertaken:

1. Desk Research and individual consultations with SPP stakeholders aiming at

    - Gaining insight into typical practices and processes through which procurement is organized and executed
    - Introducing SPP and discuss its feasibility in the Indian context
    - Assessing awareness, interests and concerns related to SPP
    - Investigating ongoing proposed public sector reforms that would impact procurement

2. Develop a case study on the potential use of ECBC (Energy Conservation Building Code) and its impact on energy efficiency

3. Develop an SPP India fact sheet for India, to be posted on Teri and IISD websites

4. Second round of research and consultations/ presentations with SPP stakeholders to

    - Present SPP India fact sheet
    - Discuss potential opportunities and hurdles for early start up initiatives to demonstrate SPP theory in practice
    - Assess the interest in attending TERI/ IISD multi sector forum on SPP in India
    - Design, plan and hold an India stakeholder forum to establish with early stakeholder buy in, the most promising way forward to enable preliminary SPP efforts in India

This report is ***not*** a full project report and covers only the first, second (only partly) and third terms of reference as mentioned above due to the fact that project has been asked to be terminated mid-way. The activities undertaken and the analysis made based on the findings in the first six months have been discussed in the report.

Methodology and approach

The project in Phase II adopted a multidisciplinary approach to the research problem. It examined the legal, institutional and political dynamics of public procurement in India and the implications for internalising energy efficiency criteria in the current procurement regime. With this objective, it attempted to balance policy analysis with an Indian industry centred case study, with each informing the other part of the study. The project activities were divided into two sub phases, these phases get comprised with Phase A and B. The first one involved background research and consultations with companies and key government departments to discuss their procurement process and gauge the level of sustainability therein. In Phase B we intended at extending our network of stakeholders for consultation, sharing, validating and discussing with them preliminary findings. The project was designed to conclude with a multi stakeholder forum to establish the most promising way forward to enable SPP efforts in India. This report is based on the findings from only the first of the sub phases mentioned above.

The project used the lens of the New Institutional Economics (NIE) perspective to examine SPP in India. The public procurement process needs to design a set of objective rules for awarding a contract that minimize transactions costs but are not easily subject to manipulation. Most contracts are variants of either, the simple fixed price or the costs plus contract. The fixed price contracts provide the strongest incentive for cost reduction but the cost of renegotiating such contracts is high. The theory of procurement suggests that regulatory environment is reflected in the design of the contract. Since there is asymmetric information in procurement deals both of the moral hazard and the adverse selection type, deals have to ensure that quality and effort are not compromised. The problem is compounded by the fact that in procurement, the principal and the agent coincide and makes it difficult to ensure a non-verifiable dimension such as quality. If the government is the only buyer then there may arise another problem termed as the 'hold up problem' by Williamson (1985). In this case, a supplier face the problem that if they invest their own funds in the design of the product, they may not be able to recover their investment if the government takes advantage of their asset specificity and drives a hard bargain later. Part of the problem also arises then due to the long-term nature of the relationship between the supplier and the buyer and the design of a contract in the long run.

There are two approaches as far as public purchasing in sustainable goods are concerned: the top down and the bottoms up approach. Some countries like Switzerland follow the latter while most countries follow the former along with desk research; the project adopted a multi stakeholder approach in order to assess awareness, interests and concerns related to SPP.

A number of studies have focused on corporate efforts to implement environmentally conscious manufacturing practices as part of the broader strategies to improve business performance and environmental outcomes. Porter (1991) contends that impetus to innovate comes from the regulatory pressure as firms respond environmental regulation by introducing innovations that improve environmental outcomes. This is borne out by studies such as Porter and van der Linde (1995a, 1995b). Another group of studies (Gerorg, Ropke and Jorgenson 1992,) note the relevance of organization factors to the adoption of environmental innovations including recycling, pollution prevention, and green product design. Some other studies link the adoption of environmental practices to innovations in supply chain management (Geffen and Rothenberg 2000, Hall 2000). Therefore, more than a top down approach of a command and control nature of a binding regulation, internalisation of sustainability practices within an organization's functioning has a key role in determining the level of energy efficiency that can be integrated with the public procurement process.

Multi- Stakeholder approach

With this rationale, the approach of this project was to link policy research with a multi-stakeholder approach. It was decided to link with government agencies such as BEE (Bureau of Energy Efficiency) and select public and private companies to assess scope and implications of internalising sustainability criteria in their procurement practices or see how can the procurement process be carried out in a manner that contributes to energy efficiency.

As a part of phase I of consultations, representatives from materials/ stores department, environment, health and safety, corporate social responsibility and TERI- Business Council for Sustainable Development nodal persons were contacted through phone and email to apprise them the project, its objective, scope etc. This was followed by personal meetings with the concerned representatives of the organization where procurement processes, environmental policies and sustainability within their

procurement process and the issues and perceptions with respect to the same were discussed. However, the discussion varied depending upon the nature and scope of the organizations, departments etc. The key stakeholders can be categorized as follows:

- Procurers
- Regulatory Agencies
- Capacity builders
- Financiers
- Suppliers

For a complete list, and a brief profile of the stakeholders, please see Annex I and II

Procurers

The primary group of stakeholders are procuring agencies or the public sector buyers. However, procurers from private sector companies were also identified to consult so as to gain a better insight into the sustainable procurement practices and evaluate the difference in approaches of the public and private sectors. Following is a brief description of the PSUs and private companies selected for our first round of consultations into the first six months of the project.

Public sector companies

Since the focus area of this project was energy efficiency in public procurement, it was natural that companies with substantial energy consumption and expenditure were identified as stakeholders for consultation in the process. However, a conscious effort was made to keep the group as broad based as possible but linked to those sectors where the TERI energy study suggested had greatest potential for energy reduction and therefore carbon dioxide emissions saving could be obtained. (See Figure 2) Since these sectors are transport, residential & commercial sectors, and industrial and end use efficiency, the public sector undertakings consulted were leading companies from the key sectors such as large manufacturing companies, transport, service sectors, energy resources and other energy intensive companies, and the government department with the largest procurement. So the following were consulted with:

Indian Oil Corporation (IOCL), Ministry of Railways, Bharat Heavy Electrical Limited (BHEL), National Thermal Power

Corporation (NTPC), Air India, National Highway Authority India (NHAI), Container Corporation of India (ConCor).

Beside these, Steel Authority of India (SAIL), Housing and Urban Development Corporation (HUDCO) and Gas Authority of India Limited (GAIL) were contacted and apprised about the project. However, due to closing of the project mid-way, a detailed consultation with them could not take place.

Private companies

Although public procurement relates to procurement by government, its departments, companies and subsidiaries only, the project intended to engage with some private companies as well. Private companies such as Andhra Pradesh Paper Mills Limited (APPM), Indian Fertilizer Cooperative (IFFCO), which had a well-designed and established procurement process, had shown leadership in incorporating energy efficiency practices and processes within their procurement chain and have generally been the pioneers of sustainable business practices in India were consulted. In the later six months of the project, consulting private and multinational companies like General Electric Company (GE) and Shell were planned to be consulted. This would have helped us to understand and compare practices of private and public companies, national and international, in the same sector and industry and analyse what are the drivers and barriers for SPP in each of the two kinds of companies.

Regulatory Agencies

We had identified the Bureau of Energy Efficiency (BEE) and the Director General of Supplies and Disposals as our primary government stakeholders to be contacted. Since the focus of this project has been on energy efficiency, Bureau of Energy Efficiency was the natural choice for our key stakeholder from the government. It is located under the Ministry of Power and is the nodal regulating agency for institutionalising and providing leadership on energy efficiency.

During the first six months of the project, we had sought to engage with the BEE at three levels – first, to introduce and apprise them about the project; second, to discuss the feasibility and issues involved in internalising energy efficiency within the public procurement process; and third, to examine the status and uptake of Energy Conservation Building Code and issues involved therein.

It was planned that in the next six months the team would hold consultations with the DGSD and BEE. The rationale for deferring the DGSD involvement for the second half of the project year was that it is an office formulating policies and procedures pertaining to public procurement and there is merit in engaging with them at a stage when the activities scheduled for first six months have been completed and a possible role for the DGSD has been identified and discussed with the procuring agencies and the BEE. The interactions with BEE in the later six months were expected to be with respect to understanding what it takes to adopt energy efficiency as a measure within the procurement system and the possible ways forward.

Capacity Builders

During our consultations the issue of capacity of procuring officials emerged prominently. It was learnt that often, procuring mangers, supply chain managers, or even project managers and technical personnel were imparted training on procurement related aspects, either in-house or by specialised institutes outside. It was realised that there was need to consult with the trainers who are preparing the management to face the challenges of efficient procurement and see how prepared is the industry to learn about sustainable public procurement. Therefore, we consulted organizers of training programmes and capacity building for supply chain management and green procurement for officials from private companies, public sector undertakings, government departments and ministries. These were the Indian Institute of Materials and Management (IIMM), Administrative Staff College of India (ASCI) and SP Jain institute of Management (SPJIM).

Financiers

Energy efficient business is particularly dependent on prevailing local economic institutions because of strong requirements in specialization, efficient packaging and financial intermediation.[5] Typically unless enterprises use their own funds, most purchases/ investments involve some form of financial intermediation. However, for energy efficiency to be incorporated as a criterion for financing at the stage of procurement, there will have to be extensive interaction of financing institutions as well as technical experts with the procurers and suppliers / service providers and this entails higher transaction costs which may have to be borne by the financing agencies as part of their overall

[5] Taylor et al (2008) 51pp

responsibility to "create" markets for energy efficiency investment. [6] After completion of the first round of stakeholder consultations with the procurers and regulatory agencies, it was hoped that consultations with some financing institutions [State Bank of India (SBI), Industrial Development Bank of India (IDBI) and Yes Bank] also would help the project gain insight into the role of financing in promoting energy efficient procurement choices.

Suppliers

It emerged from our early stakeholder consultations that SPP practices are dependent on various factors including supply choices. Therefore, we felt the need to engage with some suppliers as well in order to understand how, if at all the demand for energy efficient products during procurement, gets reflected in their manufacturing process. Although, we had scheduled such a consultation for a later date, we discussed with three of our stakeholders from procuring agencies *viz.,* BHEL, ConCor, and NTPC, their role as suppliers in a SPP chain.

For the ECBC case study, it was noted that most of the Public sector entities do not carry out construction activities (buildings) themselves, but sub contract this work to outside agencies. However, with respect to its level of uptake and possiblity of using as a tool for SPP, during our initial consultations we were informed that few companies have indeed shown interest and commitment towards adopting ECBC in their new buildings. Therefore, besides interviews with experts in BEE, Ministry of Environment and Forest, Green Rating for Integrated Habitat Assessment (GRIHA), Leadership in Energy and Environmental Design (LEED), represenstatives from PSUs like Oil and Natural Gas Corporation (ONGC) , Oil Industry Development Board (OIDB), NBCC, Delhi Metro Rail Corporation (DMRC), National Thermal Power Corporation (NTPC), Housing and Urnban Development Corporation (HUDCO), Central Public Worksd Department (CPWD), MMTC, Steel Authority of India (SAIL) and Engineers India Limited (EIL) were identified for interview.

Structure of the report

Findings from the research and consultations within the first six months of the project have been discussed in this report as per the following scheme of chapters:

[6] Taylor et al (2008)

- Chapter II – legislative and policy framework governing public procurement in India; procurement process – structures and functioning at company level
- Chapter III – stakeholder findings with respect to criteria for procurement; awareness, approach towards sustainability; influences on SPP
- Chapter IV – Ongoing public reforms process having a bearing upon public procurement; establishing linkages with SPP
- Chapter V – Concluding remarks

Chapter II: Public Procurement in India

This chapter discusses the current policy and institutional framework that exists with regard to public procurement in India. In the second part of this section, the focus is on delineating the procurement process in terms of its structures and functioning mechanisms within the companies and departments. Thereafter the chapter conceptualises public procurement choices in the theory of asset specificity. This section also includes a discussion on the new developments that have taken place within this context and its implications for incorporating energy efficiency standards as the basis for public procurement.

Practices and Processes for procurement in India

This section would be focusing on the overall institutional arrangement and practices and processes, the institutions and the legislative and policy framework governing public procurement in India.

Institutions

Ministry of Finance

Ministry of Finance is the nodal agency for financial management, which includes procurement of goods and services for use of various wings of the government. As per the General Finance Rules of 2005, it establishes general rules and procedures for procurement and contract management. Further to these rules, and in order to make the procurement processes 'in tune with the imperatives of a growing and liberalised economy', a manual on policies and procedures for purchase of goods was developed in 2006.[7] It lays down certain generic guiding principles, which are to be adopted by the procuring agencies.

[7] Manual of policies and procedures for purchase of Goods, Ministry of Finance. URL http://finmin.nic.in/the_ministry/dept_expenditure/index.html accessed on 15th June 2008

Directorate General of Supplies and Disposals, Ministry of Commerce

In the central government, it is the Directorate General of Supplies and Disposal (DGS&D) under the Ministry of Commerce and the public works department (PWD) of the respective states serves as the nodal agencies in terms of the quantum of procurement that they are involved in and in terms of laying down the purchase policy and procedure.[8]

It looks after public procurement work through the Indian Supply Service. It has commodity-wise purchase directorates including information technology, electrical sores, mechanical engineering, automobiles, steel & cement, hardware, workshop & machine tools, paper & paper products, oil & chemicals. The DGSD operates at two levels. First, it is enjoined with the function of entering into rate contracts for items which are commonly used by the Central Government departments, State Government /Quasi public bodies, statutory corporations and government undertakings. Second, it also formulates policies and procedures with respect to procurement. It periodically enacts rules and guidelines addressing specific issues in the procurement chain to be followed by individual departments and ministries.

The DGSD guidelines or rules are largely limited to specifying certain principles of financial propriety. Thus other ministries and government departments are given operational freedom to formulate rules and procedures relating to the nature of procurement that they undertake. Thus individual ministries like Health and Family Welfare, Environment, Railways, etc have individual procurement agencies that have developed detailed rules and procedures of procurement although largely in conformity with the general principles specified in the GFR and those brought out by the DGSD and PWD at regular intervals. These agencies also undertake procurement in several World Bank and ADB (Asian Development Bank) aided projects within specific central scheme areas like, national aids control, national/state highways, hydrology projects, etc. these agencies also provide their services to public sector undertakings and autonomous bodies. These exists a fully functional quality assurance department that provides a range of technical services viz. formulation of need based procurement specifications, vendor development, conformity evaluations of goods meeting the supply criteria. These services are made available at mutually

[8] See for general overview http://dgsnd.gov.in/about.htm accessed 12 June, 2008

agreed service usually ranging from 0.25 to 2% to the PSUs and other autonomous bodies. It also provides third party inspection service for civil indentors.

Central Vigilance Commission

The CVC was set up as an apex vigilance institution by the Central government in 1964 to oversee functioning of government personnel in terms of ensuring a corruption free public service standards. In 1998, it was granted statutory status through Ordinance No. 15. The parliament passed the Central Vigilance Commission Act in 2003, thereby nominating the CVC as the "designated authority" to receive complaints on any allegation of corruption or misuse of office and recommend appropriate action.[9] These oversight powers have enabled the CVC to emerge as one of the most stringent and widely adhered to statutory agencies.

The Central Vigilance Commission, a statutory body, lays down guidelines on Tenders, Procurement of Works, Goods and Services applicable to all the government Ministries/ Departments/ Public sector undertakings/ Banks/ Insurance Companies/ Societies. These guidelines cover a whole range of issues including Transparency, tendering process, negotiations with L-1, examination of public procurement contracts by CVOs, notice inviting tenders, receipt and opening of tenders, e-procurement/reverse auction, pre-qualification criteria etc. [10]

Comment on the overall institutional arrangement

Despite the almost overarching reach of the DGSD and PWDs, public procurement in India is fairly decentralized in effect. Each state and every Public Sector Unit will have their own procurement agencies. Agencies like the DGSD, Kendriya Bhandar[11] and NCCF (National Cooperative Consumers Federation)[12] function essentially as supportive structures to enable the public organizations functioning at a smaller scale

[9] See for detailed information, http://cvc.nic.in/cvc_back.htm accessed, 12 June 2008.
[10] http://www.cvc.nic.in/proc_works.htm
[11] A multi state consumer cooperative society functioning under the Ministry of Personnel, Public Grievances & Pensions, Government of India. See for detailed information http://kendriyabhandar.in/kendriyabhandar/index.htm accessed 12 February 2008.
[12] See for detailed information http://nccf-india.com/Resources/Idx_Organisation.htm accessed 12 February 2008.

comply with the procurement process. The essential mechanism of support is through the implementation and benefits accruing from the **Rate Contract System** (RCA). Under the RCA the procurement agency enters into contractual relationship with pre-approved suppliers for provision of goods at pre-determined rates over a period of time. This is similar and functionally equivalent to the Framework Agreement that is prevalent in Europe and the USA. One of the major drawbacks of such a decentralized set up has been that it has been impossible to develop a centralized database of the nature and scope of procurement carried out both at the central and state level. The lack of a tracking service has made it difficult to respond to the functioning gaps within the current procurement set up and identify mechanisms to respond to such gaps. It also makes a harmonized policy formulation in incorporating energy efficiency standards in procurement difficult.

Box 2.1 Energy Conservation Act

The Energy Conservation Act 2001 was enacted by India with the objective of setting a coordinating mechanism, which could oversee India's transition to a more energy efficient and sustainable future. The primary aim was to launch a host of measures targeted in the medium and long term towards incentivising the adoption of energy efficiency measures at the industrial and household level. For this purpose the, Bureau of Energy Efficiency (BEE) was set up as a statutory body under the Ministry of Power. The BEE is empowered to perform a range of functions that spans the value chain from the adoption of policies for mandating energy efficiency to the setting up of analogous services like energy auditing, setting up of standards, labeling, etc. Section 13 of the Act provides for a range of recommendatory powers to the BEE. This includes the power to recommend, energy consumption standards, labeling norms, formation of classes of energy consumers, etc to be legislated by the central government. Amongst the various other provisions Section 14(c) states that the central government in consultation with the BEE, could *prohibit manufacture or sale or purchase or import of equipment or appliance specified under clause (b) unless such equipment or appliances conforms to energy consumption standards*

This provides a clear basis for the BEE to undertake policy measures targeting public procurement of energy efficient products.

Interestingly the DGSD website contains a listing of "contributions to the national interest." This section lists a number of sectors like transport, drinking water supply, public utilities, health, etc wherein the DGSD has overseen procurement within the projects implemented in this sector. Under this the DGSD also lists a separate category called "energy conservation" which includes the following listing; room air conditioners,

evaporative air coolers, ballasts (electromagnetic and electronic), laminates electoral light fittings and also disaster management.[13] These presumably allude to sectors and category of equipments in which the DGSD has consciously followed an energy savings/conservation path in terms of prioritizing the more energy efficient alternative in these sectors. This also reflects that the DGSD is not completely unaware of achieving energy efficiency being one of the objectives of the procurement process itself. This is not surprising given that in the latter half of last year the government of India has taken several preliminary steps to work towards a plan for procuring energy efficient products across several sectors.[14] The Bureau for Energy efficiency is responsible for institutionalising energy efficiency in Indian policy making. It was set up under the Energy Conservation Act of 2001. (See box 2.1)

Rules & guidelines

The foundational legal basis can be found in the constitutional provision of Article 299 that forms the basis of all contractual agreements between the Government of India and any other party. It provides for legally binding contracts to be entered into by the President or the Governor on behalf of the Government of India. The other legislations providing for the basic legal structure for entering into legal contracts in India is provided for under the Indian Contract Act 1872 and the Sale of Goods Act 1930. In the specific case of procurement, however, there are two primary legal instruments, which guides public procurement in India. These include the General Financial Rules that guides the major quantum of all public procurement; the Central Vigilance Commission (CVC) guidelines form the other half of the regulatory paradigm that influences the procurement process in India.

General Finance Rules 2005

The General Financial Rules 2005 (GFRs) is the primary framework on the basis of which all public procurement is undertaken within all the offices of the Government of India. The GFR includes general principles governing financial matters in all government transactions including procurement of goods and

[13] See *Supra Note* 10.
[14] See http://www.thehindubusinessline.com/2007/07/10/stories/2007071052241000.htm accessed 12 February 2008.

services.[15] The GFR was issued in 1947 in the form of executive instructions. They were consolidated in 1963 and thereafter have undergone periodic amendments. The 2005 Rules are a result of a wide range of consultations with government departments and an extensive review process. In the preface to the Rules, it has been, it has been stated as follows:

It is expected that General Financial Rules, 2005 will provide greater flexibility to officers in transacting government business while ensuring accountability commensurate with responsibility at different levels of Government[16]

This underlines the essential objective of the review exercise was that to provide for more operational freedom to procurement officers and managers in government departments, ministries and PSUs. Since the procurement process is largely driven by these procurement officers it is critical that they are allowed some amount of leeway in designing the operations in a manner that responds to new developments and choose alternatives which address the long term sustainability goals of the organization. It is also important to note that the review exercise carried out prior to the amendment of the GFR included consultations with a wide number of government ministries and departments. And therefore it is the latter from which that the demand for flexibility would have arisen within the government.

Chapter 6 of the GFR contains the rules relating to the procurement of goods and services required for the *use in public service*. Rule 135 states that this chapter functions as a general guideline and detailed instructions for the procurement could be issued by the relevant ministries/departments *broadly* in conformity with the GFR. The term "broadly" also denotes certain amount of flexibility provided to the procurement managers in customizing their procurement according to their own circumstances. Thus the test for conformity is not very stringent and allows for structural differences in the procurement processes, as long as the fundamental principles outlined in the GFR are followed.

Rule 137 outlines the fundamental principles of public buying. It states that, every authority, which is engaged in public buying, will undertake procurement in an efficient, economical and

[15] General Financial Rules 2005, Government of India, Ministry of Finance, Department of Expenditure.
[16] Preface to the General Financial Rules 2005

transparent manner. They also have the responsibility of ensuring fair and equitable treatment of suppliers and promoting competition in public procurement.

Rule 144 explicitly provides for inclusion of social sustainability aims into the procurement process. This is in conformity with the larger social goal of the government to support the labour intensive handloom sector across India. As per the rule, all items of handspun and hand woven textiles would be purchased exclusively from the Khadi and Village Industries Commission (KVIC).[17] Further the Central Government also provides for the reservation of certain items to be purchased exclusively from the registered Small Scale Industrial Units. The last instance also illustrates the use of public procurement in supporting plans and projects in fulfillment of the aim of social sustainability across the country.

The GFR also includes for a policy of price preference. This is largely designed to provide for preferential treatment of domestic industries on the basis high inputs costs, interest rates, etc. The price preference can go upto 15% of the preference allowed for domestic bidders. The policy however comes with a number of caveats that reflect the concern with preventing its misuse and unjustified profiteering. The essential rationale for such a policy is to enable targeted growth of certain sectors of domestic industry. There is also a purchase preference policy, which is followed in the case of public sector undertakings bidding for public contracts. However sectors such as power are exempted from such a policy.

Rule 160 is the most pertinent section in the context of energy efficiency. It reiterates the fundamental principles of, transparency, competitiveness and fairness in all government purchases. It also states that procurement should also be carried out "to secure the best value for money." This in essence indicates a clear shift away from the "least price/cost" principle, which had been provided for in the earlier versions of the GFR. Best value for money also means that life cycle cost of goods could be taken into account while choosing between two alternative goods. Thus

[17] The Khadi and Village Industries Commission (KVIC) is a statutory body established by an Act of Parliament (No. 61 of 1956, as amended by act no. 12 of 1987 and Act No.10 of 2006. organization and implementation of programs for the development of Khadi and other village industries in the rural areas in coordination with other agencies engaged in rural development wherever necessary. See http://www.kvic.org.in/V4/OVERVIEW.ASP accessed, 12 June 2008.

by providing for a standard of "best value for money" the GFR ensures flexibility to procurers to implement life cycle analysis costing for of goods in terms of their energy efficiency. However despite the textual flexibility incorporated in the GFR, there are certain inherent problems that may need to be addressed if the energy efficiency criterion has to be incorporated within public procurement. For instance Rule 160(vii) that deals with specifications requires that, they be stated in a clear and unambiguous manner. The specification should also be broadly stated so as to attract a wider number of parties and propounds the use of "standard specifications, which are widely known to the industry" to ensure so.[18] In the context of energy efficiency this may be a problem, since the energy efficiency standards and measurements for only a limited number of goods are well defined. Thus the lack of standards for energy efficiency for specific goods may itself be an impediment to the adoption of such standards, given that the GFR supports the provision of widely used industry standards while formulating specifications for the procurement of goods.

The GFR has been drafted as "financial rules" and not legal provisions and therefore is denied the statutory effect of a legal provision. The Controller and Auditor General's Office (CAG) is responsible for the implementation of the rules. However since the CAG is primarily an ex post regulator – and that also only in the case of fraud, malpractice or impropriety, therefore there is extremely limited regulatory oversight available over the implementation and full application of the rules by public procurement agencies. This also creates certain leakages within the system. The CVC guidelines on the hand can be compared to the GFR Rules in terms of their status and statutory effect. However given that it is the CVC which implements these guidelines provides an important advantage to them. The CVC is one of the strongest statutory bodies that oversee the functioning of government ministries and departments and therefore the fear of punitive sanctions are adequate to create a negative incentive for procurement officers to follow the guidelines issued by periodically.

[18] Also See Use of Product with Standard Specification, Circular No. 14/04/07 Central Vigilance Commission, http://www.cvc.nic.in/098VGL25.pdf accessed, 12 June 2008.

Central Vigilance Commission guidelines

Public procurement being a governmental activity falls into the ambit of issues that is included within the CVC oversight authority. The CVC has brought into force a series of guidelines on procurement of goods, works and services.[19] Some of those pertinent to energy efficiency will be discussed below. Section 8.1(c) of the Act, includes public sector undertakings within the ambit of CVC's jurisdiction to undertake an inquiry into the actions of the officers therein.

