

BARRIERS TO ENERGY EFFICIENCY IN INDUSTRY IN ASIA

-Review and policy guidance



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BARRIERS TO ENERGY EFFICIENCY IN INDUSTRY IN ASIA

**A review of barriers to energy efficiency in industry in Asia
and guidance to policy makers to address these**

Energy Efficiency Guide for Industry in Asia

www.energyefficiencyasia.org

**United Nations Environment Programme
Division of Technology, Industry and Economics**

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1. Introduction

1.1 Introduction to this Report

Why do some companies improve their energy efficiency and others don't? Companies are faced with a range of financial, cultural, technical and external barriers that affect their ability to adopt energy efficiency measures. The question is, what are they and how can we overcome the barriers?

This report describes the results of a study into these barriers and how to overcome these. Guidance is given to policy makers on their role in addressing energy efficiency barriers. The study was carried out as part of the project Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific (GERIAP).

1.2 Background to the GERIAP Project

The three-year project 'Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific' (GERIAP) aimed to assist companies to become more energy and cost efficient and reduce greenhouse gas emissions through Cleaner Production (CP). CP is a strategy that prevents wastes and emissions and can assist companies to improve energy efficiency, reduce greenhouse gas (GHG) emissions and reduce costs

More than 40 companies from the cement, chemicals, ceramics, iron & steel and pulp & paper sectors participate in the project in nine Asian countries: Bangladesh, China, India, Indonesia, Mongolia, Philippines, Sri Lanka, Thailand and Vietnam. The project is coordinated by the United Nations Environment Programme (UNEP), funded by the Swedish International Development Cooperation Agency (Sida), and implemented together with National Focal Points (NFPs) in nine countries: Bangladesh, China, India, Indonesia, Mongolia, Philippines, Sri Lanka, Thailand and Vietnam.

The project components included:

- Capacity building: NFPs and participating companies received training on how to apply CP to identify energy efficiency options for main energy uses in industry
- Demonstration of CP and energy efficiency: CP assessments to find ways to improve energy efficiency were carried out at the participating companies. Options that were technically feasible, financially attractive and reduced energy and GHG emissions were implemented, resulting in sector specific case studies.
- Survey of barriers to energy efficiency: Why do some companies improve energy efficiency and others not? A survey assessed the financial, technical, cultural and other factors affecting businesses, resulting in proposed solutions to overcome the most important regional and national barriers in Asia. The main output of the GERIAP project is the "Energy Efficiency Guide for Industry in Asia" that contains a methodology that companies can apply to improve energy efficiency using the Cleaner Production approach, chapters and training materials for different energy equipment and processes of the five GERIAP sectors, case studies of options implemented, and a contact database. The Guide is available as a hard copy summary, on CDrom and on www.energyefficiencyasia.org. The Guide is available in English and was partly translated into nine Asian languages.

1.3 Approach to the Review

The review consisted of the following steps:

Energy Efficiency Survey (September - December 2004)

A survey into barriers was carried out that involved:

- Information review - A desktop analysis (internet and document search) was made of experiences and studies of financial, cultural, technical and external barriers to energy efficiency and Cleaner Production implementation, within and outside the GERIAP countries. This formed the basis for the survey questions.
- Identification of stakeholders - The NFPs were asked to identify key stakeholders from different stakeholder groups in their respective countries.
- Survey of companies and external stakeholders of energy efficiency - two Energy Efficiency Survey questionnaires were developed for companies and stakeholders of energy efficiency respectively. NFPs and the GERIAP Secretariat distributed the questionnaires. Phone and/or in-person interviews were held with the companies and selected stakeholders.
- Several of the NFPs organized a roundtable in their respective country where barriers to effective implementation of CP-EE options identified during the GERIAP project and possible solutions were discussed with case companies in order to obtain practical examples on barriers.

Regional Stakeholder Workshop in Thailand (January 24-26, 2005)

Key stakeholders (from industry as well as other stakeholder groups) from eight GERIAP countries (except Mongolia) gathered in a discussion about energy efficiency barriers. The outcomes of the workshop included:

- A regional overview of key barriers, possible solutions and stakeholder groups needed
- National overviews of key barriers, possible solutions and stakeholder groups needed, plus an action plan for one of the solutions for eight GERIAP countries
- What could be included in the ‘Energy Efficiency Guide for Industry Asia’ to address barriers, from each stakeholder group’s perspective

Desk-top reviews on key barriers

Three reviews were carried out to provide both policy makers and companies with guidance on how to address some of the barriers, including:

- *Improving Energy Efficiency in Industry in Asia – a policy review.* This report gives policy makers across Asia an overview of available energy efficiency policies to reduce energy use and greenhouse gas (GHG) emissions in industry.
- *Improving Energy Efficiency in Industry in Asia – a review of financing mechanisms for energy efficiency projects.* This report gives an overview of the financial and economic mechanisms available in the nine GERIAP countries to help industry pay for energy efficiency improvements or that provide financial incentives to implement such improvements.
- *Improving Energy Efficiency in Industry in Asia – CDM information paper and a decision and calculation tool.* This paper and tool are aimed at businesses in Asian developing countries that could potentially participate in the clean development mechanism (CDM) under the Kyoto Protocol. The tool assists Asian companies to assess quickly if it is possible and worthwhile to participate in the CDM, before they start to hire consultants.

Reporting

The final results of this study have been summarized in this report.

2. Identified Barriers and Solutions

The Regional Stakeholder Workshop identified four categories of barriers to energy efficiency:

- Management
- Knowledge/information
- Financing
- Policy

At the workshop, solutions to overcome barriers and the stakeholders who need to be involved in implementing solutions were also identified. The regional results of the workshop are summarized in the table below. Appendix C gives results for each individual GERIAP country.

This section discusses each of these barriers and illustrates them with real-practice examples from the energy assessments that were carried out at more than 40 industrial plants as part of the GERIAP project, including measures taken at these plants to overcome barriers.

Barriers to energy efficiency, proposed solutions and stakeholders needed to implement them

KEY BARRIERS	SOLUTIONS	STAKEHOLDERS
<p>MANAGEMENT Lack of awareness at company top management level of energy efficiency. This is the root cause of many other barriers, especially:</p> <ul style="list-style-type: none"> ▪ Management finds production more important ▪ Management is concerned about investment costs of energy efficiency measures ▪ Lack of policies, systems, energy/environment managers within companies ▪ Lack of integration of energy into core business management and reporting 	<p>Awareness raising / marketing strategy aimed at company top management</p> <ul style="list-style-type: none"> ▪ Awareness raising seminars for top management ▪ Training / capacity building of energy manager and external facilitators on how to convince and assist management ▪ Information dissemination ▪ Demonstration projects ▪ Comparative study (benchmarking) ▪ Clearing house ▪ Awards & recognition ▪ Networks ▪ Success stories / best practice examples ▪ Energy labeling of technologies ▪ Media campaign ▪ Inclusion in school curriculum 	<p>Everyone influencing company management:</p> <ul style="list-style-type: none"> ▪ international organizations, government ▪ ESCOs, financial institutions, ▪ NGOs, Academia ▪ Suppliers, customers, Industry associations ▪ Media ▪ Employees, environmental manager ▪ Business management schools & consultants (not just technical) ▪ Schools (start young!!)
<p>KNOWLEDGE / INFORMATION</p> <ul style="list-style-type: none"> ▪ Limited access to and availability of technical information ▪ Limited technical knowledge at company level and facilitating organizations 	<p>Strategy that aligns demand and supply of information / technology aimed at company staff and external facilitators</p> <ul style="list-style-type: none"> ▪ Training/ demonstration on EE technologies, EMS, and CP audits, technology requirements & feasibility studies ▪ Establish systems to maintain knowledge within companies ▪ Customize information and technologies ▪ Research & development ▪ Visits to different companies by external facilitators ▪ Comparative studies ▪ Technical training /capacity building of energy managers and external auditors and facilitators 	<ul style="list-style-type: none"> ▪ International organizations ▪ Government agencies ▪ Research institutions / universities / CP Centers ▪ ESCOs ▪ Industry / trade associations ▪ Suppliers

KEY BARRIERS	SOLUTIONS	STAKEHOLDERS
FINANCING <ul style="list-style-type: none"> ▪ Difficulty in obtaining external financing for energy efficiency projects, in particular by SMEs 	Financing strategy aimed especially at financial institutions <ul style="list-style-type: none"> ▪ Assist companies to make proposals bankable ▪ Different criteria for evaluating / investing in EE projects ▪ Special funds & CDM ▪ Awareness raising of financial institutions ▪ Inform companies about existing financing packages / institutions 	<ul style="list-style-type: none"> ▪ Financial institutions ▪ Central Bank ▪ Government ▪ International orgs (e.g. related to CDM) ▪ Company finance managers (CFO, accountants) ▪ Financial consultants / accountants
POLICY <ul style="list-style-type: none"> ▪ Weak legislation and/or enforcement ▪ Limited financial incentives by government for energy efficiency ▪ Irrational (subsidized) energy pricing policies 	Policy & legislative reform strategy aimed at government <ul style="list-style-type: none"> ▪ Resource pricing ▪ Transparency of energy prices, policy, and investments, contracts ▪ Fiscal / economic policies aimed at aligning energy, environment and economic policies and removal of energy subsidies ▪ Pragmatic legislation (something than can actually be implemented & enforced) ▪ Enforcement strategies ▪ Monitoring of compliance ▪ Capacity building of government officials ▪ Change of political will / leadership 	<ul style="list-style-type: none"> ▪ Government ▪ Policy makers ▪ Lobbyists ▪ International community ▪ Service providers (e.g. QMS) ▪ Public / community ▪ Consultants ▪ Industry associations ▪ Financial institutions ▪ NGOs ▪ Employee

2.1 Lack of Management Awareness

The lack of awareness of energy efficiency by top management of companies is an important barrier because without management commitment it is an uphill battle to improve energy efficiency. This appears to be the root cause of other barriers, such as the priority for production, lack of investment capital, and limited policies, systems and reporting processes to manage energy consumption, and hierarchical management structures. These are described below.

Perhaps the most important barrier is that **management is focused more on maximizing the production output and turnover** rather than on producing safely, more efficiently and reducing production costs. “I think the problem is that they are totally focused on producing their main products in as much volume as technically possible. In one plant, they charge their furnaces at 115% of their rated capacities, at all times!” one consultant observed, and added: “What impressed me most was their maintenance people and systems. If equipment breaks down, tens of people literary show (from somewhere) and they jump into it and work extremely hard to fix it. On the other hand, I was devastated to see how they treat operator safety and hygiene. In both plants, safety wear are non-existent.” As a result, it can be difficult to convince management to authorize an energy assessment or the implementation of energy efficiency options. Not because it is unimportant, but simply because production output is considered more important. At a Thai medical gloves company, the timing of implementation of new options was therefore planned at a different time than the launch of a new type of glove and a major customer’s order.

Related to this is the fact that **many Asian companies see “the environment” as a legal compliance issue and cost burden** instead of an opportunity to reduce costs. One consultant commented: “Water and energy issues are treated as secondary (at best) and as a nuisance (at all times).” Energy efficiency was a much better term to use than environment, cleaner production or greenhouse gas emissions because

management associate energy efficiency more with cost savings. The good news is that meetings with management at the end of the project revealed that awareness of the cost savings opportunity through environmental measures had increased significantly in some plants. For example, one Thai lime company had installed a bag filter to collect dust to improve relationships with local government and residents, although the option would not save the company any money. But upon implementation the company found out that recovered lime dust could be sold as product, saving them US\$ 35,000 each year and resulting in a payback period of the bag filter of only 18 months!

What appears to be the situation in developing countries is that company management often considers **new technologies as the only way to significantly improve resource efficiency**. But this is also a “prestige” issue. As one interviewed stakeholder put it: “There is no glory in repairing steam leaks.” One specific example is a large fertilizer plant, whose top managers attributed large energy losses to the old age of the plant and saw new technology as the only solution. A consultant collected baseline data for the plant and compared these with specific resource and energy consumption data from similar fertilizer plants. The results convinced management that at least 20 percent reductions are possible by improving existing production processes without investing in expensive new technologies. Several other companies also indicated that benchmark figures would help convince management to take action.

Lack of awareness about resource and energy efficiency of top management is also caused by the **immature systems to manage energy**, such as policies, environmental management systems, and an energy or environment manager. This way management is not sufficiently informed about energy and consequently cannot be pro-active towards energy management. In addition, without systems, staff are less able to take initiatives to reduce energy consumption. In one plant, management appointed an Environmental Manager at the start of the project, but he had to ask permission from top management to implement options, who only met once a month. So in practice this person could do very little. An interesting finding of the project was that companies that have management systems in place are also the ones most likely to continue with improving resource and energy efficiency after the project’s completion. This confirms the importance of management systems in addition to concrete actions.

Finally, the **hierarchical management structures** in many Asian companies can be an inhibitor for staff to raise suggestions even if there is a formal procedure for this. In one paper company the consultants identified some simple “good housekeeping” options that resulted in high cost and resource savings, but these were not reported to management because staff were afraid of repercussions. For this reason, during the GERIAP project we made sure that company staff reported the identified options to management, not the external facilitators or consultants.

2.2 Limited Knowledge and Information

A second barrier is about knowledge and information. It covers limited information and (technical) knowledge at company level and facilitating organizations, but also a limited access to and availability of knowledge and information.

Company information on energy and resources is crucial because only then the improvements after implementation of options can be measured, and management is more likely to continue with resource and energy efficiency if quantitative data on savings are available. For example, management of a Vietnamese fertilizer company supported the implementation of additional options, because the team could quantify savings of already implemented options.

Poor information systems were the main cause of lack of electricity and resource consumption data. The reason for poor monitoring is often that energy is considered as a fixed cost and therefore not actively monitored or managed. This is despite the fact that energy costs can be as high as 50 percent in cement plants. Common observations at GERIAP companies were:

- Many companies only had one meter to measure electricity and water consumption for the entire plant. At a Chinese chemical company, two industry experts were therefore asked to use their knowledge and experience to estimate the inputs and outputs of production steps to establish a minimum baseline. At a Sri Lankan paper company, meters at boilers were malfunctioning, and therefore the only way to obtain data was through monthly fuel oil invoices.
- Usually only the very large companies had monitoring equipment. During the energy assessments, plants often gave the design parameters of equipment (which can be quite different from actual operating parameters!) because they did not have monitoring equipment. During the GERIAP project several monitoring instruments was made available to the teams visiting each company. For companies who find monitoring instruments too expensive a solution could be hiring them (possible in Thailand) or jointly purchasing them with other companies (happens in India).
- Different departments often hold different information but no one has the overview to manage resource and energy consumption effectively. During the GERIAP project, we often managed to obtain the information and knowledge available in the plant by forming teams with staff from different departments. But this is not a solution in the long run unless the company decides to make these teams a formal part of the company's organizational and reporting structure.
- Information is not always communicated to those who can influence resource consumption. For example, at one of the paper companies, the administrative department gathers energy consumption and costs from monthly invoices. These data are included in monthly reports but these are only disseminated to management and not to section heads or staff.
- Some companies worked with more sets of data, sometimes mistakenly but sometimes on purpose. For example, when the external facilitators of one participating plant asked for production figures, to their astonishment they were asked whether they wanted the real figures or those reported to the government for tax purposes. Similarly, one plant had kept its ISO 14001 certification based on certain environmental data, but upon investigation these appeared to be different from the real figures.
- Access to information can also be hampered if services are contracted out. Suppliers of electricity and water often install only one meter for the entire plant and their invoices will therefore only state the total costs and electricity or water consumed. There were not many plants with adequate sub-metering, which would have made the identification of energy losses and monitoring of results of implemented options a lot easier. A notable example is an Indonesian pulp and paper company that has contracted its supply of compressed air out to a third party. In this case the company relies on the contractor for compressed air consumption data, but also for their support to identifying and implementing options and monitoring savings. Contractors generally do not benefit if the companies reduce resource and energy consumption, which creates a disincentive for them to highlight savings opportunities. A Sri Lankan company only found out that their supplier had been tampering with the fuel supply when they started monitoring themselves.
- A unique example is a paper plant in Bangladesh, which had been transferred almost entirely from Germany (as it was no longer meeting German environmental standards). All drawings and documentation were in German. In some instances this resulted in inappropriate installation of equipment or a mismatch between the production requirements and installed capacity of equipment, such as the boiler.

Limited internal knowledge and expertise was also a common problem. A minimum technical knowledge of energy, production processes and equipment is required to be able to identify, investigate and implement options to improve resource and energy efficiency.

In Mongolia and Bangladesh most participants of a technical training course on cleaner production and energy efficiency indicated that this was the first time they ever followed such a course. In both countries we gave additional courses on energy equipment and monitoring of resource consumption and savings of implemented options. In the other countries technical courses had been given before by Cleaner Production Centers or other technical organizations.

Even at one of the large multinationals training was limited to senior staff but production staff received very little training. In one paper company boilers were modern but operating very inefficiently because the company had not trained the boiler operators. This appears to be a common problem, especially in government-owned plants where making profits is given less emphasis. It is interesting to note that many companies joined the GERIAP project especially to give their staff the opportunity to get trained on energy efficiency.

Several companies had **difficulties in accessing external information and expertise**. Information companies really wanted includes benchmark figures, consultants, funding resources, information on the Clean Development Mechanism, suppliers who can provide new technologies and monitoring equipment. Sometimes this was caused by lack of internet access (only senior management have internet connection) and very often by language barriers (often only senior management speak English and sometimes even they did not). During the project, we tried to make use of local expertise as much as possible to avoid language and cultural barriers, but in some countries this expertise is limited and we therefore had to seek the help of international consultants in several instances.

The survey into barriers to energy efficiency also highlighted that the external information on resource efficiency is scattered because so many organizations hold a piece of the puzzle, including ministries, international organizations, consultancies etc. This makes it difficult for a company to get a clear overview of available information or even to know where to start looking.

2.3 Lack of Financing

Almost all companies mentioned the financial limitations of implementing energy efficiency options.

For some companies the issue was that **money was available, but not readily available**. For example, one of the Indonesian cement companies that is a subsidiary of a large multinational needed permission first to make investments over US\$ 10,000, which takes time. Others had to wait for the next budget round to gain access to capital or until a major production expansion or plant movement was completed. Government-owned plants in Bangladesh and China had to go through a bureaucratic process to get funds for energy efficiency options. A Bangladeshi fertilizer plant solved this by financing several options surrounding leak repair and insulation of pipelines from the already allocated maintenance budget. One government-owned paper plant in Sri Lanka was not allowed to make major investments until it had improved its cash flow situation. A big lesson learnt was to find out before an energy assessment is started what the decision-making process is with regard to approval for options and obtaining the required investment capital.

The most common barrier mentioned was the **lack of money to invest in options**. Options with a payback period of more than two or three years were rarely implemented. Some options provide huge savings and a short payback period of often less than one year, but the option requires a high investment and the company simply does not have the money at hand. One option is to take out a loan, but interest rates can be high, and banks often do not have confidence in the creditworthiness of companies to give them a loan, especially small and medium sized companies (SMEs). Other companies feel uncomfortable with taking a loan, and these are often family-run companies that are used to saving money first before

investing it.

On the other hand, lack of financing can also be a perceived barrier that stops companies from taking action. Often there is a gap between what management would like to do and how much they are willing to spend. At the start of the project management of several companies indicated an interest in technically sophisticated options. But when push came to shove, management would not approve the options citing high investment costs and long payback periods. It is therefore important to also focus on options that require little investment but have good return on investment, even if these are not the most glamorous options. One example is an Indonesian cement company that chose to invest in low cost options only, such as repairing false air leaks, compressed air leaks, and reducing fan speeds. Total investments were only US\$ 17,479, resulting in annual reductions of 1273 MW electricity, 11,808 tons coal, and 13,000 tons CO₂ emissions. Financial savings are US\$ 377,433 and therefore the payback period was less than one month!

Fortunately, financing mechanisms are increasingly developed in Asian countries, most notably the establishment of Energy Service Companies (ESCOs), which provide (part of) the investment capital for energy efficiency projects in return for a share of the financial savings over a certain number of years. These ESCOs exist amongst others in China, India, Indonesia and Sri Lanka. Interestingly, at a workshop in Vietnam participating companies mentioned lack of financial capital as barrier number one, but the Vietnam Cleaner Production Center and other organizations present were able to explain about the already available financing mechanisms in the country. Communication about what is already there is therefore equally important as looking into developing new financing mechanisms!

A relatively new means to finance options is the **Clean Development Mechanism (CDM)** under the Kyoto Protocol. In short, CDM involves the investment by industrialized countries that have ratified the Kyoto Protocol in projects in developing countries and receive emission reduction units in return. A worrying development is that many companies, especially SMEs, have unrealistic expectations of the CDM, often fuelled by government officials who are eager to promote the potential of the CDM without warning about the complicated and expensive process and strict criteria. Informing companies is therefore a priority.

2.4 Lack of Policies and Legislation and Enforcement

While companies hold the key to reducing their energy consumption, government policy certainly has a big influence. Limited policies, poor enforcement and conflicting economic and environmental policies were identified as the fourth group of barriers.

Lack of effective policies is a key issue, but the situation is different between countries. For example, India has a specific Energy Conservation Act since 2001 that requires energy intensive companies, such as pulp and paper, steel, cement and fertilizers, to appoint an energy manager and carry out regular energy audits (Ministry of Law, Justice and Company Affairs, 2001). China has specific legislation to promote Cleaner Production. But most other countries have environmental legislation focused on limiting pollution levels (such as emissions and wastewater) but not on using resources efficiently. In addition, policies are mostly command-and-control through legislation, and examples of economic policies (e.g. taxes, subsidies) and voluntary policies (e.g. covenants or agreements between government and industry) are scarce. This is particularly the case in (former) socialist countries such as China, Vietnam and Mongolia, although this is changing. One example is a charge of about US\$ 0.002 tax per liter petrol by the Thai government to fund the Energy Conservation Promotion Program and Fund, which provides financial assistance for energy conservation efforts by public and private sectors (WEC, 2001).

A second problem is **weak enforcement of environmental policies and legislation**. One interviewed company representative confessed: “It is cheaper to bribe the government official than to spend money on complying with permit conditions.” The survey also revealed that in Bangladesh stealing electricity from the network is commonplace because no one is there to check. A reason for limited enforcement is that governments allocate insufficient funds for policy implementation and enforcement. Plus local authorities are often hesitant to fine companies, afraid that they might move to other parts of the country, and thereby causing a loss of local jobs. But sometimes bold policies do work: the Bangladeshi government converted all three-wheelers in Dhaka to CNG, and this is now being extended to taxis and buses also.

But most damaging to Asian industry’s energy potential are **government policies that are only aimed at short-term rapid economic gain** but ignore the environmental impacts and therefore are a threat to long-term economic and social development. An important cause is that so many government agencies have an interest in energy, but from a different angle. For example, in Thailand there are ministries for environment, industry, energy, and science and technology which all develop energy-related policies, which are not necessarily consistent. And when economic and environmental interests clash, unfortunately the economy almost always wins.

Under pricing of water is the rule rather than the exception in many parts of Asia. A steel company in China pays 3 RMB per m³ municipal water but only 1 RMB for groundwater, despite the drop of groundwater levels from 10 meters to 70 meters below the surface in the past 20 years and millions of people in the city living on the same aquifer!

The most common example is government subsidies of oil products. With the increasing energy needs to sustain their economic growth, these subsidies comprise a significant share of the national budget. A Sri Lankan porcelain ware manufacturer converted its kiln from diesel to LP gas, thereby reducing the energy per kg of whiteware from 7,500 kcal to 4,000 kcal and saving 7,125 tons of CO₂ emissions per year. But as diesel is subsidized and LPG is not, it is pricing its products out of the market as its main competitors continue using diesel to take advantage of the high subsidies. Good environmental behavior is punished and poor environmental behavior is rewarded! Such policies undermine other policies aimed at reducing energy use and greenhouse gas emissions to combat climate change.

The only way to energy security is for Asian governments to support and subsidize energy efficiency and the development of alternative energy sources, not to continue subsidizing imported oil products. Fortunately we see a change now that oil prices have risen from US\$ 10 in 1998 to almost US\$ 70 in mid 2006, which forces governments to reduce or abolish such subsidies because they are simply no longer affordable. Due to lifting of subsidies, electricity prices have more than doubled in Indonesia in the past year. This was visible at a GERIAP training course on energy efficiency for Indonesian business representatives, which was totally booked out as companies are eager to reduce their sharply rising energy costs.

3. Guidance to Policy Makers

Policy makers can play an important role in addressing barriers to energy efficiency in industry. This section briefly describes what policy makers can do to overcome barriers in five steps.

3.1 Analyze the problem and define the scope

If a government observes that energy usage in industry is high (for example if the energy intensity or energy use per unit of GDP is significantly higher than that of a neighboring country with a similar industrial structure) and that there is potential for improvement, it is first important to analyze the biggest contributor to the inefficient use of energy:

- Sector: specific segments (e.g. manufacturing, transport) or specific sectors (e.g. cement)
- Company sizes: large companies, SMEs
- Types of energy: e.g. oil or electricity
- Location: the entire country or certain provinces

In addition to determining where the biggest energy loss occurs, it is also important to look at the costs of the energy lost (if the concern for low energy efficiency stems from high or rising energy prices) and the resulting greenhouse gas emissions (if climate change is the policy focus). Based on this analysis, the scope can be defined on which to focus, which will make it easier to develop effective policies.

3.2 Identify the main barriers

The main barriers to energy efficiency in the target industry must be identified because this will be an important factor in the choice of policy instruments. Barriers are broadly categorized into four groups as described in section 2: management, knowledge and information, financing, and policy. It is important to note that policy in itself can be the barrier to increased energy efficiency, but policy instruments in principle can be used to address all four categories of barriers.

Barriers can be identified in several ways, for example:

- Literature review of already undertaken surveys into barriers
- Survey with industry and stakeholders similar to the one carried out as part of GERIAP (see section 1 for the approach and Appendix A, B and C for results)
- In-depth interviews with experts, company management and other stakeholders

It is likely that several barriers exist, in which case barriers should be ranked in order of importance.

3.3 Identify existing and new policy instruments

The different types of policy instruments are listed on the next page. These are explained in the report “Improving energy efficiency in industry in Asia – a policy review” that was prepared under the GERIAP project. Before looking at what new policy instruments could be applied to address the main barriers, it should be determined what policies are already in place. Note that this can also include policies that aggravate inefficient energy use, such as fuel subsidies.

Policy makers should make a first selection based on what policy instruments could be applied. For

example, tradable rights can be used for water or emissions but are less suitable for energy.

Policy Category	Policy Type
Legislative Instruments	▪ Law & Regulations
	▪ Standards
	▪ Codes of Practice
	▪ Fiscal
Economic Instruments	▪ Subsidies
	▪ Property & tradable rights
	▪ Bonds and deposit refunds
	▪ Liability systems
Voluntary Instruments	▪ Voluntary agreements
	▪ Information & Programs
	▪ Research & Development

3.4 Evaluate policy instruments against criteria

Identified policy instruments should now be assessed to determine which one is the most suitable to address the barrier and thus improve energy efficiency in the target industry. The following criteria can be used to evaluate instruments:

- Environmental effectiveness
- Economic efficiency
- Budgetary impact
- Ability to implement and enforce
- Support from stakeholders

The policy review report mentioned earlier describes these criteria and also presents a general evaluation of the three categories (legislative, economic, voluntary) against these criteria.

3.5 Select policy instruments

Following the evaluation of different policy instruments, it is now time to select the most appropriate instrument. In practice, often a mix of policy instruments is needed because one instrument may not be enough to effectively address barriers. For example, a legislative requirement for companies to carry out regular energy audits can be combined with a program to train company staff on energy auditing.

Governments can do the following:

- Introduce a new policy (e.g. minimum efficiency performance standards for industrial motors)
- Abolish an existing policy (e.g. remove fuel subsidies)
- Change an existing policy (e.g. expand an existing training program to more industrial sectors)
- Improve enforcement of an existing policy (e.g. improved collection of fuel taxes)

The policy review report contains an overview of existing energy efficiency policy instruments from around the world and presents case study examples from Asian and other countries. A second review “Improving energy efficiency in industry in Asia - a review of financing mechanisms for energy efficiency projects” gives an overview of the financial and economic mechanisms available in the nine GERIAP countries to help industry pay for energy efficiency improvements or that provide financial incentives to implement such improvements. These can help policy makers to get an idea of how policy instruments can be worked out and implemented.

Appendix A: Barriers survey results

This section presents the results of the survey of barriers to energy efficiency in industry.

- Analysis of participants to the survey
- Limitations to the survey when interpreting the results
- The results of the following four key questions of the questionnaire are presented:
 - Barriers that influence companies ability to become more energy efficient
 - Main reasons for companies to implement energy efficiency measures
 - Importance of key stakeholders in making companies implement energy efficiency measures
 - What is needed to assist industry in becoming more energy efficient (i.e. possible solutions to barriers)

Results for the five GERIAP industry sectors are in Appendix B and result for eight GERIAP countries are in Appendix C.

A1. Participants

Overall

In total 186 completed questionnaires were received from 77 company representatives and 109 stakeholders from 8 countries in the Asia Pacific region. Several participants also took part in interviews. The company questionnaire and stakeholder questionnaire are in Appendix D and E.

Responses were derived from eight out of the nine GERIAP countries (except Mongolia) as shown in Figure 1 and Table 1 below. A few additional questionnaires were received from external stakeholders with substantial consulting experience in Asia, but not responding as stakeholders of any specific country. These responses were therefore put under the “Other” category.

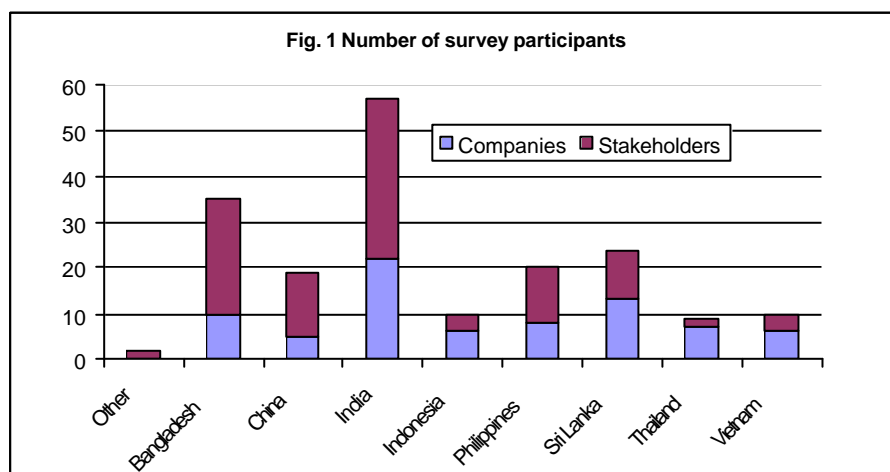
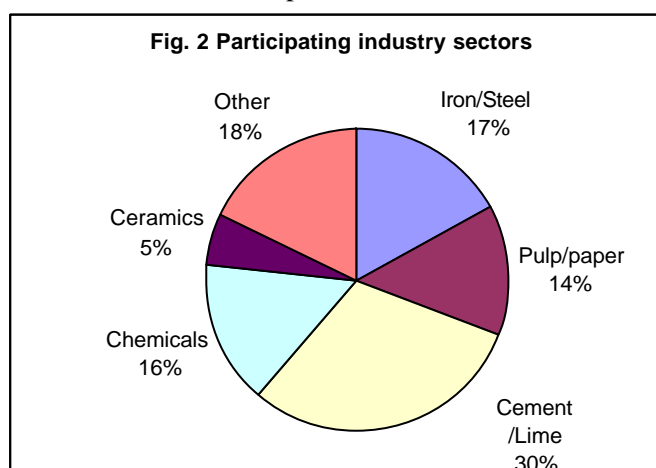


Table 1. Number of survey participants

Country	Sum of Companies	Sum of Stakeholders	Total
Other	0	2	2
Bangladesh	10	25	35
China	5	14	19
India	22	35	57
Indonesia	6	4	10
Philippines	8	12	20
Sri Lanka	13	11	24
Thailand	7	2	9
Vietnam	6	4	10
Grand Total	77	109	186

Companies

Seventy-seven company responses were received from different sectors as shown in Figure 2. Participating companies represents all the GERIAP industry sectors from eight GERIAP countries. A number of companies (19%) belonged to the “other” category and are energy intensive companies outside of the five GERIAP sectors (for instance rubber production).



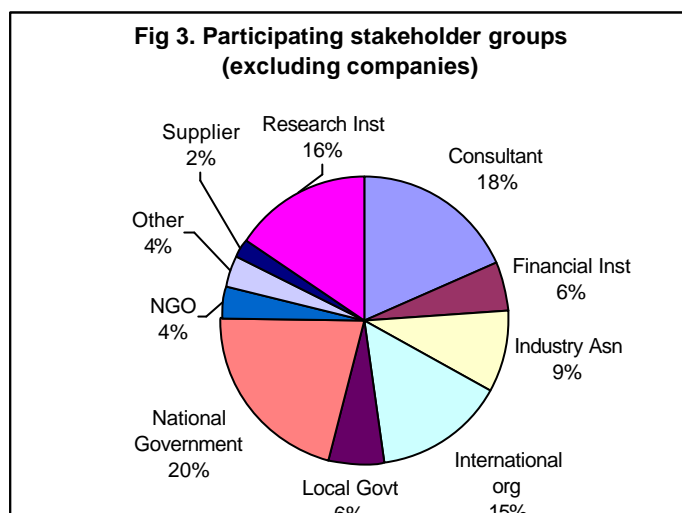
In total 39 of the 46 GERIAP companies took part in the survey. In some cases, more than 1 response was received from the same company. The respondents are mainly Managers followed by technical/production staff involved in energy issue at the company (see Table 2).

Table 2. Positions of company staff participating in the survey

Sector	No responses	Actual amount of companies	GERIAP Companies	Non-GERIAP Companies	Manager	Staff	Admin	Role not defined
Iron/Steel	13	11	8	5	7	4	0	2
Pulp/paper	11	8	10	1	6	5	0	
Cement/Lime	23	19	20	2	10	10	2	
Chemicals	12	11	7	5	10	2	0	
Ceramics	4	2	4	0	2	2	0	
Other	14	12	6	9	13	2	0	

Stakeholders

A broad range of external stakeholders with an interest in energy efficiency at companies participated to the survey. Figure 3 shows the response to the survey by stakeholder group.



Stakeholders were asked to indicate their current involvement in energy and climate change issues (Table 3). Most of the respondents have either a direct or advisory role in energy issues and can therefore be considered as relevant respondents to the survey.

Table 3. Participating stakeholders' role in energy and climate change issues

Role in Energy	No. of Stakeholders	% of Stakeholders
No direct	2	1.8 %
Indirect/minor	28	25.7%
Advisory/supervisory role	31	28.4%
Direct/major part	48	44.1%
Total:	109	100%

The majority of stakeholder respondents (78%) indicated no previous involvement in the GERIAP project, other than through the survey. Approximately 16 % of the respondents represented a GERIAP NFP and 6% were either consultants or subcontractors to the GERIAP project.

A2. Limitations to the Survey

The results of the survey presented in Appendix A, B and C must be interpreted with the following considerations in mind:

- **Comparing companies and external stakeholders.** Companies and stakeholders received the same questions but companies responded from their individual perspective whereas stakeholders gave their views of energy-intensive companies as a whole in their specific GERIAP country. For this reason results are provided for companies and external stakeholder separately.
- **Company representation.** There are approximately twice as many responses from GERIAP companies than from non-GERIAP companies. GERIAP companies may have responded more positively (e.g. about barriers) as they already have shown some degree of commitment towards energy efficiency.
- **Country representation.** The responses are unequally distributed over the eight countries, ranging from 9 responses from Thailand to 57 responses from India (see Table 1). The results are therefore relatively more influenced by countries with a high response rate. For this reason results are also provided for each country separately.
- **Sector representation.** Responses are reasonably evenly distributed over sectors and at least ten responses were received from each sector. However, only four responses were received from two companies in the ceramics sector, which is not enough to be able to draw conclusions.
- **Cleaner Production versus Energy Efficiency.** Respondents were asked for their view on barriers, reasons, stakeholders and useful activities in relation to improved energy efficiency in industry. Ideally the survey would have liked to focus on energy efficiency in industry *using the CP approach* (i.e. characterized by prevention of energy losses at the source, continuous improvement, systematic approach, and integration into business processes). However, it was anticipated that for many respondents it would be too difficult to make this distinction. Therefore it was decided to ask about energy efficiency, independent of the approach taken by companies.
- **Role of comments.** Many participants interviewed gave scores for questions in combination with comments. For example, on the barrier “it is difficult to obtain financing for energy efficiency projects” one stakeholder commented that many companies will find this an important barrier (score 5 or 6) but in his view this is a perceived barrier and not a real barrier, so he gave it the score 1. For this reason, we included a selection of comments (due to time and space constraints we did not include all comments). Consideration of the comments is important because they put the survey results into context.

A3. What are the key barriers?

This section presents the results of the survey regarding barriers to energy efficiency in industry and refers to question 4 in the questionnaire (Appendix D and E).

Survey question

Question 4 in the survey questionnaire (4a-4w)

The survey question was: “*We would like to understand what makes it difficult or easy for companies to become more energy efficient. Please rate these statements on a six point scale where 1 is “strongly disagree” and 6 is “strongly agree”. Improving energy efficiency at our company / companies is difficult because...*”

	Strongly disagree				Strongly agree		Don't know
a) Management finds production more important	1	2	3	4	5	6	?
b) There is a lack of information on energy consumption within our company / companies	1	2	3	4	5	6	?
c) There is a lack of technical knowledge within companies	1	2	3	4	5	6	?
d) There is a lack of awareness of the importance of energy efficiency	1	2	3	4	5	6	?
e) Energy is cheap	1	2	3	4	5	6	?
f) Management is concerned about the investment costs of energy efficiency measures	1	2	3	4	5	6	?
g) There is a lack of policies, procedures and systems within our company / companies	1	2	3	4	5	6	?
h) Management believe there is no/little scope for improvement	1	2	3	4	5	6	?
i) There is no specific person or committee dealing with energy at our company / companies	1	2	3	4	5	6	?
j) Only new expensive technologies will improve energy efficiency at our company / companies	1	2	3	4	5	6	?
k) There is a lack of coordination between departments within our company / companies	1	2	3	4	5	6	?
l) Management is concerned about time required to improve energy efficiency	1	2	3	4	5	6	?
m) Our company / Companies' culture does not encourage staff to give suggestions for improvement	1	2	3	4	5	6	?
n) The process to obtain approval from top management for investments is long	1	2	3	4	5	6	?
o) It is difficult to obtain financing for energy efficiency projects	1	2	3	4	5	6	?
p) Environmental policies and legislation relating to energy are weak	1	2	3	4	5	6	?
q) Authorities are not strict in enforcing environmental regulations	1	2	3	4	5	6	?
r) The Government does not give financial incentives to become energy efficient	1	2	3	4	5	6	?
s) It is difficult to access external technical information and expertise	1	2	3	4	5	6	?
t) There is a lack of coordination between external organizations	1	2	3	4	5	6	?
u) Our company / Companies do not have targets for energy (only for production)	1	2	3	4	5	6	?
v) Employees in our company / companies do not want to change the way they work	1	2	3	4	5	6	?
w) Benefits of implemented energy efficiency measures are not quantifiable	1	2	3	4	5	6	?

Results

The results from question 4 regarding barriers to energy efficiency in industry are presented in tables and graphs with comments and grouped as follows:

- Comparing companies and external stakeholders results
- Companies
- External stakeholders

a) Comparing companies and external stakeholder results

Figure 4 shows the average scores and order of priority of barriers to energy efficiency in industry as ranked by companies and by external stakeholders. The figures show that:

- In general, companies and external stakeholder have selected the same top 5 barriers, although the order of importance differs slightly.
- There is a low spread of the scores given by especially stakeholders. Most of the barriers are given an average score around 4. Because of the small difference between the average scores of barriers, the order of the barriers should be seen as an indication only.
- Overall, companies have given a lower rating of all the barriers compared to stakeholders. For instance, the highest rated barrier for companies (*The Government does not give financial incentives to become energy efficient*) has an average score of 4.18. The same barrier was given a much higher average score of 4.38 by external stakeholders but only came in fifth place. For this reason, the average score of barriers is at least as important as the order of barriers when comparing company and stakeholder results.

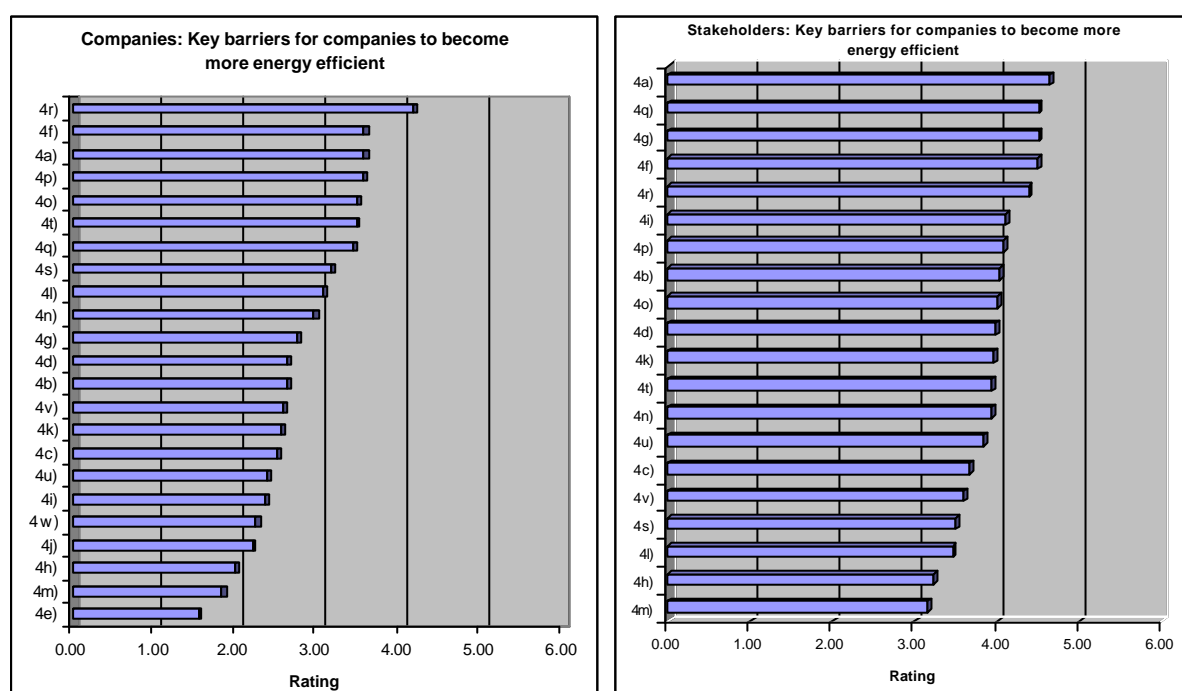


Figure 4. Average ranking of key barriers to energy efficiency in industry by companies and external stakeholders

b) Companies

For the top 5 barriers identified by companies, the spread of scores from score 1 (strongly disagree, not a barrier) to score 6 (strongly agree, important barrier) is given in Table 4. The results show that:

- The most important barrier according to companies is **4r** *The Government does not give financial incentives to become energy efficient*.
- The spread of the scores for the top barriers is quite large, which means that there company respondents have different views. For instance, nearly 16 % of the responses strongly disagrees that Management finds production more important, while 16 % strongly agrees! This also explains the relative lower average score compared with external stakeholders.
- The average scores of top barriers 2 to 5 lie very close, and therefore the priority of these barriers is difficult to determine.
- The top 5 barriers are a mix of internal (management) and external (government) barriers. Notably, none of these are technical barriers, such as technology or technical knowledge / expertise.

Table 4. The top 5 barriers to energy efficiency in industry, according to companies (77 respondents)

Barrier	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
4r) The Government does not give financial incentives to become energy efficient	4.18	9.46%	9.46%	8.11%	21.62%	29.73%	21.62%
4a) Management finds production more important	3.57	15.79%	17.11%	13.16%	18.42%	19.74%	15.79%
4f) Management is concerned about the investment costs of energy efficiency measures	3.57	14.67%	17.33%	12.00%	20.00%	24.00%	12.00%
4p) Environmental policies and legislation relating to energy are weak	3.56	13.70%	17.81%	9.59%	24.66%	26.03%	8.22%
4o) It is difficult to obtain financing for energy efficiency projects	3.49	13.51%	14.86%	17.57%	28.38%	14.86%	10.81%

c) External stakeholders

For the top 5 barriers identified by external stakeholders, the spread of scores from score 1 (strongly disagree, not a barrier) to score 6 (strongly agree, important barrier) is given in Table 5. The results show that:

- The most important barrier according to stakeholders is *4a) Management finds production more important*.
- There is a relatively little spread among the responses of the Top 5 barriers. In other words, most respondents agree that these indeed are the most important barriers.
- The average scores lie very close to each other and it is therefore difficult to determine the relative importance between these barriers.
- As for companies, the top 5 barriers identified by external stakeholders are a mix of internal (management) and external (government) barriers, and technical barriers are ranked lower.

Table 5. The top 5 barriers to energy efficiency in industry, according to external stakeholders (109 respondents)

Barrier	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
4a) Management finds production more important	4.65	0.9%	5.5%	11.0%	25.7%	23.9%	33.0%
4q) Authorities are not strict in enforcing environmental regulations	4.51	3.7%	4.6%	6.5%	27.8%	32.4%	25.0%
4g) There is a lack of policies, procedures and systems within companies	4.51	1.8%	7.3%	11.0%	21.1%	34.9%	23.9%
4f) Management is concerned about the investment costs of energy efficiency measures	4.49	1.9%	3.7%	14.8%	24.1%	34.3%	21.3%
4r) The Government does not give financial incentives to become energy efficient	4.38	2.9%	3.8%	12.5%	27.9%	26.0%	26.9%

A4. What are the main reasons for implementation?

This section presents the results of the survey regarding the main reasons for companies to implement energy efficiency measures.

Survey Question

Question 8 in the survey questionnaire (8a-8p)

The survey question was:

- For companies: *Thinking of why your company has implemented energy efficiency measures, please rate the importance of the following reasons. If your company has not implemented energy efficiency measures, please rate how important they would be. Please rate on a six-point scale where 1 is “not important” and 6 is “very important” :*
- For external stakeholders: *Thinking of why companies have implemented or would implement energy efficiency measures, please rate the importance of the following reasons. Please rate on a six-point scale where 1 is “not important” and 6 is “very important” .*

	Not important			Very important			Don't know
a) Reduced energy costs	1	2	3	4	5	6	?
b) Reduced production costs	1	2	3	4	5	6	?
c) Reduced energy consumption	1	2	3	4	5	6	?
d) Reduced greenhouse gas emissions	1	2	3	4	5	6	?
e) Reduced other emissions (e.g. SO _x , NO _x)	1	2	3	4	5	6	?
f) Improved overall environmental performance	1	2	3	4	5	6	?
g) Improved product quality	1	2	3	4	5	6	?
h) Improved reputation / recognition	1	2	3	4	5	6	?
i) Improved staff health and safety	1	2	3	4	5	6	?
j) Improved compliance with regulations	1	2	3	4	5	6	?
k) Improved compliance with corporate environmental targets	1	2	3	4	5	6	?
l) Preparation for Kyoto Protocol / Clean Development Mechanism opportunities	1	2	3	4	5	6	?
m) Improved staff pride / morale	1	2	3	4	5	6	?
n) Improved relations with customers	1	2	3	4	5	6	?
o) Other (please describe):	1	2	3	4	5	6	?
p) Other (please describe):	1	2	3	4	5	6	?

Results

The results from question 8 regarding reasons for companies to implement energy efficiency measures are presented in tables and graphs with comments and grouped as follows:

- Comparing companies and external stakeholders results
- Companies
- External stakeholders
- Countries
- Industry sectors

a) Comparing companies and external stakeholders results

Figure 5 shows the average scores and order of priority of reasons for companies to implement energy efficiency measures as ranked by companies and by external stakeholders. The figures show that:

- Companies and external stakeholders identified the same three main (related) reasons for companies to take action, which have a common cost aspect:
 - **8a) Reduced energy costs**
 - **8b) Reduced production costs**
 - **8c) Reduced energy consumption**
- Companies gave higher average scores for reasons for energy efficiency than external stakeholders. Companies rated all reasons on average 4 or higher. For external stakeholder this was 3 or higher.
- Environmental reasons, including: **8f) - Improved overall environmental performance** and **8d) - Reduced greenhouse gas emissions** receive are also considered important although they are not considered as the main reason for implementation of energy efficiency measures.