The CVC guidelines provide for several steps in enabling transparency within the public procurement process. These include, mandatory public announcement of tenders through print media and the concerned departmental/ministry website, bar of post facto alteration or amendment of qualifying requirements, sufficient time given to bidders in the upfront, clarifications to be issued to all bidders in a uniform manner. It also states that in multilateral funding (like World Bank and ADB in most cases), attendant-bidding conditions that are prescribed in the tender should be followed. It has also been specified that in order to avoid delays, a time for each stage of the procurement process should be specified in the outset, delineate the responsibility of different officials and agencies concerned with the procurement process., conclude contracts within the original validity of tenders, limit the extension of validity of tenders to those in case of exceptional circumstances and lastly to extend the rate contract system to larger number of common user items, that are required in the bulk.

Around mid last year, the CVC came across several cases of irregularity regarding the requisition of items of non-standard size. Reacting to this development, it brought a circular stating that, "items with standard specifications only should be stipulated in bid documents." It further provided for an obligation of providing a reason for procuring of non-standard specification items.[20] In another case the CVC enacted a circular censuring the award of contracts on the basis of nominations. The primary objective was to ensure transparency in the award of contracts in public sector undertakings.[21] This illustrates the nature and scope of oversight that the CVC provides especially in the case of PSUs. There have also been other instances of specific

[19] See for detailed list, http://www.cvc.nic.in/proc_works.htm accessed, 12 June 2008.
[20] *Supra Note 4.*
[21] http://www.cvc.nic.in/005crd19.pdf accessed on 12 June 2008.

references and circulars targeted towards the functioning of public sector undertakings. One instance of such has been the circular, wherein the CVC advised the PSUs to amend their CDA Rules to enable the imposition of penalty on public sector employees post-retirement.[22] All these steps taken by the CVC illustrates the degree and stringency of the oversight that it maintains over the procurement process and especially the procedure in the PSUs.

The basic objective of the regulatory oversight of the CVC over the procurement processes in PSUs has been to ensure transparency, efficiency and financial economy in the conduct of procurement processes. This prima facie does not appear to be contrary to the objectives of the GFR. Nevertheless given the quality of oversight that the CVC maintains as compared to the CAG with reference to the GFR, it is not surprising that in effect the CVC guidelines might dilute the flexibility provided for within the GFR with respect to achieving "best value for money". The entire drive of the CVC though laudatory at macro level, has had a freezing effect on procurement managers/officers within PSUs, government ministries and departments. Given the presumption of irregularity that has come to be associated with not conforming to well laid down standards and procedures, there is a real fear of attracting censure from the CVC in case of adopting new procedures and standards like the adoption energy efficiency standards in the procurement of goods.

Thus the only exceptions to stringency in procurement standards and procedures seem to be project specific procurement which is undertaken periodically by procurement officers whenever there is are goods to be purchased which are customized or required for a specific project. In such cases, the procurement officers have considerable leeway on designing procurement processes that address specific objectives like energy efficiency. However the above discussion illustrates the difficulty in incorporating energy efficiency standards within the public procurement process, as this would have to be address several structural problems viz. having a sufficient reasonable basis for using such a standard, the knowledge of and the ability to respond to such specifications by the suppliers, availability and accessibility of clearly laid down standards and procedures for calculating energy efficiency and of course most importantly the availability of such alternatives in the market. All these factors could become insurmountable

[22] Circular No. 007/VGL/074, dated 44/12/07, Central Vigilance Commission.

hurdles in design of procurement of goods that have better energy efficiency.

Nevertheless it is important to remember that the purpose of revision of the GFR rules was to enable greater flexibility to procurement managers to design processes and set up standards while formulating specifications in a manner, which would respond to present circumstances and newer developments. In essence a procurement manager should be in a position to exercise choice in responding to development of energy efficient goods that are available in the market. The principle of "best value for money" provides him the policy support to makes such a choice. However if he is to make the choice he should also be protected from censure from the CVC, acting only on the basis of the fact that the choice of a more energy efficiency product represents a departure from the business as usual processes underlying the public procurement business. In that sense, the CVC would therefore have to be sensitive to the demands of the procurement process and also ensure that its guidelines do not serve as an impediment to genuine cases of customization of the specifications in order to take into consideration energy efficiency criteria.

Ultimately the lack of a single procurement authority has been one of the major hurdles in enabling the rationalization of the procurement process. As has been seen above, the GFR are in the nature of general guidelines and provides overall principles, which should guide the design and implementation of the procurement process. This has resulted in the modification of the procurement processes in myriad ways by individual government departments and public sector undertakings. This is not necessary a regression, since the procuring entities are sufficiently different to warrant minor modifications that reflect their specific concerns. However to enable the incorporation of a specific concerns like energy efficiency while designing specifications, this lack of direction and oversight makes it difficult to harmonize the procedural aspects f procurement in a manner to provide for specific policy direction. Given that the authority overseeing the implementation of the GFR is the Controller and Auditor General's office, whose oversight is triggered only in an ex post situation of findings of grave irregularities or misappropriation, there is lack of mandate to provide for policy direction in the ex ante. Thus the CAG's oversight function is limited to that of ensuring financial propriety. Further the CVC also functions primarily as an anti-graft agency, and although it does provide for policy directions on

procurement at regular intervals, these are largely limited to introducing procedural instructions in order to facilitate more transparent functioning of the procurement authorities. Thus the CVC also lacks the mandate necessary to provide for a specific policy guideline in enabling procurement managers sufficient flexibility to incorporate energy efficiency as a variable in developing specifications. Nevertheless on the other hand, the stringent guidelines issued by the CVC have had a negative impact on the managers in terms of freezing the potential to explore the flexibility provided for within the GFR.

Although the GFR and the CVC perform two separate functions, they together guide the procurement process. While the GFR focuses on institutional and procedural aspects of the procurement process, the CVC's influence is largely by way of monitoring and evaluation oversight of the procurement process itself. In this sense, the latter functions as an agency censuring the actions of government departments and ministries.

Delegation of Powers Rules 1978

Other than the General Financial Rules, government authorities have to comply with the Delegation of Financial Power Rules also in dealing with all the financial matters, including procurement. The rules are statutory in nature and powers have been delegated to the subordinate authorities, namely, departments of the Central Government, administrators of Union Territories, heads of Departments and heads of Offices.

The Ministries / Departments have been delegated powers to make their own arrangements for procurement of goods under the Delegation of Financial Power Rules, which have to be exercised in conformity with the orders and guidelines issued by competent authorities coverings financial, vigilance, security, safety, counter trade and other regulatory aspects.[23] Any authority competent to incur contingent expenditure has the authority to sanction the purchase of goods required for use in public service in accordance with Schedule V of the Delegation of Financial Rules, 1978.[24] Further to this all government departments and companies have their own manuals and delegation of powers with respect to procurement. These manuals

[23] Ministry of Finance, Government of India, Manual of policies and procedures for purchase of Goods. URL http://finmin.nic.in/the_ministry/dept_expenditure/index.html. Last accessed on 01 April 2008

[24] ibid pp 21

and DoPs lay down explicitly the powers and functions of various officials with respect to taking procurement decisions.

Procedural framework for procurement in companies and departments

Nature and structure of procurement

Case Study I

IFFCO

The procurement manual specifies the delegation of procuring power given to every member of the management. According to this manual of IFFCO, a managing director could take decisions of procuring items of value till 2 crores. While taking those procurement decisions the managing director has to follow the laws and regulations laid by the central vigilance commission of India. The procurement process of IFFCO does not encourage a repeated procurement from the same supplier for same quantity and quality of good. IFFCO also emphasizes to procure items till the value of 25 lakhs from co-operatives. In the procurement bids for IFFCO there is a section where the details of the operational and maintenance cost has to be specified. There are three steps which are followed in the procurement process. In the first step a tender is issued. In the second step technical, unpriced bids are invited. Once a bid clears the second step then the bidders are allowed to make a financial bid. The term structure of payments for certain items are of he following types – a) 100%, b) 80%: 20%, c) 90%: 10%. In case of any exceptions from the normal clauses, they have to be specified in the unpriced bids.

There are essentially three kinds of procurement that take place within a public organization. First, is in reference to bulk and regular purchases that are overseen by the materials department of the, second are the project specific procurement (most common in public sector undertakings) that are undertaken by the specialized team overseeing the project within the organization. Usually the items procured under this are highly specialized, one off and specific to the project requirements. Third, refers to the kind of procurement that results from a contingency situation. This is overseen in most cases by the materials department, however the specific department requiring such an item can also undertake their procurement.

Of the abovementioned kinds of procurement, the first two, *viz.*, project based and routine procurement are the most common. The former kind of procurement involves purchase of goods that are specific for executing a particular project, whether a part of usual business or otherwise. The latter however covers those products, which are periodically procured by a central materials or stores department so as to maintain a stock of supplies for use by different departments within a company, such as stationary, furniture, and other office supplies. Procurements by materials or stores departments are usually items of regular and common use, not exclusive to any particular unit or project. Engineering products, machineries, tools and most raw materials etc. fall under this category. These may be procured as a part of annual budget outlay or as and when need arises depending upon the need as well as nature and structure of the procuring company.

As mentioned above, whether a particular product is procured as a project based activity or routine activity is dependent on a number of factors including the structure of the company. The structure of the companies varied across the companies we contacted. Although almost all the companies have a separate stores/ materials department and several other departments like engineering, quality assurance, manufacturing, field units etc, all engaged within the procurement process, the level of their

engagement and sharing of powers and functions is not uniform. While some companies have a very heavily centralized structure with respect to procurement, some are more decentralized in their approach, where the indentor departments can procure items themselves without taking approval from the materials department. In companies like IFFCO and NTPC, there are project subcommittees who get enjoy the freedom to take decisions of procurement for specific projects. However, all transactions are governed by the manuals or delegation of powers as discussed in the previous section. The level of decentralization present within the procurement process is also in accordance with these manuals and DoPs only.

Despite the largely decentralized nature of the procurement structure, most organizations follow a financial hierarchy in its design and division. Normally, the board of a company decides or approves at the beginning of a financial year, the budget for procurement throughout the year. Procurement of a lower value is usually delegated to single purchase managers who do not have to approach any sanctioning authority for making such purchases. In case of higher value the oversight review process is much more rigorous and usually sanctioning authority is vested in the board of directors of the entity.

Procedure of procurement

The procurement process across all the companies researched and consulted was by and large similar except for some differences in specific practices of the company. There are usually three kinds of tendering methodologies that are followed across procurement contracts. In case of high value goods, an advertised tender inquiry (ATI) system is followed. As the name suggests, it requires advertising of the tender in the print and internet media to ensure wide circulation and attract suppliers across countries. There are detailed procedures outlined for undertaking such a process. Next comes the limited tender inquiry (LTI) for goods valued at a lower amount. The circulation is limited to pre-qualified suppliers and other interested parties. This is primarily done to reduce time and transaction costs. The third variety is known as single tender inquiry wherein quotes are invited from a single party. This is practiced in cases of emergency or wherein the goods are of a proprietary nature and an adequate justification exists. However a due diligence exercises would need to be performed to justify the decision.

Bid evaluation

Case Study II

Ministry of Railways

In the Ministry of Railways, there are three kinds of items are procured viz; bearings, railway breaks, manufacturing items. The RDSO (Research Designs and Standards Organization) and RITES are two organizations that assess the quality of the goods procured by Railways. The RDSO looks onto the financial, manufacturing capability of the bidders. Locomotives are procured from U.S, Germany through a two stage bidding process. The first stage involves technical bidding followed by financial bidding. Three types of tenders are invited for bidding and they are – a) High Value Tenders, b) Medium Tenders, c) Low Value tenders. Apart from these many items are procured through bulk imports from preapproved suppliers. In the procurement process the product life is given lot of emphasis. Energy efficiency criteria are built into the procurement of tube lights and lighting components. Energy efficiency criteria is also built in the procurement of locomotives. There has been a directive from the government to buy energy efficient electric systems. For procuring capital items long term costs are taken into consideration. In electrical appliances star graded energy efficient items have been procured. While procuring some of the items preferences have been given to SSI units.

The process of evaluating tenders could consist of either a two stage or a single stage qualification process. Across most of the companies two types of bids are generally offered. The bids are of two types viz. technical and financial, which can be further classified into priced and non-priced.

In a two-stage evaluation process, the first stage includes a pre-qualification of suppliers and issuance of detailed bid documents to them. At the second stage, the technical evaluation based on predetermined parameters is carried out. The price bid for is not opened unless and until the technical bids are evaluated and settled.

There are certain general technical specifications, which are usually sought to be addressed in the tender. These include, the scale of supply and the quantity requirements, requirement of BIS mark when applicable, functional characteristics like dimensions, technical parameters and product specifications, availability and delivery of advance sample at post contract stage before the commission of production in bulk, packing and marking of goods, inspection procedure. It also includes, requirements of any special tests, type guarantee certifications, emissions, after sales service and contract maintenance guarantee, etc. The evaluation of the bids is normally carried out by an evaluation committee. Sometimes, when there are some discrepancies or confusions with regard to the specifications given by the bidders or there is lack of clarity in terms of a bidders' interpretation or performance guaranteed, the bidder is called to clarify. In some cases, this might entail even modification of the bid. This however is not common as suppliers bidding for procurement are experienced in the field and understand the requirements of the company. In any case, this is allowed only before opening of a financial bid.

Thereafter the financial bid from only the technically qualified bidders is considered. In a single stage post qualification process, the lowest bidder is evaluated simultaneously in terms of both the technical and financial criteria. If the supplier qualifies on the basis of least cost and is able to meet the technical specifications, then it is awarded the contract.

With respect to evaluation of a financial bid, normally least cost is the basis of selection in most of the bids; however, there have been instances when some of the bids with a higher least cost

quote have been selected. However in those cases justification behind higher quotes have to be provided by the bidders and accepted by the evaluation committee. In companies like IFFCO, the evaluation committee of the bids has technical, financial, management and business experts who evaluate the bids for procurement.

For small value items procurement is carried out in local project offices and sites. For procurement of items having a value greater than two crores the final approval is being given by the head office of IFFCO. Once items are procured a review and evaluation of the items procured takes place in the project sites. After review if some deviation in the quality standards are found from the ones stated in the bids, a renegotiation takes place. In some of the companies like Andhra Paper Mill, IFFCO energy efficiency criteria is given importance while the procurement decisions are made. So if a generator has greater fuel efficiency it would be preferred in the procurement in comparison to a generator, which has a lesser fuel efficiency. In certain companies like IFFCO a variation is being observed across items like cement, steel which are procured.

Bid validity

On an average, the bids are valid for approximately 120 days in the companies. Normally, a procurement process takes close to an average of 4 months for completion. However, in some companies it could take more than 4 months. The time taken to complete the procurement gets substantially reduced in a procurement based on single stage bidding. This is a practice followed either for small items or dedicated authorised dealers. This trend has been found out in companies like IFFCO, where items like steel is procured from authorized dealers.

Suppliers' involvement in the bid evaluation process

As illustrated in the above discussion, evaluation methodologies requires extensive consultation with suppliers in formulating specifications in a manner which the suppliers would be equipped to respond to. In that sense the pre-bid qualification process is the stage in which suitable suppliers are chosen who have the financial capacity and experiential knowledge to undertake the requirements of the tender. These suppliers are then taken into confidence in preparing detailed bid documents. Thus most procurement agencies follow a participatory approach, which involves regular consultation with the suppliers. This is an

important component of the procurement process itself since it enables close interaction between the procurers and suppliers and helps the latter develop both capacity and awareness in responding to a newer requirements and developments within the sector. Thus agencies like the DGSD; Kendriya Bhandar and state PWD bodies maintain a roster of suppliers, which enable them to cut down drastically on transaction costs and time taken. As mentioned earlier consultation with suppliers is a critical aspect of capacity building of suppliers and in enabling them to respond to newer developments like consideration of energy efficiency as criteria in product manufacturing. Thus establishment of long-term relationships with suppliers are an important aspect of their awareness and capacity to respond to new specifications.

In certain companies a board is formed which reviews and evaluates the procurement process and amendments to the procurement process is made based on the need. Such amendments are made after a time gap of 3 years. The budget allocation for procurement in certain companies like IFFCO takes place through the approval of a board constituted for the procurement of items. In certain cases an approval from the government is also necessary. For instance procurement of fertilizers beyond the limit of 15 crores would require an approval from the government of India, Department of Fertilizer. In companies like IFFCO, 80% of the total procurement budget is spent in procuring raw materials. Many companies carry out a specialized training course on procurement every year. For instance, in companies like IFFCO procurement training takes place in Administrative Staff College (ASCI) in Hyderabad. Suggestions are being made in these courses for improving the procurement process. Some of those suggestions made by ASCI to improve the procurement process have been accepted by the management of IFFCO.

In some of the companies an audit of the procurement also takes place. Thos audits could be of three types – a) Third Party, b) Internal Audit and c) Vigilance Audit. The third party audit of the procurement process is done once in a year. The internal audit is carried out once in 3 months and the vigilance audit is carried out continuously through out the year. The audits ensure and monitor whether ethical practices are being followed in the procurement process. The procurement process in government departments and companies is audited and monitored by the Central Vigilance Commission.

Case Study III

Oil Sector Cos (IOCL, HPCL, BPCL)

The procurement process across IOCL, HPCL, BPCL are standardized and they follow the same process. Procured items of these companies have an energy efficiency criteria imbibed into them. For instance items are procured for sulphur recovery in the refineries although it raises the costs of procurement. There are standardized guidelines of procurement for these three companies. The procurement takes place through a two part technical and financial bidding. Any proposal of technical and financial bid for supplying item to these companies goes through relevant departments within the company and reviewed. After the review process is over it goes to the Finance Cell. For procurement of items small tenders are being sent in the newspapers, embassies to reduce transaction costs. For procurement of items beyond 10,000 crore relevant Ministries co-ordinate to reduce the transaction costs. While procuring the items, credibility of the vendor, energy efficiency criteria are being considered. In some cases items are procured only after checking them in the field sites. These companies procure mainly – maintenance items, construction items, chemicals, byproducts in which energy efficiency criteria are considered. Relevant departments check all the procured items internally. A normal tender for procurement is opened till a value of 25 lakh. There are limited tenders, single tenders, open tenders and tenders through a two stage bidding system for procurement. If the bidders selected in the procurement process do not comply with the quality standards then they are put into a holiday list which is disseminated across all relevant officials. In many cases procurement is done through repeat orders to save transaction costs.

Procurement choices and Asset Specificity

Procurement choices made by companies may give rise to asset specificity[25]. This refers to the extent to which a party is locked into a two way or multiple business relationship. Such a lock in may arise when a company procures goods and services from a supplier over a long time that requires investments by the seller in physical (specialized tools or systems) and human (skills) asset specificity and/or dedicated assets (investments in plants). In such a scenario the procurer purchases items from suppliers over a long term and does not want to invest time in procuring the same assets from other alternative suppliers. One of the reasons is that the procurer is certain about the quality of the material procured from the specific suppliers over a longer period of time. The uncertainty of information on the quality of items from other suppliers could increase the transaction cost of the procurers while procuring items from them. This motivates the procuring firms to purchase goods and services from a single or a few suppliers over a long period of time. The buyer is also motivated to continue with this dependency because of the exit costs of searching and time involved in moving away to new suppliers.[26] This generates a long term dependency between the suppliers and the procuring firms by means of procurement of specific items over a long period of time. The supplier of items would also like to maintain this long term relationship with the procurer and would invest in the dedicated assets Such investments by the suppliers would maintain the quality of the items and would help in maintaining a market for such products. This trend is typically observed in the procurement decisions of companies like NTPC, IFFCO, and BHEL who have got into long term supply contracts with some specific set of suppliers who supply certain specific items to these companies. The suppliers invest in specific assets so to be able to supply the items which are being procured by companies like NTPC, IFFCO and BHEL.

[25] Williamson O.E. (1971), " The Vertical Integration of Production: Market Failure
Considerations ", American Economic Review 61, p.112-123. Also Williamson O.E. (1979), " Transaction-Cost Economics: The Governance of Contractual Relations ", Journal of Law and Economics 22, p.233-262. Williamson, O. E. "Credible Commitments: Using Hostages to Support Exchange", American Economic Review, 1983, pp. 519-38.

[26] Joskow, P. L. "Asset Specificity and the Structure of Vertical Relationships: Empirical Test of Transaction Cost Analysis", Journal of Law, Economics and Organization (4), Fall 1988, pp. 121-139.

Case Study IV

NTPC

Procurement process in NTPC has similarities with that in IFFCO. NTPC procures a large variety of items starting from heavy machinery items of a plant to small stationary items. Procurement of high value needs clearances from head office and small items are procured at procurement departments of the project sites. Procurement of items is made once engineering and other relevant departments of the company give specification. Competitive two-stage bidding is followed in NTPC. The steps and the process of procurement is similar to that of IFFCO. 40% of the total procurement budget of NTPC is being spent on coal. This is spent on a coal of ash content less than 35% which is transported for 1000 km based on government of India notifications. Coal is imported from Australia, Indonesia as well as procured from Coal India Limited. The delegation of power for procurement is based on the ISO certified contract manual. Energy efficiency standards, social clauses like child labour are built in the procurement contracts. Tenders for procurement are often published in newspapers. The valuation of such documents are Rs.7100 for each set. Spare parts, sundry items may be procured at specific sites. Duty drawback clauses and clauses of excise duty cuts are also built in the tenders. The evaluation of the foreign bids and domestic bids differ in the procurement process. The users of the items specifies the needs that are then procured. Bulk procurement of items is carried out through the corporate centre. Apart from this procurement is also done through specific project sites. Certain parameters of energy efficiency like heat rate, auxiliary consumption are mentioned in the bids. In the past environmentally benign items have been given preference in the procurement process of NTPC. For instance, NTPC has procured replaced procurement of asbestos gas kits with rubber gas kits. This is also guided by the environmental management policy of the company. NTPC's main procurement is coal followed by heavy machineries for power plants from BHEL. Small procurement contracts are given to the suppliers to create employment. Big contracts of procurement deal with the procurements of equipment, items of civil construction.

In BHEL, dependence on a single supplier over a long term holds for supply of heavy items, which are of very specific use and have high monetary value. The study also found out that that larger the complexities in the specification of a capital good, greater is the trend of a company to procure those items from specific set of suppliers. In Railways this pattern has been seen in the procurement of complicated heavy machinery items with finer specifications. In Railways, many engineering, machinery items have been procured from specific set of suppliers [NAME] from Germany since mid 1970s till now. Railways has not invested in producing these items themselves as that would have raised their transaction cost and sunk costs within the firm beyond the optimum level which could be borne by them. The uncertainty of the quality (in terms of the life cycle of the produced item) of the material produced from such investments within Railways has also pushed the organization towards long term procurement of these items from Germany.

Some companies like IFFCO do not rely on one dedicated supplier in case of procuring items that are not required frequently. For instance, it has not got into a long-term supply contract with the suppliers of small items. The decision of procuring these small items are taken at the local project sites which has a larger access to information about these small items in comparison to the material purchase department at the office headquarters. This is done to reduce the transaction cost incurred within a firm for procuring even small items through the purchase section at the office headquarters not located close to the project sites. As the local project sites and the head quarters are well connected, information regarding procurement at the local project specific sites is easily transmitted to the headquarters. In this case a stronger vertical integration within the firm reduces the transaction costs of the firm through procuring of small items at local project specific sites and subsequent easy transmission of information to the headquarters from the project sites. The same trend has been observed in case of companies like BHEL where standard small items like lights are procured at local project specific sites. In case of BHEL, the frequency of procuring these small items is guided by a company manual which details out how many times these small items could be procured. The company manual also provides guidelines on how the quality of these procured small items would be reviewed by the purchase and material section in the headquarters. In BHEL, it has been observed that small items are procured from many suppliers at the local project units.

Thus to conclude, procurement choices and relations with suppliers are linked very much to the nature of the transaction costs involved in the goods and services being procured. If transactions costs are low because of well-established contracting institutions, then these may be outsourced. Whether these are outsourced to a single seller or many sellers will depend on the nature of the product which may require investment in specialized equipment or a need of a service such as for example energy audits which may require specialized technical skills Equipment vendors may also provide technical assessment services but they "may be limited by the vendor's perspective of energy efficiency and desire to sell own product" (Taylor et al, 2008, p 94) and so there is a need to complement vendor technical assessment with in house expertise as seen in the case of IFFCO and BHEL for small value items.

Contemporary Developments in the Procurement Process

A recent noteworthy trend has been outsourcing of procurement to external consultants. Although not necessarily, but this is usually in the case of a stand-alone project, which an entity is involved in, and requires specific inputs from a specialized area. [27] The essential drive for outsourcing has been to ensure transparency and in lowering transaction costs. While some companies have been outsourcing only a part of their entire procurement, some have given the entire project or unit's procurement to external consultants. Theory suggests that outsourcing actually increases transaction costs and vertical integration occurs to reduce transaction costs. But outsourcing reduces non-transaction costs involved in idle capacity, managerial supervision etc. So firms try to reduce transaction costs of outsourcing by allowing dedicated investments by suppliers. This creates dependencies on buyer by the sellers. Firms vertically disintegrate when they reduce investments in dedicated or specific assets to supply in house and move to outsourcing.

In the Indian public sector scenario, it is seen as a step towards an economically efficient means of ensuring supply chain management and quality control. Also the rising costs of personnel management and the need for specialized training and

[27] *See* news item The Statesman, May 27 2008. Coal India limited has contracted out its procurement process worth Rs 3,400 crore to MSTSC Limited. URL http://www.thestatesman.net/page.news.php?clid=12&theme=&usrsess=1&id=205750.

regular upgradation of skills have meant that companies also find it a drain on their resources to maintain a fully functional procurement/materials department. Thus increasingly there has been a trend towards the outsourcing of procurement by public sector undertakings and retaining only few personnel to liaison with the outsourcing firm. In most of such cases the oversight of the parent company on the procurement process is limited to ascertaining the financial security of the process. Although the trend towards outsourcing is *per se* not negative, however given the distancing (both physically and structurally) from the process that the entity experiences once the procurement is outsourced, there is bound to be a lack of commitment to influence the procurement process or to even bring it in conformity with the internal policies of the entity. This therefore may (indirectly) create difficulty in ensuring that energy efficiency or any environmental criterion features in the procurement process.