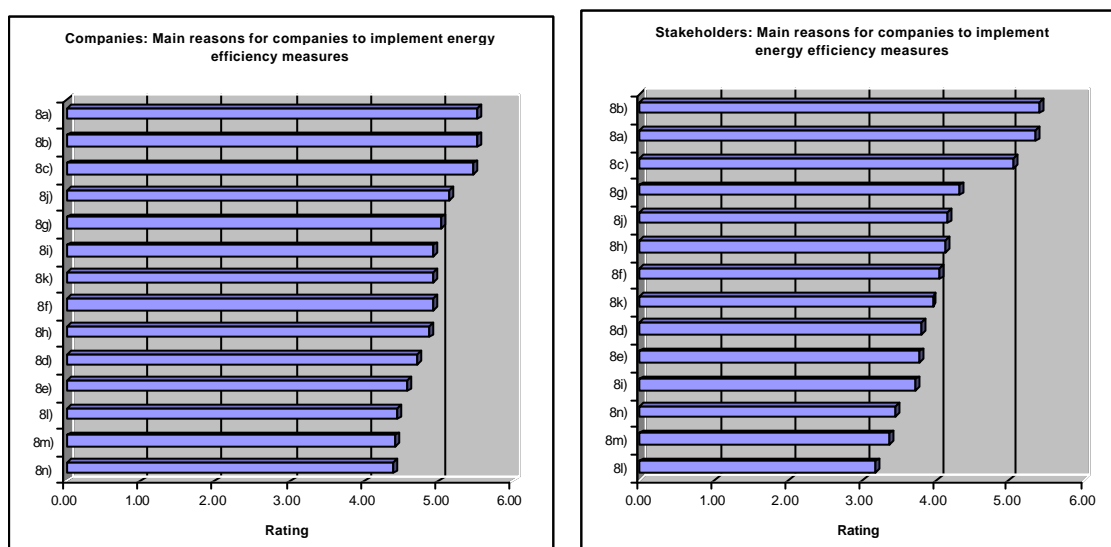


Figure 5. Average ranking of reasons for companies to implement energy efficiency measures as given by companies and external stakeholders

b) Companies

For the top 5 reasons identified by companies, the spread of scores from score 1 (strongly disagree, not a reason) to score 6 (strongly agree, important reason) is given in Table 6. The results show that:

- The most important reasons for implementation according to companies are: **8a) Reduced energy costs**, **8b) Reduced production costs** and **8c) Reduced energy consumption**
- There is little spread in scores between individual company responses, with all reasons receiving scores of 4 or higher. More than 70% of the respondents have ticked 6 – the highest score – for the top 3 reasons.
- Among the top 5 listed reasons are also **8j) Improved compliance with regulations** and also **8g) Improved product quality** – both receiving the same average score of 5.15.
- Even the least important reason for implementation (**8n) Improved relations with customers**) has received a high average score of 4.39.

Table 6. The top 5 reasons for companies to implement energy efficiency measures, according to companies (77 respondents)

Reasons	Average score	Strongly disagree					Strongly agree	
		1	2	3	4	5	6	
8a) Reduced energy costs	5.53	1.32%	2.63%	0.00%	9.21%	11.84%	75.00%	
8b) Reduced production costs	5.52	1.33%	2.67%	0.00%	5.33%	20.00%	70.67%	
8c) Reduced energy consumption	5.48	1.33%	2.67%	2.67%	5.33%	16.00%	72.00%	
8j) Improved compliance with regulations	5.15	1.35%	0.00%	8.11%	10.81%	32.43%	47.30%	
8g) Improved product quality	5.15	2.67%	4.00%	5.33%	14.67%	21.33%	52.00%	

c) Stakeholders

For the top 5 reasons identified by external stakeholders, the spread of scores from score 1 (strongly disagree, not a reason) to score 6 (strongly agree, important reason) is given in Table 7. The results show that:

- The most important reasons for implementation, are, according to stakeholders: 8b) *Reduced production costs*, 8a) *Reduced energy costs* and 8c) *Reduced energy consumption*.
- There is little spread in scores between individual stakeholder responses (although more than for companies), with all reasons receiving mostly scores of 3 or higher. More than 70% of the respondents have ticked 6 – the highest score – for the top 3 reasons
- External stakeholders identified *Improved compliance with regulations* as a more important reason than companies did.

Table 7. The top 5 reasons to energy efficiency in industry, according to external stakeholders (109 respondents)

Reasons	Average score	Strongly disagree					Strongly agree	
		1	2	3	4	5	6	
8b) Reduced production costs	5.42	0.00%	0.00%	3.74%	12.15%	21.50%	62.62%	
8a) Reduced energy costs	5.37	0.00%	2.83%	3.77%	10.38%	18.87%	64.15%	
8c) Reduced energy consumption	5.06	0.00%	2.88%	6.73%	18.27%	26.92%	45.19%	
8g) Improved product quality	4.31	1.90%	5.71%	16.19%	25.71%	35.24%	15.24%	
8j) Improved compliance with regulations	4.16	1.89%	5.66%	16.98%	35.85%	30.19%	9.43%	

A5. Who are the key stakeholders?

This chapter presents the results of the survey regarding the key stakeholders that affect business to implement energy efficiency measures.

Survey Question

Question 9 & 10 in the survey questionnaire (9a-9p and 10a-10p)

Note: The survey included two questions about stakeholders. One question about how much different stakeholders try to make companies implement energy efficiency measures, and the second question asked about how important different stakeholders are actually making companies implement energy efficiency measures. As respondents answered these two questions almost in the same way it was decided to combine the results.

The question was:

- For companies: *If your company has implemented energy efficiency measures, please rate how important the following stakeholders were. If your company has not implemented measures, please rate how important they would be. Please rate stakeholders on a six-point scale from 1 “not important” until 6 “very important”.*
- For external stakeholders: *For companies that implement measures to become more energy efficient, please rate how important the following stakeholders are in achieving this. Please rate stakeholders on a six-point scale from 1 “not important” until 6 “very important”.*

	Not important						Very important	Don't know
a) Corporate Head Office	1	2	3	4	5	6	?	
b) Plant management	1	2	3	4	5	6	?	
c) National Government (e.g. Ministry)	1	2	3	4	5	6	?	
d) State/Local government agencies	1	2	3	4	5	6	?	
e) Industry / business associations	1	2	3	4	5	6	?	
f) Financial institutions	1	2	3	4	5	6	?	
g) Universities / Research institutes	1	2	3	4	5	6	?	
h) Consultants	1	2	3	4	5	6	?	
i) International organisations (e.g. UNEP)	1	2	3	4	5	6	?	
j) Customers	1	2	3	4	5	6	?	
k) Employees	1	2	3	4	5	6	?	
l) Shareholders of company	1	2	3	4	5	6	?	
m) NGOs	1	2	3	4	5	6	?	
n) Local communities	1	2	3	4	5	6	?	
o) Media	1	2	3	4	5	6	?	
p) Other (please describe):	1	2	3	4	5	6	?	

Results

The results from the question regarding stakeholders that are important to companies when implementing energy efficiency measures are presented in tables and graphs with comments and grouped as follows:

- Comparing companies and external stakeholders results
- Companies:
- External stakeholders
- Countries
- Industry sectors

a) Comparing companies and external stakeholders results

Figure 6 shows the average scores and order of priority of stakeholders who are important for companies to implement energy efficiency measures as ranked by companies and by external stakeholders. The figures show that:

- Companies and stakeholders indicate similar responses over the main stakeholders that affect business to implement energy efficiency measures. Internal stakeholders (company management, corporate head office) are most important, especially among the company replies. However, external stakeholders, such as international organizations as well as consultants are also among the overall most important stakeholders for both industry and stakeholder respondents.
- Company respondents agree more overall about the top 5 key stakeholders that affect them, as compared to stakeholder respondents. (More than 80% of all companies rate plant management a 5 or 6)

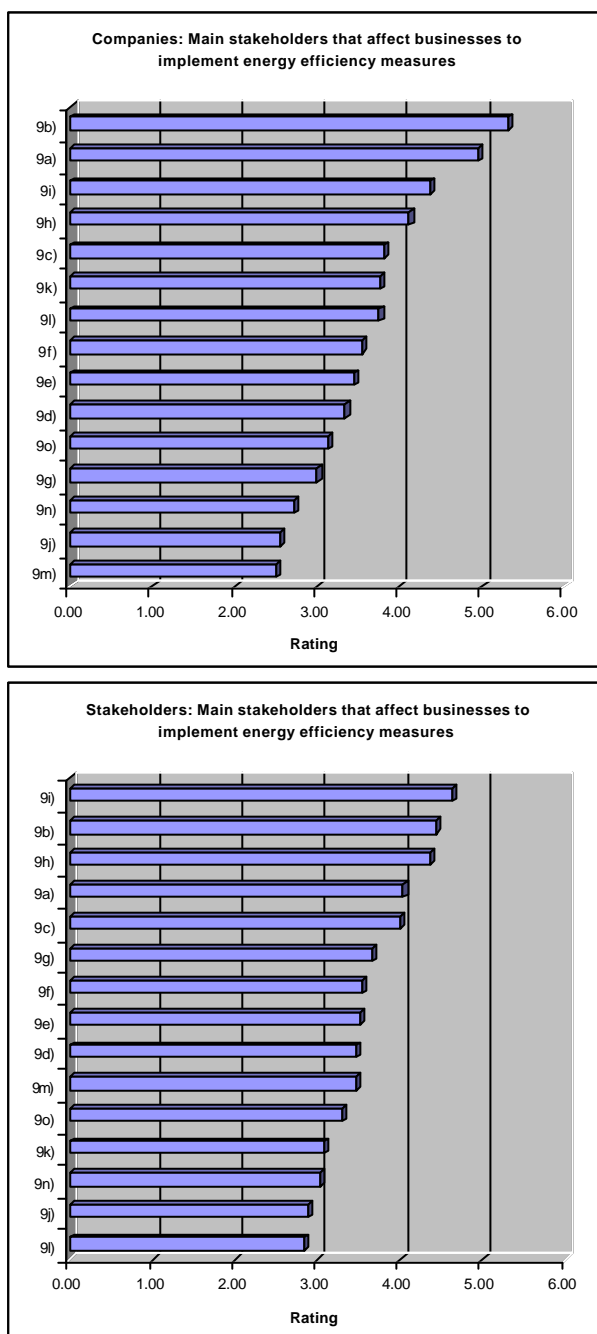


Figure 6. Average ranking of stakeholders that are important for companies to implement energy efficiency measures as given by companies and external stakeholders

b) Companies

For the top 5 stakeholders identified by companies, the spread of scores from score 1 (strongly disagree, not an important stakeholder) to score 6 (strongly agree, important stakeholder) is given in Table 8. The results show that:

- Plant management is clearly the most important stakeholder affecting business to implement energy efficiency measures (the only stakeholder that scores over 5, overall)
- The internal stakeholders **9b) Plant management and 9a) Corporate Head Office**, are clearly (and not surprisingly) more important than any external stakeholder when it comes to improving energy efficiency
- International organizations are considered as the most important external stakeholder (outside the company boundaries)
- Consultants also play a key role in a company's effort to become more energy efficient

Table 8 Ranking of the top 5 stakeholders that affect business to implement energy efficiency measures, according to companies (77 respondents)

Stakeholder	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
9b) Plant management	5.31	0.00%	0.00%	1.41%	18.31%	28.17%	52.11%
9a) Corporate Head Office	4.96	0.00%	1.45%	7.25%	24.64%	27.54%	39.13%
9i) International organisations (e.g. UNEP)	4.38	3.08%	4.62%	18.46%	26.15%	20.00%	27.69%
9h) Consultants	4.12	3.08%	7.69%	16.92%	27.69%	35.38%	9.23%
9c) National Government (e.g. Ministry)	3.82	7.69%	12.31%	18.46%	29.23%	16.92%	15.38%

c) External stakeholders

For the top 5 stakeholders identified by external stakeholders, the spread of scores from score 1 (strongly disagree, not an important stakeholder) to score 6 (strongly agree, important stakeholder) is given in Table 9. The results show that:

- There is a mix of internal and external stakeholders in the top 5 of stakeholders that affect business to implement energy efficiency
- **9i) International organizations** are identified as the most important stakeholder that affects business to implement energy efficiency measures. The fact that this survey was conducted by UNEP may have resulted in a more favorable score.
- Plant management is rated second most important followed by consultants and the corporate head office.

Table 9. Ranking of the top 5 stakeholders that affect business to implement energy efficiency measures, according to stakeholders (109 respondents)

Stakeholder	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
9i) International organisations (e.g. UNEP)	4.63	0.00%	2.91%	8.74%	31.07%	36.89%	20.39%
9b) Plant management	4.44	2.86%	2.86%	11.43%	33.33%	29.52%	20.00%
9h) Consultants	4.36	0.00%	1.90%	15.24%	38.10%	34.29%	10.48%
9a) Corporate Head Office	4.04	4.90%	5.88%	15.69%	35.29%	30.39%	7.84%
9c) National Government (e.g. Ministry)	4.00	2.80%	8.41%	22.43%	29.91%	25.23%	11.21%

A6. What is needed to improve energy efficiency?

This section presents the survey results regarding the activities that could be useful in assisting companies to improve their energy efficiency.

Survey Question

Question 11 in the survey questionnaire (11a-11z)

The question was:

- For companies: *Please rate the following activities on how useful they could be in assisting your company to become more energy efficient. On a six-point scale, 1 is “not useful” and 6 is “very useful”.*
- For external stakeholders: *Please rate the following activities on how useful they could be in assisting companies to become more energy efficient. On a six-point scale, 1 is “not useful” and 6 is “very useful”.*

	Not useful					Very useful	Don't know
Training / courses on:							
▪ Energy efficient technologies	1	2	3	4	5	6	?
▪ Environmental / Energy management systems	1	2	3	4	5	6	?
▪ Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?
▪ Financing CP / energy efficiency projects	1	2	3	4	5	6	?
▪ Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?
▪ Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?
Information on:							
▪ Energy efficient technologies	1	2	3	4	5	6	?
▪ Environmental / Energy management systems	1	2	3	4	5	6	?
▪ Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?
▪ Financing CP / energy efficiency projects	1	2	3	4	5	6	?
▪ Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?
▪ Energy monitoring instruments	1	2	3	4	5	6	?
▪ Case studies of other companies	1	2	3	4	5	6	?
▪ Government policies / legislation / \$ incentives	1	2	3	4	5	6	?
▪ Benchmarking data	1	2	3	4	5	6	?
▪ Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?
Other:							
▪ Loans / subsidies for energy efficiency	1	2	3	4	5	6	?
▪ Discounted / free expert's advice	1	2	3	4	5	6	?
▪ Energy monitoring instruments for hire	1	2	3	4	5	6	?
▪ Programmes to participate in / access	1	2	3	4	5	6	?
▪ Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	1	2	3	4	5	6	?
▪ Software (for energy monitoring, benchmarking etc.)	1	2	3	4	5	6	?
▪ Industry networks	1	2	3	4	5	6	?
▪ Newsletters with energy developments	1	2	3	4	5	6	?
▪ “Energy Fair” (with technology providers, advisors etc.)	1	2	3	4	5	6	?
▪ Other (please describe):	1	2	3	4	5	6	?

Results

The results from the question regarding useful activities for companies to improve their energy efficiency are presented in tables and graphs with comments and grouped as follows:

- Comparing companies and external stakeholders results
- Companies:
 - External stakeholders
 - Countries
 - Industry sectors

a) Comparing companies and external stakeholders results

Figure 7 shows the average scores and order of priority of stakeholders who are important for companies to implement energy efficiency measures as ranked by companies and by external stakeholders. The figures show that:

- Almost all activities received an average score of 5 or 6 by companies and external stakeholders! This suggests that there is a need for a combination of (1) Training, (2) Information and (3) Other assistance. It also suggests that several respondents find that ANY assistance would be appreciated. Ranking of activities is difficult because the scores are very similar.
- The top 3 activities identified by companies and external stakeholders under the categories Training and Information are:
 - 11a)/11g) Energy efficient technologies*
 - 11c)/11i) Cleaner Production (CP) / Energy auditing*
 - 11b)/11h) Environmental / Energy management systems.*
- Other activities ranked as most important are:
 - 11r) Discounted / free expert's advice*
 - 11q) Loans / subsidies for energy efficiency*

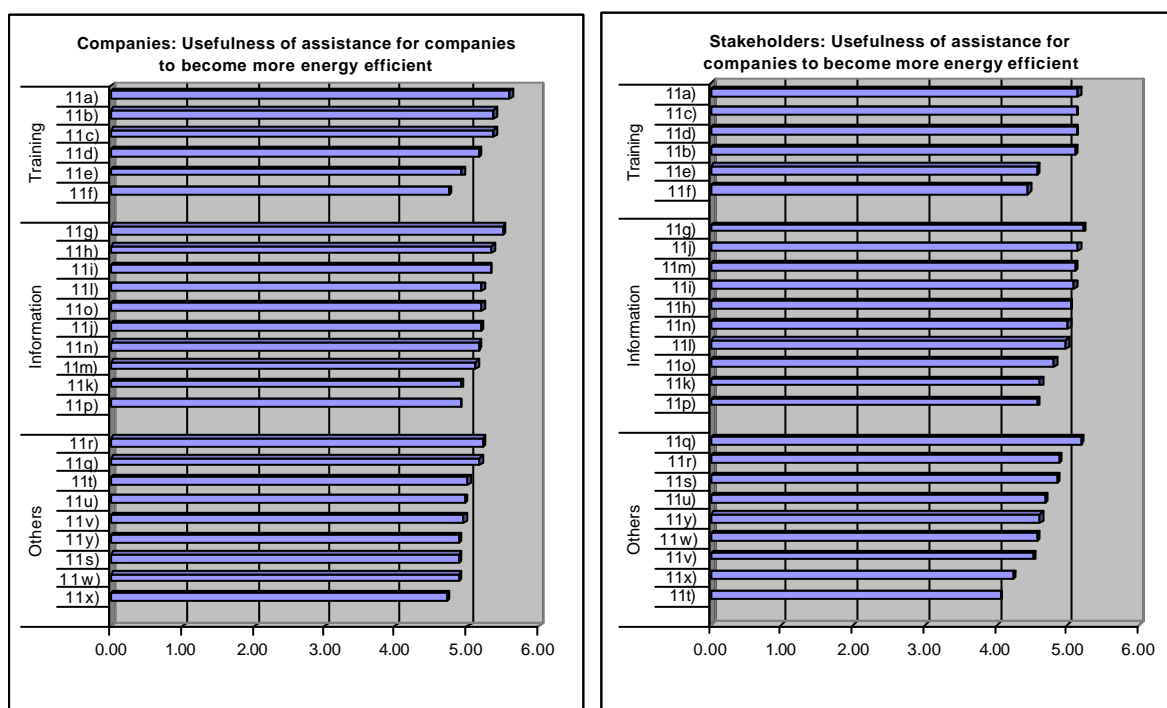


Figure 7. Average ranking of activities that could assist companies in improving energy efficiency as given by companies and external stakeholders

b) Companies

For the top 5 activities identified by companies as useful, the spread of scores from score 1 (strongly disagree, not an important stakeholder) to score 6 (strongly agree, important stakeholder) is given for Training / courses (Table 10), Information (Table 11) and Other (Table 12) below. The most important results are:

- The same top 3 topics were selected for Training / courses and Information. Interestingly, energy efficient technologies was ranked highest, whereas the top 5 barriers identified in the survey did not include any technical barriers.
- The top 3 activities under “other” are all directly or indirectly finance related: *11r) Discounted / free expert’s advice* and *11q) Loans / subsidies for energy efficiency* and *11t) Programmes to participate in / access*.
- The scores by individual respondents are spread unevenly for all activities, with a strong bias towards scores higher than 4.

Table 10. The top 5 training topics identified as most useful by companies (77 respondents)

Training / courses	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11a) Energy efficient technologies	5.61	0.00%	0.00%	0.00%	9.21%	21.05%	69.74%
11b) Environmental / Energy management systems	5.37	0.00%	0.00%	2.67%	13.33%	28.00%	56.00%
11e) Cleaner Production (CP) / Energy auditing	5.37	0.00%	0.00%	1.33%	18.67%	21.33%	58.67%
11d) Financing CP / energy efficiency projects	5.17	NA	NA	NA	NA	NA	NA
11e) Energy and greenhouse gas monitoring / targeting	4.92	NA	NA	NA	NA	NA	NA

Table 11. The top 5 information topics identified as most useful by companies (77 respondents)

Information	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11g) Energy efficient technologies	5.49	0.00%	0.00%	2.67%	13.33%	16.00%	68.00%
11h) Environmental / Energy management systems	5.35	0.00%	0.00%	4.05%	14.86%	22.97%	58.11%
11i) Cleaner Production (CP) / Energy auditing	5.32	0.00%	0.00%	2.74%	19.18%	21.92%	56.16%
11l) Energy monitoring instruments	5.21	0.00%	0.00%	5.48%	13.70%	35.62%	45.21%
11o) Benchmarking data	5.20	0.00%	0.00%	2.86%	22.86%	25.71%	48.57%

Table 12. The top 5 other activities identified as most useful by companies (77 respondents)

Other	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11r) Discounted / free expert’s advice	5.21	NA	NA	NA	NA	NA	NA
11q) Loans / subsidies for energy efficiency	5.18	2.78%	1.39%	4.17%	15.28%	19.44%	56.94%
11t) Programmes to participate in / access	5.01	NA	NA	NA	NA	NA	NA
11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	4.97	NA	NA	NA	NA	NA	NA
11v) Software (for energy monitoring, benchmarking etc.)	4.94	NA	NA	NA	NA	NA	NA

c) External stakeholders

For the top 5 activities identified by external stakeholders as useful, the spread of scores from score 1 (strongly disagree, not an important stakeholder) to score 6 (strongly agree, important stakeholder) is given for Training / courses (Table 13), Information (Table 14) and Other (Table 15) below. The most important results are:

- The same topic **11a)/11g) Energy Efficient technologies** was selected as number 1 for Training / courses and Information.
- Unlike companies, external stakeholders ranked **11m) Case studies of other companies** in the top 5 of information topics.
- The top 3 activities under “other” are all directly or indirectly finance related: **11r) Discounted / free expert’s advice** and **11q) Loans / subsidies for energy efficiency advice** and **11s) Energy monitoring instruments for hire**.
- The scores by individual respondents are spread unevenly for all activities, with a strong bias towards scores higher than 4.

Table 13. The top 5 training topics identified as most useful according to external stakeholders (109 respondents)

Training / courses	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11a) Energy efficient technologies	5.14	0.94%	1.89%	4.72%	17.92%	23.58%	50.94%
11c) Cleaner Production (CP) / Energy auditing	5.11	0.94%	1.89%	3.77%	15.09%	34.91%	43.40%
11d) Financing CP / energy efficiency projects	5.11	0.93%	0.93%	2.80%	16.82%	38.32%	40.19%
11b) Environmental / Energy management systems	5.09	0.93%	1.87%	5.61%	15.89%	29.91%	45.79%
11e) Energy and greenhouse gas monitoring / targeting	4.56	1.90%	2.86%	5.71%	36.19%	33.33%	20.00%

Table 14. The top 5 information topics identified as most useful according to external stakeholders (109 respondents)

Information	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11g) Energy efficient technologies	5.21	0.95%	0.00%	5.71%	15.24%	26.67%	51.43%
11j) Financing CP / energy efficiency projects	5.14	0.95%	0.00%	3.81%	16.19%	37.14%	41.90%
11m) Case studies of other companies	5.1	0.00%	0.00%	2.83%	20.75%	39.62%	36.79%
11i) Cleaner Production (CP) / Energy auditing	5.09	0.96%	1.92%	5.77%	13.46%	34.62%	43.27%
11h) Environmental / Energy management systems	5.03	0.95%	2.86%	2.86%	19.05%	34.29%	40.00%

Table 15. The top 5 other activities identified as most useful according to external stakeholders (109 respondents)

Other	Average score	Strongly disagree 1	2	3	4	5	Strongly agree 6
11q) Loans / subsidies for energy efficiency	5.18	0.00%	1.89%	8.49%	14.15%	20.75%	54.72%
11r) Discounted / free expert’s advice	4.88	0.00%	1.87%	6.54%	28.97%	27.10%	35.51%
11s) Energy monitoring instruments for hire	4.84	0.94%	1.89%	6.60%	23.58%	36.79%	30.19%
11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	4.68	0.94%	0.94%	8.49%	34.91%	28.30%	26.42%
11y) “Energy Fair” (with technology providers, advisors etc.)	4.61	0.00%	0.95%	10.48%	36.19%	31.43%	20.95%

Appendix B: Country specific results

This appendix includes the country specific results of the Energy Efficiency Survey and of the Regional Stakeholders Workshop. The results of the workshop are considered as the final outcome for the country because these were based on the survey results combined with the group discussion at the workshop. For this reason the workshop results are presented first.

B1. Overall country results

a) What are the key barriers?

The ranking of barriers (companies and external stakeholders combined) for the eight GERIAP countries is shown in Table 16 below.

Table 16. Ranking of barriers to energy efficiency in industry for eight GERIAP countries for stakeholders and companies combined (the top 5 barriers are highlighted in grey)

Barrier	Overall Rank	Bangladesh	China	India	Indonesia	Philippines	Sri Lanka	Thailand	Vietnam
4r)	1	1	6	4	1	4	1	15	10
4a)	2	2	1	1	4	8	5	17	2
4f)	3	8	2	5	7	3	2	5	1
4q)	4	4	3	3	6	5	8	2	6
4p)	5	3	12	6	3	2	11	12	9
4o)	6	7	7	7	8	6	6	18	5
4g)	7	5	11	8	10	13	3	9	3
4t)	8	10	4	2	2	11	10	3	15
4n)	9	11	13	9	16	7	12	6	16
4b)	10	9	9	15	9	15	7	4	11
4d)	11	6	14	13	14	9	18	7	8
4i)	12	14	18	11	13	10	9	10	14
4k)	13	15	10	10	11	14	14	13	12
4s)	14	12	5	18	15	12	17	1	7
4l)	15	16	16	16	5	1	15	16	4
4c)	16	13	17	17	17	16	13	8	13
4u)	17	21	21	14	20	21	4	11	20
4v)	18	22	15	12	18	22	16	14	21
4h)	19	19	22	19	12	17	20	20	18
4w)	20	23	8	21	23	23	19	21	17
4m)	21	17	19	22	19	18	21	23	23
4j)	22	18	23	20	22	19	22	19	19
4e)	23	20	20	23	21	20	23	22	22

All countries share at least two of the top 5 barriers with the overall top 5 barriers for the region. Some exceptions include:

- **Thailand:** The top listed barrier here is **4s**) - *It is difficult to access external technical information and expertise.* With the exception of China (rank 5) and Vietnam (rank 7), none of the other countries have included this barrier in the top 10.
- **India and Indonesia:** Both countries list as their second most important barrier **4t**) - *There is a lack of coordination between external organizations.*
- **Sri Lanka:** Respondents in Sri Lanka ranked the barrier **4u**) - *There is a lack of policies, procedures and systems within companies,* as number 4. All other countries ranked this barrier as one of the least important ones.

More detailed results for each individual country are provided in sections B2 to B9. These results show that most top 10 barriers for each country have an average score of around 4, although some barriers were highlighted as very important with an average score of 5 or higher.

b) What are the main reasons for implementation?

The ranking of reasons (companies and external stakeholders combined) for the eight GERIAP countries is shown in Table 17 below. The main results are:

- The top 3 reasons for industry to become more energy efficient are almost the same in all countries: reduced production costs, reduced energy consumption and reduced energy costs.
- Reasons ranked 4 and 5 are different between the countries. Most notable are **Bangladesh** and **Thailand**, which rank **8n**) *Improved relations with customers* in the top 5. This is interesting considering that the participating companies across the eight countries this is considered as the least important reason!

Table 17. Ranking of reasons for companies to implement energy efficiency measures for eight GERIAP countries (results for stakeholders and companies are combined and the top 5 reasons are highlighted in grey)

Reasons to implement	Overall Rank	Bangladesh	China	India	Indonesia	Philippines	Sri Lanka	Thailand	Vietnam
8b)	1	2	1	1	2	2	2	3	2
8a)	2	1	2	2	3	3	1	2	1
8c)	3	3	3	3	1	1	3	1	3
8e)	4	8	4	5	4	4	5	6	4
8j)	5	6	5	4	8	6	4	7	6
8h)	6	4	6	8	9	5	6	9	11
8f)	7	9	11	6	7	8	8	8	9
8i)	8	7	7	12	6	7	7	5	5
8d)	9	12	14	7	5	10	10	12	10
8e)	10	13	8	9	10	9	9	13	8
8n)	11	5	10	14	13	11	12	4	13
8m)	12	10	9	13	12	12	11	11	12
8k)	13	14	12	10	11	14	14	10	14
8l)	14	11	13	11	14	13	13	14	7

c) Who are the key stakeholders?

The ranking of stakeholders (companies and external stakeholders combined) that are important for companies to implement energy efficiency measures as ranked by the eight GERIAP countries is shown in Table 18 below. Most of all the participating countries share the overall view of the stakeholders that affect business the most in becoming more energy efficient. 7 out of 8 countries list **10b**) *Plant*

Management as the most or second most important stakeholder.

Exceptions to the overall result are:

- **China and Vietnam.** The National Government as well as the State/local government are considered as more important stakeholders, compared to the other countries.
- **Bangladesh.** The stakeholder **9g) Universities and Research Institutes** are considered to be an important stakeholder in Bangladesh (Ranked No 4).
- **Sri Lanka.** In Sri Lanka, **9k) Employees** are considered as an important stakeholder group! No other countries have listed this stakeholder group as high as in Sri Lanka (Ranked No 5).

Table 18. Ranking of stakeholders that affect business to implement energy efficiency measures for eight GERIAP countries (results for stakeholders and companies are combined and the top 5 stakeholders are highlighted in grey)

Stakeholder	Overall Rank	Bangladesh	China	India	Indonesia	Philippines	Sri Lanka	Thailand	Vietnam
9b)	1	3	2	1	1	1	1	1	4
9i)	2	1	4	4	2	2	4	5	1
9a)	3	5	1	3	3	3	2	2	5
9h)	4	2	8	2	4	4	3	4	7
9c)	5	7	3	6	6	6	10	3	2
9f)	6	10	13	5	12	11	11	10	13
9e)	7	6	15	8	11	5	8	6	11
9d)	8	13	5	7	9	10	14	12	3
9g)	9	4	10	11	8	7	7	9	6
9k)	10	11	9	10	7	12	5	8	12
9o)	11	9	7	9	15	15	13	15	8
9l)	12	14	6	15	5	9	6	7	9
9m)	13	8	11	13	10	8	9	14	15
9n)	14	12	12	12	14	13	15	11	10
9j)	15	15	14	14	13	14	12	13	14

d) What is needed to improve energy efficiency?

The activities (companies and external stakeholders combined) that are useful for companies to improve their energy efficiency as ranked by the eight GERIAP countries is shown in Table 19 below. The main results are:

- The results are very similar to those of companies and external stakeholders. Training and information on energy efficient technologies is ranked number 1 or 2 by most countries.
- The other activities are ranked quite differently by different countries. Still activities ranked highest by most countries are the same as earlier results: **11q) Loans / subsidies for energy efficiency**, and **11s) Energy monitoring instruments for hire**.
- It is interesting to note that some countries mention **11t) Programmes to participate in / access** (like the GERIAP project) as a key need (Vietnam, Thailand, India and Indonesia), while others claim the opposite – it is listed as a last “wish” on their list (Sri Lanka, Philippines, Bangladesh and China).
- Exception for information topics is Bangladesh with the number one priority **11n) Government policies / legislation / \$ incentives**. This specific information need has also been highlighted by China (Rank 2) and the Philippines (Rank 2).
- Vietnam is also an exception, ranking **11o) Benchmarking** data as the number 1 priority in the information category.

Table 19. Ranking of activities that can be useful to companies to improve their energy efficiency for eight GERIAP countries (results for stakeholders and companies are combined and the top 5 barriers are highlighted in grey)

Activity	Overall Rank	Bangladesh	China	India	Indonesia	Philippines	Sri Lanka	Thailand	Vietnam
TRAINING									
11a)	1	2	1	2	1	2	1	1	3
11c)	2	3	2	1	3	1	2	3	1
11b)	3	1	3	3	2	3	3	2	2
11d)	4	5	4	4	4	5	4	4	4
11f)	5	4	5	5	5	4	5	5	5
11e)	6	6	6	6	6	6	6	6	6
INFORMATION									
11g)	1	3	3	3	2	1	1	1	4
11h)	2	2	7	4	1	5	7	5	8
11i)	3	5	8	1	3	3	4	6	3
11j)	4	4	5	2	6	7	8	8	2
11k)	5	10	10	9	9	9	9	9	10
11l)	6	7	6	5	8	6	6	3	7
11m)	7	6	1	6	7	8	2	2	6
11n)	8	1	2	7	5	2	3	7	5
11o)	9	8	4	8	4	4	5	4	1
11p)	10	9	9	10	10	10	10	10	9
OTHERS									
11q)	1	1	1	1	2	1	2	5	1
11s)	2	2	5	3	6	2	1	6	2
11v)	3	5	3	4	8	3	7	2	6
11u)	4	6	2	6	4	7	8	3	4
11r)	5	3	4	5	5	5	6	9	9
11w)	6	8	7	7	9	4	3	7	8
11x)	7	4	9	9	7	6	4	4	5
11v)	8	7	6	8	3	8	5	8	7
11t)	9	9	8	2	1	9	9	1	3

B2. Bangladesh

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from Bangladesh. The results under item 2 – 5 are based on 35 completed survey questionnaires for Bangladesh and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
<p>1. Lack of awareness about value of savings at all levels in company from management to workers (4d)</p> <ul style="list-style-type: none"> • Ambiguous about costs of energy • Life costing / replacement & benefits and costs • EE impact / projects not considered significant or important 	Cultural, attitude Organizational	<p>Awareness campaigns</p> <ol style="list-style-type: none"> Top management seminars, capacity building Media campaigns (trade – oriented) Awards and recognition Newsletters 	<p>Industry associations Universities International organizations / donors NGOs Consultants associations</p>
<p>2. Lack of technical knowledge and know how by factory management (4c)</p> <ul style="list-style-type: none"> • Limited infrastructure for knowledge dissemination • Limited number of qualified consultants • Limited access to latest technical know how 	Knowledge	<p>Establish long-term program for CP and EE</p> <ol style="list-style-type: none"> Technical dissemination Train the trainers and consultants 	<p>Industry associations Universities International organizations / donors NGOs Consultants associations</p>
<p>3. Lack of corporate social responsibility / ethical standards (new)</p> <ul style="list-style-type: none"> • Pilferage of energy • No responsibility for environment / society • No true disclosure of data on production, finances etc. 	Cultural Organizational	<ol style="list-style-type: none"> More commitment from government and utilities to reduce system losses Awards / recognition scheme for environmental and social responsibility Programs oriented to self-help (capacity building) to reduce need for information disclosure 	<ol style="list-style-type: none"> Government, NGOs, civil society, international organizations Chamber of Commerce International experts, consultants, training institutes
<p>4. Access to financing from banks is difficult for SMEs (4o)</p> <ul style="list-style-type: none"> • Banks lack knowledge about EE • Unreliable financial disclosure affects evaluation and lending • High collateral requirement • Lack of transparency 	Financial	<p>Finance incentive program sponsored by international organizations</p> <ol style="list-style-type: none"> Awareness raising for bank officials Technical EE assistance to banks / lenders Partner with SME divisions of banks Concession / collateral rules change by Central Bank 	<p>Central Bank SME oriented community banks Leasing companies Banker training college</p>

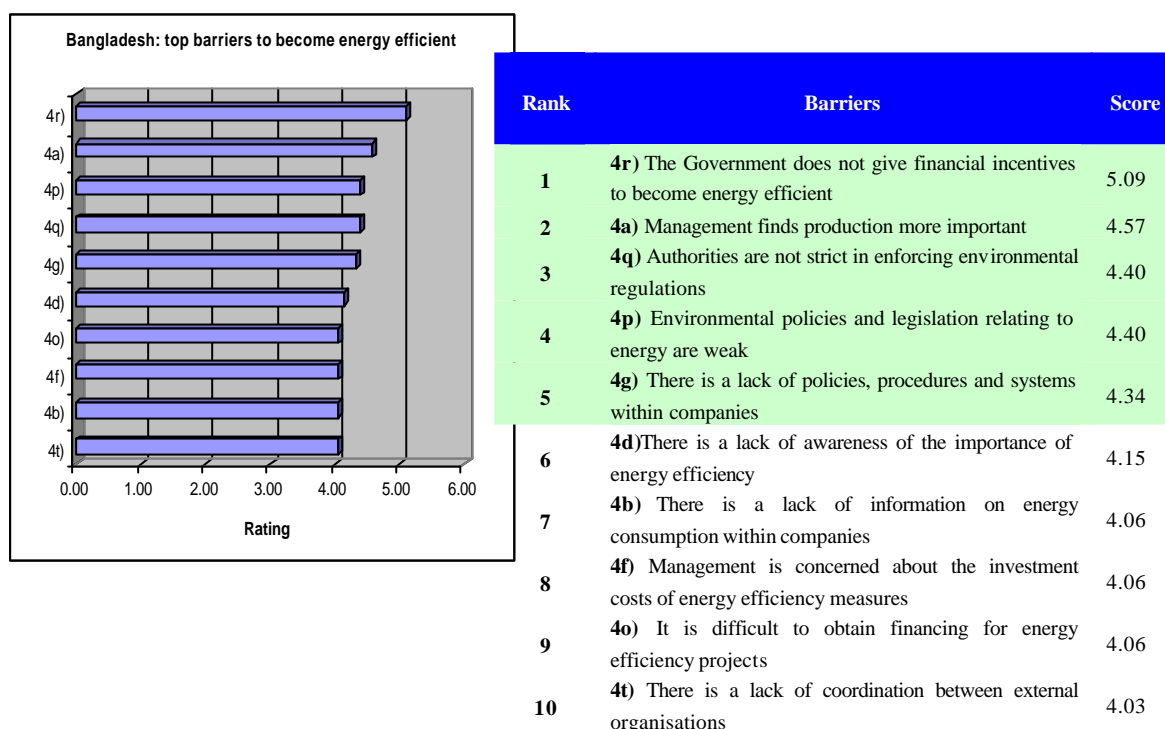
BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
5. Absent or ineffective government policies/ incentives and outreach (4P & 4r)	Policy	a) Empower industry associations with resources b) Inject resources to government to allow outreach and enforcement of existing policies	Government / outreach oriented government agencies Industry associations International organizations

One proposed solution was worked out in more detail.

- Barrier: lack of awareness, technical knowledge, financing
- Solution: Establish CP/EE Centre to implement many solutions mentioned above

WHAT IS NEEDED	DESCRIPTION
What	A CP/EE Center would be established that will undertake: <ul style="list-style-type: none"> • Awareness campaigns (industry, government, banks) • Lobbying government • Technical information clearinghouse and dissemination • Hands-on technical assistance to targeted sectors • Training to develop pool of consultants and capacity building of technical institutions • Develop cooperation with banks and coordinate interaction banks and target sectors • Establish network between suppliers, consultants and industry
Where	Dhaka but covering all of Bangladesh
For whom	Targeted industry sectors
By whom	FBCCI, BCI or associations of industry or consultants
When	Five years needed for establishing centre and reach level of self sustenance
How much	To be determined (based on experience in establishing CP Centers in other countries)
GERIAP relevance	Could be done as an extension of GERIAP or as new project Covers CP and EE and its barriers
Other	-

b) What are the Key Barriers?



Results

- The most important barrier is clearly 4r) *The Government does not give financial incentives to become energy efficient*

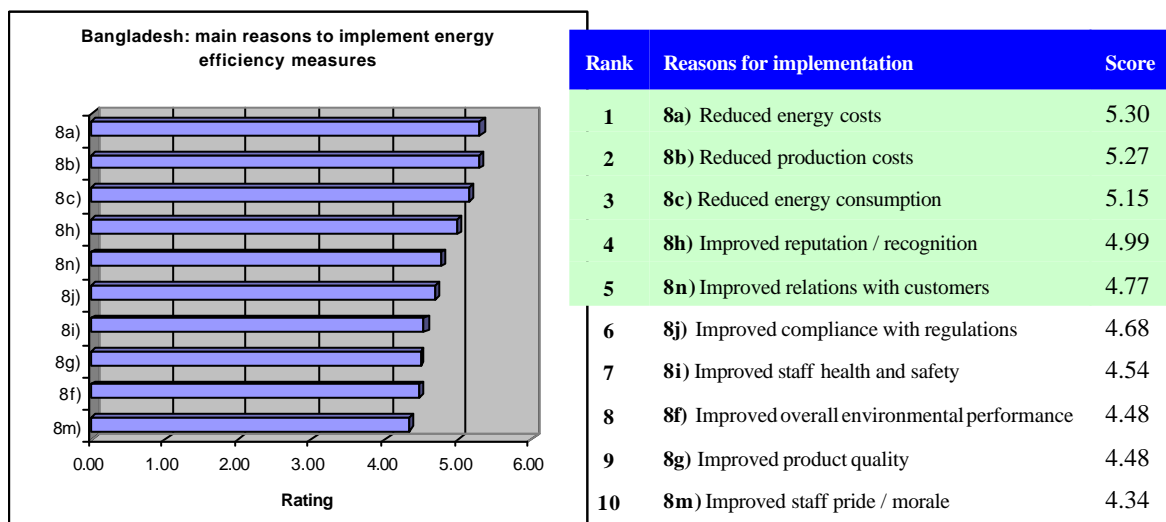
For the barriers rated 5 or 6, can you explain why?

- The government does not have any policy that can encourage energy efficiency projects or for a company to introduce green products. Lack of laws, policies and enforcement are the main obstacles to introduce these initiatives. (4q) (stakeholder)
- All other activities start with production (4a) (company)
- Private companies, even public ones, are concerned more with short term profits because of various uncertainties. Thus, energy efficiency which raises long-term profit is not rated a high priority. Furthermore, lack of incentives to conserve energy may occur when there are informal ways to cut down on energy costs, particularly electricity costs (stakeholder).
- Energy efficiency has secondary importance (4a) (Stakeholder)
- Initial cost is the deciding barrier (4f) (stakeholder)
- There is little incentive from the Government (4o) (Stakeholder)
- Companies must become more aware about the hidden aspects of the production systems (not only profit or immediate results) (Stakeholder)
- The cost of energy is too low (4e) (Stakeholder)
- There is a lack of special training programs on energy saving (4t) (stakeholder)
- Companies are more interested to run the wheels at any cost. (stakeholder)
- Due to corruption barrier pays less bill for energy than accurate (stakeholder)
- Entrepreneurs are first generation, want only profit or immediate result (stakeholder)
- Entrepreneurs are not aware about the hidden loss (stakeholder)
- It is key to develop consciousness about energy savings, the greenhouse effect, pollution control and maintaining of United Nations rules and regulations (4f) (Company)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- There is a lack of profit motivation (stakeholder),
- It helps significantly to be familiar with indigenous ways and technologies (stakeholder)
- Reality is that people think short term (Stakeholder)
- Theft of energy is a major barrier (Stakeholder)
- Companies should get the real bills on their energy use (Stakeholder)
- Higher energy savings need retrofitting or new equipments making this a costly affair in the short run. Unless attractive financing terms for such investments are available, this may mean apparent lack of competitiveness and thus loss of market share in the short run (stakeholder)
- Easy credits or tax breaks would be very useful for companies (Stakeholder)
- Due to corruption, there is non-payment of energy bills. Therefore, there is very little incentive to conserve. Usually, the IRR for energy efficiency improvement projects is lower than investing in new projects. Management considers EE implementation to be handled (stakeholder).
- Laws should be enforced in order to make it easier for companies to become more energy efficient (Stakeholder)
- There is a limited knowledge among companies regarding cost effective energy efficient technologies (Stakeholder)
- Motivation from top management is key (Stakeholder)
- Good amount of energy savings need retrofitting or new equipments which payback is longer. It is difficult to motivate top management to invest in energy saving projects due to lack of awareness. (Stakeholder)
- There is a need for fiscal incentives and appropriate rules (stakeholder)

c) What are the main reasons for implementation?



Results

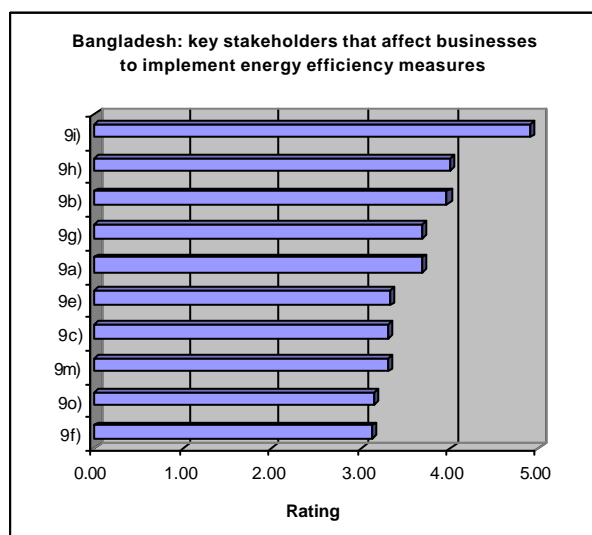
- The main reasons for companies to implement energy efficiency measures are: **8a) Reduced energy costs, 8b) Reduced production costs and 8c) Reduced energy consumption** – all almost equally important according to the survey.

For the reasons rated 5 or 6, can you explain why?

- A Bangladeshi company will not think about environmental issues because the company will get the same benefit whether it adapts to those issues or not.(stakeholder)
- Only a few companies in Bangladesh have any awareness about energy efficiency (stakeholder) – the Kyoto protocol is largely unheard of.
- Energy efficiency measures would give opportunity for companies to know the real situation and actual status of energy efficiency (stakeholder)
- Most companies are regulated by the top management. Only if an entrepreneur himself understand that he will have some direct benefit by applying energy saving options, will he immediately implement those (Stakeholder)

d) Who are the key stakeholders?

Rank	Stakeholder	Score
1	9i) International organisations (e.g. UNEP)	4.91
2	9h) Consultants	4.00
3	9b) Plant management	3.97
4	9a) Corporate Head Office	3.68
5	9g) Universities / Research institutes	3.68
6	9e) Industry / business associations	3.33
7	9c) National Government (e.g. Ministry)	3.31
8	9m) NGOs	3.30
9	9o) Media	3.16
10	9f) Financial institutions	3.13



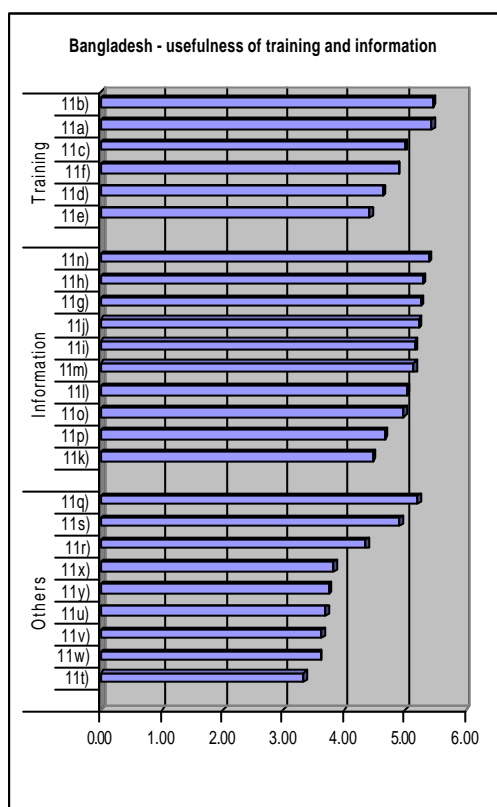
Results

- The most important stakeholder is by far 9i) *International organisations*

For the stakeholders rated 5 or 6, can you explain why?

- Those type of initiatives have so far only been taken by UNEP for the first time in Bangladesh. There are not so much awareness built up so far (9i) (stakeholder)

e) What is needed to improve energy efficiency?



Rank	Assistance Needed	Score
Training		
1	11b) Environmental / Energy management systems	5.46
2	11a) Energy efficient technologies	5.44
3	11c) Cleaner Production (CP) / Energy auditing	5.00
4	11f) Kyoto Protocol / Clean Development Mechanism	4.88
5	11d) Financing CP / energy efficiency projects	4.63
6	11e) Energy and greenhouse gas monitoring / targeting	4.43
Information		
1	11n) Government policies / legislation / \$ incentives	5.37
2	11h) Environmental / Energy management systems	5.29
3	11g) Energy efficient technologies	5.26
4	11j) Financing CP / energy efficiency projects	5.23
5	11i) Cleaner Production (CP) / Energy auditing	5.17
6	11m) Case studies of other companies	5.15
7	11l) Energy monitoring instruments	5.03
8	11o) Benchmarking data	4.97
9	11p) Kyoto Protocol / Clean Development Mechanism	4.67

Rank	Assistance Needed	Score
10	11k) Energy and greenhouse gas monitoring / targeting	4.46
Others		
1	11q) Loans / subsidies for energy efficiency	5.21
2	11s) Energy monitoring instruments for hire	4.91
3	11r) Discounted / free expert's advice	4.35
4	11x) Newsletters with energy developments	3.82
5	11y) "Energy Fair" (with technology providers, advisors etc.)	3.74
6	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	3.70
7	11v) Software (for energy monitoring, benchmarking etc.)	3.64
8	11w) Industry networks	3.61
9	11t) Programmes to participate in / access	3.34

Results

- The most important **training** needs are: **11b) Environmental / Energy management systems and 11a) Energy efficient technologies**
- The key **information** needs are: **11n) Government policies / legislation / \$ incentives, 11h) Environmental / Energy management systems and 11g) Energy efficient technologies**. The scores for these three (and for the rest!) are very similar
- The most important **other needs** are: **11q) Loans / subsidies for energy efficiency** followed by **11s) Energy monitoring instruments for hire**.