Chapter III: Stakeholder Perspectives on SPP

This chapter discusses the findings from our first round of stakeholder consultations, and summarises the procurement practices and procedure as followed by the companies. Then it locates sustainability within the existing practices in terms of their awareness about SPP, and identifying the positive as well as negative influences on making sustainable procurement choices.

Criteria for procurement

Procurement is generally governed by three key factors – technical requirements/ performance, cost, and timely delivery, of which performance is usually the most instrumental factor. Besides these, certain social and environmental criteria also become apart of the public procurement process.

Performance

The primary purpose behind procuring any given item is to meet the need for any goods or services required in carrying out various functions in special circumstances as well as regular course of the company/ institution. Considering the objective, with which it is procured, is to meet these manufacturing and operational requirements, one of the main criteria to be fulfilled is vis-à-vis performance. Performance forms the basis of any procurement decision, whether before the actual bidding, *that is*, designing of specifications, notice inviting tenders, or during the evaluation of a bid document.

For the purposes of clarity, one can classify performance on the basis of technical performance and timeliness.

Technical

All the companies, whether public or private, rate technical performance very high and ensure that the items procured by them are able to meet the technical parameters required. The indentor department raises a request for procurement or initiates a procurement exercise with a certain mechanical or procedural activity planned and the role of the item to be procured already identified. Therefore, other factors like cost, sustainability etc. are taken into consideration only after the technical requirements are

up to the mark and as per the needs of the company/ department. This is a criteria rated high by all the companies consulted, irrespective of their nature of activities, whether large manufacturing, energy, or service industry. Since most of our stakeholders, except the railways, are competing with other players in the market, they are bound to maintain the quality of their products, hence give performance related criterion a high weightage in the course of evaluation of a bid.

Timely Delivery

Another parameter on which performance of an item to be procured is evaluated is in terms of timeliness. Companies expressed that timely delivery for them is as important as any other performance measure since they deal with products and processes which are fast moving and have to meet sharp deadlines. In fact this emphasis on timely delivery is one of the drivers of the trend in outsourcing of procurement. Unlike some other developed countries, when public procurement is outsourced, it is not done so as to ensure sustainability, but to ensure timeliness and technical requirements.

In a two-parts bid process, the first part deals with these specifications only. Normally, performance guarantee is given by the supplying agency but some organizations, e.g. BHEL, IOCL and NTPC have a quality department that conducts quality tests at different stages of procurement. Depending on the nature of the goods to be procured, monitoring of a performance guarantee test is done. Companies that are ISO certified and have a quality manual and audit, are under an even greater obligation to meet established standards, which demands technically sound purchases and a timely delivery of the same.

Cost

Price of the product is one of the driving factors in evaluating a bid for purchase. Once a technical bid is evaluated and a vendor meets the requisite technical and performance related specifications as laid down in the NIT, the financial bid is opened and the cheapest option is procured. The financial bid is normally opened only after the technical bid has been evaluated and any modification or alteration required has been made or any explanation from the vendors is sought. No consultation with the supplier takes place after the financial bid is opened.

Cost as a criterion can be classified into two kinds, *viz.,* cost at the time of purchase and cost over the life term of the product procured. The decision to go for least cost the time of purchase or whole life term depends on a number of factors. While often the former is considered, in certain circumstances, the latter also plays a determining role. During our consultations, we found that going for the cheapest available option if it fulfils the technical requirements is the most common practice. However, in some companies and in some products, calculating and evaluating financial bid on the basis of life term cost is also practised.

Social

Social sustainability may not be *the* determining criterion in carrying out public procurement, but it is indeed an essential factor that influences procurement options of the government departments and companies. Government departments, subsidiaries and companies are under government direction to practice social sustainability in various prescribed forms. The GFR amongst other things explicitly lays down the area and manner in which preference to small scale industries can be given. Government notifications issued from time to time call for social preferences in the form of waiver from earnest money deposit, price preferences, reservation of items, local producer preference etc. Social sustainability becomes a criterion for procurement when companies as a mater of policy and under government orders make sure that they are providing a level playing ground for small scale industries to compete with big companies.

Over and above the government directives, few companies are engaged in social criteria for procurement. Railways, IFFCO and NTPC give different levels of preference to goods manufactured locally. Companies like NTPC and IOCL link their corporate social responsibility initiatives with sustainability in procurement, when in order to mitigate the impacts of their mega-projects, they procure services from those displaced or at a disadvantage due to coming up of projects or plants.

Environmental Sustainability

Environmental concern per se does not form one of the criteria of procurement. However, different elements of environmental sustainability feature in and influence the procurement choices across companies.

For instance, waste reduction and management is an important issue in power generation in India. Indian power generation is heavily dependent on coal based thermal power plants and Indian coal is very high in ash content, thereby leaving a challenge of ash management. Ash content in coal creates many problems such as reduced efficiency of power plants, storage, transportation and disposal of ash etc. Besides, the fixed cost of storing the ash of the coal is very high.

NTPC, which spends most of its procurement budget on coal[28], emphasises waste reduction, both as a part of its environmental policy and reducing operational costs. To manage ash disposal, NTPC puts stress on low ash content coal. All the plants till 1000 km from coalmine are supposed to use coal with a maximum ash content of 34%. For some of its power plants, low ash coal is imported from other countries despite high financial costs involved.[29] However, despite imports from high quality low ash content coal from Indonesia and Australia, bulk of coal is Indian high ash content coal.

It is important to note that environmental criteria in procurement are not usually a part of either an institution's procurement or environmental policy. However, it emerged from our consultations is that companies with a well laid down environmental policy or a commitment or membership at any environmental forum usually follow these kinds of environmental criteria in their procurement. Our stakeholders, who do not have an internal policy to this effect, were of the view that its absence caused hindrance in adopting any environmental criteria in their course of affairs. In such cases, they justify environmental actions in terms of energy efficiency.

Energy efficiency

Energy efficiency, although not a part of any formulated policy or decision, is often considered as a criterion for making a procurement choice or evaluating a bid. Energy efficient practices lead to reduced energy consumption and consequent expenditure. Thus, internalising energy efficiency within the procurement process is in effect a move towards reducing transaction costs and maximising profits in the long run.

[28] A typical NTPC power plant (for instance the Badarpur power plant) procures 13000 tonnes of coal per day.
[29] At the moment 7 plants of NTPC are also importing coal from abroad

However, due to various factors EE as a criterion is ad-hoc and irregular. These factors have been discussed later in the chapter.

One main factor driving energy efficient procurement choices these days can be explained in terms of reduced expenditure on energy. Sustainable consumption and reducing carbon footprints are other milestones, that companies want to reach, especially those, which are dealing in the international market or facing competition form multi national companies. These days many companies are going for carbon neutrality through voluntary emission reduction to tell people that they are concerned with environment/ sustainable development.

Energy specifications in ISO certified companies are often based on ISO standard. Star labelling in procurement of energy efficient lighting products is being considered by organizations now. The minimum requirements are those laid down by the laws and ISO, but at times, keeping in mind the long-term production and plant life, higher standards are also sought for.

It is noteworthy that the growing trend towards outsourcing may not be very conducive to internalising environmental sustainability within the public procurement. Blanket purchase agreements and outsourcing agreements for public procurement are usually entered into to ease the burden of internal administration, smoothen the procurement process and ensure a timely delivery. Often this can be linked to a cost cutting initiative. Thus, the consultants are informed of the technical requirements and budget for procurement. Normally the outsourcing agency is not involved in the process of the consultants. Certain private companies, which outsource their procurement related work, have a strong monitoring mechanism. However, most public companies that are engaged in outsourcing are not involved in monitoring or checking of the external consultants activities, once they inform them of their requirements. This is likely to have a negative impact on sustainability of the process, as the rationale behind such an action is little beyond efficient and timely delivery and reducing the work of internal procurement departments.

Awareness related to SPP

Most of our stakeholders were not very well versed with the term “Sustainable Public Procurement”. However, the concept was not absolutely new or unfamiliar to them. Without commenting on their level of engagement or adoption of the principle of SPP, it

must be mentioned that the principle of practising business, including procurement of goods and services, in a manner that is environmentally and socially sustainable was known to them.

The project assessed the awareness of stakeholders with respect to SPP on the following parameter

- SPP as a term
- Concept of SPP
- Green procurement
- Energy efficiency measures in procurement in particular

SPP, the term

As a term SPP seemed to be jargonistic for the stakeholders, especially the procurers. The term SPP does not feature in the framework governing public procurement. However, the Bureau of energy efficiency, our stakeholder from the regulatory agencies was well aware of the concept, international developments, initiatives, and issues involved in SPP policy and implementation. Some stakeholders, who were indeed familiar with the term, felt that there was a need to define sustainability and link it with general sustainable business practices. Absence of a clear and definitive definition of the term SPP was identified as an issue in introducing SPP.

Concept of SPP

Even though not all stakeholders may be accustomed to the terminology, sustainability was not absent in their procurement related activities. In fact social sustainability was much more incorporated in their procurement process, than environmental. Social sustainability such as employment to local persons, preference to goods manufactured locally, or by small scale industries are all initiatives directed towards social sustainability. Environmental sustainability, as discussed in the previous section, relatively more ad hoc and intermittent. While some of our stakeholders were aware of the principle behind sustainable procurement and admitted that many a times, they practise the same, others were unconsciously and as a part of ensuring smooth and efficient activities were making environmental friendly procurement.

Green procurement

Awareness related to green procurement was not extensive. About the concept most stakeholders were categorical in informing that any green procurement can be included only after cost and performance criteria are fulfilled. Moreover, the awareness differed from company to company with respect to their nature of activities and institutional dynamics. Green procurement was viewed as an environmental goal in the nature of public gain. The stakeholders looked at it as something, which causes public gain but may not be beneficial to the company. However, they distinguished it from energy efficiency, which is both pubic gain as well as private gain, thereby creating a win-win situation for the companies.

Energy efficiency in procurement

As the scope of our project was not an overall green procurement, but clearly focussing on energy efficiency, our concept of sustainability, (*viz*, in terms of energy efficiency) was easier to understand and relate to the process and activities of the stakeholders. They were in agreement that EE procurement not only helps them become a part of a responsible industry, but also leads to an overall long-term economic advantage. Their awareness about the subject was much more than the others as they could see a direct advantage arising thereof. However, not all of them had given enough thought to issues in implementation of the same other than the capacity and incremental and initial costs incurred in such a kind of procurement. Ministry of Power through BEE is well aware of energy efficient measures in public procurement and had already set up an inter-ministerial group for the same and trying to develop enabling tools for implementing it.

Approach towards energy efficiency

As discussed in the previous sections, through the consultations with stakeholders, it emerged very clearly that energy efficiency in procurement is not a norm but nevertheless a practice not unknown to the procuring agencies and officials. It is practised in different areas, goods, and different manners varying from company to company and industry to industry depending on a number of factors.

Before discussing what are the drivers of introducing energy efficiency measures in procurement and what are the issues involved in internalising SPP, one must recapitulate how stakeholders from the companies view energy efficiency in procurement. Their perception and approach to EE in procurement can be broadly divided into two categories –

- Environmental responsibility and commitments
- Low life term cost

Environmental responsibility and commitments

Today, there is an increasing realisation across industries and companies that sustainability in business practices is not only valuable for the environment and natural resources but also offers an "opportunity for business to improve its profitability, competitiveness, and market share".[30] With this realisation, there have been several formal and semi-formal initiatives, which have attracted support and membership from the business community. The World Business Council for Sustainable Development (WBCSD) and UN global Compact Principles are some of such international fora. Besides, companies have been setting up their own environmental initiatives and making use of their existing environmental activities so as to leverage their position as a company committed towards sustainability.

Most of these fora are established with the objective of promoting leadership in environmental management, social responsibility, and economic performance directly or indirectly. Many of our stakeholders were a member of some sustainability forum or had a clear CSR vision and strategy in place. While most of them had environmental concerns reflected in their vision or mission, some even had a full-fledged environmental policy in place.

Those companies, which had such environmental memberships, saw great opportunity in procuring energy efficient goods to fulfil their commitments of taking actions towards practising sustainable business practices, including reducing carbon foot prints, restoring ecological imbalance, mitigating the negative impacts of their projects on environment, waste reduction etc. In Andhra Pradesh Paper Mills, where EE criterion has been introduced in procuring boilers, evaporators, pumps, and motors

[30] Source: TERI- BCSD website. Url - http://bcsd.teri.res.in/index.php?option=com_content&task=view&id=106&Itemid=173

in three projects, two of them have already got CDM accreditation in UNFCCC.

CDM refers to the Clean Development Mechanisms that has been operational under the Kyoto Protocol to enable the generation of certified emission reduction (CERs) units for transfer to Annex I parties. In order to illustrate the scale of CDM project implementation in India, it would be useful to take a look at the following numbers. There have been more than 600 projects approved by the NCA (National CDM Authority). Out of a total worldwide registered 732 projects, Indian alone accounts for 252 or 34% of the global total. Further out of a total of 62 million units of CERs issues, 26 million are issued out of Indian projects. In terms of sectoral distribution, energy efficiency accounts for almost 26% of the total CDM projects in India.[31] This also gives us an idea of the scope for change that CDM could bring in terms of energy efficiency within the procurement system, by making it economically viable and lucrative for companies to invest in energy efficiency. There have been several examples of CDM driving energy efficiency in procurement especially in the iron and steel sector. For instance the Bhilai Steel Plant at Chattisgarh replaced coke through coal tar and coal dust in the blast furnace. Also installation of energy efficient pushers type furnace, high efficiency recuperator and flue line and chimney have all been part of the energy efficiency drive in specific steel companies in Bihar. Other projects include fuel switching in the boiler at M/S Cadbury India Ltd at Thane, Maharashtra, energy efficiency through lights switches in Lotus Suits at the Orchid Hotels Projects at Mumbai, etc.

Despite the promise, however there are certain structural impediments that exist in the potential for developing energy efficient CDM projects and thereby influencing procurement. One of such impediments relate to preparation and approval of CFL methodology by the Executive Board, preparing and testing methodology for energy efficient refrigerators, etc.[32] Thus

[31] See for detailed information http://www.unescap.org/esd/climatechange/workshop/2007_07_18/documents/Thu,%2019%20July/Session5-1/3_Nitu%20Goel.pdf, accessed on 12 January 2008.

[32] See for overview, http://www.cdmindia.com/General_Presentations/Presentation_19_Energy%20Efficient%20CDM%20Projects.pdf accessed 12 June 2008. Also http://www.ongcindia.com/press_release1_new.asp?fold=press&file=press324.txt accessed 12 June 2008.

development of methodology is one of the critical aspects which would need to be addressed for the expansion of energy efficiency and thus its implication for procurement in India.

Internal policies of the companies, such as environmental policies and R& R policy influence the procurement process indirectly. Therefore, they see SPP as a means of implementing their policy and mission. Companies like IOCL and NTPC, which are involved in mega projects which cause large scale displacement and relocation, see this as an opportunity to mitigate the ill effects and win the confidence of the local people. This brings back the point mentioned in the previous section that companies with an environmental policy find it easier to justify their choice of energy efficient items, even though it may cost more to the company. Unless there is an internal institutional commitment towards environment protection at the level of the company, a sustainable approach in their procurement process is difficult to find.

Low life term cost

It is clear that performance and cost are the two most important factors determining the procurement made by companies. Financial cost of a product can be determined on the basis of either least cost at the time of purchase or a lifetime cost of the product. Depending on the nature of goods being procured, requirements, quantity and cost of item to be procured, choice between immediate and long term cost is made for the purposes of evaluation of a bid.

Least cost at the time of purchase is the most common and usual practice but a lifetime low cost is what serves as the basis for following an energy efficiency criterion while making a procurement decision. Reduced energy consumption gets translated into reduced operating costs and hence, a more economical in the long run despite the initial incurring of expenses. The basic difference between whole life costing and L1 cost is that the concept of former “allows for the consideration of environmental, social and economic costs and benefits that occur throughout the life of the a product or service, rather than simply restricting these to the financial outlay involved in initial

procurement".[33] The Green Guide of the UK[34] identifies the following elements as components of the whole life costing:

- Direct running costs e.g. energy, water and other resources used over the lifetime of the product or service
- Indirect costs e.g. loading on cooling plant from energy inefficient equipment
- Administration costs: overhead from buying hazardous products, which require additional control and special handling and disposal
- Spending to save: investing in higher levels of insulation to save energy
- Recyclability: creating markets for waste
- Costs of disposal: choosing a product, which is more durable, reusable, recyclable, or is free of hazardous materials requiring disposal in a special way

Evaluation based on life term cost plays an important role in sustainable procurement as often a lifetime cost analysis rationalises the choice of more energy efficient products. Mostly, energy efficiency in the procurement process is reflected in the variable cost components of the project. Moreover energy efficient component helps in reducing the life cycle costs and the long - term variable costs of the projects. In some cases, cost considerations come after looking at the energy efficiency of the materials procured for the projects.

Although whole life cost analysis often helps a company procure more energy efficient goods, it is not always practised and not always feasible to do so. This is the reason why most of the companies that undertake lifetime cost analysis at the time of evaluating the financial bid do so for big and energy intensive item only. Many times end of pipe treatment and related costs are so high that a total life cycle approach has to be adopted (*for example,* amount spent on ash disposal in case of high ash coal used by power generation companies. Ash content in coal creates many problems such as reduced efficiency of power plants, storage, transportation and disposal of ash etc.).

Some companies like BHEL practice whole life costing as a routine and for almost all procurement but others adopt this

[33] European Commission, Director General for Energy and transport (2004) Life Cycle costing: A guide for Local Authorities

[34] URL http://www.sustainable-development.gov.uk/government/estates/green-guide/index.htm. Last Accessed on June 30th

criteria only for those items which are either very expensive or are energy intensive and are likely to consume large amounts of energy thereby increasing the company's overall energy expenditure. There is a condition in IFFCO's NIT that if power consumption is less in one product, then it is the chosen product for procurement. Power consumption is quantified and then accordingly, annual total cost is calculated, on the basis of which a decision is taken. This is a technical requirement and normally (90%), it is there in procurement of big items only as it is not feasible to follow this procedure in small requirements due to cost factor. Similarly, BHEL procures high grade CRGO (Cold Rolled Grain Oriented Steel) that reduces the heat loss. These grades are more expensive but are still procured considering their energy efficiency.

In order to calculate a life cycle cost, the present value of all the costs is taken into consideration. The costs include initial capital cost, repair, operation and maintenance cost, cost of energy, water and replacement over the life time. [35]

While calculating the total cost, an inflation factor is added in each of the cost components to reflect the changes over the time period considered for the life cycle analysis. The present value of the costs is calculated by using the discount factor, which is based on the weighted average cost of capital. The weighted average cost of capital is the average of the bank interest rates and return on equity weighted by the proportion of the debt and equity amount. In the United States of America, in projects related to energy efficiency, energy conservation projects, renewable energy projects, the discount factor has a floor of 3% and a ceiling of 12%[36]. It is calculated based on the average yields of the treasury bonds that could not be called off before 10 years[37]. The discount factor is dependent on the cost of capital, lifetime considered. Often the discount factor is adjusted by the inflation rate and a real discount factor is used in calculating the life cycle costs.

[35] A simple formula for life cycle costs would be – Life Cycle Costs = (Present Value of capital cost, repair, operation and maintenance cost, cost of energy, water and replacement)

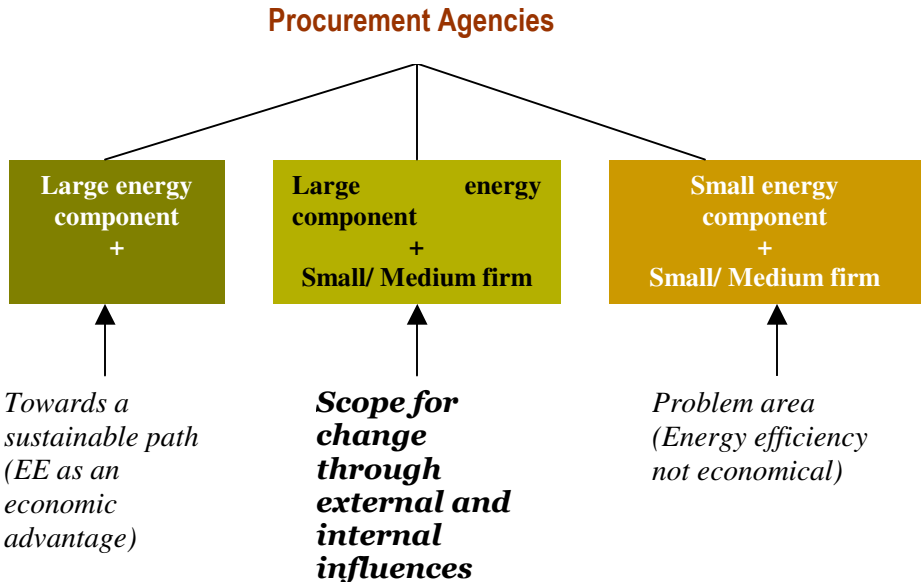
[36] Guidance on Life-Cycle Cost Analysis Required by Executive Order 13123
January 8, 2003, www1.eere.energy.gov/femp/pdfs/lcc_guide_rev2.pdf

[37] Guidance on Life-Cycle Cost Analysis Required by Executive Order 13123
January 8, 2003, www1.eere.energy.gov/femp/pdfs/lcc_guide_rev2.pdf

Calculating a life term cost is not always practised, as it requires both in house technical capacity and other related expenses. Not many companies have the expertise in life term cost assessment. In the absence of adequate capacity and ready to use information, companies are reluctant in carrying out the analysis unless the size and/or value of procurement are large. Instances of energy efficiency in small procurements can be seen in the case of CFL lighting as there is already a rich awareness and ready to use information in the form of labelling that helps the procuring agencies distinguish an energy efficient product from the other. Beside capacity and costs involved, there are several other impediments in a life term cost approach for procurement. A company looks at both immediate costs and long terms costs at the time of evaluating bids. In case of undertaking a feasibility study to ascertain the lifetime costs sometimes companies face difficulties as there is no guarantee with respect to life-time performance of the item purchased given by suppliers. This makes it difficult to justify purchases based on lifetime operating costs.

Green purchasing in other countries has followed either the single-issue approach or the life cycle approach (OECD 1999). In the former, a single criteria like energy efficiency or recycled content is used to guide the purchasing decisions of the public authorities. In the latter, a tool is developed for an objective examination of the product's environment impact along all the stages of its life, which include manufacturing, distribution, use and disposal. Usually low powered contracts are employed in the early phases of the life cycle i.e. contracts where the residual claimant is the government. Also, low powered contracts are employed more for high technology than for standard equipment. Some of the low powered contracts are cost reimbursement type while some of the high-powered contracts are fixed price or price cap type. This means that the contract has to suit the technological characteristic of the good in question.

Fig: 3.1: Size of energy budgets and procurement choices perceptions of roles of energy efficiency



We can divide procurers in Indian Industry into three categories – First, large firms having large energy budgets, second, small firms with big energy budgets and third, small firms with small energy budgets. The first category of companies usually make large procurements and of big energy intensive items and are already in some way or other following the sustainable pathway in making their procurement decisions. Second category is one that has the potential to internalise sustainability in their procurement process but may or may not be adopting energy efficiency measures in their procurement process at the moment. There is a need for a push by way of policies, guidance and incentives to hep them make that shift. The third category is the difficult one for SPP as it is this category that is and will continue to pose problems in making the procurement process sustainable. (*See* figure 3.1). Any attempts/interests to establish SPP efforts will need to address these industry groups differently.

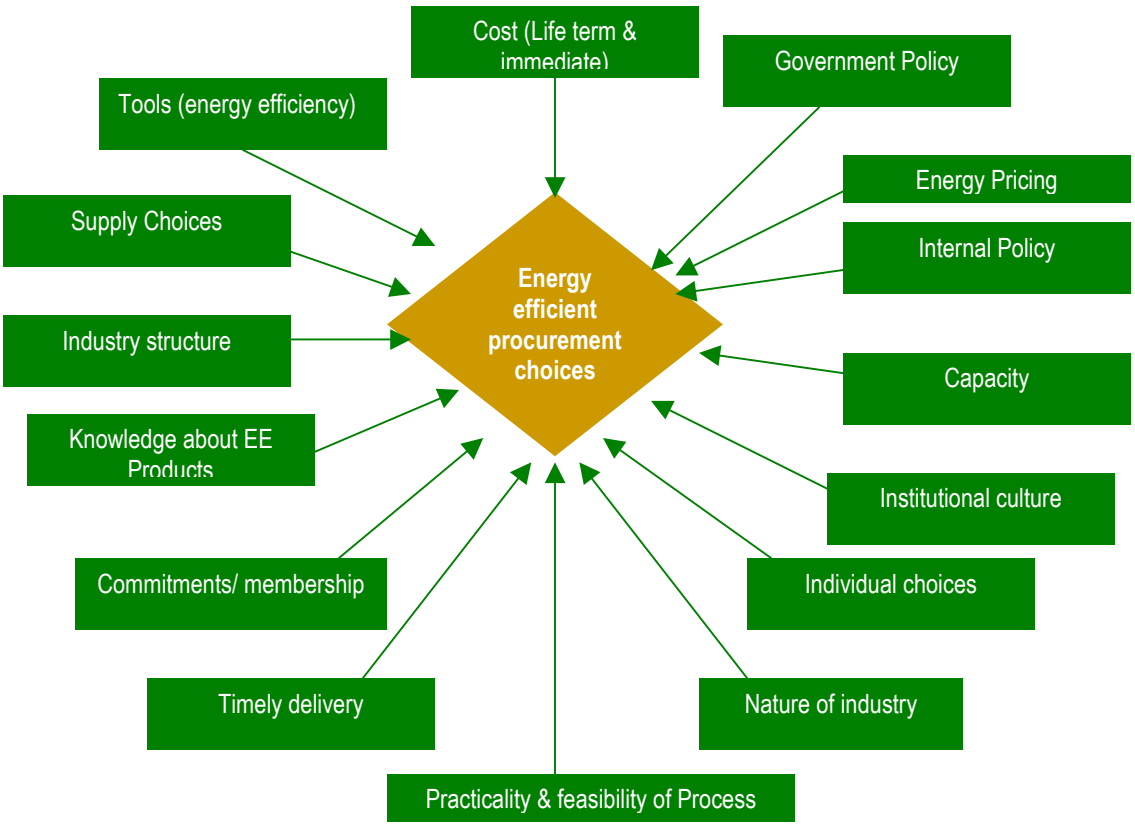
Influences on public procurement: Implications for energy efficiency

The perception of stakeholders with respect to energy efficiency in procurement was thus either in terms of environmental responsibility or reducing life term cost. However, these two approaches were not and cannot be looked at in isolation, as there is a whole range of factors that have both a positive as well as negative influence on incorporating energy efficiency measures

as a part of the procurement process. Influences can be both internal and external.