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- Motivational activities are very important (Stakeholder)
- Training and information on energy related topics are hard to find in Bangladesh and will contribute to increased awareness among companies (Stakeholder)
- Note that information is necessary but not enough to initiate energy-efficiency programmes. One needs hand-on experience or case studies and guidance. Finally unless there are easy financial terms to adopt energy efficiency programme is it would have very few takers (stakeholder).
- Financing is the most important (stakeholder)
- All assistance is needed because it is a new concept in Bangladesh to save energy (stakeholder)
- Energy saving programs is a new concept in Bangladesh and vast awareness campaigns and incentives among entrepreneurs are needed in order to build up a strong network (stakeholder)
- Human resources development through training on awareness building will pay a great role in this regard (stakeholder)

B3. China

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from China. The results under item 2 – 5 are based on 19 completed survey questionnaires for China and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

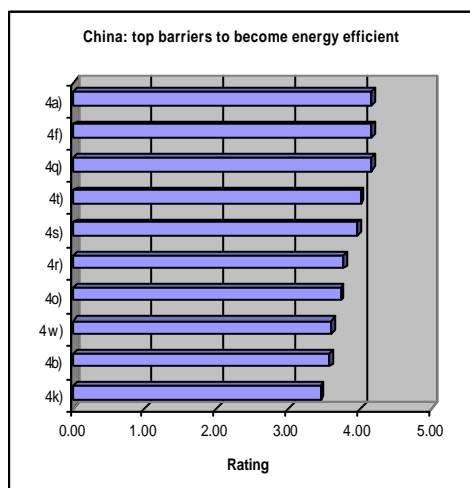
BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
1. Lack of awareness at company level <ul style="list-style-type: none"> • Management find production more important • Lack of detailed information on EE in company 	Culture Attitude Knowledge Organizational	a) Developing easy to use tools for energy accounting in companies to meet the needs of energy department and accounting department; b) CEO networks and forums share and exchange experiences	a) Government, companies and technical experts b) Industry and trade associations, industrial park management, international organizations
2. Difficult to obtain external financing	Financial Organizational Knowledge	a) Training of financial institutes in financing EE projects; b) Developing financial incentives for FI to finance EE projects c) Special funding sources including CDM	a) International development banks b) Government c) International organizations and bilateral agencies
3. Access to technologies and technical knowledge (lack of good network)	Knowledge Organizational	a) Training of key stakeholders to provide services b) Capacity building for industry associations	a) Government and international organizations b) International industry associations
4. Poor enforcement of legislation and environmental policy	Policy Legislative Cultural	a) Environmental information transparency and public participation b) Financial penalties for energy related emissions	a) Local governments and NGOs, media b) Government
5. Lack of coordination within company and among external organizations	Organizational Political	a) Publicize good corporate management systems and examples b) Coordination of international agencies working in China on energy c) Integration of policies d) GERIAP communicates with other agencies on the outcome and follow up	a) Government, industry and trade associations b) Government, industry and trade associations c) International agencies d) GERIAP secretariat

One proposed solution was worked out in more detail.

- Barrier: Difficult to obtain external financing
- Solution: Tools for energy costing

WHAT IS NEEDED	DESCRIPTION
What	Develop and promote the use of easy to use tools for energy costing Three components: <ul style="list-style-type: none"> • Follow up of the current GERIAP activities in the 5 companies; • Develop and promote the use of energy accounting tool(s) for companies • Development and capacity building of networks Purpose: To assist companies to understand the economic implications of energy efficiency
Where	In a selected industry sector at company level
For whom	Company managers: top management, energy, production and finance managers
By whom	UNEP, SEPA, industry association of selected sector and companies
When	Project preparation: 6 months (starting now) Project implementation: 24 months
How much	US\$ 10,000 for scoping and preparation (under current GERIAP) US\$ 500,000 (total) (sequel of GERIAP, or approaching EU or other agencies)
GERIAP relevance	To remove one of the key barrier identified by GERIAP project
Other	Additional considerations <ul style="list-style-type: none"> • the project will help to build capacity of industry associations in China • The project will contribute to the demonstration of current SEPA approach of co-benefits • The project results can be disseminated through and support implementation of the current scheme of environmentally friendly enterprises award by SEPA

b) What are the Key Barriers?



Rank	Barriers	Score
1	4q) Authorities are not strict in enforcing environmental regulations	4.16
2	4f) Management is concerned about the investment costs of energy efficiency measures	4.16
3	4a) Management finds production more important	4.16
4	4t) There is a lack of coordination between external organisations	4.00
5	4s) It is difficult to access external technical information and expertise	3.95
6	4r) The Government does not give financial incentives to become energy efficient	3.78
7	4o) It is difficult to obtain financing for energy efficiency projects	3.72
8	4w) Benefits of implemented energy efficiency measures are not quantifiable	3.61
9	4b) There is a lack of information on energy consumption within companies	3.58
10	4k) There is a lack of coordination between departments within companies	3.44

Results

- The most important barriers are (shared among three): **4q) Authorities are not strict in enforcing environmental**

regulations, **4f) Management is concerned about the investment costs of energy efficiency measures and 4a) Management finds production more important**

- Other barriers have received a similar score

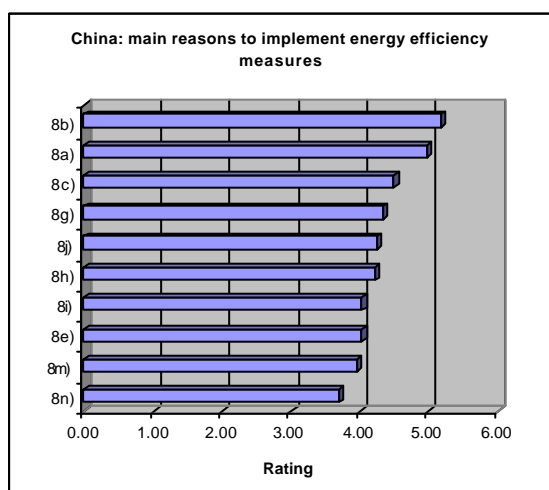
For the barriers rated 5 or 6, can you explain why?

- Benefits of energy efficiency measures are not quantified properly as data is not available (Stakeholder)
- Concrete evidence is needed to persuade top management that EE options are profitable and that other similar projects have been implemented successfully (Stakeholder)
- It is difficult to access advanced technology in some parts of China (Company)
- The first thing is to let the management realize the benefits they can get from EE options (Stakeholder)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- Lack of knowledge of energy consumption in competitors (Stakeholder)
- For many companies, energy consumption data is not available for each section of the process and/or is not reported to management (stakeholder)
- Stricter environmental standards are needed from the government (stakeholder)

c) What are the main reasons for implementation?



Rank	Reasons for implementation	Score
1	8b) Reduced production costs	5.17
2	8a) Reduced energy costs	4.97
3	8c) Reduced energy consumption	4.50
4	8g) Improved product quality	4.33
5	8j) Improved compliance with regulations	4.23
6	8h) Improved reputation / recognition	4.21
7	8e) Reduced other emissions (e.g. SOx, Nox)	4.03
8	8i) Improved staff health and safety	4.03
9	8m) Improved staff pride / morale	3.96
10	8n) Improved relations with customers	3.69

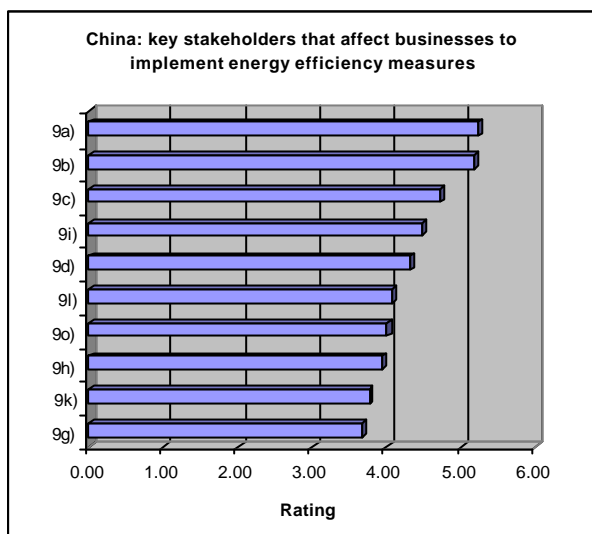
Results

- The most important reasons for implementation are clearly **8b) Reduced production costs** followed by **8a) Reduced energy costs**

For the reasons rated 5 or 6, can you explain why?

- The relative importance depends on the awareness and sensitivity of the local stakeholders (customers, communities etc) (Stakeholder)

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9a) Corporate Head Office	5.24
2	9b) Plant management	5.18
3	9c) National Government (e.g. Ministry)	4.72
4	9i) International organisations (e.g. UNEP)	4.47
5	9d) State/Local government agencies	4.33
6	9l) Shareholders of company	4.06
7	9o) Media	4.00
8	9h) Consultants	3.95
9	9k) Employees	3.76
10	9g) Universities / Research institutes	3.67

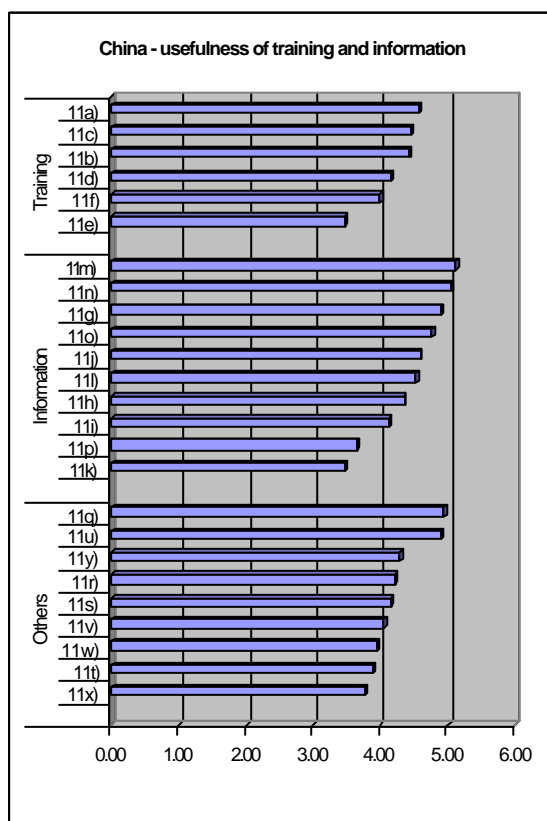
Results

- The two key stakeholders are **9a) Corporate Head Office** followed by **9b) Plant management**

For the stakeholders rated 5 or 6, can you explain why?

No comments

4. What is needed to improve energy efficiency?



Rank	Assistance Needed	Score
Training		
1	11a) Energy efficient technologies	4.58
2	11c) Cleaner Production (CP) / Energy auditing	4.44
3	11b) Environmental / Energy management systems	4.42
4	11d) Financing CP / energy efficiency projects	4.16
5	11f) Kyoto Protocol / Clean Development Mechanism	4.00
6	11e) Energy and greenhouse gas monitoring / targeting	3.47
Information		
1	11m) Case studies of other companies	5.11
2	11n) Government policies / legislation / \$ incentives	5.05
3	11g) Energy efficient technologies	4.89
4	11o) Benchmarking data	4.76
5	11j) Financing CP / energy efficiency projects	4.59
6	11l) Energy monitoring instruments	4.53
7	11h) Environmental / Energy management systems	4.35
8	11i) Cleaner Production (CP) / Energy auditing	4.13
9	11p) Kyoto Protocol / Clean Development Mechanism	3.65
10	11k) Energy and greenhouse gas monitoring / targeting	3.47
Others		
1	11q) Loans / subsidies for energy efficiency	4.95
2	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	4.89
3	11y) “Energy Fair” (with technology providers, advisors etc.)	4.29
4	11r) Discounted / free expert’s advice	4.21
5	11s) Energy monitoring instruments for hire	4.16
6	11v) Software (for energy monitoring, benchmarking etc.)	4.06
7	11w) Industry networks	3.94
8	11t) Programmes to participate in / access	3.88
9	11x) Newsletters with energy developments	3.76

Results

- The most important **training** needs are: **11a) Energy efficient technologies** followed by **11c) Cleaner Production (CP) / Energy auditing** and **11b) Environmental / Energy management systems**
- The key **information** needs are: **11m) Case studies of other companies** and **11n) Government policies / legislation / \$ incentives**
- The most important **other needs** are: **11q) Loans / subsidies for energy efficiency** followed by **11u) Directory with energy contacts**

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- Once information on competitors (benchmarking) is available as well as the information on how to increase profitability and competitiveness then management will act (provided that the management is interested in the overall performance of the company) (Stakeholder)
- Sufficient “Know-how” is very important for energy efficiency implementation (Stakeholder)
- Experiences and lessons learnt should be shared among companies (Stakeholder)
- Money and technology are the two key needs (Stakeholder)

B4. India

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from India. The results under item 2 – 5 are based on 57 completed survey questionnaires for India and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
1. Lack of awareness about CP and EE benefits (4d) <ul style="list-style-type: none"> In depth knowledge about cost benefit analysis Perceived risk / mindset 	Organizational System Attitudinal	a) Publish early success of implementation, success stories b) Demonstrations c) Involvement of employees	Top management INSTT Industry associations International organizations Media
2. Lack of access to information (4s) <ul style="list-style-type: none"> Companies know how to do it but there is no data 	System Networking Communication	a) Sharing of information and best practices b) Interactive networking (bilateral and multilateral) c) Hosting of user group on inter and intra network	Industry associations and institutions Suppliers Organizations promoting EE (government, service providers, research inst.) Bilateral and multilateral cooperation needed
3. Lack of capacity building of technical staff (4c)	Organizational Technical	a) Upgrading of skills b) Encourage employees for training, trial and experiments	Top management Employees Institutions Suppliers Bilateral and multilateral cooperation needed
4. Access to financing <ul style="list-style-type: none"> High capital / investment costs (4f) Finance accessibility (4o) 	Financial Knowledge	e) Financial incentives f) Capacity building g) Consistent and long-term government policies	Financial institutions Government Service providers
5. Lack of policies, systems, procedures within companies (4g)	Organizational Knowledge Attitude	a) Recognition and awards b) Change of attitude of top management c) Appoint energy / environmental manager in organization	Top management Employees Consultants Service providers

Prioritized future activities for India

TRAINING	INFORMATION	OTHERS
1. Theory combined with practical training of operators 2. Training of auditors, trainers and planners 3. Energy efficiency technologies	1. Benchmarking / targeting 2. Financing 3. Energy efficiency technologies 4. Environmental and energy monitoring	1. Fiscal incentives for energy efficient equipment 2. Discounted advice 3. Sector specific task forces 4. Exchange program between developing and developed

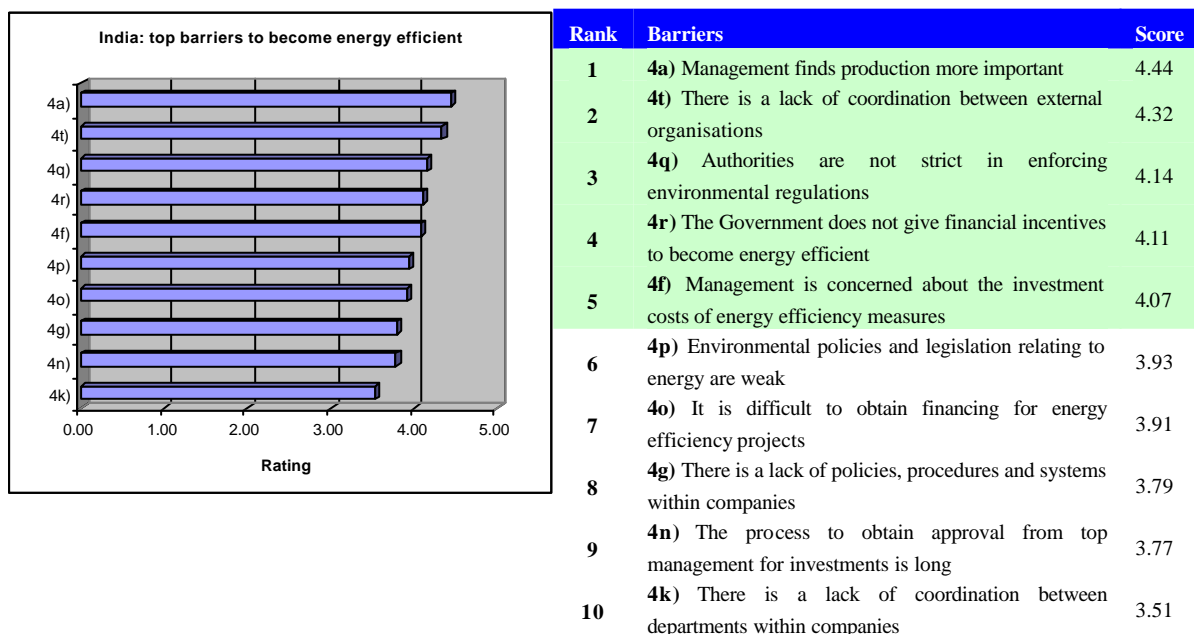
4. Financial	5. Case studies	countries
5. Link between energy, environment and MEAs (multilateral environmental agreements)		5. Energy monitoring equipment for hire

One proposed solution was worked out in more detail

- Barrier: Lack of access to information
- Solution: Interactive networking

WHAT IS NEEDED	DESCRIPTION
What	Dedicated website to be established either within the existing NFP or separate entity
Where	All of India
For whom	Energy intensive sectors: Management, technical staff, shop floor workers (information in local language) Industry associations Consultants, Suppliers, students, R&D institutions, planners, financial institutions
By whom	NFP for content in collaboration with host institution of website
When	6 months required
How much	USD 60,000 per year from multilateral / international donors
GERIAP relevance	Website can be linked to other GERIAP countries
Other	Donor assistance on a continuous basis is required

b) What are the Key Barriers?



Results

- The most important barrier is 4a) *Management finds production more important*
- Several of the other barriers have received a similar score

For the barriers rated 5 or 6, can you explain why?

- There is no funding available for energy conservation equipment that covers 90-100 % of the investment cost. The Government does not have any specific scheme for this. We are committed to save energy but need finance (4o) (company)
- In many enterprises, the production manager does not have access to commercial information like cost of energy (4k) (Stakeholder)
- The lack of policies, procedures and systems is true for some companies (4g)
- Financial institutions are reluctant to fund EE projects and/or charges high interests and if a company cannot pay themselves than they are also financially weak and cannot get funding (4o) (stakeholder)
- The management concentrate only on production and marketing.(stakeholder)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- An open mind and attitude to receive new ideas is key (company)
- There is a need for identification of relevant energy saving options available (company)
- If there is a very tough competition, then focus will increase on cutting costs and energy (company)
- There is a discomfort among operating personnel to let go of convenient operating margins in favor of efficiency (company)
- External technical support should be more freely available at affordable cost & an ESCO model for implementation should be applied (company)
- Better awareness campaign needed (company)
- Companies lack the willingness to become more competitive through energy efficiency (Stakeholder)
- There is a lack of knowledge and exposure regarding energy saving measures being implemented in similarly placed companies (stakeholder)
- It would be useful to conduct an energy audit and to do periodical reviews of measures being implemented at operational levels – fixing of benchmarks) (stakeholder)
- There is a need for a change in the mindset of the top management in order to get a commitment for energy conservation (stakeholder)
- There is a lack of will to change (stakeholder)
- ESCO funding and top management commitment are important barriers for implementation of energy efficiency measures (stakeholder)
- There is a collision between field staff of energy companies (utilities) and unscrupulous industry owners that overuse energy. A way out of this is to radically increase energy costs and eliminate any kind of subsidies for energy supply (stakeholder)
- There is a fear among companies of being reprimanded for not having identified energy conservation options earlier on (stakeholder).
- There is a need for a changed mindset (Stakeholder)
- There is a need for easy access to money at soft (low) interest rates (stakeholder)

c) What are the main reasons for implementation?

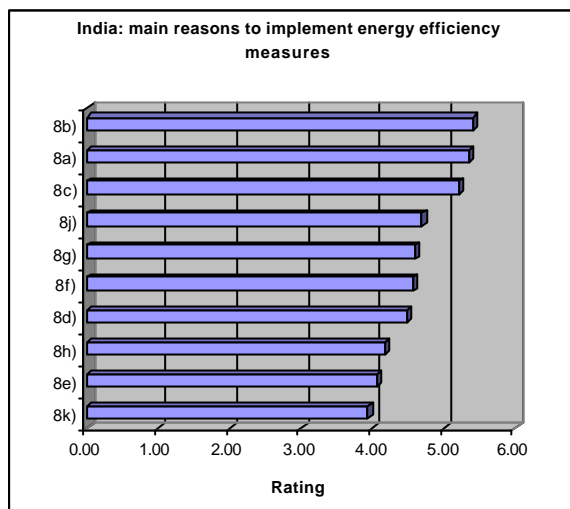
Results:

- The main reasons for companies to implement energy efficiency measures are: **8b) Reduced production costs, 8a) Reduced energy costs and 8c) Reduced energy consumption** – all almost equally important according to the survey.

For the reasons rated 5 or 6, can you explain why?

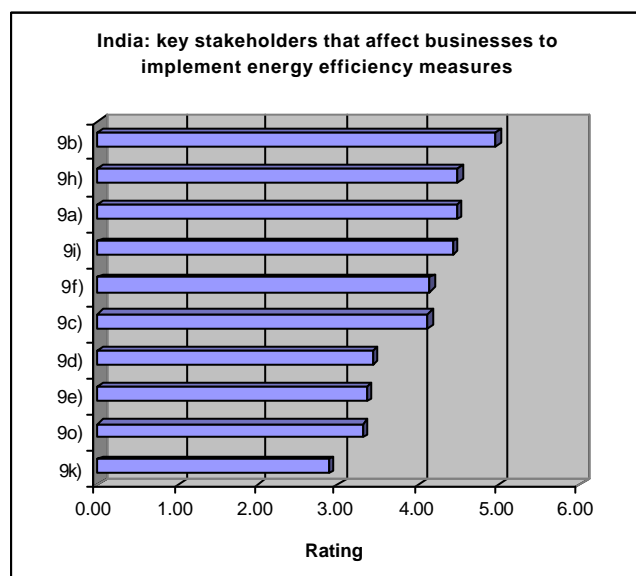
- Reduction in production/energy cost is more important than energy consumption or GHG emission (8a, 8b) (Stakeholder)

- Companies have started to pay attention to reputation/recognition in terms of improved energy performance (8h) (stakeholder)



Rank	Reasons for implementation	Score
1	8b) Reduced production costs	5.40
2	8a) Reduced energy costs	5.34
3	8c) Reduced energy consumption	5.21
4	8j) Improved compliance with regulations	4.69
5	8g) Improved product quality	4.58
6	8f) Improved overall environmental performance	4.57
7	8d) Reduced greenhouse gas emissions	4.49
8	8h) Improved reputation / recognition	4.17
9	8e) Reduced other emissions (e.g. SOx, Nox)	4.07
10	8k) Improved compliance with corporate environmental targets	3.94

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9b) Plant management	4.95
2	9h) Consultants	4.49
3	9a) Corporate Head Office	4.47
4	9i) International organisations (e.g. UNEP)	4.42
5	9f) Financial institutions	4.13
6	9c) National Government (e.g. Ministry)	4.11
7	9d) State/Local government agencies	3.43
8	9e) Industry / business associations	3.35
9	9o) Media	3.30
10	9k) Employees	2.88

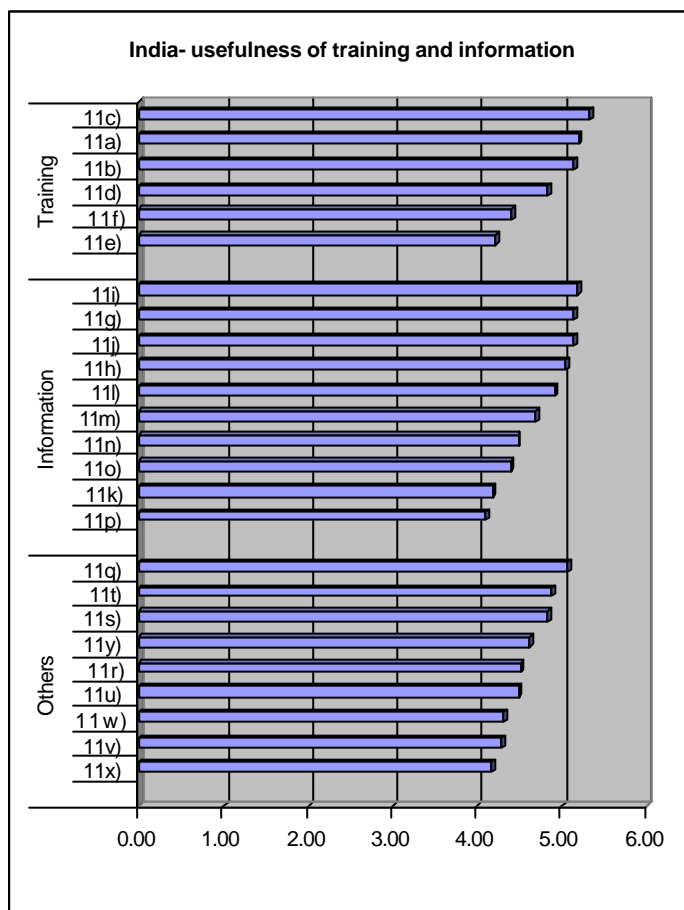
Results

- The key stakeholder is **9b) Plant management**
- Other stakeholders that also are important (all with very similar scores) are: **9h) Consultants, 9a) Corporate Head Office** and **9i) International organisations (e.g. UNEP)**

For the stakeholders rated 5 or 6, can you explain why?

- The government has to come up with special funding schemes (company)

e) What is needed to improve energy efficiency?



Rank	Assistance Needed	Score
Training		
1	11c) Cleaner Production (CP) / Energy auditing	5.33
2	11a) Energy efficient technologies	5.19
3	11b) Environmental / Energy management systems	5.14
4	11d) Financing CP / energy efficiency projects	4.84
5	11f) Kyoto Protocol / Clean Development Mechanism	4.41
6	11e) Energy and greenhouse gas monitoring / targeting	4.21
Information		
1	11i) Cleaner Production (CP) / Energy auditing	5.18
2	11j) Financing CP / energy efficiency projects	5.14
3	11g) Energy efficient technologies	5.14
4	11h) Environmental / Energy management systems	5.05
5	11l) Energy monitoring instruments	4.91
6	11m) Case studies of other companies	4.68
7	11n) Government policies / legislation / \$ incentives	4.48
8	11o) Benchmarking data	4.39
9	11k) Energy and greenhouse gas monitoring / targeting	4.18
10	11p) Kyoto Protocol / Clean Development Mechanism	4.11

Others		
1	11q) Loans / subsidies for energy efficiency	5.07
2	11t) Programmes to participate in / access	4.88
3	11s) Energy monitoring instruments for hire	4.84
4	11y) “Energy Fair” (with technology providers, advisors etc.)	4.61
5	11r) Discounted / free expert’s advice	4.53
6	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	4.49
7	11w) Industry networks	4.32
8	11v) Software (for energy monitoring, benchmarking etc.)	4.30
9	11x) Newsletters with energy developments	4.18

Results

- The most important **training** needs are: **11c) Cleaner Production (CP) / Energy auditing** closely followed by **11a) Energy efficient technologies** and **11b) Environmental / Energy management systems**
- The key **information** needs are : **11c) Cleaner Production (CP) / Energy auditing, 11j) Financing CP / energy efficiency projects** and **11g) Energy efficient technologies**
- Several other information needs have received a similar score
- The most important **other needs** are: **11q) Loans / subsidies for energy efficiency** followed by **11t) Programmes to participate in / access** and **11s) Energy monitoring instruments for hire**

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- Financing is the most important barrier for our company. Information on energy efficient technologies makes us aware of the benchmark in energy management. Energy monitoring instruments are needed to understand the present status of energy management in our company (company)
- Comprehensive online monitoring of Energy, water resources needs to be put in place. Monitoring systems (online) makes it possible for operating staff to tack corrective measures (company)
- An energy audit is needed to estimate the energy efficiency opportunities that means reduced energy and cost at the same time (Stakeholder)
- Most companies fail to get the right know how because they are restricted to the competency level of the consultants that train/assist them (stakeholder).

B5. Indonesia

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from Indonesia. The results under item 2 – 5 are based on 10 completed survey questionnaires for Indonesia and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
1. Lack of awareness (4d) and commitment (new)	Attitude Organizational	<ul style="list-style-type: none"> • <u>Commitment</u> building mechanisms / tools • Training • Information dissemination (networks) • Information clearing house • Campaign / promotion (media, public awards & recognition, education) • Comparative study (success stories / best practices) • Demonstration projects 	Companies: employees and management and International organizations Government (national and local) Universities, research institutions, schools Consultants Industry associations Suppliers, Customers Media
2. Lack of policies, procedures and systems within companies (4#)	Knowledge	<ul style="list-style-type: none"> ▪ Performance indicators (personal and unit) ▪ Integrate CPE program into the company systems through special team and coordinator ▪ Energy monitoring system ▪ Training and capacity building on management policies, systems and EE technologies ▪ Comparative benchmarking ▪ R&D 	Industry associations Universities International organizations / donors NGOs Consultants associations
3. Policies & financing <ul style="list-style-type: none"> • Poor enforcement of legislation (4q) • Lack of government financial incentives (4r) • Irrational energy price (new) • Difficult to obtain external financing (4o) 	Policy Regulation Political Financial	<ul style="list-style-type: none"> • Review and formulated EE related regulations and policies (conform to environmental policy/regs; to include step-by-step implementation) • Develop enforcement strategy • Assist company to make bankable proposals • Develop different criteria for EE project evaluation and investment 	Government International organizations Financial institutions Central Bank Company finance managers Financial consultants
4. Technical knowledge, information and expertise <ul style="list-style-type: none"> • External lack of access / availability (4s) • Within company (4c) 	Knowledge Information Access Availability	<ul style="list-style-type: none"> • Build and update database on appropriate technologies / best practices on EE (website) • Information dissemination • R&D • Comparative study • Demonstration project for medium enterprises 	International organizations Research institutions, universities, CP Centers Government agencies Industry / trade associations Suppliers

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
5. Lack of coordination between external organizations (4t) and companies (new)	Organizational Political	<ul style="list-style-type: none"> • Communication forum • Networking 	All stakeholders (see solution 1)

One proposed solution was worked out in more detail.

- Barrier: Lack of technical knowledge and know how by factory management
- Solution: Promoting CP/EE application at GERIAP companies in Indonesia

WHAT IS NEEDED	DESCRIPTION
What	Promotion campaign to include: <ul style="list-style-type: none"> • Success stories of 5 or 6 participating companies • Training • Information clearing house • Information dissemination (including appropriate technical information) • Network establishment • Communication forum • Demonstration project at other companies • Developing implementation tools (including the review of policy and regulations) • Commitment building mechanism at companies
Where	National level, but particularly focusing on Java, Sumatra and Kalimantan
For whom	Similar industries at national level Medium enterprises Government related institutions working in the area of CP and EE Industry associations, consultants, suppliers Financial institutions
By whom	GERIAP national focal point (Ministry for Environment, BPPT) GERIAP companies UNEP or other international organization
When	June 2005 start (or when funding can be secured) Duration: 5 years
How much	USD 300,000 over 5 years (multilateral fund)
GERIAP relevance	As a follow up of the GERIAP project
Other	Networking facilities and organizations needed (e.g. UNEP, R&D institutions, industry associations)

b) What are the Key Barriers?

Results

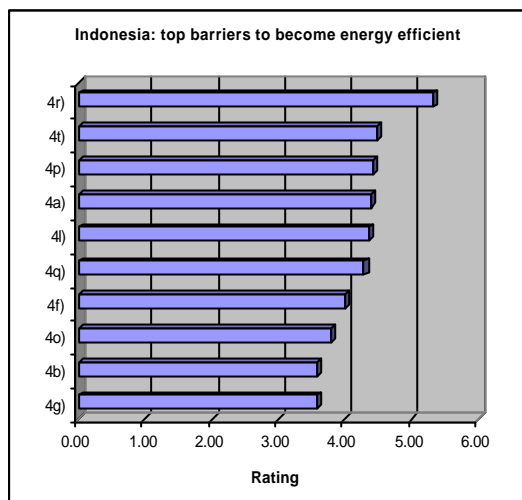
- The most important barrier is clearly 4r) *The Government does not give financial incentives to become energy efficient*

For the barriers rated 5 or 6, can you explain why?

- If management is committed than there is no problem anywhere (Stakeholder)
- The answers will be different according to the type of companies such as private or governmentally owned (Stakeholder)

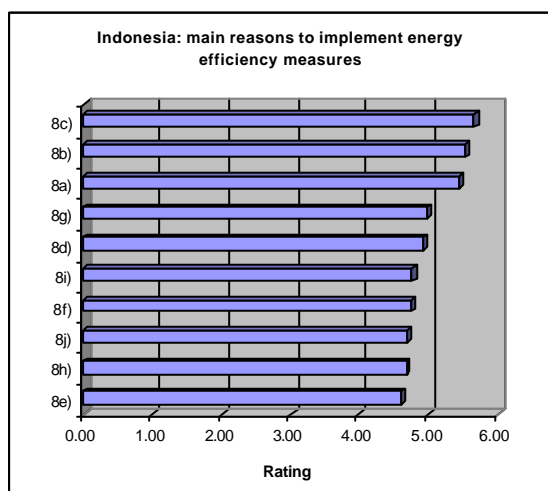
Is there anything else that makes it easy or difficult for companies to become more energy efficient?

No comments received



Rank	Barriers	Score
1	4r) The Government does not give financial incentives to become energy efficient	5.33
2	4t) There is a lack of coordination between external organisations	4.50
3	4p) Environmental policies and legislation relating to energy are weak	4.44
4	4a) Management finds production more important	4.40
5	4l) Management is concerned about time required to improve energy efficiency	4.38
6	4q) Authorities are not strict in enforcing environmental regulations	4.30
7	4f) Management is concerned about the investment costs of energy efficiency measures	4.00
8	4o) It is difficult to obtain financing for energy efficiency projects	3.80
9	4g) There is a lack of policies, procedures and systems within companies	3.60
10	4b) There is a lack of information on energy consumption within companies	3.60

c) What are the main reasons for implementation?



Rank	Reasons for implementation	Score
1	8c) Reduced energy consumption	5.67
2	8b) Reduced production costs	5.55
3	8a) Reduced energy costs	5.45
4	8g) Improved product quality	4.99
5	8d) Reduced greenhouse gas emissions	4.93
6	8i) Improved staff health and safety	4.76
7	8f) Improved overall environmental performance	4.75
8	8j) Improved compliance with regulations	4.68
9	8h) Improved reputation / recognition	4.67
10	8e) Reduced other emissions (e.g. SOx, Nox)	4.60

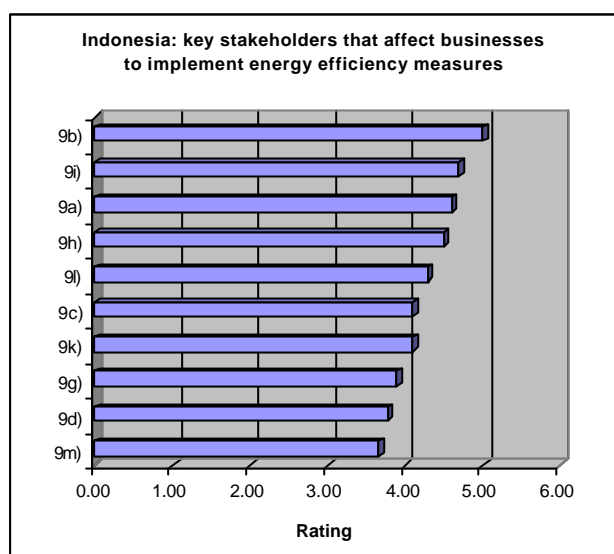
Results

- Several reasons for implementation have received high scores. The top three ones are: **8c) Reduced energy consumption**, **8b) Reduced production costs** and **8a) Reduced energy costs**

For the reasons rated 5 or 6, can you explain why?

No comments received.

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9b) Plant management	5.00
2	9i) International organisations (e.g. UNEP)	4.70
3	9a) Corporate Head Office	4.60
4	9h) Consultants	4.50
5	9j) Shareholders of company	4.29
6	9c) National Government (e.g. Ministry)	4.11
7	9k) Employees	4.10
8	9g) Universities / Research institutes	3.89
9	9d) State/Local government agencies	3.78
10	9m) NGOs	3.67

Results

- The most important stakeholder is **9b) the Plant management**

For the stakeholders rated 5 or 6, can you explain why?

No comments received

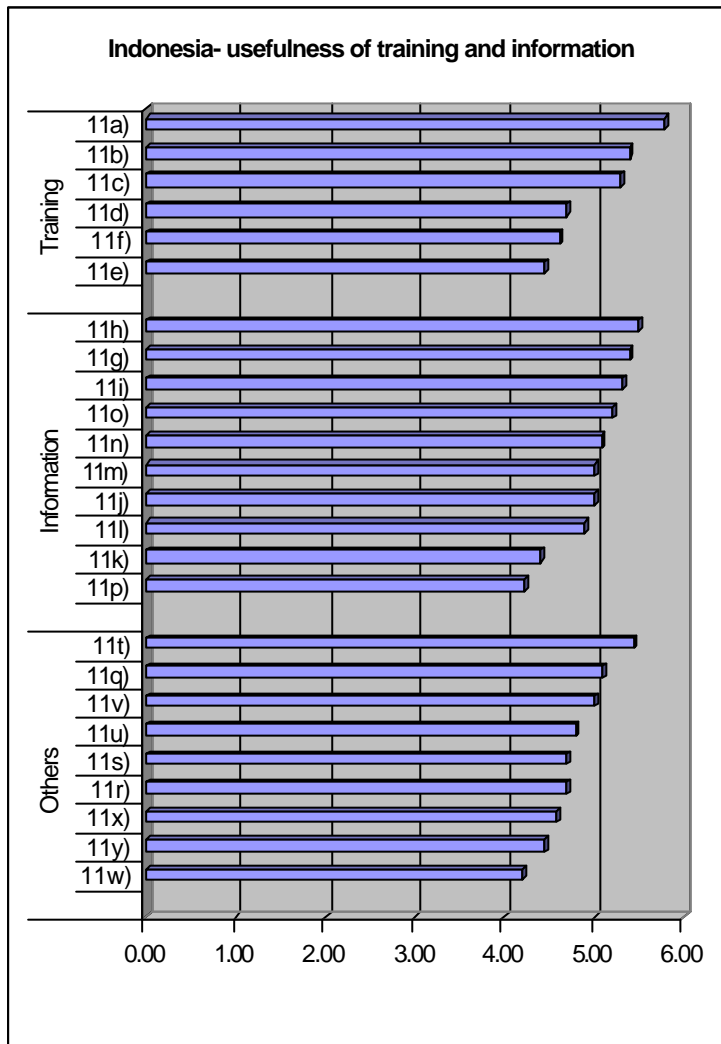
e) What is needed to improve energy efficiency?

Results

- The most important **training** needs are: **11a) Energy efficient technologies** (almost 6 as average score!) followed by **11b) Environmental / Energy management systems** and **11c) Cleaner Production (CP) / Energy auditing**
- The key **information** need is : **11h) Environmental / Energy management systems**, followed by a range of other needs with a similarly high score
- The most important **other need** is: **11t) Programmes to participate in/access**

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

No comments received



Rank	Assistance Needed	Score
Training		
1	11a) Energy efficient technologies	5.80
2	11b) Environmental / Energy management systems	5.40
3	11c) Cleaner Production (CP) / Energy auditing	5.30
4	11d) Financing CP / energy efficiency projects	4.70
5	11f) Kyoto Protocol / Clean Development Mechanism	4.63
6	11e) Energy and greenhouse gas monitoring / targeting	4.44
Information		
1	11h) Environmental / Energy management systems	5.50
2	11g) Energy efficient technologies	5.40
3	11i) Cleaner Production (CP) / Energy auditing	5.33
4	11o) Benchmarking data	5.22
5	11n) Government policies / legislation / \$ incentives	5.10
6	11j) Financing CP / energy efficiency projects	5.00
7	11m) Case studies of other companies	5.00
8	11l) Energy monitoring instruments	4.90
9	11k) Energy and greenhouse gas monitoring / targeting	4.40
10	11p) Kyoto Protocol / Clean Development Mechanism	4.22
Others		
1	11t) Programmes to participate in / access	5.44
2	11q) Loans / subsidies for energy efficiency	5.11
3	11v) Software (for energy monitoring, benchmarking etc.)	5.00
4	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	4.80
5	11r) Discounted / free expert's advice	4.70
6	11s) Energy monitoring instruments for hire	4.70
7	11x) Newsletters with energy developments	4.60
8	11y) "Energy Fair" (with technology providers, advisors etc.)	4.44
9	11w) Industry networks	4.20

B6. Philippines

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from the Philippines. The results under item 2 – 5 are based on 20 completed survey questionnaires for Philippines and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
1. Management priorities <ul style="list-style-type: none"> • Management is concerned about time required to improve EE (4l) • Management find production more important (4a) 2. Policies / legislation <ul style="list-style-type: none"> • Environmental policies & legislation relating to energy are weak (4p) • Authorities are not strict in enforcing environmental regulations (4q) 	Organizational Attitudinal Policy Regulatory	d) Provide information education and motivation (IEM) on load management and comparative benefits of EE and downtime activities e) Encourage ESCOs / suppliers to provide service units to industry d) Lobby for the passage of an Energy Efficiency and Conservation Act e) Review the Clean Air Act	Industry associations Utilities Training institutions Government ESCOs Government Industry associations Consultants NGOs International organizations
3. Investment <ul style="list-style-type: none"> • Management is concerned about the investment costs of EE measures (4f) • Process to obtain approval from top management for investments are long (4n) 	Organizational Financial	c) Provide information education and motivation (IEM) on EE investments d) Provide case studies / success stories	Financial institutions Government Industry associations
4. The government does not give (financial) incentives to become energy efficient (4r)	Policy	h) Lobby for the passage of an Energy Efficiency Conservation Act i) Include in Board of Investments (BOI) / Investments Priority Plans (IPPs)	Government Industry associations
5. Difficult to obtain financing for EE projects (4o)	Financial	d) Develop ESCO-initiated model projects e) Provide information education and motivation (IEM) for financial institutions	Government Industry associations Training institutions International organizations
6. Lack of availability of consolidated information on EE technologies and services (4s)	Technical Information	a) Consolidate information and validate b) Formulation of national strategy to disseminate information	Government Industry associations Consultants /Suppliers Utilities

Three proposed solutions were worked out in more detail.

Barrier 1

- Barrier: Management priorities
- Solution: Provide sustainable information, education and motivation (IEM) activities on available energy efficient technologies, benefits and applications

WHAT IS NEEDED?	DESCRIPTION
What	Training, seminars, workshop, case studies, demo projects, publications, tool kits
Where	Manila, Cebu, Davao
For Whom	CEOs/CFOs, COOs/ Legislators Energy managers/engineers Industry associations Financial institutions/NGOs Suppliers/manufacturers
By Whom	Industrial Technology Development Institute Department of Energy Energy Management Association of the Philippines
When	3 trainings/ 3 seminars/ 2 workshop (July 2005 – Dec 2006) 10 case studies, 2 publications (manuals), tool kits and brochures (April – Dec 2005) 2 Demo projects (July 2005 – June 2007)
How Much \$	\$ 100,000
GERIAP relevance	Sequel to GERIAP Retain GERIAP sectors + semicon and food industries Promote environmental benefits of CP-EE
Other	

Barrier 2

- Barrier 5: Difficult to obtain financing for EE projects
- Solution 5a: Develop ESCO initiated model projects

WHAT NEEDED?	IS	DESCRIPTION	COMMENTS
What		Creation of ESCO Fund	
Where		Manila	
For Whom		ESCOs Financial institutions Industry	
By Whom		Energy Management Association of the Philippines ESCO Association of the Philippines	
When		Oct 2005 – Dec 2006	
How Much \$		\$ 1,000,000 (Source: UNEP-GEF, others)	
GERIAP relevance		Sequel to GERIAP project and as ENMAP regular project Removal of energy efficiency barriers	
Other		Development and establishment of guidelines and mechanism	

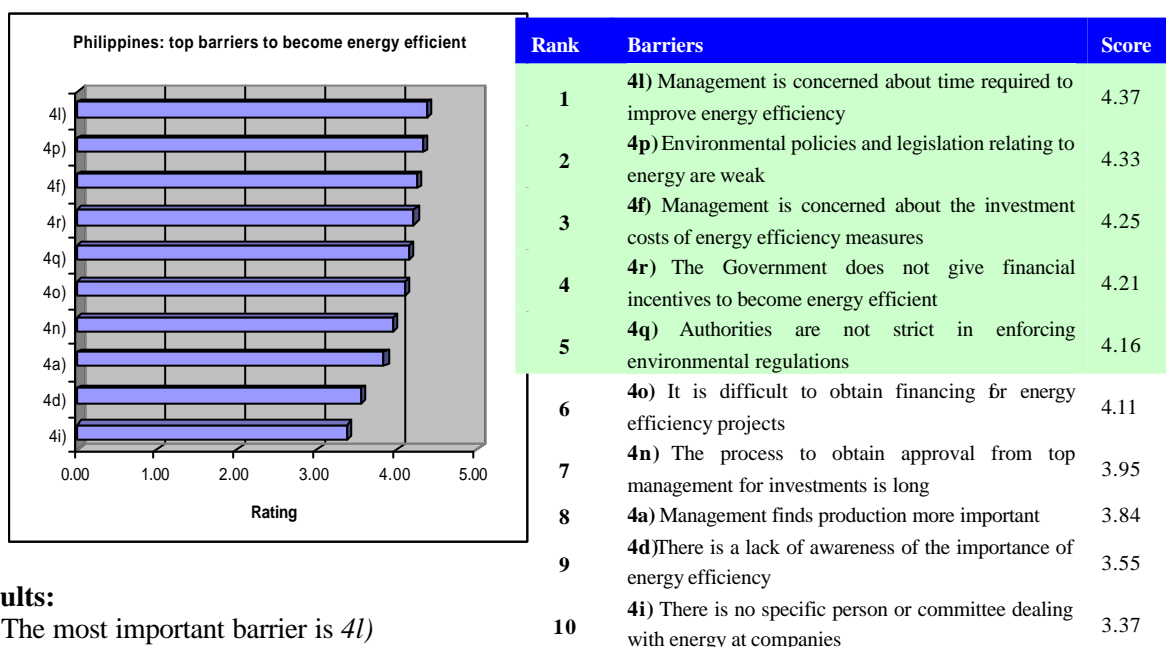
Barrier 3

- Barrier: Policies / legislation
- Barrier: The government does not give (financial) incentives to become energy efficient
- Solution 2a & 4a: Lobby for the passage of an Energy Efficiency and Conservation (EE&C) Act

WHAT NEEDED?	IS	DESCRIPTION	COMMENTS

What	Preparation of EE&C framework through research and surveys	
Where	Manila	
For Whom	Industry (major beneficiary), commercial, residential	
By Whom	Department of Energy Energy Management Association of the Philippines	
When	Research & surveys (July 2005 – June 2006) Lobbying for passage of the EE&C Act (Jan 2006 – Dec 2008)	
How Much \$	\$ 200,000 (Source: GERIAP, UNIDO, JETRO, etc)	
GERIAP relevance	Sequel to GERIAP project and as ENMAP regular project Removal of energy efficiency barriers	
Other		

b) What are the Key Barriers?



Results:

- The most important barrier is 4l) *Management is concerned about time required to improve energy efficiency*
- Many of the other barriers have received a similar score

For the barriers rated 5 or 6, can you explain why?

- Cost and financing are the biggest problems of the industry due perhaps with the economy and prioritization (Company).
- Government support is essential in pushing energy efficiency projects in the industry (Company).
- The barriers are mostly rated 5 or 6 because management priority, availability of financing and technical expertise really does impede the implementation of energy efficiency in companies. However, if the cost of energy in their operations becomes to prohibiting, then even without any government policy, the companies will take upon themselves to adopt energy conservation measures. (stakeholder)
- For large companies, the driving force is the high cost of energy. Nowadays big companies would adopt an Environmental Management System to improve productivity, to improve “image” or to follow regulations. Seldom would you see companies embark on an energy management system if

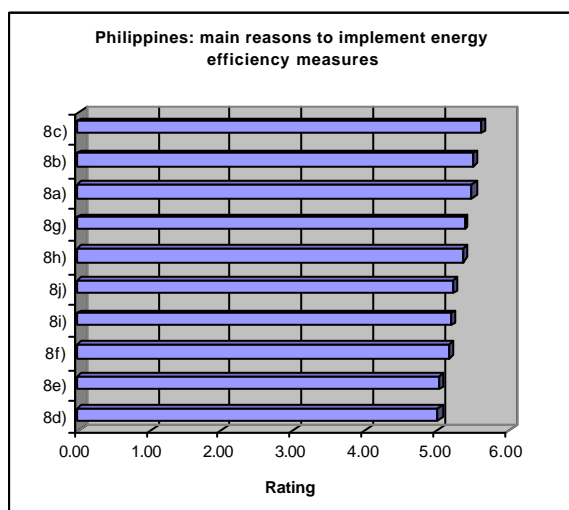
cost of fuel and electricity is low. Why? Because there are no regulations on energy conservation. (stakeholder)

- Most of the company employees (support staff) are not prioritizing energy efficiency even though they are aware of the cost savings mainly because they are not the ones directly paying for the bill (Stakeholder)
- The Clean Air act is not yet fully implemented (company)
- The payback period is an important factor. Companies are not interested in long term projects (4l) (Stakeholder)
- Some companies don't know how to package a financing application (4o) (stakeholder)
- External technical information and expertise requires consultation fees which may add to company costs (4s) (stakeholder)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- The lack of access to financing and the terms and conditions that go with that is a major barrier (Stakeholder)
- Some companies still finds it difficult to allot some funds for energy efficiency projects. There are a lot of opportunities for acquiring some loans but there are no takers (Stakeholder)
- It would be helpful for companies to seek assistance from ESCO's for performance contracting. (Stakeholder)
- A comprehensive and thorough explanation to management about EE either in the form of meetings or presentations would be useful (Company)
- Support from top management and availability of funds is needed (stakeholder)
- Companies lack records of equipment maintenance history, performance characteristics etc (Stakeholder)
- It would be useful to add possible sharing of savings as bonuses for the staff (Stakeholder)

c) What are the main reasons for implementation?