Here we discuss some of the factors influencing SPP choices of the companies. There are bound to be some overlaps amongst these and presence of other influences as well but the ones discussed here are those, which emerged very clearly from our stakeholder consultations. These include life time cost, government policy, internal or organization specific policy, institutional culture and individual choices/ decisions, commitments/ memberships, nature and structure of industry, knowledge about EE products, tools of energy efficiency, supply choices, capacity (suppliers and buyers), timely delivery, practicality and feasibility of the process (figure 3.2). The company use influence on EEPP is given in Table 3.1

Figure 3.2 Influences on energy efficient procurement choices



A whole life cost analysis has a positive impact on energy efficiency through procurement. It not only helps explain and justify a SPP decision but also acts as an important tool to arrive at the decision. As discussed earlier in this chapter, cost minimisation is very high on companies' priority, approaching SPP from a sustainable consumption perspective leads to a greater buy in amongst the procurers. In order to reduce the lifetime expenditure on energy, companies go for this analysis albeit for big and/or energy intensive procurement only. Although this is not a common and regular practice across companies and products, the link between considering a long term cost and energy efficient procurement choice was clearly established.

The role of government in promoting SPP is complex. It can be classified into two kinds - regulatory and enabling. Regulatory functions are performed through various acts, rules, orders to govern the actions of the government and its subjects. These are often in the nature of making actions subject to command and control. As against these, another set of laws and rules exist, which works on the principle of directing and enabling in order to meet the objectives of a proposed legislation.

When it comes to procurement, government policies therefore operate at two levels – enabling, providing guidance in adopting sustainability (e.g. BEE notifications) and another command and control, (e.g. CVC, ECA guidelines). Currently the enabling role of the government policies and institutions in promoting social sustainability in the functioning of government departments and companies is fairly established. A government framework, which provides for energy efficiency in procurement, like the one that provides for social sustainability, is therefore central to developing and implementing SPP. While the possible and existing role of the government in promoting energy efficiency in procurement cannot be undermined, the obstacles in the form of government policy and procedure cannot be ignored either.

As noticed in chapter II, the institutional framework governing public procurement in India is primarily governed by the Ministry of Finance's GFR and the guidelines by the Central Vigilance Commission and the DGSD. Government departments and companies are usually concerned about meeting the regulatory requirements as per the rules and policies of the government. To meet (and come out clean of) the audit requirements is placed very high on their agenda. And it is this feature that acts as a negative influence for making SPP choices.

Considering the influence that CVC has on overall functioning of a government company, companies have to make sure that they are in conformity with the L1 cost requirement (*See* chapter II). This often acts as a disincentive for the procuring agencies to consider any energy efficient options other than the lowest cost. Thus the lack of harmonisation between different government policies creates obstacles in making energy efficient procurement choices.

The need for a cohesive government policy and framework for SPP was clearly felt but at the same time it was clear that government policies couldn't direct SPP alone. The concept of energy efficiency in procurement is such that has to be internalised. External influences are indeed vital but not sufficient for practising SPP. It was noticed that companies which had an environmental policy or an institutional EHS programme faired much better at practising SPP than those which did not have any of these. Moreover, a company that did not have an environmental policy and an institutionalised CSR initiative said that it becomes difficult for them to take actions towards sustainability. It was mentioned that even if there were an external policy, in the absence of the institution adopting it internally and commits to it, implementation would remain poor and ad hoc.

Implementation at the company level is also dependent on the institutional culture of the procuring agency. The level of decentralization, decision-making structure, approach towards environmental and social responsibility etc. that is incorporated within a company's organizational culture also influences and acts as a catalyst in making sustainable procurement choices. Being a part of sustainable business networks or forums also puts certain kind of obligation on the organizations to take environment friendly actions. Sometimes, a sustainable procurement acts as an example of such initiative. Thus, internalising SPP to a large extent is dependent on the institutional dynamics of a company. Where such practices are not institutionalised, it remains a result of individual executive's commitment and vision. Thus sustainable business is practised for as long as the tenure of that particular executive. It has been noticed that most sustainable initiatives in business are a result of a particular executive's vision and actions, but it has continued only where this vision has been incorporated and accepted within the institutional culture.

It is not possible to have a blanket SPP policy for all the sectors as the scope and issues in making the procurement process energy efficient varies according to the nature and structure of the industry. While the scope of internalising and benefits perceived by the procurers was more obvious in some industries, it was lesser in another. Even the level of energy efficiency in the current procurement process was different in large manufacturing sectors and energy intensive industries than, say, service industry. Moreover, the nature and process in some industries, *for example,* oil industry, mandates ensuring energy efficiency at each level of production and operations, including procurement. In some sectors, where there are clearly laid down international standards, *for example* railways and air lines it is often difficult to deviate from the regular practice and procure new and energy efficient alternatives or variants. In Air India, introducing CFLs in their factories was met with a lot of opposition from workforce on grounds of luminosity and considering the high-risk activity and stringent international standards, the company decided to continue with the conventional fluorescent lights. Beside nature, the overall market structure also plays an important role in determining the choices made by companies. Sectors monopolised by one or two players are under a lesser pressure to adopt sustainable procurement practices. For example rail transport and inland container depots are still a domain of single or few players. When it comes to energy efficiency within procurement, they have few comparisons to make vis-à-vis other companies' practices which are more sustainable, financially as well as environmentally.

Awareness is key to any change in existing unsustainable practices. Not many of our stakeholders were aware of energy efficient options with respect to the items they normally procure other than those in which BEE has been active like lighting equipments etc. There was greater awareness where the manufacturing units were involved in procurement. In some cases, where this awareness did exist, there were other impediments such as lack of suppliers, enabling tools to identify those goods etc. in purchasing energy efficient options. The stakeholders emphasised the need for making certain enabling tools available so as to help them make informed sustainable procurement choices. Determining which product is more energy efficient than the other requires capacity and resources, which companies may not always be willing to spend for routine procurements, therefore the need for tools to facilitate identification and calculate the life time cost was underlined during consultations.

Supply choices are very important in adopting energy efficiency as a part of a company's procurement practice. While most of our stakeholders mentioned that they had not faced a lack of suppliers for their specifications, they admitted that specifications are designed keeping in mind the supply options available in the market. Public sector companies also ensured that their specifications do not lead to monopolisation by a single supplier. Thus it is to a large extent dependent on suppliers' capacity as well. However, in some industries, e.g. IOCL the situation is reverse, where the suppliers often suggest more advanced techniques and energy efficient variants.

We have discussed earlier in the chapter how companies give great importance to timely delivery. In the interest of time, less sustainable items are procured if they meet with the other criteria – performance, cost and timely delivery. This acts as a negative influence on SPP as it is this concern for timely delivery that often drives outsourcing of procurement in PSUs. Outsourcing, the way it is being practised, with little monitoring and no concern for sustainability, is certainly not a positive step towards internalising SPP. (*See* chapter II)

Thus, while internalising sustainability, or even introducing through external influences, in a procurement process, it has to be ensured that it does not make the render the whole process difficult to sustain on a long term. Practicality and feasibility of the process is very important and that calls for flexibility, therefore our stakeholders emphasised that at the end of the day, if practising SPP is not feasible and putting a burden on companies' finances and administration, there will be strong disincentives for adopting SPP.

Table 3.1 Influences on Energy Efficient Procurement Choices (company-wise spread)[38]

	Air India	Andhra Pradesh Paper Mills Limited	Bharat Heavy Electrical Limited	Container Corporation of India	Indian Fertilizer Cooperative	Indian Oil Corporation	Ministry of Railways	National Highway Authority India	National Thermal Power Corporation
Life term cost	⇑	⇑	⇑	----	⇑	⇑	----	----	⇑
Initial cost	----	----	----	⇓	⇓	----	⇓	⇓	----
Govt. Policy	----	⇑	----	⇑	⇑	⇑	⇑	⇑	⇑
CVC influence	⇓	N/A	⇓	⇓	N/A	⇓	⇓	⇓	⇓
Organizational Policy and institutional culture	⇓	⇑	⇑	----	----	⇑	⇑	----	⇑
Individual choices/ decisions	⇑	⇑	----	----	⇑	⇑	----	----	----
Commitments memberships	⇑	⇑	⇑	⇑	⇑	⇑	----	----	⇑
Nature of industry	⇓	⇑	⇑	----	⇑	⇑	⇓	N/A	⇓
Structure of industry	⇓	----	----	⇓	⇓	----	⇓	⇓	⇓
Knowledge (EE products)	⇑	⇑	⇑	⇓	⇑	⇑	⇑	----	⇑
Supply choices	⇓	----	----	----	⇓	⇑	----	N/A	⇓
Buyer Capacity	----	----	⇑	----	⇓	----	⇑	N/A	----
Timely delivery	⇓	----	----	⇓	⇓	⇓	----	----	⇓
Practicality and feasibility	⇓	----	----	⇓	⇓	⇓	⇓	----	⇓

⇑ - Positive influence (This refers to the variables having a favorable impact in terms of enabling, supporting or even forcing a procurer to undertake procurement of energy efficient products. This however does not comment on the scale of the influence/impact. Thus a positive influence of say government policy could be negated by any of the other variables – like individual choices – if the latter variable plays a more important role and therefore has a much stronger influence on the overall role and behavior of the entity). Thus this is a qualitative assessment that comments on the possibility or potential for action based on the variables that have been selected on the basis of interaction with government procurers and PSUs.

⇓ - Negative influence (This refers to the influence of variables that creates a disincentive for procurers to procure energy efficiency alternatives. To reiterate it does not comment on the scale or intensity of the influence of the variable on the procurer behavior.

[38] Proposed to be validated in the second round of consultations

---- No influence (This refers to the lack of any impact, both positive or negative, of the variable on the company's/government department's procurement choices. Lack of influence could be due to various factors. For instance the lack of influence of supply choices could be because the company is in a monopoly position and therefore has a commanding position vis-à-vis their suppliers. Lack of influence could also result from the nature of the sector, which negates the influence of the certain variables in as much as they have little or no effect on company choices and decision regarding procurement of energy efficient goods).

N/A – Not applicable (This is a qualitative assessment referring to the inapplicability of certain factors with reference to specific procurers. In applicability needs to be differentiated from no influence value in as much as the latter refers to a factor which would be of relevance and impact company behavior but may not influence the procurement behavior of a company/government department. Whereas in the case of the former, the variable does not have any influence or is not a required value that is reflected or impact company behavior on general. Thus it is a non-value in the case of a specific company/government department.

Chapter IV: Linkages with ongoing initiatives

As mentioned in the previous chapter, despite having several manuals and institutions governing public procurement, there is no detailed framework, guideline or tool to enable sustainable public procurement in the companies and departments of government. However, sustainability in procurement is such that can enter through various channels and routes. There are several policy initiatives and schemes with which linkages can be established in order to facilitate or justify internalising energy efficiency within the procurement process. Such initiatives can be broadly classified under three heads, *viz.*, voluntary instruments, market based instruments and instruments of command & control.

Market based instruments such as energy labels and ratings are relatively new and so far have had a mixed response in the Indian context depending on their scope and design. Besides there are also certain voluntary instruments such as energy conservation building code, directives allowing for social sustainability and instruments of command and control where the government has laid down explicit rules with regard to transparency, financial accountability, right to informations, reservation for certain products etc. For the sake of clarity the discussion in this chapter divides some key ongoing initiatives not on the basis of their nature but scope, *i.e.,* environment, social and transparent governance. Following are some of such different schemes and initiatives.

Environmental

Reflective of the environmental concerns associated with development, India has a fairly extensive environmental legislation and jurisprudence and several voluntary and non-voluntary schemes and initiatives. Although these schemes have been launched in the past with a specific purpose, their influence is possible, and occasionally present, in sustainable public procurement. There have been several government and non-government led environmental actions and initiatives and campaigns in the past, in which the industry and market has

actively participated. However, it is the market-based instruments (MBI) that offer an interesting study in terms of influencing the procurement process.

MBIs can be defined as 'instruments or regulations that encourage behaviour through market signals rather than through explicit directives'[39]. Thus, inter alia, they seek to seek to " address the market failure of environmental externalities by facilitating the establishment of a proxy market for the use of environmental services".[40] The link between SPP and MBI is of great importance as both of these lead to creation of a market for sustainable products and consequently promote an environment of sustainable production and consumption.

Eco-mark

It was found in our consultations that one of the factors responsible for companies' reluctance to opt for energy efficient or environment friendly products was their lack of knowledge with respect to environment friendliness of the product. In such scenario readily available and accessible information, such as in the form of labelling, helps to remove this barrier.

In 1991, an ecol-labelling scheme by the name of 'Eco Mark' was launched by the government to provide for easy and ready identification of products that are of environment friendly nature. Accordingly, any product 'made, used or disposed of in a way that significantly reduces the harm it would otherwise cause the environment could be considered as Environment-Friendly Product'. [41] The eco mark adopted a lifetime approach, beginning from raw material till the disposal.

This scheme could have been very useful as an enabling market based instrument to identify environment friendly goods, especially where companies want to procure such products but do not want to spend time or resources in investigating how environment friendly they are. However, the eco-mark scheme was not quite a success and till date has had a fairly low uptake

[39] Stavins, R. N. 2000, Experience with market based environmental policy instruments, Resources for the Future Discussion Paper 0009, January 2000. p. 1 cited in Market-based tools for environmental management, Proceedings of the 6th annual AARES national symposium 2003.
[40] Definition by European Environment Agency based on UNEP. URL http://glossary.eea.europa.eu/EEAGlossary/M/market-based_instrument
[41] http://envfor.nic.in/cpcb/ecomark/scheme.html

from both the manufacturers as well as buyers. Amongst other things, lack of a reasonable incentive and a foreseeable profit in adopting this scheme by the companies has been an important factor responsible for a poor uptake of Eco-mark.[42]

Energy Star Rating

With the passing of Energy Conservation Act in 2001, energy efficiency became a distinct area of sustainability in the Indian policy regime. This was followed by establishment of a statutory body, Bureau of Energy Efficiency to assist in developing policies and strategies with a thrust on self-regulation and market principles. In 2006, the National Energy labelling programme to give star ratings based on energy efficiency of electrical appliances was launched. Figure 4.1

Box 4.1: List of items with Energy Star rating

- Refrigerators
- Room air conditioner
- Electric motors up to 100 KW
- Electric light sources, control gears and luminaries including tubular fluorescent lamps, inductive type ballasts, electronic ballasts, luminaries and compact fluorescent lamps
- Agricultural pump sets
- Distribution Transformers

To begin with, the energy star-rating scheme was launched for frost-free (no-frost) refrigerator, tubular fluorescent lamps, room air conditioners, direct cool refrigerator, and distribution transformer. Gradually, in the subsequent phases, the scheme has been in the process of extending it to motors, agricultural pump sets etc. covering a wider range of industrial goods as well. (Box 4.1)

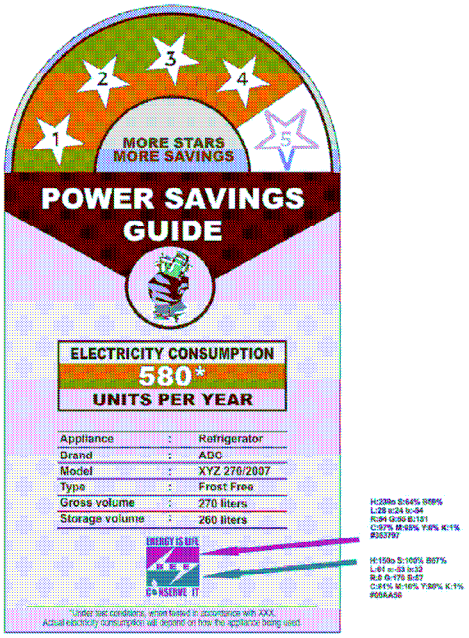
As mentioned in the discussion above, it was emphasised by the companies during our consultations that even where they are interested in procuring energy efficient products, lack of information about the energy efficiency of a given item acts as a disincentive. In such a scenario, they were appreciative of BEE's energy star rating and suggested this as a possible positive step in facilitating identification of energy efficient products that can be procured.

Despite being voluntary in nature, the star rating is gaining popularity as it has avoided a top down approach and is clearly a market based instrument that succeeds in offering an incentive to the both buyers as well as sellers of products bearing this mark. While it increases information for consumers it helps the producers to advertise accordingly and thus creates a market for energy efficient products. It is expected that this will lead to energy savings of about 18 billion units annually from 2011-12

[42] See CUTS International (2006) Why was India's Ecomark Scheme Unsuccessful? Available at http://www.cuts-citee.org/PDF/060909IES.pdf

onwards.[43] Such an incentive based mechanism has a great potential for acting as an enabling tool for internalising energy efficiency within the procurement process.

Fig. 4.1 Sample Energy Star Labelling



Green Building Practices

Green building practices refers to the practice of bringing efficiency within the way in which buildings use resources such as energy, water and materials. Such efficient use can be a result of better planning, design, choice of site, construction, operation, maintenance, and removal throughout the complete building life cycle and can be instrumental in reducing building impacts on human health, environment and overall carbon foot print of the organization functioning out of that building.

Therefore, green buildings are built with the objective of meeting one or more of the following:

- Reduced Operating Costs
- Improved Public and Occupant health

[43] Ministry of Power notification. Available at URL http://powermin.nic.in/acts_notification/energy_conservation_act/EC_Standard.htm

- Reduced Environmental Impact[44]

Reduction of operating costs is key as until and unless a practice is sustainable economically, there is no incentive to adopt or switch to such practices. Energy efficiency, therefore, is a rational choice as not only does it make the practitioners more environmentally responsible and at a reduced threat from environmental pollutants but also brings down their energy expenditure by following sustainable consumption. However, there are several impediments to adoption of energy efficiency in building practices such as builders incurring initial cost but not enjoying the benefits, hence the first cost bias exists very strongly. There is also a lack of availability of efficient products, equipment testing and certification and energy expertise.[45]

However, in recent times, there has been a realisation of the potential of practising sustainable building practices and its role in reducing the operational costs. Rating systems to facilitate and support an objective evaluation and differentiation of buildings based on their energy efficiency have also come up. The potential of energy savings in residential and commercial buildings is stated below [46]–

- 30% savings in energy could come through energy efficient residential building
  - In this 15% savings could come from proper orientation, fenestration, shading, roof and wall insulation
  - 5% savings could come from energy efficient internal lighting
  - 10% savings could come from the use of solar eater heating
- 40% savings in energy could come through energy efficient commercial buildings
  - In this 10% energy savings could come from proper orientation, fenestration, shading, roof and wall insulation, efficient glazing
  - 15% energy savings could take place from energy efficient internal lighting

[44] Louisiana CleanTech Network (2008) URL http://www.lacleantech.net/green_building.htm
[45] Mathur, Ajay (2006) Current Status of Energy Efficiency Building Codes in India. Presentation at IEA Workshop October 4-5 2006 New Delhi
[46] Mili Majumdar (2008) at Indo-German Symposium on Energy Efficiency, May 2008, New Delhi

- 15% energy savings could take place through energy efficient space conditioning

In order to incorporate sustainability in the buildings in India through energy efficiency several rating systems before the ECBC were started in Indiaincluding LEED, GRIHA, Ecohousing Programme. The internationally accepted rating system of the United States Green Building Council (US-GBC) called **Leadership in Energy and Environmental Design** (LEED) was introduced in India in the year 2001. It is a third-party certification programme that has a defined rating system for new buildings, existing buildings, commercial interiors, core and shells, schools, retail, homes etc.

Most international standards are designed keeping in mind the conditions and practices of developing countries, which are remarkably different from India. Most International standards are developed on the premise of air conditioning of buildings and climatic conditions there. [47]Indian buildings have been traditionally different and therefore, need a rating system that is in line with their climatic conditions and style. TERI has developed a rating system called TERI– **Green Rating for Integrated Habitat Assessment** (GRIHA) that acts as "a tool to evaluate the 'greenness' of Indian buildings. The prevailing qualitative and quantitative assessment criteria to rate new and existing buildings – commercial, institutional, or residential – take into consideration current building practices and the varied climate of India". [48] It adopts a holistic perspective by taking into account the entire life of a building and providing standards accordingly.

Energy Conservation Building Code

The role of voluntary instruments in promoting sustainable practices is of great importance and potential. One such instrument is the Energy conservation building code released by the BEE, ministry of Power.

[47] India: The Way Towards Energy and resource efficient buildings. Building Energy Efficiency Technical Papers. Asia Buisness Council. URL http://www.asiabusinesscouncil.org/docs/BEE/papers/BEE_Policy_India.pdf

[48] "Training programme on green buildings: Sustainable design, energy efficiency and best practices", 21–23 December 2005, TERI New Delhi

Prior to 2007, there was National Building Code governing building practices in India. BEE has identified ten thrust areas including energy efficiency in buildings and establishments. In 2007, the Bureau of Energy Efficiency launched a new code with focus on making the buildings more energy efficient. Speaking at a programme on Energy Conservation Day, the power minister observed, "shortages of 15,000 to 16,000 MW could be overcome by practicing conservation and efficiency". [49] On a similar premise, the Energy Conservation Building Code was launched by the BEE in March 2007 estimating a 25% to 40% reduction of energy use for new buildings. Figure 4.2

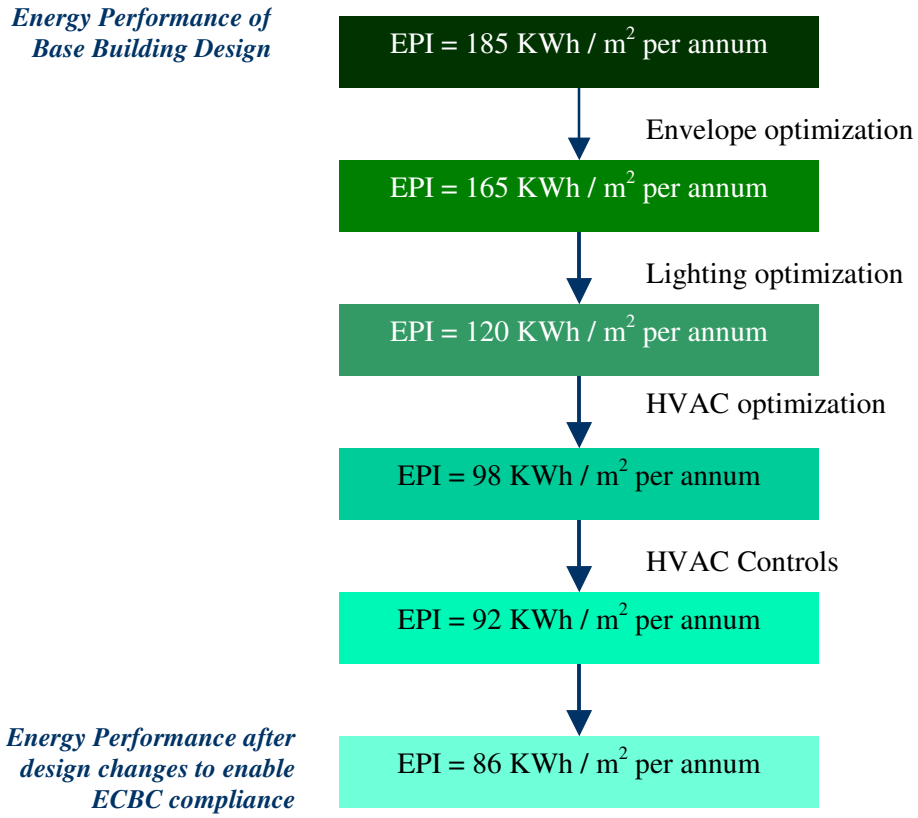
The ECB code is a voluntary code laying down certain voluntary specifications and minimum energy performance standards for commercial buildings. Just like it is not very practical to have blanket standards for things like sustainable procurement, energy efficient building standards also have to give due consideration to the nature, purpose and location of buildings. Therefore, the ECBC prescribes standards for commercial buildings in the five climatic zones, *viz*., hot-dry, warm-humid, composite, temperate and cold with the objective of providing minimum requirements for the energy-efficient design and construction of buildings. The code has detailed specifications under the following categories

- Envelope
- Heating, ventilation and air conditioning
- Service hot water and pumping
- Lighting
- Electrical power

Besides compliance standards under each of these heads, other information pertaining to whole building performance method, default values for typical constructions, building envelope trade-off method have been provided within the code. At the moment there are about 300 ECBC compliant buildings across India. Introduced as mandatory, the code is scheduled to be made mandatory under the Energy Conservation Act 2001 for the buildings having connected load of 500 kw or more.

[49] News item n the Hindu, Date:15/12/2007 URL: http://www.thehindu.com/2007/12/15/stories/2007121556611600.htm

Figure 4.2: Example of reduction in energy demand in a new ECBC compliant building



Source: Ministry of Environment & Forests and Ministry of Power (2007) Addressing Energy Security & Climate Change. http://envfor.nic.in/divisions/ccd/Addressing_CC_09-10-07.pdf

One of the biggest impediments expected in making this code voluntary is the lack of capacity. If the code were to go mandatory, it would require a large number of skilled professionals for certification and monitoring all over the country. The current capacity is grossly inadequate and is sufficient to meet only a limited application of the code. There is a lack of both resource as well as human capacity. Many building materials required to make sustainable buildings are either not available or available at very high prices. Constructing green buildings is a costly affair and calls for huge investments, which acts as a deterrent from wide adoption of the code. Even though the long term cost of an ECBC compliant building is substantially reduced than conventional designs, there is reluctance due to the initial investment that has to be put in.