Rank	Reasons for implementation	Score
1	8c) Reduced energy consumption	5.62
2	8b) Reduced production costs	5.52
3	8a) Reduced energy costs	5.49
4	8g) Improved product quality	5.37
5	8h) Improved reputation / recognition	5.36
6	8j) Improved compliance with regulations	5.22
7	8i) Improved staff health and safety	5.20
8	8f) Improved overall environmental performance	5.15
9	8e) Reduced other emissions (e.g. SOx, Nox)	5.02
10	8d) Reduced greenhouse gas emissions	5.00

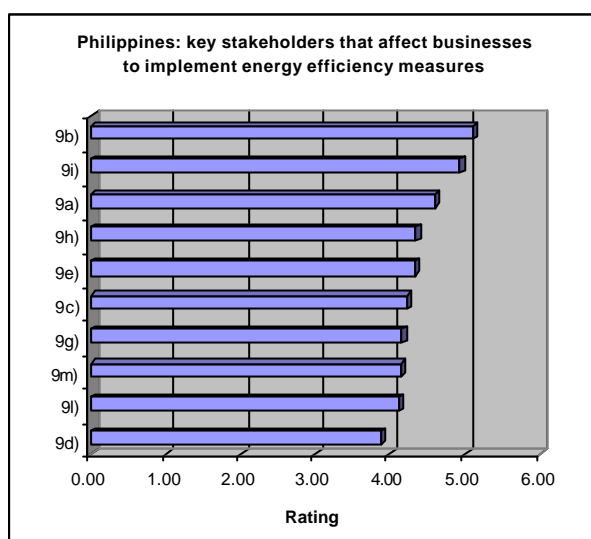
Results

- All the Top 10 main reasons for companies received over 5 in average score!

For the reasons rated 5 or 6, can you explain why?

No comments received

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9b) Plant management	5.11
2	9i) International organisations (e.g. UNEP)	4.94
3	9a) Corporate Head Office	4.61
4	9h) Consultants	4.35
5	9e) Industry / business associations	4.33
6	9c) National Government (e.g. Ministry)	4.24
7	9g) Universities / Research institutes	4.17
8	9l) Shareholders of company	4.13
9	9m) NGOs	4.13
10	9d) State/Local government agencies	3.89

Results

- The most important stakeholder is the **9b) Plant management**
- The second most important stakeholder is **9i) International organisations (e.g. UNEP)**, followed by **9a) Corporate Head Office**

For the stakeholders rated 5 or 6, can you explain why?

No comments received

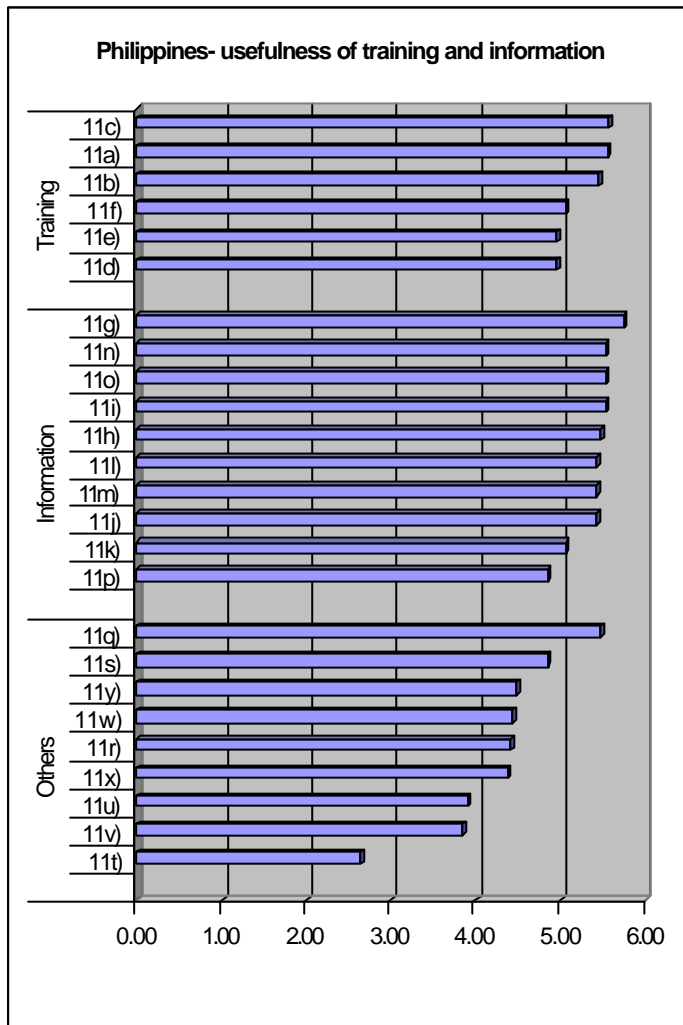
e) What is needed to improve energy efficiency?

Results

- The most important **training** needs are: **11c) Cleaner Production (CP) / Energy auditing together with 11a) Energy efficient technologies** followed by **11b) Environmental / Energy management systems**
- The key **information** need is : **11g) Energy efficient technologies** , followed by virtually all the rest
- The most important **other need** is: **11q) Loans / subsidies for energy efficiency**
- It is interesting to note that **11t) Programmes to participate in** received the lowest priority!

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies

- Energy efficiency is technology driven. The more they become aware of these technologies, the higher the success of it. Plus the availability of financing (Company)
- Awareness raising needs to be done among all stakeholder groups in order to create a critical mass for change (Stakeholder)
- Training and information regarding energy efficiency will always increase awareness and interest of top management. That will in turn affect the top-down approach to implementation (Company)
- Our plant machinery and utilities are obsolete and inefficient. Information and know-how will help us to upgrade the plant in the direction of energy efficiency and comply with statutory requirement (company)



Rank	Assistance Needed	Score
Training		
1	11c) Cleaner Production (CP) / Energy auditing	5.58
2	11a) Energy efficient technologies	5.56
3	11b) Environmental / Energy management systems	5.44
4	11f) Kyoto Protocol / Clean Development Mechanism	5.05
5	11d) Financing CP / energy efficiency projects	4.95
6	11e) Energy and greenhouse gas monitoring / targeting	4.95
Information		
1	11g) Energy efficient technologies	5.74
2	11i) Cleaner Production (CP) / Energy auditing	5.53
3	11o) Benchmarking data	5.53
4	11n) Government policies / legislation / \$ incentives	5.53
5	11h) Environmental / Energy management systems	5.47
6	11j) Financing CP / energy efficiency projects	5.42
7	11m) Case studies of other companies	5.42
8	11l) Energy monitoring instruments	5.42
9	11k) Energy and greenhouse gas monitoring / targeting	5.05
10	11p) Kyoto Protocol / Clean Development Mechanism	4.84
Others		
1	11q) Loans / subsidies for energy efficiency	5.47
2	11s) Energy monitoring instruments for hire	4.84
3	11y) “ Energy Fair” (with technology providers, advisors etc.)	4.47
4	11w) Industry networks	4.44
5	11r) Discounted / free expert’s advice	4.42
6	11x) Newsletters with energy developments	4.37
7	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	3.89
8	11v) Software (for energy monitoring, benchmarking etc.)	3.84
9	11t) Programmes to participate in / access	2.63

B7. Sri Lanka

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from Sri Lanka. The results under item 2 – 5 are based on 24 completed survey questionnaires for Sri Lanka and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

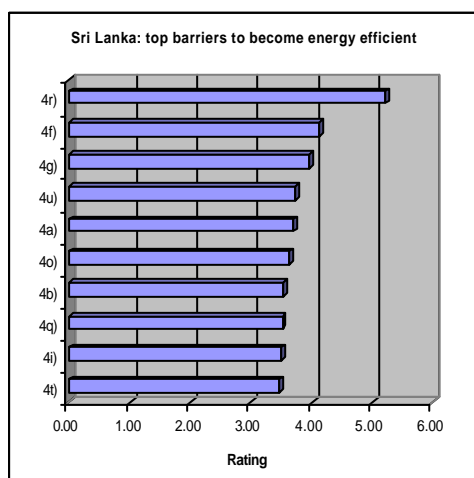
BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
1. Lack of awareness (4b) <ul style="list-style-type: none"> • Potential for EE improvement • Costs and benefits • Poor marketing • Technologies / equipment (4s) 	Organizational Government Communication Attitudinal Information Knowledge	<ul style="list-style-type: none"> • Training at all levels • Demonstration projects • Case studies, best practices, success stories • Media campaign • Award schemes • Curricula development in education • CP / EE audits • Information clearing house • Trade / technology fairs 	Management and employees Industry associations ESCOs Consultants Universities Suppliers International organizations Media Customers
2. Lack of financial incentives and resources <ul style="list-style-type: none"> • Government / fiscal (4r) • Donors 	Government Communication Information Knowledge	<ul style="list-style-type: none"> ▪ Government policy development (fiscal and economic) ▪ Award schemes ▪ Grants / concessions ▪ Technical assistance 	Ministries of Industries / Finance / Power Industry associations Donors NGOs Suppliers, customers Financial institutions
3. Lack of standards and legislation for energy efficiency improvements (4p)	Regulatory Communication Knowledge	<ul style="list-style-type: none"> • Preparation and enforcement of legislation • Media campaign about existing / new legislation 	Ministries of Power, Industry, Commerce /Trade, Environment Industry associations Media Public, CBOs
4. Lack of policies, procedures and systems in companies <ul style="list-style-type: none"> • Management find production more important (4a) • Less concern for energy efficiency measures 	Organizational Attitudinal Knowledge	<ul style="list-style-type: none"> • See under 1 • Award schemes • Communication and media • Introduce system standards 	Top management, employees, customers, Industry associations ESCOs, consultants, universities, suppliers, BDS, Media, public, CBOs
5. Difficulty / inability to obtain external funding <ul style="list-style-type: none"> • External: bank processes • Internal: inability to make bankable proposals • Lack of human resources 	Financial Organizational Knowledge	<ul style="list-style-type: none"> • Training / assistance in preparing bankable proposals • Capacity building within companies • Recognition of EE improvement proposals by financial institutions • Awareness raising of financial institutions • Special funds and CDM 	Top management (CEO, CFO) Financial institutions Financial consultants / trainers Ministries of Industry, Environment International organizations

One proposed solution was worked out in more detail.

- Barrier: Lack of awareness
- Solution: Demonstration projects

WHAT IS NEEDED	DESCRIPTION
What	Implementation of a project to demonstrate emission reduction in industry / sectors through EE improvement <ul style="list-style-type: none"> • Identify industry sectors • Training at all levels • Formulate policies, procedures and systems at company level • Carry out CP/EE audits to identify EE potential and options • Implement low/no cost options • Training and capacity building of company staff for preparation of bankable proposal for medium / high cost options • Negotiate funding internally and externally • Implement medium / high cost options • Monitoring and evaluation • Disseminate results
Where	Western province of Sri Lanka
For whom	Rubber and plastics industry of Sri Lanka, rubber product sector
By whom	New association that will be formed following the GERIAP project (has already been agreed)
When	Starting May 2005 or as soon as funding can be secured
How much	USD 40,000 – 50,000
GERIAP relevance	Directly related to GERIAP project, except now for different sectors
Other	Multiplier effect Enhance competitiveness of the sector GHG reduction Additional benefit of identifying CDM projects Networking between stakeholders

b) What are the Key Barriers?



Rank	Barriers	Score
1	4f) There is no specific person or committee dealing with energy at companies	5.22
10	4f) The Government does not give financial incentives to become energy efficient	3.48
2	4i) There is a lack of coordination between external organisations	4.13
2	4f) Management is concerned about the investment costs of energy efficiency measures	4.13
3	4g) There is a lack of policies, procedures and systems within companies	3.96
4	4u) Companies do not have targets for energy (only for production)	3.75
5	4a) Management finds production more important	3.71
6	4o) It is difficult to obtain financing for energy efficiency projects	3.63
7	4b) There is a lack of information on energy consumption within companies	3.54
8	4q) Authorities are not strict in enforcing environmental regulations	3.52

Results

- The most important barrier is clearly *4r) The Government does not give financial incentives to become energy efficient*
- The other barriers are given significantly lower score

For the barriers rated 5 or 6, can you explain why?

- The cost of energy is hidden and it is difficult to quantify (Company)
- Energy efficient systems are difficult to implement (Company)
- Staff are not trained properly (4c) (company)
- There is no organization structure in place for energy projects (4i) (Company)
- There is a lack of incentives introduced by the government (Company)
- Most companies have to fulfill export orders under very tight schedules, to keep the business alive. In that context, energy efficiency is disregarded may be unintentionally (stakeholder)
- Only a few companies have regular reporting on energy (4g) (Stakeholder)
- There are no programs in place on the governmental as well as company level on energy related issues (Stakeholder)
- People have been used to cheap power or subsidized power in the past. Hence culture and confidence in Energy reductions technologies are poor. (Stakeholder)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- Available energy meters are not reliable (Company)
- There is a lack of trained and experienced staff (Company)
- We have implemented several energy saving projects. To implement further we need the help of external technical experts (Company)
- Capital investment is needed to improve energy efficiency (Company)
- Government tax rebates are needed as well as incentives to import energy efficient equipment and machinery that consumes less electricity (Stakeholder)
- There is a lack of benchmarking studies for energy efficiency improvement (Stakeholder)
- There is a lack of instrumentation and/or measurements (Stakeholder)
- National level awareness programs as well as soft loans on energy efficiency investments are needed (Stakeholder)
- The need for short term investment recovery makes it difficult to improve energy improvement measures (Company)
- A way of solving many barriers is to form a clearing house/one stop shop to help enterprises obtain/advise/meet suppliers on EE issues. (stakeholder)

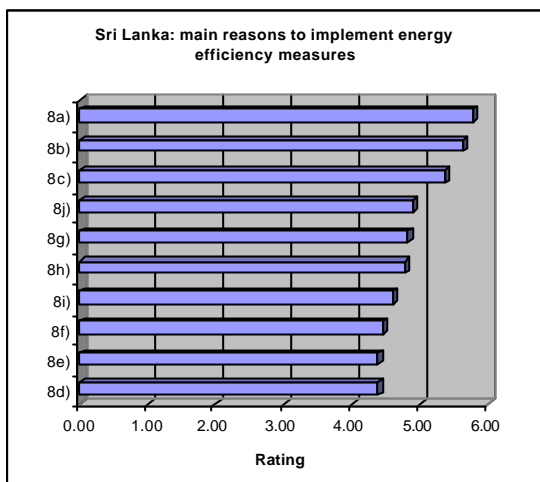
c) What are the main reasons for implementation?

Results

- The main reasons for companies to implement energy efficiency measures are: *8a) Reduced energy costs, 8b) Reduced production costs and 8c) Reduced energy consumption*

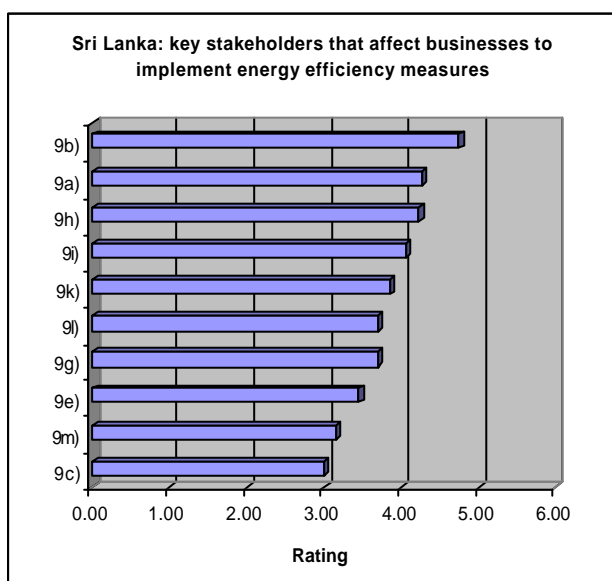
For the reasons rated 5 or 6, can you explain why?

- Most companies are not aware about the opportunities available in carbon trading or CDM (Stakeholder)



Rank	Reasons for implementation	Score
1	8a) Reduced energy costs	5.78
2	8b) Reduced production costs	5.65
3	8c) Reduced energy consumption	5.37
4	8j) Improved compliance with regulations	4.91
5	8g) Improved product quality	4.83
6	8h) Improved reputation / recognition	4.78
7	8i) Improved staff health and safety	4.59
8	8f) Improved overall environmental performance	4.46
9	8e) Reduced other emissions (e.g. SOx, Nox)	4.39
10	8d) Reduced greenhouse gas emissions	4.38

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9b) Plant management	4.75
2	9a) Corporate Head Office	4.28
3	9h) Consultants	4.24
4	9j) International organisations (e.g. UNEP)	4.05
5	9k) Employees	3.85
6	9l) Shareholders of company	3.71
7	9g) Universities / Research institutes	3.70
8	9e) Industry / business associations	3.45
9	9m) NGOs	3.16
10	9c) National Government (e.g. Ministry)	3.00

Results

- The key stakeholder is clearly **9b) Plant management**

For the stakeholders rated 5 or 6, can you explain why?

No comments received

e) What is needed to improve energy efficiency?

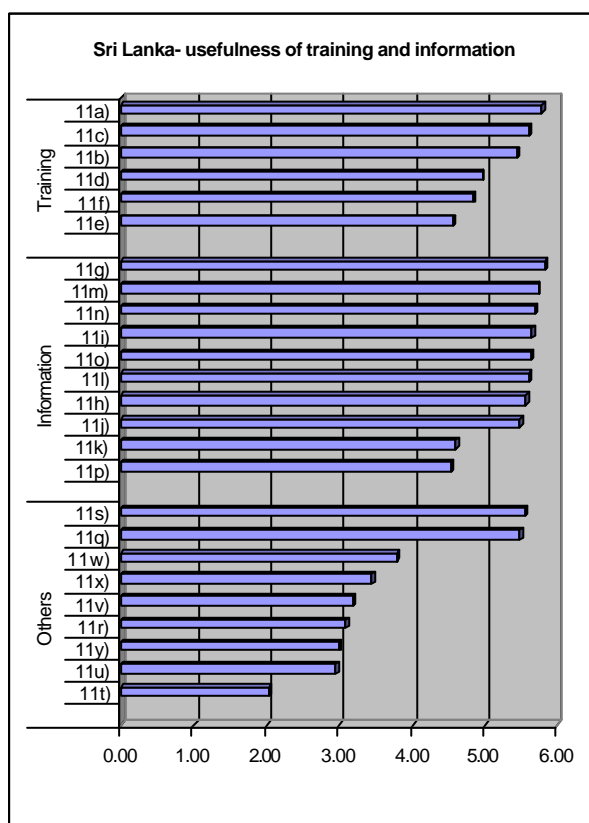
Results

- The most important **training** needs are: **11a) Energy efficient technologies** followed by **11c) Cleaner Production (CP) / Energy auditing together** and **11b) Environmental / Energy management systems**

- The key **information** need is : **11g) Energy efficient technologies** , followed by **11m) Case studies of other companies** and all the rest! (very high scores on almost all)
- The most important **other needs** are: **11s) Energy monitoring instruments for hire, 11q) Loans / subsidies for energy efficiency**
- It is interesting to note that **11t) Programmes to participate in** received the lowest priority – only 2.05!

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- Access to relevant information, training of staff and financing are the key factors (Company)
- Training, information and other related services are very important for our company (Company)
- Especially low interest loans are useful as the costs of projects are very high (Company)
- If loans and subsidies are provided than we will be able to improve energy efficiency (Company)
- Training and information as well as financial incentives are very important in order to guarantee results (Stakeholder)
- There is no proper institutional arrangement to support industry on energy efficiency issues (Stakeholder)
- Case studies and a comprehensive directory would help in evaluating equipment suppliers (Company)



Rank	Assistance Needed	Score
Training		
1	11a) Energy efficient technologies	5.78
2	11c) Cleaner Production (CP) / Energy auditing	5.61
3	11b) Environmental / Energy management systems	5.43
4	11d) Financing CP / energy efficiency projects	4.96
5	11f) Kyoto Protocol / Clean Development Mechanism	4.83
6	11e) Energy and greenhouse gas monitoring / targeting	4.57
Information		
1	11g) Energy efficient technologies	5.83
2	11m) Case studies of other companies	5.73
3	11n) Government policies / legislation / \$ incentives	5.68
4	11i) Cleaner Production (CP) / Energy auditing	5.65
5	11o) Benchmarking data	5.64
6	11l) Energy monitoring instruments	5.61
7	11h) Environmental / Energy management systems	5.57
8	11j) Financing CP / energy efficiency projects	5.48
9	11k) Energy and greenhouse gas monitoring / targeting	4.61
10	11p) Kyoto Protocol / Clean Development Mechanism	4.53
Others		
1	11s) Energy monitoring instruments for hire	5.55
2	11q) Loans / subsidies for energy efficiency	5.48
3	11w) Industry networks	3.80
4	11x) Newsletters with energy developments	3.45
5	11v) Software (for energy monitoring, benchmarking etc.)	3.19
6	11r) Discounted / free expert's advice	3.09
7	11y) "Energy Fair" (with technology providers, advisors etc.)	3.00
8	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	2.95
9	11t) Programmes to participate in / access	2.05

B8. Thailand

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from Thailand. The results under item 2 – 5 are based on 9 completed survey questionnaires for Thailand and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

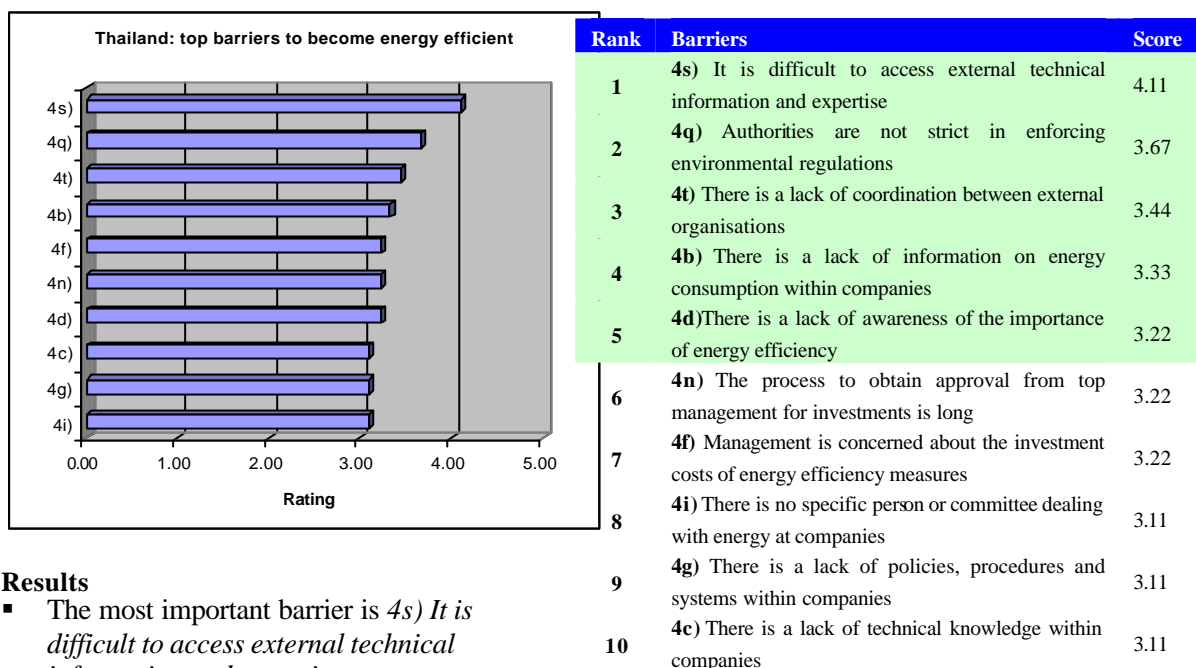
BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
<p>1. Management has competing priorities</p> <ul style="list-style-type: none"> The <u>customer</u> determines business priorities!! (new) Management finds production more important (4a) Management is concerned about the time required to improve EE (4l) No specific energy manager (4i) because energy / env. is not urgent 	<p>Market (customer) Organizational Attitude</p>	<p>Awareness campaigns for:</p> <ul style="list-style-type: none"> Customers Top management 	<p>Customers Top management Marketing people Opinion, business and government leaders</p>
<p>2. Lack of awareness / access to (4b and 4s)</p> <ul style="list-style-type: none"> How to improve EE (management process) What to do to improve EE (technical info, technologies, options) 	<p>Knowledge Organizational</p>	<ul style="list-style-type: none"> Awareness campaigns (see 1) Training Study tours / cross learning Information packages and dissemination Awards Networks 	<p>For: Top management, middle management and operators By: Technical suppliers, Industry associations, Service providers</p>
<p>3. Policy conflict</p> <ul style="list-style-type: none"> Energy is important but not urgent Conflict between economic growth and environmental policy, so energy is subsidized instead of EE promoted 	<p>Political</p>	<ul style="list-style-type: none"> Integration of economic and environmental policies Removal of energy subsidies 	<p>Thai Ministries:</p> <ul style="list-style-type: none"> Industry Energy Natural Resources Finance Science & Technology
<p>4. Risk of investment in EE (and other projects, not just EE) by SMEs (4o and 4f)</p>	<p>Organizational Knowledge Access</p>	<ul style="list-style-type: none"> Information about \$ savings Trials to demonstrate savings Training of financial institutions and SMEs about preparing proposals and evaluating EE projects Special / cheap loans / flexible payback Set up special funds (e.g. ESCOs) 	<p>SMEs Financial institutions Government Technical suppliers ESCOs</p>
<p>5. Lack of coordination between external organizations (4t)</p>	<p>Organizational Political</p>	<ul style="list-style-type: none"> Energy Efficiency Summit to discuss cooperation EE Portal for centralized information dissemination 	<p>Int. organizations National organizations (e.g. Ministries, NGOs, research institutions)</p>

One proposed solution was worked out in more detail:

- Barrier 1: Management has competing priorities
- Solution 1a and b: Customer and top management awareness

WHAT IS NEEDED	DESCRIPTION
What	<p>Message to customers:</p> <ul style="list-style-type: none"> • Importance of EE and GHG • Benefits to the customer (reputation, \$ savings, liability) • How they can put pressure on suppliers <p>Message to top management:</p> <ul style="list-style-type: none"> • CP and EE can really benefit the company and does not conflict with production increase • EE can provide competitive edge with customers <p>Activities:</p> <ol style="list-style-type: none"> a) Targeted media campaign / advertisements b) Targeted mailing by opinion leaders to customers and top management c) Forum with specific sectors and customers about something that is of interest to them (EE message is hidden) d) Product labeling (e.g. a 1-6 energy star system for cement, steel etc like there is for electronic equipment) e) “Magic Eye” campaign for students / general public
Where	Thailand
For whom	<ul style="list-style-type: none"> • Wholesalers, direct customers of industry (activities a, b, c and d) • Industry sectors (activity a, b, c and d) • Final customers (activity e) • Students and business schools (e.g. Thammasat University where environmental management is part of the business management courses) (activity e)
By whom	<ul style="list-style-type: none"> • Media: internet industry sites, industry magazines, trade journals (activity a) • Industry associations (activity (a and c) • Consumer organizations (activity a and c) • Opinion leaders (e.g. Mr. Adard Pandiarachun from UN and former Thai PM; Dr Supachai from WTO) (activity b) • Ministry of Energy (activity a and c) • Famous and popular people (e.g. Panadorn) (activity a)
When	<ul style="list-style-type: none"> • Activity a: Short term, several months • Activity b: Short term, several months • Activity c: Medium term, up to 1 year • Activity d: Long term, several years • Activity e: Medium / long term, more than 1 year
How much	<ul style="list-style-type: none"> • Activity a, b and c: low (<10,000 USD) • Activity d: high (> 100,000 USD) • Activity e: low (< 10,000 USD) if via existing Magic Eye campaign, otherwise medium (10,000 – 100,000 USD)
GERIAP relevance	<p>Activities a, b and c: high relevance with GERIAP (same target group)</p> <p>Activities d and e: low because wider target group</p>
Other	Involvement of non-technical specialists or organizations is essential: marketing, communication, business, financial

b) What are the Key Barriers?