Moreover, the ECBC has to be made mandatory through notifications by state governments, who lack capacity with respect to building sciences and to implement it. States have not even started taking steps towards voluntarily adopting the standards prescribed in the code. In such a scenario, where there is neither the capacity nor any preliminary and preparatory steps have yet been built upon, making the code mandatory would pave way for another set of problems related to faulty implementation, corruption, rent seeking and poor monitoring.

A mandatory code will be successful only if there is a fair standardisation of the code all across the states. Therefore, even though a deadline was set to make the code mandatory, there is little likelihood of the same in the near future. In fact, given the current situation, it is better to keep the code voluntary and not impose it on states till they attain the requisite capacity for the same. In order to internalise sustainability in the building process, a cost benefit analysis should be made and clearly reflect the benefits of going for ECBC compliant buildings. Import related barrier is also an important issue in ensuring energy efficiency in infrastructure. Therefore, even though there may be guidelines, rules, codes, unless the atmosphere is conducive to its adoption and availing benefits therefrom, there can be little possibility in terms of a successful integration of sustainable practices in a given process. Thus, the need for a strong business model.

Although we did not get the ECBC questionnaire filled by the respondents as planned under the normal course of the project, through our consultations with the experts on ECBC, the impression gauged was that since ECBC is a fairly new initiative and not even freely available in the market, there is a possibility that not many companies would be aware of the code as such. However, this does not rule out buildings being ECBC compliant as all the Ministry of Environment and Forest buildings, LEED compliant, GRIHA rated buildings etc. will also be in conformity with the standards laid down in the ECBC. With respect to energy conservation building code as a step towards internalising energy efficiency within the procurement process and sustainable consumption, the Indian market is still adapting to the energy conservation building code and is awaiting a stronger business model to provide enough incentives to opt for ECBC compliant buildings.

Box 4.2 Energy Efficiency through green buildings in India

Estimates by BEE shows that owing to the economic growth, there would be a 70% increase in the buildings in IT sector, 15% for financial service sector, 15% for other sectors. With the objective of creating sustainability through energy efficient buildings, policies have been designed :

- Buildings require environmental clearance from MOEF and State Environment Impact Assessment Authority clearance has been made mandatory.
- MNRE has tried to mainstream energy efficient building through solar building program and also through the launch of national green building rating system.
- Through the launching of the ECBC 2007 appliance labelling has been launched and ministry of power is empowered to take forward this initiative.

Energy Conservation Building Code

ECBC covers new commercial buildings and focuses on building envelope, lighting, HVAC, Solar Water Heating and Pumping. Energy savings could increase by 50% through the implementation of ECBC. A climate sensitive (sensitive to sun and climate) implementation of ECBC could increase the initial cost by 10 – 15%. However the payback could be achieved in 5 – 7 years. However implementation and internalization of sustainability in the buildings through energy efficiency in India often gets hindered due to the asymmetry in the sharing of the costs and benefits in the building sector. This asymmetry has to be reduced through public awareness campaign, incentives for consumers for adopting efficient lighting, solar water heater, performance guarantee contracting through ESCOs. Under the ECBC, technical reference material has been developed. It consists of tip sheets on envelope design, lighting, HVAC. Also a curriculum development by BEE has taken place under which 20 architectural, engineering colleges have commited to offer technical courses on energy efficient building design. An ECBC programme committee has been formed to implement ECBC compliant buildings through implementation of demonstration projects. However there is a need for convergence in these policies to bring in sustainability in the buildings in India. This could be achieved through – a) Performance contracting through ESCOs, b) Larger monitoring, c) Innovative financial instruments.

Initiatives by State Governments

State governments have also taken initiatives to incorporate sustainability into the buildings. For instance, haryana state government has been promoting the use of CFLs in buildings and through the use of energy efficient buildings. The government of Himachal Pradesh has been pushing for the use of solar passive techniques in public and government buildings. Thane Municipal Corporation has been promoting the use of solar water heater in the buildings, followed by the governments of West Bengal, Karnataka, and Rajasthan, which has been promoting the application of renewable energy.

West Bengal has taken a lead in constructing a solar housing complex which has a grid interactive photovoltaic system with a system of net metering in all buildings of the complex. The environmental building initiative of Hyderabad is carrying out extensive awareness generation programme on the concept of sustainability through green buildings. The Hyderabad Urban Development Authority (HUDA) has initiated compulsory minimum standards, voluntary green building standard and economic appraisal methodologies for introducing sustainability in the buildings. Incentives for adoption of voluntary guidelines, compulsory standards have also been introduced by HUDA along with web based tool and education material for building and enhancing capacities of HUDA staffs.

Source: Based on consultation with Saurabh Kumar, Sanjay Seth, BEE and Mili Majumdar, TERI
Presentations by Seth and Majumdar at Indo-German Symposium on Energy Efficiency, May 2008, New Delhi

Social

Small-scale industries

In 2007, the Government of India (Allocation of Business) Rules, 1961 was amended and after merging the ministries on agro and rural industries and small scale industries, a new ministry was set up called, "Ministry of Micro, Small And Medium Enterprises (*Sukshma Laghu aur Madhyam Udyam Mantralaya*)".

In 2006, a Micro, Small and Medium Enterprises Development Act was passed to 'provide for facilitating the promotion and development and enhancing the competitiveness of micro, small and medium enterprises'. The Act suggests several measures that can be adopted to achieve the objectives mentioned therein.

Procurement preference policy has been recognized as one of the measures for promotion, development and enhancement of competitiveness of these small-scale industries. Section 11 of the Act provides for preference policies in respect of procurement of goods and services that have been produced and provided, as the case may be, by micro and small enterprises. These measures for promotion and development can be taken by both the Central as well as state governments through a notification or an order. The Central Government has also reserved some items for purchase from registered Small Scale Industrial Units. *See* Annex V

Domestic and village industries

As per Rule 144 of the General Finance Rules, the Central Government has reserved all items of hand spun and hand-woven textiles (*khadi* goods) for exclusive purchase from Khadi Village Industries Commission (KVIC). 'It has also reserved all items of handloom textiles required by Central Government departments for exclusive purchase from KVIC and/or the notified handloom units of ACASH (Association of Corporations and Apex Societies of Handlooms)'[50].

Although besides these reservations, the Rules do not provide for preference to domestic industries as such, there are departments and companies that give preference to domestic industries as a

[50] Rule 144 General Finance Rules 2005

matter of practice and policy for procurement. For example, North East Frontier Railways Store Department explicitly lays down in its purchase policy that in their purchases, they will give first preference to 'goods manufactured in India out of Indian raw materials', if the quality and delivery terms are fine. [51] Other schemes like employing the local people and displaced population are also included within the project management. Procurement of services, in particular becomes more sustainable where the local units assign minimum wages to the unskilled, semi skilled and skilled labour according to the circulars of the state governments.

Governance

Most of the governance initiatives and public reforms processes have their bases in command and control. These C&C instruments are mandatory and its adoption is not subject to internalisation by the companies. These have to be adhered to irrespective of the incentives it offers to its subjects.

Transparency & Accountability

Past few years have witnessed an increased and active focus on asserting the right to transparency and accountability in governance in India. A rigorous civil society movement and a subsequent legislation towards making the governance system transparent is based on two principles – of state's obligation to disclose and the citizens' right to informed choices. The Right to Information Act has been widely accepted as one of the most instrumental pieces of legislation embodying good governance in recent times.

E-procurement

Vide Ministry of Finance Notification, 8(5)/E.II (A)/2006, dated January 10th, 2007 the government asked the Ministries/ Departments to develop an advanced government wide IT enabled system for all aspects of government procurement, including setting up of an e-Government Procurement (e-GP) portal for services such as registration of vendors, accessing

[51] The order of preference will be as – (1) Articles produced in India out of indigenous raw material; (2) Articles produced in India out of imported raw material; (3) Articles imported but held in stock in India; (4) Imports. *Source* Purchase Policy of North East Frontier Railways. Available at URL http://www.nfr.railnet.gov.in/store/read/ch6.htm

details of procurement made, tenders awarded, tenders advertised etc. In the meanwhile, creating an environment conducive for adoption of a full-fledged e-procurement system is called for. The directorate also proposed a phased switching over to e-procurement by placing orders through the website of DGS&D for all the goods under the rate contract (RC) concluded by DGSD.

Both the governance initiatives mentioned above are intended towards increasing transparency and accountability in overall governance procedure including public procurement. It must be noted that transparency is an important tool in making the public procurement process more efficient and responsible. There is already a directional shift towards making the whole process transparent while remaining within the same institutional framework, i.e. of Ministry of commerce and DGSD and procuring departments. Good governance principles can also be used and developed in terms of energy efficient procurement choices by government department and companies.

Linkages with energy efficiency and public procurement

Given that the external policy for SPP as of now is driven by market and voluntary instruments, it is observed that sustainability choices in public procurement in India in many instances are guided by transaction costs. Keeping a low transaction cost is always high on companies' priority and this emerged clearly and repeatedly during the course of our consultations with different stakeholders. Companies at times are open to making changes to their existing practices, make a shift towards sustainable practices, reduce their energy expenditure but with a proviso that this does not lead to additional transaction cost. These transaction costs are of three kinds, first, search and information costs; second, bargaining and decision costs; and third, monitoring and enforcement costs. (*See* Box 4.3). There are various policies, schemes, initiatives launched by the government but companies pick and choose and adopt those practices which offer them adequate incentives, whether direct or indirect.

Command and control instruments in the form of laws and regulations may thus be an important tool of governance, and any successful attempt at improving sustainability of a process is to a large extent dependent on how successfully the concerned agency internalises it within its own process. As can be seen from the

initiatives discussed above, MoEF's eco mark *inter alia* could not be as successful as aimed because of its considerable dependence on political support[52] and the opposition from certain sections of business community. It failed to project itself as a scheme that could benefit the buyers and suppliers. This takes us back to the observation that best practices have to be internalised and this is a process that is best developed by incentivising sustainability in business practices. Energy efficiency in particular is one such area where procuring agencies are direct beneficiaries.

Box 4.3: Transaction Cost Components

- **Search and Information Costs**
  - This is the cost of finding and searching who are the suppliers that can supply the items to be procured. Information costs involve costs incurred in gathering information about the suppliers who are selected for supplying the items. The nature and extent of this cost during procurement would depend on the medium by which the search and information gathering is done.
- **Bargaining and Decision Costs**
  - Once the supplier firms are selected and information gathering about the firms have been done, the procurers incurs a cost while bargaining with the suppliers and in finally selecting one supplier from the number of suppliers initially selected.
- **Monitoring and Enforcement Costs**

  In order to procure quality materials from suppliers, monitoring costs are incurred by the companies to monitor the quality of supply from the suppliers. In case of deviations from the suppliers in terms of quality, time and delivery enforcement costs are incurred by the procuring companies to maintain the quality standards of the materials procured.

Source: ANDERSON E. [1988], " Transaction Costs as Determinants of Opportunism in Integrated and Independent Sales Forces ", Journal of Economic Behavior and Organization, 9(2), p.247-70.

A look at the analysis in this and the previous chapters would highlight the fact that Ministry of Commerce & Industry, through its different departments and directorates, is key in influencing the public procurement process in India. Different elements within procurement such as social sustainability and transparency are initiated and led by the commerce ministry. In the past it has given directives with respect to ensuring quality of items being procured. Vide a circular dated 4th May 2000 it was

[52] For a discussion on factors hindering Eco-Mark's success, *see* http://www.cuts-citee.org/PDF/060909IES.pdf

declared that a DGSD committee constituted under the chairmanship of ADG (QA) had identified 16 items, which had to be procured with ISI marking only. Under another Circular of 2004, it was enjoined upon the DGS&D to buy ISI marked goods only. A similar order in case of energy efficient products or energy star products could go a long way in influencing energy efficient procurement choices through command and control instruments. Such directives would be rightly placed under the DGSD under Ministry of Commerce, as it is already the coordinating and responsible agency for procurement in the government.

With respect to the scope of the project, *that is*, focus on energy efficiency in public procurement, energy star rating led by BEE has immense potential as a market based instrument. Although, not many companies were either aware or making use of the star rating as an evaluation criteria in their procurement, those who were indeed aware of the scheme were hopeful that in future, when more products, especially industrial goods, get these kinds of ratings, it would become easier to make informed energy efficient procurement choices.

Chapter V: Concluding remarks

This study sought to provide insights into the practical workings of the procurement business in India across public sector undertakings, government departments and a few private sector companies. The insights provided herein would help in understanding the current scale and quality of procurement and whether energy efficiency is being used as a measure within the public procurement process in India. The study also sought to identify a range of institutional, structural, policy and market factors that impacted firm level decision-making on this aspect of procurement. The overall objective was to study the current scenario of procurement within specific sectors and the scope and feasibility of adopting energy efficiency as a measure within the public procurement system. It is however important to add a caveat, that the conclusion drawn remains preliminary and that it was to be confirmed and validated through the second round of consultations.

Comment on Public Procurement framework in India

The first task as specified under the terms of reference was to gain an insight into the typical policies, practices and processes through which public procurement is organized and executed in India. In the study it was found that there is no specific legal instrument that solely addresses public procurement in India. However, there are several institutions dealing with public procurement and some legal and policy instruments that directly or indirectly govern the public procurement framework in India.

The Directorate General of Supplies and Disposal (DGS&D) under the Ministry of Commerce and the public works department (PWD) of the respective states serve as the nodal agencies in terms of the quantum of procurement that they are involved in terms of laying down the purchase policy and procedure to be followed in the all the agencies and departments of the Government of India. The DGSD guidelines or rules are largely limited to specifying certain principles of financial propriety. As part of financial management, procurement of goods and services falls under the ambit of Ministry of Finance as

well, whereby under the General Finance Rules 2005 and Delegation of Financial Powers Rules of 1978, it lays down certain generic guiding principles, which are to be adopted by the procuring agencies. Other than the DGSD and MoF, another institution that has a key role in influencing procurement policies and practices of companies and departments of the government is the Central Vigilance Commission (CVC). The CVC is the apex vigilance institution working towards a corruption free public service and in order to maintain such standards, it lays down guidelines on tenders, procurement of works, goods and services.

Based on the abovementioned rules and guidelines pertaining to procurement and delegation financial power rules, companies have their own procurement manuals which define the scope, powers of officials, checks and balances, and different criteria to be followed at different stages of procurement. Generally speaking every company has its own structure and procedure of procurement; however the procedure is largely common except for some variations specific to the industry, goods, and internal organizational structure. The first round of stakeholder survey was undertaken to gauge the interests and concerns of firms and government departments with reference to their procurement process and to assess the feasibility of introducing SPP at the firm level within the Indian context. Based on our first six months of consultations, details about the kinds of procurement, structure and procedure have been discussed in Chapter II.

Consultations with the companies suggested that the criteria followed by them while evaluating their bid are fairly clear and generally governed by three key factors – technical requirements/ performance, cost, and timely delivery. All the companies, whether public or private irrespective of their nature of activities, whether large manufacturing, energy, or service industry, rate technical performance very high and ensure that the items procured by them are able to meet the technical parameters required and time schedules. Cost, both at the time of purchase and over the life term of the product procured is instrumental in making a procurement decision. It was found that in most of the companies consulted that although the former was considered more regularly, in certain circumstances, the latter also played a determining role. However, in companies like BHEL and IOCL it observed that energy efficiency is used as a general criterion in their procurement system. Environmental and social criteria are also a part of procurement system, albeit not always and mostly dealt with in an informal and ad hoc manner.

Policy that emerges in a particular country is a reflection of the policy-making environment of that country. And the responses to that policy depend very much on the culture of companies involved. In order to have SPP in place, external policies are not sufficient and the decisions and initiatives have to be internalised at the organizational level. The extent to which an external policy or initiative can influence a company's decision is at the end dependent on the institutional design and culture of the concerned respective organization along with a variety of external influences which impact on the procurement choices of the company.

SPP at a company level: Awareness, interests and concerns

Beside studying the typical policies, practices and processes of public procurement in India, our first phase of consultations and background research was also directed towards introducing SPP and discussing its feasibility in the Indian context and therefore, assessing awareness, interests and concerns related to SPP. Our consultations suggested that even though awareness related to "sustainable public procurement" as a term its usage was limited within the procuring agencies, (*see* chapter III) they were indeed practising sustainability in one form or the other. They were aware of issues involved in practising business, including procurement of goods and services, in a manner that is environmentally and socially sustainable. Of all our stakeholders, BEE was the most aware of the need to adopt energy efficiency as a measure within the procurement process, its feasibility and issues involved in implementing it in the Indian context. Not many of our stakeholders were aware of energy efficient options with respect to the items they normally procure other than those in which BEE has been active in promoting; like lighting equipments etc. There was greater awareness where the manufacturing units were involved in procurement rather than leaving it to a centralized material or purchase department, *for example,* NTPC and BHEL.

Through the consultations, it emerged that adoption of energy efficiency as a measure within the procurement process was not self consciously practised as a matter of policy aimed towards SPP, but actions influenced and driven by several other internal and external factors. These factors have been discussed in detail in chapters III and IV. These findings were to be validated and discussed with our stakeholders in our second round of consultations. The study also suggests that understanding and

practice of SPP is not uniform and varies across industry groups as size of energy budgets affects perceptions of importance of energy efficiency in procurement choices. For instance companies with large energy component such as NTPC, IOCL, BHEL are more inclined towards taking energy efficient measures in procurement.

Internalising energy efficiency within the procurement process of any institution depends on a range of internal and external factors. While some of these are clearly in the nature of directions or tools of procurement or energy efficiency, others are more indirect in while influencing procurement decisions so as to facilitate adoption of energy efficiency measures therein. These influences could be both positive as well as negative.

Although it is not possible to draw water tight distinctions between internal and external factors as both the kinds are interdependent on each other and are intertwined in terms of their existence and impact. Amongst the external factors, government policy is indeed one of the most instrumental ones, as has been discussed above and in chapter II. Other external factors are mostly market related factors such as supply choices, labelling, energy prices, etc. The availability of supply choices was identified as an important aspect, by all sections of our stakeholders. The degree and manner in which it leads to adopting energy efficiency in procurement varies from company to company. While most of our stakeholders mentioned that they had not faced any lack of suppliers for their specifications, they admitted that specifications are designed keeping in mind the supply options available in the market. These were mostly companies, which fall under the type II category, which have a large energy component but the company is not too big in terms of their annual turnover. (*See* chapter III).

Challenges for adoption of SPP

Public procurement in India is fairly decentralized in effect as each state and every Public Sector Unit can have its own set of procurement agencies. Although decentralization is not per se negative for procurement, one of its drawbacks has been that it has been impossible to develop a centralized database of the nature and scope of procurement carried out both at the central and state level. The lack of a tracking service has made it difficult to respond to the functioning gaps within the current procurement set up and identify mechanisms to respond to such

gaps. It also makes a harmonized policy formulation in incorporating energy efficiency standards in procurement difficult.

Regulatory impediments

With respect to procurement, there is multiplicity of institutions with roles not clearly defined in terms of their regulatory authority over public procurement. This not only results in overlapping functions and jurisdictions but also leads to a negative influence on procurement itself as the institutional dynamics and its overall value determines its role in governing the public procurement system in India. A clear example of this can be illustrated in terms of the application of General Finance Rules and CVC guidelines. GFRs are considered to be the main rules governing public procurement in India yet the flexibilities that it provides vis-à-vis making procurement more sustainable is rarely utilized due to concomitant application of another instrument, i.e. the CVC guidelines. The stringent guidelines issued by the CVC have had a negative impact on the managers in terms of curtailing their operational freedom to explore the flexibility provided within the GFR to go for "best value for money" and opt for energy efficient goods. Although CVC guidelines are not statutory in nature, they are a stronger instrument of command and control with companies and departments adhering to them. This adherence emanates from the nature of CVC as an institution that is of a statutory body to oversee the functioning of government ministries and departments and ensures corruption free functioning. The fear of punitive sanctions is in itself sufficient to create a negative incentive for procurement officers to adopt any practices that deviate from the CVC guidelines.

Apart from the audit requirements, many times complying with other government directives such as preferences and reservations may cause an impediment to a successful implementation of energy efficiency within the procurement process. Certain criteria with regard to preference in procurement may come in direct conflict with energy efficiency criteria, which often requires sophisticated and high investments. (Small-scale industries may not have such capacity at times). Thus while some ongoing public sector reforms may accelerate introducing SPP, some may actually act as a deterrent (preference policies, strict accountability etc. which restricts flexibility in making procurement decisions).

Nature and structure of industry and company

Our research and consultations also suggested that even where enabling, government policies are vital, they by themselves are not sufficient in enabling the practice of SPP. Internal factors such as nature of the industry, nature and quantum of products to be procured, institutional culture and internal company specific policies are crucial in determining whether or not energy efficiency can be a factor to be considered in public procurement. The level of decentralization, decision-making structure, approaches towards environmental and social responsibility etc. are all influential in internalising energy efficiency or any other kind of sustainability within the procurement process. While procurement based on energy efficiency may be conducive in certain kinds of goods, it may not be feasible for all the goods. Similarly, it also depends upon the scale of procurement and nature of industry in general.

Supply choices

Supply choices are very important in procuring energy efficient products. While most of our stakeholders, including NTPC and IFFCO mentioned that they had not faced a lack of suppliers for their specifications, they admitted that specifications are designed keeping in mind the supply options available in the market. The capacity of suppliers to provide energy efficient options in viable costs is also a challenge as it requires a huge financial as well as technical capacity on the part of the manufacturing agency.

Another way in which supply choice may get affected is through market instruments. Although, this needed to be further corroborated as planned, in our second round of consultations, it was observed that market based instruments have an important role to play in creating a market for adopting sustainability criteria like energy efficiency within the procurement process and that they were mutually supportive and could benefit from such a scenario. Market based instruments such as the energy star rating by BEE emerged as a good option to explore in this regard. However, BEE found it to be a costly option in the short term and therefore is moving gradually with the energy star rating at its planned pace, and is taking lead in pushing energy efficiency through *inter alia*, procurement by developing energy calculators and setting up of inter ministerial taskforce etc.

As mentioned in chapter I, the linkages between SPP and market for energy efficient products with the financing institutions was something planned for a later stage in the project. However, our research and consultations suggest that one of the challenges in financing and promoting energy efficiency stems from principal-agent (PA) problems which refer to the potential difficulties that arise when two parties engaged in a contract have different goals and different levels of information (IEA 2007[53]). In other words, in the case of energy efficiency investments, sometimes the procurer, beneficiary and the supplier are all different agents posing serious challenges to the promotion and financing energy efficiency. Moreover, considering that public procurement in India is still driven by considerations like lowering transaction costs, reducing misuse, meeting regulatory and audit requirements, energy efficiency is difficult to integrate into public procurement.

Procurers' Capacity

Although suppliers' capacity to provide energy efficient options for procurement is crucial, procurers' capacity plays a very important role in incorporating energy efficiency within their process. Our stakeholders expressed their concern with respect to capacity and resources required in determining which product is more energy efficient than the others while making procurement decisions. Enabling tools, whether in the form of ratings, calculators, codes, guiding documents, can help the procurers meet this capacity deficit. Awareness and access to these tools are instrumental in bringing a change in existing unsustainable practices. Therefore, the level of awareness, availability of options, and even feasibility of introducing sustainability measures varies from company to company and sector. For example, NTPC, which procures large amounts of coal, has to procure high ash content coal, which is less energy efficient than high-grade coal, due to the simple reason that Indian coal is of high ash content. Therefore, even if the company wants to introduce energy efficiency measures through procurement, they can do so only to an extent as there are extraneous circumstances with respect to the same. Similarly, in oil companies, because of availability of energy efficient options and suppliers' capacity, they appear to be better equipped and better positioned to make energy efficient procurement choices.

[53] Mind the gap: Quantifying the principal-agent problems in energy efficiency

Emerging trends in procurement

Procurement choices and relations with suppliers are linked very much to the nature of the transaction costs involved in the goods and services being procured. An emerging trend in public procurement has been with respect to outsourcing of procurement. While experience in other countries may show outsourcing as a more sustainable option, in the Indian context, it could prove otherwise, considering the reasons driving such a move. In view of the distancing (both physically and structurally) from the process once the procurement is outsourced, there is a high probability of lack of commitment to influence the procurement process or to even bring it in conformity with the internal policies of the entity. This consequently, could lead to obstacles in ensuring that energy efficiency or any environmental criterion is adopted within the procurement process.

Government polices and SPP: Enabling or Restrictive?

A favourable regulatory environment that promotes energy efficient practices provides the imperative (though in itself this may not be sufficient)[54] for the adoption of energy efficiency measures within the public procurement process. The current regulatory environment in India does not offer enough incentives for procuring agencies to make a shift towards more energy efficient products. Firstly, there are no policies to incentivize energy efficiency in procurement, secondly, there are policies and instruments, which make it difficult for public companies to deviate from normal practices and adopt energy efficiency measures as a part of procurement practices. Although, there are enabling government policies providing guidance in adopting sustainability (e.g. Energy Conservation Act and BEE notifications), there are others that create a disincentive for a successful implementation of SPP (e.g. L1 cost specified under CVC guidelines). In this regard, a system of life time costs analysis can become a part of the policy system, which serves a dual purpose – enable a push towards a sustainable path of procurement and be in conformity with CVC's least cost criterion, where the cost is viewed in terms of life time rather than immediate financial cost. Moreover, a lack of harmonisation

[54] See Table 3.1, Influences on Energy Efficient Procurement (Company-wise spread).

between different government policies creates obstacles in making energy efficient procurement choices.

Overarching Policy or Targeted Initiatives

Sustainability in public procurement is not something that can be achieved by way of an overarching or blanket policy. The value of customisation or tailoring of sector specific or even firm specific measures for enabling the adoption sustainability criteria such as energy efficiency is crucial to the long-term sustainability of such a development. Another noteworthy observation, is that companies which had environmental concern institutionalised or had a laid down environmental policy appeared better suited and relatively better prepared to change their procurement practices to SPP, substantiates this point. One of the most important points that emerged from our research and discussions was that while goals need to be articulated in policy documents (both government and company level) for the implementation of energy efficiency criteria in the public procurement process, the nuances in implementation vary from product to product and industry to industry. In order to address sector or even firm specific application of SPP, it is important to explore the cumulative impact of the internal and external factors on enabling procurement choices internalising energy efficiency factors in the choice of goods.

The adoption of energy efficiency as a measure in public procurement is a win-win situation for the companies as while it leads to a public gain by reducing energy consumption and therefore, reduced carbon footprint, it also secures private gains at the firm level. Therefore, its adoption can be justified through a lifetime cost analysis as against the least financial cost at the time of purchase. It also helps companies take advantage in terms of their environmental obligations and commitments. Although our stakeholders were in agreement with this fact, energy efficiency was not practiced in their procurement practices regularly (except a few). This was explained by the fact that given the current regulatory and company-level scenario, following energy efficiency criteria may not always be practical.

Our stakeholders recognized that while adopting energy efficiency as a measure within their procurement processes helps them become socially responsible, it is also economically advantageous in the long term. However, as a procuring agency, practicality and feasibility of the process itself was of critical

importance to our stakeholders. Therefore, the scope and extent of internalising SPP depends inter alia on the nature and structure of industry and procurements therein. The role of a government policy in this regard can play a crucial but largely complimentary role. Relevance of life time cost analysis in a future policy is instrumental. Further it has to be defined clearly and ensure that there is no multiplicity or overlap of institutional jurisdictions.

The regulatory role should be more in nature of enabling rather than command and control so as to facilitate an incentivized adoption of energy efficient measures in procurement that contributes towards a low carbon economy. How this should be done? What are the roles that different stakeholders, within and outside the government, should have? What are the enabling tools and instruments that would incentivize companies and departments to procure in an energy efficient manner? What should be their nature? These are some of the questions that emerge from our first round of consultations. While concluding it is important to reiterate that the adoption of energy efficient as a measure within the public procurement process requires a range of measures both market and non-market. It is necessary to point out that there are specific sectors and the financial strength and operating flexibility of certain companies that make them more amenable to the adoption of such measures. Thus in the first round of consultations, inputs from public sector undertakings in the oil sector like the IOC and ONGC[55] made it clear that the sector specific imperatives of functioning as an oil major required the adoption of a host of operating measures to minimise the loss of revenue from inefficient operating systems and supplier facilities. This therefore forced such firms to adopt a host of measures (including within the procurement system) with the aim of achieving minimal energy loss through energy efficiency measures. Thus a national commitment to SPP should be planned in a phased manner. This would entail the identification of certain specific sectors (like Oil and Power, Heavy electricals, etc) amenable to energy efficiency and companies with adequate operating capacity in these sectors, to be targeted in the initial phase.

In concomitance with the above, regulators like BEE have their job cut out in terms of providing for a enabling and supportive

[55] Information was procured electronically through the establishment of contact but formal consultations did not take place.

regulatory environment through measures like the adoption and marketing of sector wise good practices in procurement, providing for guidelines and templates for the calculation of energy efficiency between comparative products. At a policy level it is important the BEE plays a catalyst in enabling harmonization and policy convergence across sectors and regulatory levels (municipality, state and central) within the state machinery in order to enable measures supporting the adoption of energy efficient practices within the public procurement systems. Thus if we were to design a national plan of action the points of intervention would have to be at multiple levels and would also need to target specific (at least in the initial phase) sectors depending on their preparedness in adopting sustainable procurement processes.

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Annex I: List of stakeholders consulted

S.No	Organization	Person Details
1.	Air India, Mumbai	Mr. K.M. Unni, General Manager – Engineering Facilities Division
2.		Mr. Sam Samuel, DGM, Engineering Facilities Division (EFD)
3.		Mr. D.L. Kathekar, DGM, EFD
4.		Ms. Naja Shanker, Deputy Chief Engineer, EFD
5.	Andhra Pradesh Paper Mills Limited, Hyderabad	Mr. P.S. Rao
6.	Administrative Staff College of India, Hyderabad	Prof. Sachendra, B.V.N., Associate Professor
7.	Bharat Heavy Electrical Limited, New Delhi	Mr. V.K. Arya, General Manager, Materials
8.	Bureau of Energy Efficiency, Ministry of Power	Mr. Saurabh Kumar, Secreatry
9.		Mr. Sanjay Seth, ECBC coordinator
10.	Container Corporation of India, New Delhi	Mr. Alok Kumar, Group GM (Technical)
11.	Indian Fertilizer Cooperative, New Delhi	Mr. N.K. Verma, Sr. Manager- Process; Carbon Programme coordinator
12.		Mr. Birinder Singh Jt. General Manager (PS)
13.	Indian Institute of Materials Management, Mumbai	Mr. B.R. Jayaraman, Director General
14.	Indian Oil Corporation, New Delhi	Mr. Noorana, Manager Corporate Communication
14.	Ministry of Railways, New Delhi	Mr. A K Goyal, ED Stores
15.		Mr. Singhal, Stores
16.	National Highway Authority India, New Delhi	Dr.B.Mukhopadhay, Deputy GM, Environment
17.	National Thermal Power Corporation, NOIDA	Mr. Ashu Gupta, Deputy General Manager (Enviro)
18.		Mr. R.K. Chander, R Manager (AUD)
19.		Mr. Tushar Kumar, Manager (Envt Mgmt.)
20.	SP Jain Institute of Management, Mumbai	Prof. Jamshedji Modi, Professor (Operations/ supply chain management)
21.	Expert on Green buildings and ECBC	Mili Majumdar

Annex II: Stakeholder Profile

Bureau of Energy Efficiency

Profile

The Bureau of Energy Efficiency (BEE) was established by the Central Government following a notification in line with the provisions of the *Energy Conservation Act 2001*. According to the guidelines of the *Energy Conservation Act 2001*, the management affair of the Bureau is governed by a Governing Council comprising of at least 20 members. The number of members could not exceed 26. These members are appointed by the Government of India and belong to Ministry of Power, Ministry of Petroleum and Natural Gas, Ministry of Coal, Ministry of Non – Conventional Energy, Department of Consumer Affairs, Department of Atomic Energy, Central Electricity Authority, Central Power Research Institute, Petroleum Conservation Research Association, Central Mine Planning and Design Institute Limited, Bureau of Indian Standards, Ministry of Commerce, Indian Renewable Energy Development Agency Limited, Director General of the Bureau. BEE has been working to implement energy efficient services across various sectors of India. In order to implement that BEE has actively participated in framing policies, direction to energy conservation, efficiency measures across the country[56]. BEE has also initiated measures for monitoring energy efficiency across various sectors in the country following the mandate of the *Energy Conservation Act 2001*.

For further details, please visit - http://www.beeindia.nic.in/aboutbee/Mission%20&%20objectives.html

Environmental initiatives

BEE has been proactive in implementing the guidelines of the ECBC (Energy Conservation Building Code) which has been

[56]For further details - http://www.bee-india.nic.in/aboutbee/Mission%20&%20objectives.html

prescribed by the Central Government as par the empowerment of the section 56 (2) of the *Energy Conservation Act, 2001*. The code sets well-defined norms and standards of energy consumption in buildings across various climatic zones of India in order to improve energy efficiency of buildings. BEE has also been instrumental in introducing energy efficient BEE labelled fluroscent lamps, airconditioners, distribution transformers in the market to promote energy efficient services across various sectors in the country.

Air India

Company profile

Air India is India's national and the first flag carrier. Recently it has merged with the Indian airlines, the country's leader in the domestic sector. It is a major force in the airline industry and has been expanding its fleet and network in both the domestic as well as international frontiers.

Environmental initiatives

Air India is a member of TERI – BCSD and UN Global Compact Principles but it does not have an established laid down environmental policy. Most of its environmental initiatives have been led by the concerned officials.

For more information, please visit
http://home.airindia.in/SBCMS/Webpages/JRD.aspx?MID=196#

Andhra Pradesh Paper Mills

Company profile

The Company was incorporated on 29th June 1964 as "The Andhra Paper Mills Ltd." at Rajahmundry. The Certificate of Commencement of business was obtained on 10th July 1964. In 2001, Coastal Paper ltd. was taken over by the Company. The Production capacity of both the units put together is 1, 53,500 TPA. The estimated paper production will increase to 1,74,500 TPA after the completion of paper modernization plan in the year 2007.

Environmental initiatives

APPM, as a concern for Safety, Health & Environment has taken precautions for ensuring health and safety of its employees and the responsibility of controlling and preventing pollution. It has installed devices such as dust collector and Electrostatic Precipitators, utilized solid wastes like wood/bamboo dust as auxiliary fuel in its Coal Fired Boilers, reclaimed lime sludge in its Rotary Lime Kiln to regenerate the required burnt lime for re-use in the, preparation of cooking liquor.

It has also commissioned the biggest Diffused Aeration System in paper industry this year. This system consumes less power and gives higher reduction of BOD & COD due to better absorption efficiency of Oxygen compound when compared to conventional Surface Aeration System. In the year FY 2005-06, there has been a considerable reduction in consumption of power and chemicals. There has also been a marginal reduction in consumption of raw materials, along with arrangements for alternate source of raw materials. This decrease as well as cost-effectiveness has led to an overall lower manufacturing cost this year.

For further details, please visit www.andhrapaper.com

Bharat Heavy Electrical Limited

Company profile

BHEL is the largest engineering and manufacturing enterprise in India in the energy- related / infrastructure. BHEL was established 40 Years ago. It manufactures over 180 products under 30 major product groups and caters to core sectors of the Indian Economy viz. Power Generation and Transmission, Industry, Transportation, Telecommunication, Renewable Energy etc.

It has an installed equipment for over 90,000MW of Power generation – for utilities, captive and Industrial users and last year supplied over 2, 25,000 MVA transformer capacities and other equipment operating in Transmission and Distribution Network up to 400 kV (AC and DC and supplied motors with drive control system to power projects, petrochemicals, refineries, steel, aluminium, fertilizer, cement plants etc.

Environmental initiatives

A Health, Safety and Environmental policy has been formulated and implemented through the management systems of BHEL. The policy aims to strive to be an environmental friendly company in its Activities, Products and Services through compliance with applicable Environment legislation/Regulation, Environment Management System, promotion of activities for conservation of resources and assist and co-operate with concerned Government Agencies / Regulatory bodies engaged in environmental activities, offering BHEL'S capabilities in this field.

In the field of Non – Conventional and Renewable Energy, BHEL has successfully launched products like Wind electric generators, Solar heating systems, solar photovoltaic systems, solar lanterns and battery powered road vehicles. Technology up gradation has been done to minimize environmental impact of fossil energy products, by way of low NOx oil/gas burners, circulating fluidized bed combustion boiler etc. BHEL is a member of TERI – BCSD.

For further details, please visit www.bhel.com

Container Corporation of India

Company profile

Container Corporation of India Ltd. (CONCOR), a government of India undertaking was established in 1988 as a company that took over the existing network of 7 ICDs from the Indian Railways. It has the largest network of 57 ICDs/CFSs in India. Beside providing inland transport by rail for containers, in recent years it has expanded its operations to include management of Ports, air cargo complexes and establishing cold-chain. It organizes specialized cargo/container handling services by deployment of state-of-the-art equipment on contractual basis.

For further details, please visit
http://www.concorindia.com/index.asp

Gas Authority of India Limited

Company profile

GAIL (India) Limited, is a Natural Gas company, integrating all aspects of the Natural Gas value chain (including Exploration & Production, Processing, Transmission, Distribution and Marketing) and its related services.

Environmental initiatives

The vision of GAIL is to be the leading company in natural gas and beyond, with global focus, committed to customer care, value creation for all stakeholders and environmental responsibility. GAIL places a special emphasis on environmental issues and responsible stewardship of the environment. It puts emphasis on providing cleaner energy and infrastructure for development. It seeks to operate in an environmentally responsible manner that benefits both nature and those who depend on it, identifying and managing the environmental impacts and risks of our operations. To further this objective, it extends support to initiatives that conserve plants and animals, improve land and water use, protect forest tracts, beautify road sides and traffic islands.

For further details, please visit, www.gailonline.com

Indian Farmers Fertiliser Cooperative Limited

Company profile

Indian Farmers Fertiliser Cooperative Limited (IFFCO) began as an unique venture in which the farmers of the country through their own Co-operative Societies created this new institution to safeguard their interests.

Environmental initiatives

IFFCO has begun an Energy Saving Project (ESP) for its five Ammonia Plants located at Kalol, Phulpur-I, Phulpur-II, Aonla-I and Aonla-II at a total cost of Rs. 405 crore. The Project was bifurcated in to two parts as Phase-I and Phase-II for ease of implementation and to facilitate accrual of early benefits. Phase-I Energy Saving Schemes Project has begun. Besides, IFFCO is

installing a Carbon Di-Oxide (CO_2) Recovery (CDR) Plant of 450 MTPD capacity each at Aonla and Phulpur Units at an estimated capital cost of Rs. 120 crore to recover CO_2 from flue gases and to avoid Naphtha usage.

It has won the First as well as Second National Energy Conservation Awards from Bureau of Energy Efficiency, Ministry of Power, Government of India for the year 2006 – 07 in the Fertiliser Sector.

For further details, please visit http://www.iffco.nic.in

Indian Oil Corporation Limited

Company profile

IOCL is an Indian Public – Sector Petroleum Company. It is India's largest commercial enterprise, ranking 135th on the fortune Global 500 listing. It began operation in 1959 as Indian Oil Company ltd.

The IOCL was formed in 1964, with the merger of Indian Refineries ltd. Indian Oil and its subsidies account for a 47% share in the petroleum products markets, 40% share in refining capacity and 67% downstream sector, pipelines capacity in India. The Indian Oil Group of Companies own and operates, 10of India's 19 refineries with a combined refining capacity of 60.2 million metric tons per years. The sales turnover for the year 2007-2008 is Rs. 2, 47,479 crore and profit of Rs.6, 963 crore.

Environmental initiatives

Protection of the environment is the core commitment of its business and fully focused on "sustainable development". Because of this all operating units and installations have a comprehensive safety, health and environment management system in place. The management system and major marketing installation terminals are certified to ISO-14001 Standards. The facilities are periodically reviewed and upgraded from time to time for better performance. It is also the Active Partner of the Global Compact Programme.

All Indian Oil Refineries comply with the prescribed environmental standards and incorporate State-of-the-Art effluent technologies that further improved these standards.

These Refineries are accredited for Occupational Health and Safety Assessment Series (OHSAS -18001) and also rated under International Safety Rating System (ISRS). The Refineries provided with full- fledged effluent treatment plants consisting of physical, chemical, biological and tertiary Treatment facilities. Oilivorous-S and Oilivorous-A technologies are being used for the treatment of Oily Sludge and Acid Tar. Various measures and Ambient Air Monitoring Stations are established for control of gaseous emission and to minimize the impact on Air quality.

Some of its green initiatives are:

- Low Sulphur (0.5%) Diesel was introduced in Metros from April 1996 and Diesel with 0.05% Sulphur content introduced in 2001.
- Extra –low Sulphur (0.2%) Diesel in eco- sensitive areas.
- Unleaded Motor Sprit (petrol or Gasoline) was made available all over the country since Feb 1, 2000
- Invested Rs. 7,000 crore in green fuel projects
- R& D Centre engaged in the formulation of Eco – friendly biodegradable lube of formulations and also certified under ISO-14000:1996 for Environment Management System.
- Fully Geared to meet the target of reaching EURO-III compliance fuels by the year 2010.

For further details, please visit www.iocl.com

Ministry of Railways

Company profile

Ministry of Railways is headed by the Minister of Railways appointed by the Central Government of India assisted by two ministers of state for railways. The three ministers head the railway board that comprises of a chairman, member electrical, engineering, traffic, member of finance commission and member staffs. The board also has representatives from various zones of India through zonal general managers, executive directors, directors representing various regional railway units[57].

[57] For further details - http://www.indianrailways.gov.in/

Environmental initiatives

Over the years, Railways has taken measures to improve energy efficiency. It ranges from adoption of 3 phase locomotives (saving 15% - 18% of energy) to 3 phase EMU (saving 35% - 40% of energy). Along with this procurement of static converter of higher efficiency, power factor correction equipments for traction substations, CFL and T5 fluroscent lamps have added onto the energy efficiency promotion measures of Railways. Other than this, energy audits for work centres, application of solar energy for manned level crossing, roadside stations and use of biodiesel for traction has been some of the significant initiatives of Railways in addressing energy efficiency. The Ministry of Railways is in the process of issuing a directive of applying 3 star energy appliances for saving energy.

For further details, please visit - http://www.indianrailways.gov.in/

National Highway Authority India

Company profile

The National Highways Authority of India is a statutory company established under the National Highways Authority of India Act, 1988. It is responsible for the development, maintenance and management of National Highways. It has the mandate to implement the National Highways Development Project, which includes, India 's largest ever highways project and world-class roads with uninterrupted traffic flow.

Environmental initiatives

NHAI does not have a separate environmental policy or guideline as such. However, being a statutory organization, it is bound to follow the polices laid down by the government of India. This is mainly in the form of regular environment impact assessments, afforestation etc.

For further details, please visit, www.nhai.org

National Thermal Power Corporation

Company profile

One of the Public Sector '*Navratnas*', National Thermal Power Corporation (NTPC) Limited is the largest public sector power generating company of India. In 1975 it was established in 1975 as a government owned company, today 89.5 % shares are held by the government. Its core business is engineering, construction and operation of power generating plants. The installed capacity of NTPC is 29,144 MW through its 15 coal based (23,395 MW), 7 gas based (3,955 MW) and 4 Joint Venture Projects (1,794 MW). As on 31 Mar 2008, its share in India's total installed capacity was 19.1% and 28.50% in the total power generation during 2007-08.

Environmental initiatives

NTPC has an established environment management policy and environment practices for 'minimizing environmental impact arising out of setting up of power plants'. The "NTPC Environment Policy" and "Environment Management System" are guided by 'optimum utilisation of equipment, adoption of latest technologies and continual environment improvement' and aims at efficient utilisation of resources, and consequently minimizing waste, maximising ash utilisation and green belt for ecological balance.

All the NTPC power stations are Environmental Management System (EMS) ISO 14001 and Occupational Health and Safety Assessment System (OHSAS) 18001 certified. NTPC has developed or/ and deployed advanced / eco-friendly technologies, pollution control systems, liquid waste treatment plants & management system, sewage treatment plants & facilities, waste management systems. It has been engaged with reclamation of abandoned ash ponds, afforestation & energy plantations. The company has also constituted Environment Management Groups at project, regional and centre level to carry out specific environment related functions.

For more details refer to http://www.ntpc.co.in

Steel Authority of India Limited

Company profile

Steel Authority of India Limited (SAIL) is the leading steel-making company in India. It is a fully integrated iron and steel maker, producing both basic and special steels for domestic construction, engineering, power, railway, automotive and defence industries and for sale in export markets. It manufactures and sells a broad range of steel products, including hot and cold rolled sheets and coils, galvanised sheets, electrical sheets, structurals, railway products, plates, bars and rods, stainless steel and other alloy steels.

For further details, please visit, www.sail.co.in

Indian Institute of Materials Management

Indian Institute of Materials Management (IIMM) is a National Apex body representing professionals engaged in various aspect of materials management, including planning, sourcing, logistics and supply chain management. Its national network consists of 36 branches and 18 chapters and includes more than 5500 members drawn from the public and private sectors and is headquartered in Mumbai. The main aim of IIMM is promotion of the profession of materials management through a structured programme of training viz. Executive Development Programme, workshops, seminars, and in-house training programs, advance material management programs and research programs. The objective is to regularly respond to the training needs of procurement professionals in India with a view of professionalising the procurement workforce.

The institute is also well connected globally and is a chartered member of the International Federation of Purchasing and Supply Management (IFPSM), Atlanta (USA). It also conducts Certified Purchase Manager (CPM) and Accredited Purchasing Practitioner (APP), courses of National Association of Purchasing Management (NAPM), USA. Other skill enhancement courses undertaken by them includes the Graduate Diploma Course in Materials Management (GDMM) recognized by Govt. of India for appointment of superior posts and services under the Central Government and also accredited by IFPSM (International Federation of Purchasing and Supply Management) and the three-year Post Graduate Diploma Course in Materials

Management (PGDMM) by correspondence which is recognized by AICTE. Diploma in Logistics Management a one-year distance education program has been launched since July 2000. In the last two years it has also incorporated lectures on green procurement as part of its scheduled courses on supply chain management. For more details refer to http://www.iimm.org/about_iimm/aboutus.htm

S P Jain Institute of Management and Research

The S P Jain Institute of Management and Research (SPJIMR) is a constituent unit of the Bharatiya Vidya Bhavan, which was founded in 1938 by the then Kulpati Dr. K.M. Munshi and 53 other eminent professionals. Bharatiya Vidya Bhavan is registered under the Societies Registration Act XXI of 1860 and the Bombay Public Trust Act 1950. Bharatiya Vidya Bhavan's S.P.Jain Institute of Management & Research (SPJIMR) grew rapidly in eminence from one of the three B-schools in the country in 1981 to one of the top ten B-schools in the country by 1994-1995. SPJIMR is an autonomous management institute with entrepreneurial agility that has made it totally self-financing, personal freedom with professional accountability and corporatized culture, structure and processes

The guiding philosophy of SPJIMR is influencing practice and promoting value based growth. The institute has an enviable track record of recognizing the needs of the society, especially the under managed sectors, and responding with quick and appropriate responses. Presently, SPJIMR has to its credit five centers with multifarious activities, two-year full time postgraduate diploma (equivalent to MBA) and a few continuing executive education programmes. Sustainable/green procurement is taught as a course module within the Operational Management course of the MBA Program and has been operational for the last five years. There are plans to have a separate course on procurement as an operations major for the second year students. Currently they are in the process of developing such a module.

SPJIMR has been known for its path breaking initiatives in 1990s such as delinking from the erstwhile Mumbai University, social Projects during summer, autumn Projects, and the ADMAP (Assessment and Development of Managerial Potential) program. This pursuit was continued later with focus on influencing practice through customization, application exercise, dissertation

on projects relevant to Industry, extending ADMAP to other programs and building across sensitivity to underprivileged class of society and business ethics in traditional management areas. The current focus has been on developing an effective and symbiotic relationship between the Industry and the Institute. Development of Corporate Citizenship (DOCC), internship, industry-supported project work, and lecture series are several initiatives in operationalizing the development of such a linkage. For more information refer to http://www.spjimr.org/deans_msg.asp

Administrative Staff College of India

The Administrative Staff College of India [ASCI] is the college for practicing managers. Since it established in 1956, as a result of the enterprising collaborative initiative of the corporate world and the government, the Administrative Staff College of India (ASCI- as it is popularly branded by the participants who have passed through its portals), has been at the forefront of executive development in the country. ASCI prides itself on being the first and foremost institution for practicing managers. ASCI has synthesized managerial theory and practice to equip corporate managers, administrators, entrepreneurs and academicians to effectively respond to the ever-increasing complexity of managerial issues confronting government, industrial enterprises and non-government organizations, rather than end up as victims of outcomes.

Modelled originally on the world-renowned management institute at Henley in the United Kingdom, ASCI is the only institution in India that covers its annual operating expenditure solely from its training, consultancy and research activities without any grants or assistance from either the Central or State Governments in India or national and international organization. It runs the management development programme, postgraduate diploma in hospital management and various in house programs covering a wide range of public policy areas. The Centre for Management Studies includes the procurement operations, materials and project management and information systems area. This area provides specialized training in procurement, disbursement and financial management procedures for The World Bank aided projects, procurement reform and capacity building, project impact evaluation and reengineering and enterprise management. For more information refer to http://www.asci.org.in/about/introduction.asp

Annex III: Energy Conservation Building Code Questionnaire

Schedule No			

Contact Information of the Respondent

Country	
Company	
Address	
Name	
Division	
Title	
Telephone No.	
(extension)	
E-mail address	

Objective of the questionnaire

To assess the awareness and potential use of ECBC (Energy Conservation Building Code) on energy efficiency in order to understand the level of uptake of the code and understand issues in implementing the code

Confidentiality

Your reply to this questionnaire will be used only for the purpose of this survey and will not be used for any other purposes. In addition, no individual respondents or company name will be disclosed when making the results of this survey public. Please acknowlege that we may need to contact you if we have any queries in the process of summarizing the results.

Company Profile

1. Describe the Company's industry and products

    - Aerospace and Defence
    - Automobile and Components
    - Chemicals
    - Construction materials and other
    - Constuction Related Activities
    - Transportation
    - Energy Equipment and services
    - Metals and Mining
    - Oil, Gas and Consumable fuels
    - Paper and Forest Products
    - Pharmaceuticals
    - Utilities
    - Others

    If others, please specify.....

2. Briefly describe the Company's size and number of plant and corporate locations.

Energy Costs

3. What are the total costs of your company's energy consumption from fossil fuels and Electric power?
4. What Percentage of Your total operating costs does this represent?

Environmental Policy

5. Does your organization have an environmental policy
6. Is impact on environment a part of your company's vision or mission statement?
7. Is energy efficiency a part of your company's vision or mission statement?

8. Does the organization have a separate
    - environmental division/ department
    - officer for environmental affairs
    - environmental affairs as a part of corporate social responsibility
    - none
9. Is your organization a member of any group committed towards environment or energy efficiency?
    - Yes
    - No
10. If yes to 9, list memberships
11. Does the organization undertake construction related activities (procurements, designing/ or we write activities) on its own or outsources to consultants?
12. IF yes, which of the following influences the building procedures
    - Company's requirements
    - Company's past records and examples of construction
    - International ratings like LEED
    - TERI-GRIHA
    - National Building Code
    - Energy Conservation Building Code
    - Any other, please specify

Questions on awareness of ECBC

Q No.	*Questions and Filters*	*Coding categories and codes*	*Go to*
1.	Are you aware of the ECBC Code of the Bureau of Energy Efficiency?	Yes, to a large extent .....1 Yes, to a moderate extent .....2 Yes, to small extent .....3 Yes, to very small extent .....4 No.....5	Q. 2
2.	If Yes, then do you know the scope of application of ECBC?	Yes, to a large extent .....1 Yes, to a moderate extent .....2 Yes, to small extent .....3 Yes, to very small extent .....4 No.....5	Q. 3
3.	If Yes, do you know about the building systems for which ECBC Code applies?	Yes .....1 No.....2	Q.4
4.	**If Yes, are you aware of the exempted buildings for which ECBC Code doesnot apply?**	Yes .....1 No.....2	Q . 5
5.	If Yes, are you aware of the safety, health and environmental codes taking precedence with ECBC?	Yes .....1 No.....2	
6.	Are you aware of the reference document and standards of the ECBC 2007?	Yes .....1 No.....2	
7.	Are you aware of the compliance requirements of the ECBC Code 2007?	Yes .....1 No.....2	Q. 8
8.	If Yes, are you aware of the compliance approach of the ECBC Code 2007?	Yes .....1 No.....2	Q. 9

9.	If Yes, do you know about the prescriptive and energy budget method of the compliance approach?	Yes …….. 1 No……2	
10.	Are you aware of the administrative requirements for the implementation of the ECBC Code 2007?	Yes …….. 1 → No……2	Q.11
11.	If Yes, do you know the details of permit requirements, enforcement, interpretations, claims of exemption, approved calculation methods and rights of appeal specified by the designated authorities?	Yes to a large extent ……1 Yes to a moderate extent……2 → Yes to a small extent……. .3 No……4 Any other……5	Q.12
12.	If yes, are you aware of the building envelope, heating, ventilation and air conditioning, solar water heating system, lighting and electric power specifications of ECBC Code?	Yes to a large extent ……1 → Yes to a moderate extent……2 Yes to a small extent…… .3 No……4 Any other……5	Q. 13

QUESTION ON ADOPTION OF ECBC

B			
Q No.	*Questions and filters*	*Coding categories and codes*	*Go to*
13.	If Yes, how far the ECBC Code has been adopted in the designated kind of buildings?	Yes to a large extent ……1 → Yes to a moderate extent……2 Yes to a small extent……. .3 No……4 Any other……5	Q. 14

B			
Q No.	*Questions and filters*	*Coding categories and codes*	*Go to*
14.	If Yes, how far building envelope related requirements (fenestration, U factors, solar heat gain coefficient, air leakage, opaque construction, building envelope sealing) has been adopted?	Yes to a large extent ……1 Yes to a moderate extent……2 Yes to a small extent……3 No……4 Any other……5	→ **Q. 15**
15.	If Yes, how far the prescriptive requirements of roofs, vertical fenestration, glazing, lighting has been adopted?	Yes to a large extent ……1 Yes to a moderate extent……2 Yes to a small extent……3 No……4 Any other……5	→ **Q. 16**
16.	If Yes, how far the mandatory requirements of heating, ventilation, cooling , lighting, hot water and pumping, are being adopted?	Yes to a large extent ……1 Yes to a moderate extent……2 Yes to a small extent……3 No……4 Any other……5	→ Q. 17
17.	If No, have there been other issues that has acted as a hindrance towards adoption?	Yes……1 No……2	→ Q. 18

QUESTION ON OTHER ISSUES

18.	If Yes, what are the factors which have acted as a hindrance towards the adoption of ECBC Code 2007?	Policy related factors……1 Regulatory factors……2 Financial Factors……3 Lack of technical capacity…4 Institutional factors……5 Any other……6	→ Q. 19 → Q. 20 → Q.21 → Q.22 Q.23 → Q.24

19.	If policy related factors, then what policy related factors have acted as a hindrance towards adoption and how it has created the hindrance?	Please specify	
20.	If regulatory factors, then what regulatory factors have acted as a hindrance towards adoption and how it has created the hindrance?	Please specify	
21.	If financial factors, then what financial factors have acted as a hindrance towards adoption and how it has created the hindrance?	Please specify	
22.	If lack of technical capacity, then how it has created the hindrance?	Please specify	
23.	If institutional factors, then what institutional factors have acted as a hindrance towards adoption and how it has created the hindrance?	Please specify	
24.	If any other, then what are they and how it has created the hindrance towards adoption?		
25.	Over and above, after considering this what has been the awareness level of the concept of green building practices amongst the relevant stakeholders?	Less than 5% Less than 10% Less than 15% Less than 20% Less than 25% Over 25%	
26.	Over and above, after considering all the above issues, what has been the awareness level of the concept of green ratings, coding amongst the relevant stakeholders?	Less than 5% Less than 10% Less than 15% Less than 20% Less than 25% Over 25%	
27.			

Thank You

Interviewer's Remarks:

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Annex IV: Energy Star labelling in India

BEE Labelled Tubular Fluorescent Lamps as of April 25, 2008

S.No.	*Description*	*BEE Labelled*
Brand :	**SURYA**	
1	40 W, 6500 K Tubular Fluorescent Lamp	3 (Three) Star
2	36 W, 6500 K SLIMLITE Tubular Fluorescent Lamp	3 (Three) Star
3	36 W, 6500 K SUPER BRIGHT Tubular Fluorescent Lamp	4 (Four) Star
Brand :	**GALAXY**	
1	40 W, 6500 K Tubular Fluorescent Lamp	3 (Three) Star
2	36 W, 6500 K SLIMLITE Tubular Fluorescent Lamp	3 (Three Star
3	36 W, 6500 K SUPER BRIGHT Tubular Fluorescent Lamp	4 (Four) Star
Brand :	**OSRAM**	
1.	36 W, 6500 K Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, 4000 K, HL Tubular Fluorescent Lamp	5 (Five) Star
3.	36 W, 2700 K, HL Tubular Fluorescent Lamp	5 (Five) Star
4.	40 W, 6500 K OSRAM BASIC PLUS TFL	3 (Three) Star
5.	40 W, 6500 K, TFL	3 (Three) Star
6.	36 W, 6500K, HL TFL	
Brand :	**PHILIPS**	
1.	36 W TRULITE 6500 K Tubular Fluorescent Lamp	5 (Five) Star
2.	40 W LVF 6500 K Tubular Fluorescent Lamp	2 (Two) Star
3.	40 W CHAMPION AR 6500 K Tubular Fluorescent Lamp	3 (Three) Star
4.	36 W LIFEMAX 6500 K Tubular Fluorescent Lamp	3 (Three) Star
5.	36 W/84 TRULITE 4300 K Tubular Fluorescent Lamp	5 (Five) Star
Brand :	**WIPRO**	
1.	40 W, 6500 K PREMIUM Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, 6500 K SAFELITE Tubular Fluorescent Lamp	3 (Three) Star
3.	36 W 6500 K Ultralite Tubular Fluorescent Lamp	5 (Five) Star
4.	36 W 4000 K Ultralite Tubular Fluorescent Lamp	5 (Five) Star
5.	36 W 2700 K Ultralite Tubular Fluorescent Lamp	5 (Five) Star
6.	40W SAFELITE 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand :	**ANCHOR**	
1.	40 W, 6500 K Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand :	**CROMPTON**	
1.	36 W, 6500K, Super Saver Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W HL 6500K, Power-Lux Tubular Fluorescent Lamp	5 (Five) Star
3.	36 W HL 2700K, Power-Lux Tubular Fluorescent Lamp	5 (Five) Star
4.	40 W, 6500K, Brightlux, Tubular Fluorescent Lamp	3 (Three) Star
5.	40 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand :	**BAJAJ**	
1.	40 W, 6500K, Cool Day Light Tubular Fluorescent Lamp	3 (Three) Star

S.No.	*Description*	*BEE Labelled*
2.	36 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand : **HIND**		
1.	40 W, 6500K, Cool Day Light Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, 6500K, Cool Day Light Tubular Fluorescent Lamp	3 (Three) Star
Brand : **MYNA**		
1.	36 W, 6500K, high lumen, Tubular Fluorescent Lamp	4 (Four) Star
2.	40 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
3.	36 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand**: GE**		
1.	T8 / 36 W, 6500 K, GE SLENDER TFL	3 (Three) Star
2.	T12/40 W, 6500 K, GE Standard TFL	3 (Three) Star
Brand**: CEMA**		
1.	T8/ 36 W, 6500 K, CEMA Energy Saver	3 (Three) Star
2.	T12/ 40 W, 6500 K, CEMA TC – 3	3 (Three) Star
Brand: **Samsung**		
1.:	40 W, 6500K, Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, HL 6500 K, Tubular Fluorescent Lamp	5 (Five) Star
Brand: **ONIDA**		
1.	36 W, Cool daylight 6500K, Tubular Fluorescent Lamp	3 (Three) Star
2.	40 W, Cool daylight 6500K, Tubular Fluorescent Lamp	3 (Three) Star
Brand: **ECOLITE**		
1.	40 W, 6500 K Tubular Fluorescent Lamp	3 (Three) Star
2.	36 W, 6500 K, Tubular Fluorescent Lamp	3 (Three) Star
Brand: **JINDAL**		
1.	40 W 6500 K, Cool Day Light, Tubular Fluorescent Lamp	3 (Three) Star

BEE Labeled Air Conditioners as of May 13, 2008

Brand: Carrier Type: Window Air Conditioner

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1	WCARS09FA	2423	996	2.43	1 (One)
2	WCARS09FE	2423	996	2.43	1 (One)
3	WCARS12FA	3412	1381	2.47	1 (One)
4	WCARS12FE	3412	1381	2.47	1 (One)
5	GWRAC018X1001	4876	1889	2.58	2 (Two)
6	GWRAC018X1e001	4876	1889	2.58	2 (Two)
7	GWRAC018X2001	4876	1889	2.58	2 (Two)
8	GWRAC018X2e001	4876	1889	2.58	2 (Two)
9	GWRAC018DM001	4876	1889	2.58	2 (Two)
10	GWRAC018DMe001	4876	1889	2.58	2 (Two)
11	GWRAC018DR001	4876	1889	2.58	2 (Two)
12	GWRAC018DRe001	4876	1889	2.58	2 (Two)
13	GWRAC018ER001	5214	1861	2.80	3 (Three)
14	GWRAC018ERe001	5214	1861	2.80	3 (Three)
15	GWRAC024X1002	6078	2545	2.39	1 (One)
16	GWRAC024X1e002	6078	2545	2.39	1 (One)
17	GWRAC024X2002	6078	2545	2.39	1 (One)
18	GWRAC024X2e002	6078	2545	2.39	1 (One)
19	GWRAC024DM001	6078	2545	2.39	1 (One)
20	GWRAC024DMe001	6078	2545	2.39	1 (One)
21	GWRAC024DR001	6078	2545	2.39	1 (One)
22	GWRAC024DRe001	6078	2545	2.39	1 (One)

Brand: Carrier Type: Split Air Conditioner

SL.No.	Model No.	Cooling Capacity (Watts)	Power Consumption (Watts)	Energy Efficiency Ratio (EER)	Star rating
1	Durakool 012	3175	1240	2.56	1 (One)
2.	Estrella 012	3693	1128	3.27	5 (Five)
3	Durakool 018	4725	1860	2.54	1 (One)
4	Durakool-e 018	4725	1860	2.54	1 (One)
5.	Estrella 018	5375	1696	3.17	4 (Four)
6	Durakool 024	6320	2580	2.45	1 (One)
7	Durakool-e 024	6320	2580	2.45	1 (One)
8	Durakool 009	2606	969	2.69	2 (Two)
9	SX2 012	3175	1240	2.56	1 (One)
10	SX2 018	4725	1860	2.54	1 (One)
11	SX2 018-e	4725	1860	2.54	1 (One)
12	Durakool R 024	5993	2462	2.43	1 (One)
13	Durakool R-e 024	5993	2462	2.43	1 (One)
14	SX2 024	5993	2462	2.43	1 (One)

SL.No.	Model No.	Cooling Capacity (Watts)	Power Consumption (Watts)	Energy Efficiency Ratio (EER)	Star rating
15	SX2-e 024	5993	2462	2.43	1 (One)
16	Daiseikai 012	3858	1183	3.26	5 (Five)
17	Daiseikai 018	5196	1682	3.09	4 (Four)
18	Durakool 018B	4740	1810	2.62	2 (Two)
19	Durakool 018Be	4740	1810	2.62	2 (Two)

Brand: Voltas Type: Window Air Conditioner

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1	4010854	2630	980	2.68	2 (Two)
2	4010849	3510	1310	2.68	2 (Two)
3	4010852	5270	1980	2.66	2 (Two)
4	4010853	7030	2650	2.65	2 (Two)
5.	4010870	2630	940	2.80	3 (Three)
6.	4010877`	3510	1250	2.80	3 (Three)
7.	4010876	5270	1880	2.80	3 (Three)
8.	4010871	3510	1430	2.45	1 (One)
9.	4010872	3510	1430	2.45	1 (One)
10.	4010874	5160	2100	2.45	1 (One)
11.	4010875	5160	2100	2.45	1 (One)

Brand: Voltas Type: Split Air Conditioner

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1	4501081	6450	2110	3.00	4 (Four)
2	4501082	2630	940	2.80	3 (Three)
3	4501083	3510	1250	2.80	3 (Three)
4	4501084	5270	1880	2.80	3 (Three)
5	4501085	7030	2510	2.80	3 (Three)
6	4501087	2630	940	2.80	3 (Three)
7	4501088	3510	1250	2.80	3 (Three)
8	4501089	5270	1910	2.75	3 (Three)
9	4501090	7030	2510	2.80	3 (Three)

Brand: LG Type: Window Air Conditioners

SL.No.	Model No.	Cooling Capacity (Watts)	Power Consumption (Watts)	Energy Efficiency Ratio (EER)	Star rating
1	LWA3CW1AM1	3222	1340	2.40	1 (One)
2	LWA3CW1AB1	3222	1340	2.40	1 (One)
3.	LWA5HG2DT1	5275	2050	2.57	2 (Two)
4.	LWA5HW2DT1	5275	2050	2.57	2 (Two)
5.	LWA3FW2DF1	3516	1350	2.6	2 (Two)
6.	LWA3GW1AS1	3370	1360	2.48	1 (One)
7.	LWA3CC1AB1	3370	1360	2.48	1 (One)
8	LWA3CC1AM1	3370	1360	2.48	1 (One)

Brand: LG Type: Split Air Conditioners

SL.No.	Model No.	Cooling Capacity (Watts)	Power Consumption (Watts)	Energy Efficiency Ratio (EER)	Star rating
1	LSA3TW2AB1	3516	1335	2.63	2 (Two)
2	LSA3TW2AS1	3516	1335	2.63	2 (Two)
3	LSA3UW2AF1	3516	1335	2.63	2 (Two)
4	LSA3UW2VF1	3516	1335	2.63	2 (Two)
5	LSA3WB2VF1	3516	1310	2.68	2 (Two)
6	LSA3WG2VF1	3516	1310	2.68	2 (Two)
7.	LSA5ZG4NTY1	5275	1785	2.96	4 (Four)
8.	LSA3ZG5NTY1	3516	1120	3.14	5 (Five)
9.	LSA3ZSSNTY1	3516	1120	3.14	5 (Five)
10.	LSA3ZB5NTY1	3516	1120	3.14	5 (Five)
11.	LSA5SW2AB1	5125	1975	2.59	2 (Two)
12.	LSA5SW2AS1	5125	1975	2.59	2 (Two)
13.	LSA5XW2VF1	5125	1975	2.59	2 (Two)
14.	LSA3FB3VTY1	3516	1240	2.84	3 (Three)
15.	LSA3FG3VTY1	3516	1240	2.84	3 (Three)
16.	LSA3MB4NL1	3660	1220	3.00	4 (Four)
17.	LSA3MG4NL1	3660	1220	3.00	4 (Four)
18.	LSA3ZG5NTP1	3516	1120	3.14	5 (Five)
19.	LSA3ZB5NTP1	3516	1120	3.14	5 (Five)
20.	LSA5WG2VF1	5125	1970	2.60	2 (Two)
21.	LSA5WB2VF1	5125	1970	2.60	2 (Two)
22.	LSA5FB3VTY1	5275	1880	2.80	3 (Three)
23.	LSA5FG3VTY1	5275	1880	2.80	3 (Three)
24.	LSA5MB3NL1	5275	1880	2.80	3 (Three)
25.	LSA5MG3NL1	5275	1880	2.80	3 (Three)
26.	LSA5ZB4NTP1	5275	1785	2.96	4 (Four)
27.	LSA5ZG4NTP1	5275	1785	2.96	4 (Four)
28.	LSA5ZB4NTY1	5275	1785	2.96	4 (Four)
29.	LSA5ZS4NTY1	5275	1785	2.96	4 (Four)
30.	LSA6WG2VF1	6450	2480	2.60	2 (Two)
31.	LSA6WB2VF1	6450	2480	2.60	2 (Two)
32.	LSA6FG2VTY1	6450	2480	2.60	2 (Two)
33.	LSA6FB2VTY1	6450	2480	2.60	2 (Two)
34.	LSA6ZB2NTP1	6450	2480	2.60	2 (Two)

35.	LSA6ZG2NTP1	6450	2480	2.60	2 (Two)
36.	LSA6ZB2NTY1	6450	2480	2.60	2 (Two)
37.	LSA6ZG2NTY1	6450	2480	2.60	2 (Two)
38.	LSA3WW2VF1	3516	1310	2.68	2 (Two)
39.	LSA3FS3VTY1	3516	1240	2.84	3 (Three)
40.	LSA3FW3VTY1	3516	1240	2.84	3 (Three)
41.	LSA3ZW5NTY1	3516	1120	3.14	5 (Five)
42.	LSA5WW2VF1	5125	1970	2.60	2 (Two)
43.	LSA5FS3VTY1	5275	1880	2.80	3 (Three)
44.	LSA5FW3VTY1	5275	1880	2.80	3 (Three)
45.	LSA6WW2VF1	6450	2480	2.60	2 (Two)
46.	LSA7FS2VTY1	6600	2480	2.66	2 (Two)
47.	LSA7FW2VTY1	6600	2480	2.66	2 (Two)
48.	LSA7ZS2NTY1	6600	2480	2.66	2 (Two)
49.	LSA7ZW2NTY1	6600	2480	2.66	2 (Two)
50.	LSA7FG2VTY1	6600	2480	2.66	2 (Two)
51.	LSA7FB2VTY1	6600	2480	2.66	2 (Two)
52.	LSA7ZB2NTP1	6600	2480	2.66	2 (Two)
53.	LSA7ZG2NTP1	6600	2480	2.66	2 (Two)
54.	LSA7ZB2NTY1	6600	2480	2.66	2 (Two)
55.	LSA7ZG2NTY1	6600	2480	2.66	2 (Two)

Brand: DAIKIN Type: Split Air Conditioners

SL.No.	Model No.	Cooling Capacity (Watts)	Power Consumption (Watts)	Energy Efficiency Ratio (EER)	Star rating
1	FT50BVM/R50BV1	5100	1750.00	2.91	4 (Four)

Brand: SAMSUNG Type: Window Air Conditioner

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1	AWT12ZKA	3300	1330	2.48	1(One)
2	AWT18WKE	4800	1950	2.46	1(One)

Brand: SAMSUNG Type: Split Air Conditioners

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1.	AS12FB	3800	1320	2.88	3 (Three)
2.	AS18FD	5300	1760	3.01	4 (Four)
3.	AS10FCA	2700	940	2.87	3 (Three)
4.	AS10FCB	2700	940	2..87	3 (Three)
5.	AS12FJ	3500	1330	2.63	2 (Two)
6.	AS12NA	3500	1330	2.63	2 (Two)
7.	AS12WD	3500	1330	2.63	2 (Two)
8.	AS12FK	3500	1330	2.63	2 (Two)
9.	AS12NB	3500	1330	2.63	2 (Two)
10.	AS12WE	3500	1330	2.63	2 (Two)
11.	AS12NFA	3500	1180	3.05	4 (Four)
12.	AS13FJ	3650	1360	2.68	2 (Two)
13.	AS13NA	3650	1360	2.68	2 (Two)
14.	AS13FK	3650	1360	2.68	2 (Two)
15.	AS13NB	3650	1360	2.68	2 (Two)
16.	AS18FJ	5270	1960	2.69	2 (Two)
17.	AS18NA	5270	1960	2.69	2 (Two)
18.	AS18WD	5270	1960	2.69	2 (Two)
19.	AS18FK	5270	1960	2.69	2 (Two)
20.	AS18NB	5270	1960	2.69	2 (Two)
21.	AS18WE	5270	1960	2.69	2 (Two)
22.	AS18NFB	5300	1760	3.01	4 (Four)
23.	AS18FCA	5100	1940	2.63	2 (Two)
24.	AS18NCA	5100	1940	2.63	2 (Two)
25.	AS18WCD	5100	1940	2.63	2 (Two)
26.	AS18FCB	5100	1940	2.63	2 (Two)
27.	AS18NCB	5100	1940	2.63	2 (Two)
28.	AS18WCE	5100	1940	2.63	2 (Two)
29.	AS19FJ	5400	2060	2.62	2 (Two)
30.	AS19NA	5400	2060	2.62	2 (Two)
31.	AS19VB	5400	2060	2.62	2 (Two)
32.	AS19FK	5400	2060	2.62	2 (Two)
33.	AS19NB	5400	2060	2.62	2 (Two)
34.	AS19VC	5400	2060	2.62	2 (Two)
35.	AS24FJ	6500	2420	2.69	2 (Two)
36.	AS24NA	6500	2420	2.69	2 (Two)
37.	AS24WD	6500	2420	2.69	2 (Two)
38.	AS24FK	6500	2420	2.69	2 (Two)
39.	AS24NB	6500	2420	2.69	2 (Two)
40.	AS24WE	6500	2420	2.69	2 (Two)
41.	AS18VXB	5350	1720	3.11	5 (Five)

Brand : BLUE STAR **Type: Split Air Conditioner**

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1	KHWE181YPS	5070	1720	2.95	4 (Four)
2	KHWE121YPS	3520	1090	3.23	5 (Five)
3	KHWE101YPS	2830	930	3.04	4 (Four)
4	4HW121YA	3300	1120	2.95	4 (Four)
5	4HW181YA	5070	1720	2.95	4 (Four)
6	4HW241YA	6700	2300	2.91	4 (Four)
7	3HW121YA	3250	1160	2.8	3 Three)
8	3HW181YA	5000	1820	2.75	3 (Three)
9	2HW121YA	3270	1230	2.66	2 (Two)
10	2HW181YA	5000	1900	2.63	2 (Two)
11	2HW241YA	6400	2500	2.56	2 (Two)

Brand : ONIDA **Type: Split Air Conditioners**

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1.	SZ18GRL2	4872	1854	2.63	2 (Two)
2.	SM12SLH	3818	1089	3.50	5 (Five)
3.	SG12SCL	3634	1318	2.76	3 (Three)
4.	SG12DFL	3383	1220	2.77	3 (Three)
5.	SG12TRDN	3609	1276	2.82	3 (Three)
6.	SG18SLM	5050	1827	2.76	3 (Three)
7.	SG18SCLN	5050	1827	2.76	3 (Three)
8.	SM18SLH	5221	1745	3.00	4 (Four)
9.	SG18TRDN	5249	1858	2.82	3 (Three)

Brand : ONIDA **Type: Window Air Conditioner**

Sl.No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Ratio (EER) (W/W)	Star rating
1.	WG18	5187	1978	2.62	2 (Two)
2.	WG18N	5079	1971	2.58	2 (Two)

Brand: KORYO **Type: Split Air Conditioner**

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1	KS109AA-N	2470	930.4	2.65	2 (Two)
2	KSI 18GR	4345	1650	2.64	2 (Two)
3.	KSI 18AB-N1	4912	1747	2.81	3 (Three)
4.	KSI 12AB-N1	3366	1202	2.80	3 (Three)

Brand : SENSEI **Type: Split Air Conditioner**

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1	SSI12GA	3340	1281	2.60	2 (Two)
2	SSI18GA	4825	1984	2.40	1 (One)
3.	SSI 12 AB-N	3403	1179	2.88	3 (Three)
4.	SSI 18 AB-N	4999	1753	2.85	3 (Three)

Brand: Whirlpool **Type: Split Air Conditioner**

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1	WASR09K20	2460	920	2.67	2 (Two)
2	WASR12K20	3370	1290	2.61	2 (Two)
3.	WASR18K30	5330	1910	2.79	3 (Three)
4.	WASR18K40	5625	1860	3.02	4 (Four)
5.	WASR24K20	6445	2400	2.69	2 (Two)
6.	WAWR09G20	2580	950	2.63*	2 (Two)
7.	WAWR12G20	3400	1250	2.63*	2 (Two)
8.	WAWR18G10	5190	2020	2.42*	1 (One)
9.	WAWR18G20	5270	1990	2.63	2 (Two)
10.	WAWR18G30	5190	1800	2.84*	3 (Three)
11.	WASR12K30	3430	1215	2.82	3 (Three)
12..	WASR18G20	5275	1890	2.69*	2 (Two)

* The EER declared on the label is lesser than the corresponding Cooling Capacity and Power Input declared on the label.

Brand: La Vida **Type: Window Air Conditioner**

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1	AG18WC2WH	5036	1904	2.64	2 (Two)

Brand : VIDEOCON **Type: Split Air Conditioner**

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1	VS3C3544	3480	1230	2.83	3 (Three)
2	VS3C2644	2580	955	2.70	3 (Three)
3.	VS2C52331	5070	1970	2.57	2 (Two)
4.	VS3R3544	3590	1330	2.7	3 (Three)

Brand : VIDEOCON Type: Window Air Conditioner

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1.	VW1R5244	5050	2070	2.44	1 (One)

Brand : ELECTROLUX Type: Window Air Conditioner

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1.	EA18WCRPA11	4833	1950	2.48	1 (One)
2	EA18WCRXA12	5035	1888	2.67	2 (Two)
3	EA18WCRPA12	5035	1888	2.67	2 (Two)
4	EA18WCRXA13	5017	1800	2.79	3 (Three)
5	EA24WCRPA11	6115	2545	2.4	1 (One)
6	EA12WCRPF12	3380	1334	2.53	2 (Two)
7	EA09WCRPF11	2405	1035	2.32	1 (One)
8	EA09WCRPF12	2405	930	2.59	2 (Two)

Brand : ELECTROLUX Type: Split Air Conditioner

Sl. No.	Model No.	Cooling Capacity (W)	Power Consumption (W)	Energy Efficiency Rating (EER) (W/W)	Star rating
1.	EA12SCRPA11	3199	1280	2.49	1 (One)
2	EA12SCRPA12	3199	1197	2.67	2 (Two)
3	EA18SCRPD11	4850	1950	2.49	1 (One)
4	EA18SCRPA11	4929	1980	2.49	1 (One)
5	EA18SCRDA12	4849	1895	2.56	2 (Two)
6	EA18SCRDA11	4820	1938	2.49	1 (One)
7	EA18SCRDA13	5041	1835	2.75	3 (Three)
8	EA24SCRDA11	6126	2460	2.49	1 (One)
9	EA12SCRLC1	3366	1200	2.81	3 (Three)
10	EA18SCRLC1	4715	1701	2.77	3 (Three)
11	EA09SCRPF11	2447	982	2.49	1 (One)
12	EA18SCRPA12	4929	1920	2.57	2 (Two)

BEE Labeled Direct Cool Refrigerators as of May 13, 2008

Brand : Whirlpool

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
1.	DC 18	175	163	372	3 (Three)
2.	DC 19	180	168	312	4 (Four)
3.	DC 21	200	195	324	4 (Four)
4.	DC 24	230	218	330	4 (Four)
5.	FC 21	200	195	324	4 (Four)
6.	FC 24	230	218	330	4 (Four)
7.	FC 27	260	249	350	4 (Four)
8.	FC 32	310	280	365	4 (Four)
9.	FC 32 Maxigerator	310	280	395	3 (Three)
10.	FC 21 5S	200	195	252	5 (Five)

Brand : Samsung

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
1.	RA20UVBSI/XTL	195	188	330	4 (Four)
2.	RA20TVSS1/XTL	195	188	330	4 (Four)
3.	RA20TVPS1/XTL	195	188	330	4 (Four)
4.	RA20RVTT1/XTL	195	188	330	4 (Four)
5.	RA20RVMS1/XTL	195	188	330	4 (Four)
6.	RA20RVBS1/XTL	195	188	330	4 (Four)
7.	RA18UVBS1/XTL	180	174	265	5 (Five)
8.	RA18TVSS1/XTL	180	174	305	4 (Four)
9.	RA18TVPS1/XTL	180	174	305	4 (Four)
10.	RA18SVMS1/XTL	180	174	305	4 (Four)
11.	RA18SVBS1/XTL	180	174	305	4 (Four)
12.	RA18RVWR1/XTL	180	174	305	4 (Four)
13.	RA18RVTT1/XTL	180	174	305	4 (Four)
14.	RA18RVMS1/XTL	180	174	305	4 (Four)
15.	RA18QHDR1/XTL	180	174	305	4 (Four)
16.	RA18QHMB1/XTL	180	174	305	4 (Four)
17.	RA18QHMG1/XTL	180	174	305	4 (Four)
18	RA18XHDR1/XTL	180	174	305	4 (Four)
19	RA18XHMB1/XTL	180	174	305	4 (Four)
20	RA18XHMG1/XTL	180	174	305	4 (Four)
21	RA18XHDS1/XTL	180	174	305	4 (Four)

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
22	RA18YVMS1/XTL	180	174	305	4 (Four)
23	RA18YVTT1/XTL	180	174	305	4 (Four)
24	RA18YVWR1/XTL	180	174	305	4 (Four)
25	RA18ZVMS1/XTL	180	174	305	4 (Four)
26	RA18ZVBS1/XTL	180	174	305	4 (Four)
27	RA18WVSS1/XTL	180	174	305	4 (Four)
28	RA18WVPS1/XTL	180	174	305	4 (Four)
29	RA18EVBS1/XTL	180	174	265	5 (Five)
30	RA20YVMS1/XTL	195	188	330	4 (Four)
31	RA20YVBS1/XTL	195	188	330	4 (Four)
32	RA20YVTT1/XTL	195	188	330	4 (Four)
33	RA20WVSS1/XTL	195	188	330	4 (Four)
34	RA20WVPS1/XTL	195	188	330	4 (Four)
35	RA23YVMS1/XTL	230	224	310	4 (Four)
36	RA23WVSS1/XTL	230	224	310	4 (Four)
37	RA23WVPS1/XTL	230	224	310	4 (Four)

Brand : LG

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
1.	GL-181 CM	175	160	299	4 (Four)
2.	GL-201 CM	200	183	305	4 (Four)
3.	GL –181TM4	175	166	299	4 (Four)
4.	GL –181CM4	175	166	299	4 (Four)
5.	GL – 201TM4	200	189	310	4 (Four)
6.	GL – 201CM4	200	189	310	4 (Four)
7.	GL –181TMF	175	166	249	5 (Five)
8.	GL –181PP4	175	166	299	4 (Four)
9.	GL – 181CN4	175	166	299	4 (Four)
10.	GL – 181PM4	175	166	299	4 (Four)
11.	GL –191 TME4	190	175	300	4 (Four)
12.	GL –191 PME4	190	175	300	4 (Four)
13.	GL –231 TME4	330	215	330	4 (Four)
14.	GL –231 PME4	330	215	330	4 (Four)
15.	GL – 191TTE4	190	175	300	4 (Four)
16.	GL – 281TME4	270	250	350	4 (Four)
17.	GL-181 TAF	175	166	249	5 (Five)

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
18.	GL-181 TA4	175	166	299	4 (Four)
19.	GL-191 TAE4	190	175	300	4 (Four)
20.	GL-191 PAE4	190	175	300	4 (Four)
21.	GL-185 RP4	180	170	295	4 (Four)
22.	GL-185 TP4	180	170	295	4 (Four)
23.	GL-195 NP4	185	175	299	4 (Four)
24.	GL-195 NM4	185	175	299	4 (Four)
25.	GL-195 SM4	185	175	299	4 (Four)
26.	GL-195 SV4	185	175	299	4 (Four)
27.	GL-195 SA4	185	175	299	4 (Four)
28	GL-195 NH4	185	175	299	4 (Four)
29	GL-195NC4	185	175	299	4 (Four)
30	GL-195 SV5	185	175	244	5 (Five)
31	GL-211NM4	200	185	300	4 (Four)
32	GL-211NT4	200	185	300	4 (Four)
33	GL-211SM4	200	185	300	4 (Four)
34	GL-211SA4	200	185	300	4 (Four)
35	GL-241NM4	230	215	330	4 (Four)
36	GL-241ST4	230	215	330	4 (Four)
37	GL-241SA4	230	215	330	4 (Four)
38	GL-241SM4	230	215	330	4 (Four)
39	GL-281SM4	270	250	350	4 (Four)
40	GL-241SM5	230	215	260	5 (Five)

Brand : ELECTROLUX

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
1.	4E172 OI PM	172	157	323	4 (Four)
2.	4E172 OI LX	172	157	323	4 (Four)
3.	4E180 OS BA	180	169	330	4 (Four)
4.	EDR180L4 LX	180	173	322	4 (Four)
5.	EDR190L4 PM	190	178	331	4 (Four)
6.	EDR190L4 LX	190	178	331	4 (Four)
7.	EDR230L4 PM	230	210	339	4 (Four)
8.	EDR230L4 LX	230	210	339	4 (Four)
9.	3E172 OI PM	172	157	392	3 (Three)
10.	3E172 OI LX	172	157	392	3 (Three)

Sl. No.	Refrigerator Model No.	Gross Volume, Liters	Storage Volume, Liters	Electricity Consumption, Units per year	Star rating
11.	3E180 OS BA	180	169	405	3 (Three)
12.	EDR180L3 LX	180	173	397	3 (Three)
13.	EDR190L3 PM	190	178	408	3 (Three)
14	EDR190L3 LX	190	178	408	3 (Three)
15.	EDR230L3 PM	230	210	418	3 (Three)
16.	EDR230L3 LX	230	210	418	3 (Three)
17.	EDR180L3 PM	180	170	397	3 (Three)
18.	EDR180L4 PM	180	170	322	4 (Four)

Brand : VIDEOCON

Sl. No.	Refrigerator Model No.	Gross Volume Litres	Storage Volume, Litres	Electricity Consumption, Units per year	Star rating
1	S 192	190	186	405	3 (Three)
2	S 192 DLX	190	186	405	3 (Three)
3	S 192 FLR	190	186	332	4 (Four)
4	S 225	215	210	425	3 (Three)
5	S 225 DLX	215	210	425	3 (Three)
6	S 225 GLX	215	210	425	3 (Three)
7	S 225 WDDX	215	210	425	3 (Three)
8	S 225 FLR	215	210	335	4 (Four)
9	S 192 GLX	190	186	405	3 (Three)
10	S 192 WDDX	190	186	405	3 (Three)

Brand : KELVINATOR

Sl. No.	Refrigerator Model No.	Gross Volume Litres	Storage Volume, Litres	Electricity Consumption, Units per year	Star rating
1	KD181BMC / 2007	180	169	328	4 (Four)
2	KD186B / 2007	180	173	322	4 (Four)
3	KD186M / 2007	180	173	322	4 (Four)
4.	KD186L / 2007	180	173	322	4 (Four)
5.	KD201B / 2007	200	189	329	4 (Four)
6.	KD201M / 2007	200	189	329	4 (Four)
7.	KD201L / 2007	200	189	329	4 (Four)
8.	KD226B / 2007	225	214	342	4 (Four)
9.	KD226M / 2007	225	214	342	4 (Four)
10.	KD226L / 2007	225	214	342	4 (Four)
11.	KD180BMC / 2007	180	169	398	3 (Three)

Sl. No.	Refrigerator Model No.	Gross Volume Litres	Storage Volume, Litres	Electricity Consumption, Units per year	Star rating
12.	KD185B / 2007	180	173	398	3 (Three)
13.	KD185M / 2007	180	173	398	3 (Three)
14.	KD185L / 2007	180	173	398	3 (Three)
15.	KD200B / 2007	200	189	418	3 (Three)
16.	KD200M / 2007	200	189	418	3 (Three)
17.	KD200L / 2007	200	189	418	3 (Three)
18.	KD225B / 2007	225	214	427	3 (Three)
19.	KD225M / 2007	225	214	427	3 (Three)
20.	KD225L / 2007	225	214	427	3 (Three)
21.	KD 195 B-A	190	186	402	3 (Three)
22.	KD 195 M-A	190	186	402	3 (Three)
23.	KD 195 L-A	190	186	402	3 (Three)
24.	KD 195 L-A1	190	186	330	4 (Four)
25.	KD-195 M-A1	190	186	330	4 (Four)
26.	KD 180 DMC	180	173	330	4 (Four)
27.	KD 186 D	180	173	332	4 (Four)
28.	KD 186 P	180	173	332	4 (Four)

Brand : GODREJ

Sl. No.	Refrigerator Model No.	Gross Volume Litres	Storage Volume, Litres	Electricity Consumption, Units per year	Star rating
1	GDC 110 S	99	86	339	3 (Three)
2	GDN 180 S	169	144	401	3 (Three)
3	GDN 180 P	169	144	401	3 (Three)
4.	GDA 19 B	181	150	318	4 (Four)
5.	GDA 19 C	181	150	318	4 (Four)
6.	GDA 19 E	181	148	318	4 (Four)
7.	GDA 19 F	181	148	318	4 (Four)
8.	GDA 23 C	216	178	314	4 (Four)
9.	GDA 23 E	216	178	314	4 (Four)
10.	GDA 23 F	216	178	314	4 (Four)
11.	GDA 26 C	249	209	412	3 (Three)
12.	GDA 26 E	249	209	412	3 (Three)
13.	GDA 26 F	249	209	412	3 (Three)
14.	GDP 195 S	181	139	314	4 (Four)
15.	GDP V2 195 S	181	139	314	4 (Four)
16.	GDP 195 P	181	139	314	4 (Four)

Sl. No.	Refrigerator Model No.	Gross Volume Litres	Storage Volume, Litres	Electricity Consumption, Units per year	Star rating
17.	GDP V2 215 S	203	159	325	4 (Four)
18.	GDD 310 S	302	229	489	2 (Two)
19.	GDD 310 P	302	229	489	2 (Two)

Brand : KENSTAR

Sl.No.	Refrigerator Model No.	Gross Volume (Litres)	Storage Volume (Liters)	Electricity Consumption Units per year	Star Rating
1.	U-VA 200 P	190	186	402	3 (Three)
2.	U-VA 200 S	190	186	402	3 (Three)

Brand : Haier

Sl.No.	Refrigerator Model No.	Gross Volume, Litres	Storage Volume, Liters	Electricity Consumption Units per year	Star Rating
1.	HRD-211GX	190	179	330	4 (Four)
2.	HRD-211HP	190	179	330	4 (Four)
3.	HRD-211BLC	190	179	330	4 (Four)
4.	HRD-211MRX	190	179	330	4 (Four)
5.	HRD-211RLC	190	179	330	4 (Four)
6.	HRD-211BY	190	179	330	4 (Four)
7.	HRD-211GZ	190	179	330	4 (Four)
8.	HRD-211MRY	190	179	330	4 (Four)
9.	HRD-211GLC	190	179	330	4 (Four)
10.	HRD-231 HP	210	198	340	4 (Four)
11.	HRD-231 MRY	210	198	340	4 (Four)
12.	HRD-231BY	210	198	340	4 (Four)

BEE Labeled Distribution Transformers as of May 13, 2008

Brand: VIJAY ELECTRICALS LTD.

SL. NO.	Capacity of The Transformer	Total Losses		Star Rating
		50% loading	100% loading	
1.	100 kVA	414	1441	5(Five)
2.	100 kVA	413	1162	5(Five)

Brand: ROYALSEEMA GREEN ENERGY LTD.

SL. NO.	Capacity Of The Transformer	Total Losses		Star Rating
		50% loading	100% loading	
1.	25 kVA	210	695	3(Three)

Brand: SUVARNA TRANSFORMER

SL. NO.	Capacity Of The Transformer	Total Losses		Star Rating
		50% loading	100% loading	
1.	63 kVA	380	980	3(Three)

Brand: CLASSIC TECHNOLINES (P) LTD.

SL. NO.	Capacity Of The Transformer	Total Losses		Star Rating
		50% loading	100% loading	
1.	25 kVA	290	785	1(One)
2.	25 kVA	210	695	3(Three)
3.	63 kVA	380	1250	3(Three)

ANNEX V: List of Items Reserved for Small Scale Industry Units as on 31.03.2007

1. AAC/& ACSR Conductor upto 19 strands
2. Agricultural Implements
3. Hand Operated tools & implements
4. Animal driven implements
5. Air/Room Coolers
6. Aluminium builder's hardware
7. Ambulance stretcher
8. Ammeters/ohm meter/Volt meter (Electro magnetic upto Class I accuracy)
9. Anklets Web Khaki
10. Augur (Carpenters)
11. Automobile Head lights Assembly
12. Badges cloth embroidered and metals
13. Bags of all types i.e. made of leather, cotton, canvas & jute etc. including kit bags, mail bags, sleeping bags & water-proof bag
14. Bandage cloth
15. Barbed Wire
16. Basket cane (Procurement can also be made from State Forest Corpn. and State Handicrafts Corporation)
17. Bath tubs
18. Battery Charger
19. Battery Eliminator
20. Beam Scales (upto 1.5 tons)
21. Belt leather & straps
22. Bench Vices
23. Bituminous Paints
24. Blotting Paper
25. Bolts & Nuts
26. Bolts Sliding
27. Bone Meal
28. Boot Polish
29. Boots & Shoes of all types including canvas shoes
30. Bowls
31. Boxes Leather
32. Boxes made of metal
33. Braces
34. Brackets other than those used in Railways
35. Brass Wire
36. Brief Cases (other than moulded luggage)
37. Brooms
38. Brushes of all types
39. Buckets of all types
40. Button of all types
41. Candle Wax Carriage
42. Cane Valves/stock valves (for water fittings only)

43. Cans metallic (for milk & measuring)
44. Canvas Products
45. Capes Cotton & Woollen
46. Capes Waterproof
47. Castor Oil
48. Ceiling roses upto 15 amps
49. Centrifugal steel plate blowers
50. Centrifugal Pumps suction & delivery 150 mm. x 150 mm
51. Chaff Cutter Blade
52. Chains lashing
53. Chappals and sandals
54. Chamois Leather
55. Chokes for light fitting
56. Chrome Tanned leather (Semi-finished Buffalo & Cow)
57. Circlips
58. Claw Bars and Wires
59. Cleaning Powder
60. Clinical Thermometers
61. Cloth Covers
62. Cloth Jaconet
63. Cloth Sponge
64. Coir fibre and Coir yarn
65. Coir mattress cushions and matting
66. Coir Rope hawserlaid
67. Community Radio Receivers
68. Conduit pipes
69. Copper Napthenate
70. Copper sulphate
71. Cord Twine Maker
72. Cordage Others
73. Corrugated Paper Board & Boxes
74. Cotton Absorbent
75. Cotton Belts
76. Cotton Carriers
77. Cotton Cases
78. Cotton Cord Twine
79. Cotton Hosiery
80. Cotton Packs
81. Cotton Pouches
82. Cotton Ropes
83. Cotton Singlets
84. Cotton Sling
85. Cotton Straps
86. Cotton tapes and laces
87. Cotton Wool (Non absorbent)
88. Crates Wooden & plastic
89. Cumblies & blankets
90. Curtains mosquito
91. Cutters
92. Dibutyl phthalate
93. Diesel engines upto 15 H.P
94. Dimethyl Phthalate
95. Disinfectant Fluids

96. Distribution Board upto 15 amps
97. Domestic Electric appliances as per BIS Specifications :-
- Toaster Electric, Elect. Iron, Hot Plates, Elect. Mixer, Grinders Room heaters & convectors and ovens
98. Domestic (House Wiring) P.V.C. Cables and Wires (Aluminium) Conforming to the prescribed BIS Specifications and upto 10.00 mm sq. nominal cross section
99. Drawing & Mathematical Instruments
100. Drums & Barrels
101. Dust Bins
102. Dust Shield leather
103. Dusters Cotton all types except the items required in Khadi
104. Dyes
105. Electric Call bells/buzzers/door bells
106. Electric Soldering Iron
107. Electric Transmission Line Hardware items like steel cross bars, cross arms clamps arching horn, brackets, etc
108. Electronic door bell
109. Emergency Light (Rechargeable type)
110. Enamel Wares & Enamel Utensils
111. Equipment camouflage Bamboo support
112. Exhaust Muffler
113. Expanded Metal
114. Eyelets
115. Film Polythene - including wide width film
116. Film spools & cans
117. Fire Extinguishers (wall type)
118. Foot Powder
119. French polish
120. Funnels
121. Fuse Cut outs
122. Fuse Unit
123. Garments (excluding supply from Indian Ordnance Factories)
124. Gas mantels
125. Gauze cloth
126. Gauze surgical all types
127. Ghamellas (Tasllas)
128. Glass Ampules
129. Glass & Pressed Wares
130. Glue
131. Grease Nipples & Grease guns
132. Gun cases
133. Gun Metal Bushes
134. Gumtape
135. Hand drawn carts of all types
136. Hand gloves of all types
137. Hand Lamps Railways
138. Hand numbering machine
139. Hand pounded Rice
140. Hand presses
141. Hand Pump
142. Hand Tools of all types

143. Handles wooden and bamboo (Procurement can also be made from State Forest Corpn. and State Handicrafts Corporation)
144. Harness Leather
145. Hasps & Staples
146. Haver Sacks
147. Helmet Non-Metallic
148. Hide and country leather
149. Hinges
150. Hob nails
151. Holdall
152. Honey
153. Horse and Mule Shoes
154. Hydraulic Jacks below 30 ton capacity
155. Insecticides Dust and Sprayer
156. Invalid wheeled chairs
157. Invertor domestic type upto 5 kvA
158. Iron (dhobi)
159. Key board wooden
160. Kit Boxes
161. Kodali
162. Lace leather
163. Lamp holders
164. Lamp signal
165. Lanterns Posts & bodies
166. Lanyard
167. Latex foam sponge
168. Lathies
169. Letter Boxes
170. Lighting Arresters - upto 22 kv
171. Link Clip
172. Linseed Oil
173. Lint Plain
174. Lockers
175. Lubricators
176. L.T. Porcelain KITKAT & Fuse Grips
177. Machine Screws
178. Magnesium Sulphate
179. Mallet Wooden
180. Manhole covers
181. Measuring Tapes and Sticks
182. Metal clad switches (upto 30 Amps)
183. Metal Polish
184. Metallic containers and drums other than N.E.C. (Not elsewhere classified)
185. Metric weights
186. Microscope for normal medical use
187. Miniature bulbs (for torches only)
188. M.S. Tie Bars
189. Nail Cutters
190. Naphthalene Balls
191. Newar
192. Nickel Sulphate
193. Nylon Stocking
194. Nylon Tapes and Laces

195. Oil Bound Distemper
196. Oil Stoves (Wick stoves only)
197. Pad locks of all types
198. Paint remover
199. Palma Rosa Oil
200. Palmgur
201. Pans Lavatory Flush
202. Paper conversion products, paper bags, envelops, Ice-cream cup, paper cup and saucers & paper Plates
203. Paper Tapes (Gummed)
204. Pappads
205. Pickles & Chutney
206. Piles fabric
207. Pillows
208. Plaster of Paris
209. Plastic Blow Moulded Containers upto 20 litre excluding Poly Ethylene Terphthalate (PET) Containers
210. Plastic cane
211. Playing Cards
212. Plugs & Sockets electric upto 15 Amp
213. Polythene bags
214. Polythene Pipes
215. Post Picket (Wooden)
216. Postal Lead seals
217. Potassium Nitrate
218. Pouches
219. Pressure Die Casting upto 0.75 kg
220. Privy Pans
221. Pulley Wire
222. PVC footwears
223. PVC pipes upto 110 mm
224. PVC Insulated Aluminium Cables (upto 120 sq. mm) (ISS:694)
225. Quilts, Razais
226. Rags
227. Railway Carriage light fittings
228. Rakes Ballast
229. Razors
230. RCC Pipes upto 1200 mm. Dia
231. RCC Poles Prestressed
232. Rivets of all types
233. Rolling Shutters
234. Roof light Fittings
235. Rubber Balloons
236. Rubber Cord
237. Rubber Hoses (Unbranded)
238. Rubber Tubing (Excluding braided tubing)
239. Rubberised Garments Cap and Caps etc
240. Rust/Scale Removing composition
241. Safe meat & milk
242. Safety matches
243. Safety Pins (and other similar products like paper pins, staples pins etc.)
244. Sanitary Plumbing fittings
245. Sanitary Towels

246. Scientific Laboratory glasswares (Barring sophisticated items)
247. Scissors cutting (ordinary)
248. Screws of all types including High Tensile
249. Sheep skin all types
250. Shellac
251. Shoe laces
252. Shovels
253. Sign Boards painted
254. Silk ribbon
255. Silk Webbing
256. Skiboots & shoes
257. Sluice Valves
258. Snapfastner (Excluding 4 pcs. ones)
259. Soap Carbolic
260. Soap Curd
261. Soap Liquid
262. Soap Soft
263. Soap washing or laundary soap
264. Soap Yellow
265. Socket/pipes
266. Sodium Nitrate
267. Sodium Silicate
268. Sole leather
269. Spectacle frames
270. Spiked boot
271. Sports shoes made out of leather (for all Sports games)
272. Squirrel Cage Induction Motors upto and including 100 KW440 volts 3 phase
273. Stapling machine
274. Steel Almirah
275. Steel beds stead
276. Steel Chair
277. Steel desks
278. Steel racks/shelf
279. Steel stools
280. Steel trunks
281. Steel wool
282. Steel & aluminium windows and ventilators
283. Stockinet
284. Stone and stone quarry rollers
285. Stoneware jars
286. Stranded Wire
287. Street light fittings
288. Student Microscope
289. Studs (excluding high tensile)
290. Surgical Gloves (Except Plastic)
291. Table knives (Excluding Cutlery)
292. Tack Metallic
293. Taps
294. Tarpaulins
295. Teak fabricated round blocks
296. Tent Poles
297. Tentage Civil/Military & Salitah Jute for Tentage
298. Textiles manufacturers other than N.E.C. (not elsewhere classified)

299. Tiles
300. Tin Boxes for postage stamp
301. Tin can unprinted upto 4 gallons capacity (other than can O.T.S.)
302. Tin Mess
303. Tip Boots
304. Toggle Switches
305. Toilet Rolls
306. Transformer type welding sets conforming to IS:1291/75 (upto 600 amps)
307. Transistor Radio upto 3 band
308. Transistorised Insulation – Testers
309. Trays
310. Trays for postal use Trolley
311. Trollies - drinking water
312. Tubular Poles
313. Tyres & Tubes (Cycles)
314. Umbrellas
315. Utensils all types
316. Valves Metallic
317. Varnish Black Japan
318. Voltage Stablisers including C.V.T's
319. Washers all types
320. Water Proof Covers
321. Water Proof paper
322. Water tanks upto 15,000 litres capacity
323. Wax sealing
324. Waxed paper
325. Weighing Scale
326. Welded Wiremash
327. Wheel barrows
328. Whistle
329. Wicks cotton
330. Wing Shield Wipers (Arms & Blades only)
331. Wire brushes and Fibre Brushes
332. Wire Fencing & Fittings
333. Wire nails and Horse shoe nails
334. Wire nettings of gauze thicker than 100 mesh size
335. Wood Wool
336. Wooden ammunition boxes
337. Wooden Boards
338. Wooden Box for Stamps
339. Wooden Boxes and Cases N.E.C. (Not elsewhere classified)
340. Wooden Chairs
341. Wooden Flush Door Shutters
342. Wooden packing cases all sizes
343. Wooden pins
344. Wooden plugs
345. Wooden shelves
346. Wooden veneers
347. Woollen hosiery
348. Zinc Sulphate
349. Zip Fasteners
350. Cane Furniture
351. Bamboo file tray, Baskets, Pencil stand, side racks etc.

352. Artistic Wooden Furniture
353. Wooden paper weight, racks etc.
354. Glass covers made of wood and Grass jute
355. Jute furniture
356. Jute bags, file cover
357. Woollen & silk carpets