Results

- The most important barrier is 4s) *It is difficult to access external technical information and expertise*

For the barriers rated 5 or 6, can you explain why?

- Expensive technology is needed in order to have any substantial savings (Company)
- Management needs to recognize that Energy Efficiency can help the whole production efficiency, otherwise nothing will happen (Stakeholder).
- It takes a lot of time to contact suppliers in order to receive technical data (4s) (Company)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- Networking, sharing experiences with other organizations would assist companies to become more energy efficient (Stakeholder)
- There is a lack of detailed figures from different departments within the company due to no metering (Company)

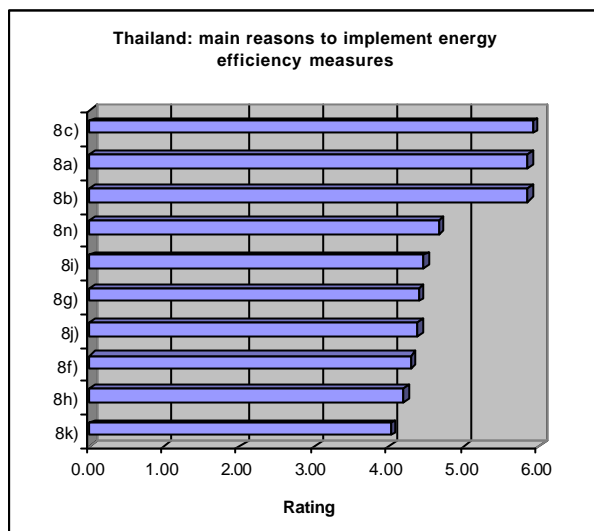
d) What are the main reasons for implementation?

Results

- The main reasons for companies to implement energy efficiency measures are: 8c) *Reduced energy consumption*, 8b) *Reduced production costs* and 8a) *Reduced energy costs*

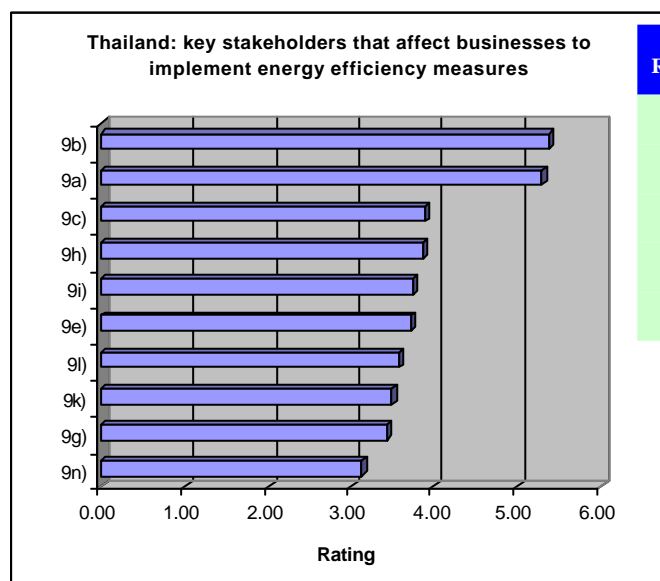
For the reasons rated 5 or 6, can you explain why?

No comments received



Rank	Reasons for implementation	Score
1	8c) Reduced energy consumption	5.92
2	8b) Reduced production costs	5.86
3	8a) Reduced energy costs	5.86
4	8n) Improved relations with customers	4.67
5	8i) Improved staff health and safety	4.47
6	8g) Improved product quality	4.40
7	8j) Improved compliance with regulations	4.39
8	8f) Improved overall environmental performance	4.30
9	8h) Improved reputation / recognition	4.20
10	8k) Improved compliance with corporate environmental targets	4.04

c). Who are the key stakeholders?



Rank	Stakeholder	Score
1	9b) Plant management	5.38
2	9a) Corporate Head Office	5.29
3	9c) National Government (e.g. Ministry)	3.89
4	9h) Consultants	3.86
5	9i) International organisations (e.g. UNEP)	3.75
6	9e) Industry / business associations	3.71
7	9l) Shareholders of company	3.57
8	9k) Employees	3.50
9	9g) Universities / Research institutes	3.43
10	9n) Local communities	3.14

Results

- The company stakeholders are clearly considered most important: **9b) Plant management** and **9a) Corporate Head Office**

For the stakeholders rated 5 or 6, can you explain why?

- Plant management can be an important stakeholder but it depends if they have environmental responsibilities or not (Stakeholder)

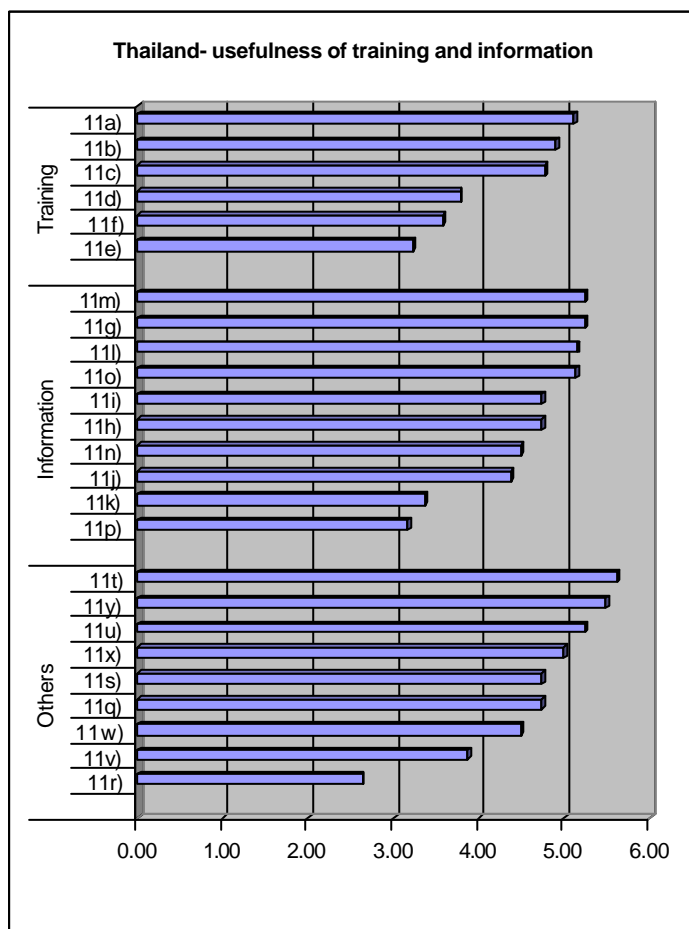
d) What is needed to improve energy efficiency?

Results

- The most important training needs are: 11a) *Energy efficient technologies* followed by 11b) *Environmental / Energy management systems* and 11c) *Cleaner Production (CP) / Energy auditing*
- The key information need is : 11g) *Energy efficient technologies* sharing the same score as 11m) *Case studies of other companies*
- The most important other needs are: 11t) *Programmes to participate in* and 11y) “*Energy Fair*” (with *technology providers, advisors etc*)

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- It would be very useful to learn from other companies and get case studies on how to become more energy efficient – especially on energy management systems and energy efficiency projects (Company)
- Case studies shared from company to company would be useful (Stakeholder)
- Energy fair between companies and suppliers is useful (Stakeholder)
- In general, training is more useful than just information (Company)
- Training course on how to calculate return on investment etc financing aspects would be most useful (Company)
- There is a lack of benchmark information that truly is comparable to our own production (Company).



Rank	Assistance Needed	Score
Training		
1	11a) Energy efficient technologies	5.11
2	11b) Environmental / Energy management systems	4.89
3	11c) Cleaner Production (CP) / Energy auditing	4.78
4	11d) Financing CP / energy efficiency projects	3.78
5	11f) Kyoto Protocol / Clean Development Mechanism	3.57
6	11e) Energy and greenhouse gas monitoring / targeting	3.22
Information		
1	11g) Energy efficient technologies	5.25
2	11m) Case studies of other companies	5.25
3	11l) Energy monitoring instruments	5.14
4	11o) Benchmarking data	5.13
5	11h) Environmental / Energy management systems	4.75
6	11i) Cleaner Production (CP) / Energy auditing	4.75
7	11n) Government policies / legislation / \$ incentives	4.50
8	11j) Financing CP / energy efficiency projects	4.38
9	11k) Energy and greenhouse gas monitoring / targeting	3.38
10	11p) Kyoto Protocol / Clean Development Mechanism	3.17
Others		
1	11t) Programmes to participate in / access	5.63
2	11y) “ Energy Fair” (with technology providers, advisors etc.)	5.50
3	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	5.25
4	11x) Newsletters with energy developments	5.00
5	11q) Loans / subsidies for energy efficiency	4.75
6	11s) Energy monitoring instruments for hire	4.75
7	11w) Industry networks	4.50
8	11v) Software (for energy monitoring, benchmarking etc.)	3.88
9	11r) Discounted / free expert’s advice	2.63

B10. Vietnam

The final results under item 1 are based on the Regional Stakeholders Workshop with stakeholders from Vietnam. The results under item 2 – 5 are based on 10 completed survey questionnaires for Vietnam and comments made in questionnaires and during interviews.

a) Barriers, Solutions and Stakeholders – final results

BARRIERS	TYPE	SOLUTIONS	STAKEHOLDERS
<p>1. Lack of awareness about CP and EE benefits (4d) Also related to:</p> <ul style="list-style-type: none"> • Management finds production more important (4a) • Management is concerned about investment costs (4f) • Lack of systems / processes within companies (4g) 	<p>Cultural, attitude Communication Organizational</p>	<ul style="list-style-type: none"> • Training targeting management • Awareness raising seminar • Capacity building for service providers and companies • Information dissemination targeting companies • Success stories and best practices • Public communication targeting public at large and consumers • University curriculum targeting lecturers, students in engineering and business management 	<ul style="list-style-type: none"> • Top management; EE/CP service providers (e.g. VNCPC, VECR); Universities and research institutions • Media (brochures, newsletters, manuals); Service providers; auditors; international organizations; NGOs; experts; customers and suppliers • Media (TV, newspapers, radio) • EE/CP service providers; international experts; university
<p>2. Public signals from leadership</p> <ul style="list-style-type: none"> • Weak policies (4p) • Poor enforcement (4q) • Weak financial incentives (4r) • National energy prices (new) 	<p>Political Organizational Regulatory</p>	<ul style="list-style-type: none"> • Capacity building for policy makers • Capacity building for enforcement for local authorities • Policy advice on incentives and resource pricing 	<ul style="list-style-type: none"> • EE/CP service providers (NA21, MPI); international organizations (e.g. UNDP) • Government central and local; Donors • Research institutions (EI, CIEM); international organizations (e.g. World Bank)
<p>3. Access to technology / technical expertise and information (4s)</p> <ul style="list-style-type: none"> • Within company • From outside: EE service providers 	<p>Knowledge / expertise Information Technical availability</p>	<p>See solutions for barrier 1</p>	<p>See actors for barrier 1</p>
<p>4. Access to financing</p> <ul style="list-style-type: none"> • Banking and financial institutions (4o) • Lack of information and skills on wider evaluation and monitoring • Lack of capacity to formulate bankable proposals 	<p>Financial Technical</p>	<ul style="list-style-type: none"> • Dissemination of info on finance providers, website brochures, roundtables SMEs and banks • Training of bank staff on EE project evaluation • Training of employees (finance/ accounts depts) on EE project formulation • Capacity building of EE 	<ul style="list-style-type: none"> • Media (e.g. brochures); industry associations (VCCI, VICOOPSME) • Service providers; financial institutions (MoF); international organizations (IFC/MPDF, UNEP); expert network (e.g. ACMC, ECE) • Consulting firms; service

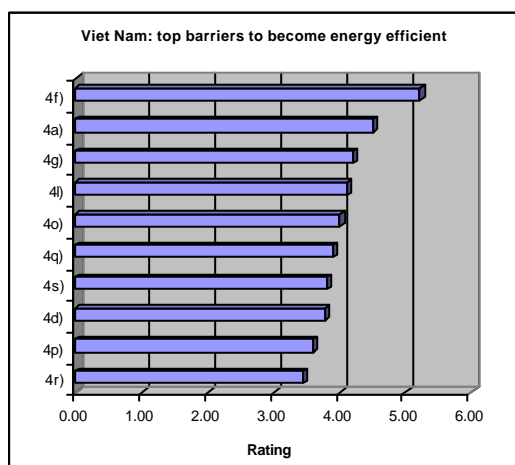
		and CP service providers on preparation of bankable project proposals	providers (ECE, VNPC)
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One proposed solution was worked out in more detail.

- Barrier: Lack of awareness about CP and EE benefits
- Solution: University curriculum targeting lecturers, students in engineering and business management

WHAT IS NEEDED	DESCRIPTION
What	CP/EE Methodology (technology assessment, EE options, cost-benefit analysis, preparation of bankable project proposals)
Where	Hanoi and Ho Chi Minh City
For whom	Service providers, experts
By whom	VNCPC, ECC (Energy Conservation Centres by MOST), VECP (Vietnam Energy Conservation Project by MOST and UNDP), international experts
When	Combination of 10 days classroom and 20 days factory practice X 3 groups = 3 months spread over 1 year
How much	USD 100,000 estimate
GERIAP relevance	Provides international expertise to design curriculum together with organizations mentioned under “by whom” Facilitates regional exchange of experience and best practices
Other	Networking amongst national projects is needed

b) What are the Key Barriers?



Rank	Barriers	Score
1	4f) Management is concerned about the investment costs of energy efficiency measures	5.22
2	4a) Management finds production more important	4.50
3	4g) There is a lack of policies, procedures and systems within companies	4.20
4	4j) Management is concerned about time required to improve energy efficiency	4.11
5	4o) It is difficult to obtain financing for energy efficiency projects	4.00
6	4q) Authorities are not strict in enforcing environmental regulations	3.90
7	4s) It is difficult to access external technical information and expertise	3.80
8	4d) There is a lack of awareness of the importance of energy efficiency	3.78
9	4p) Environmental policies and legislation relating to energy are weak	3.60
10	4r) The Government does not give financial incentives to become energy efficient	3.44

Results

- The most important barrier is clearly 4f – *Management is concerned about the investment costs of energy efficiency measures.*

For the barriers rated 5 or 6, can you explain why?

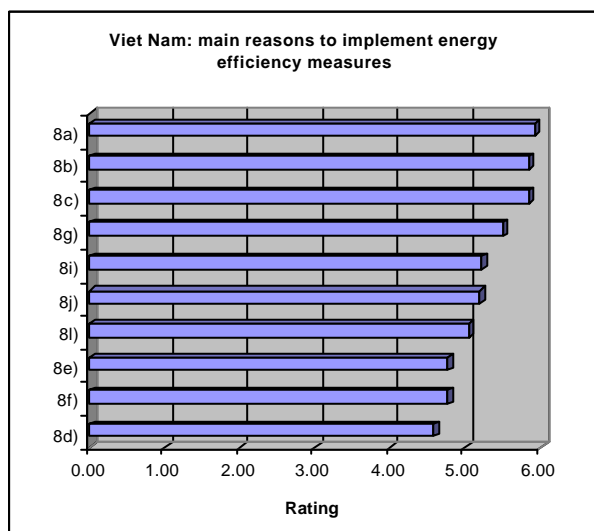
- The difficulty in quantifying energy use is to find out the % of contribution of each production step, not the overall figure (4w) (Stakeholder)

- The companies misunderstand that the role of the energy manager is to keep the system running, NOT to run it efficiently (4i) (stakeholder)
- A repair or change of machinery means a stop of production and this is not allowed at many companies. The production line should be designed differently (Stakeholder)
- State-owned companies are the ones facing a problem with long approval times from management for obtaining energy investments (4n) (Stakeholder)
- Authorities are not strict in enforcing environmental regulations because this is a very costly procedure (4q) (Stakeholder)

Is there anything else that makes it easy or difficult for companies to become more energy efficient?

- The price distortions on energy, water etc is a major barrier for companies to become more energy efficient. The subsidies reduces the incentives for companies to become more resource efficient (Stakeholder)
- The conditions in Vietnam are very regulation driven and there are very few incentives for companies to become more energy efficient (Stakeholder)
- There is a lack of analytical book keeping for many companies in Vietnam and this is a key barrier for companies in order to control their energy usage (Stakeholder)
- Companies do not understand the benefits of energy efficiency. Therefore, increased information sharing and awareness raising are needed (Stakeholder)

c) What are the main reasons for implementation?



Rank	Reasons for implementation	Score
1	8a) Reduced energy costs	5.92
2	8c) Reduced energy consumption	5.84
3	8b) Reduced production costs	5.84
4	8g) Improved product quality	5.51
5	8i) Improved staff health and safety	5.22
6	8i) Improved staff health and safety	5.20
7	8l) Preparation for Kyoto Protocol / Clean Development Mechanism opportunities	5.06
8	8f) Improved overall environmental performance	4.77
9	8e) Reduced other emissions (e.g. SOx, Nox)	4.77
10	8d) Reduced greenhouse gas emissions	4.57

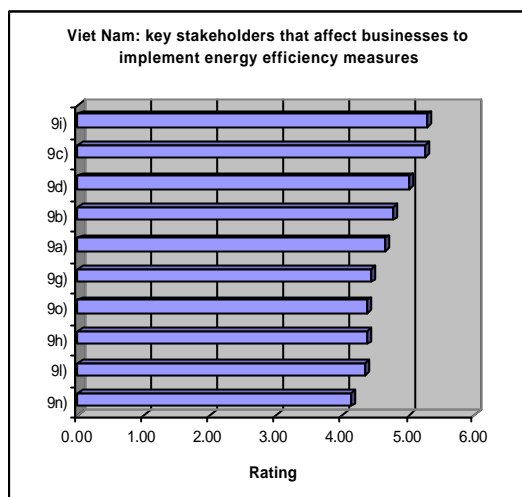
Results

- The main reasons for companies to implement energy efficiency measures are: **8a) Reduced energy costs, 8c) Reduced energy consumption and 8b) Reduced production costs**

For the reasons rated 5 or 6, can you explain why?

- Environment is not seen as a business opportunity (Stakeholder)
- The customers do not see the benefits of products that have been produced in a resource efficient way.

d) Who are the key stakeholders?



Rank	Stakeholder	Score
1	9i) International organisations (e.g. UNEP)	5.29
2	9c) National Government (e.g. Ministry)	5.25
3	9d) State/Local government agencies	5.00
4	9b) Plant management	4.78
5	9a) Corporate Head Office	4.63
6	9g) Universities / Research institutes	4.44
7	9h) Consultants	4.38
8	9o) Media	4.38
9	9l) Shareholders of company	4.33
10	9n) Local communities	4.13

Results:

- The top stakeholders are 9i) *International organisations (e.g. UNEP)*, 9c) *National Government (e.g. Ministry)* and 9d) *State/Local government agencies* – all governmental institutions are listed above the company stakeholders

For the stakeholders rated 5 or 6, can you explain why?

- National Government set up the policies and is a key stakeholder especially in Vietnam (9d) (Stakeholder)
- State/local agencies do the follow up work on policy implementation and are therefore an important stakeholder (4d) (Stakeholder)
- Shareholder of a company can be an important stakeholder provided that they show interest in EE issues (4l) (Stakeholder)
- There are examples where the local community has taken measures to reduce pollution by nearby industries. (Stakeholder)
- Media has to a greater extent included energy and climate change in their news coverage and this has an impact on industry behaviour (9o) (stakeholder)

e) What is needed to improve energy efficiency?

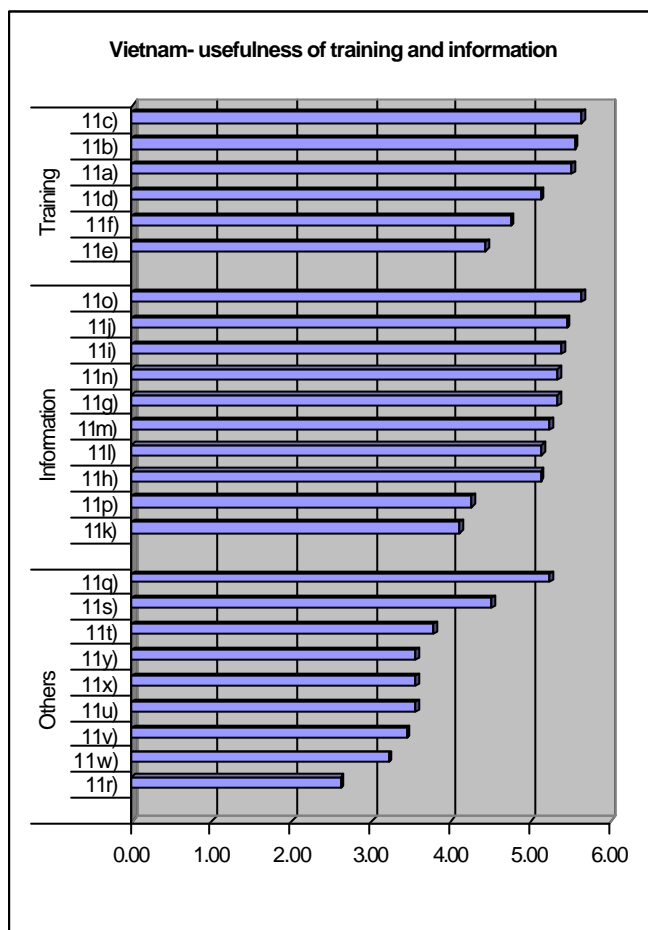
Results

- The most important **training** needs are: 11c) *Cleaner Production (CP) / Energy auditing*
- 11b) *Environmental / Energy management system* and 11a) *Energy efficient technologies*
- The key **information** need is : 11o) *Benchmarking data*
- The most important **other need** is 11q) *Loans / subsidies for energy efficiency*

For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

- Discounted expert fees can be a good incentive for companies but it is not a good idea to offer services for free. This means that there is no commitment from the company (11r) (Stakeholder)
- A directory with energy contacts can be useful only if companies have the right access to such a network. These networks also need to be maintained and managed properly (4u) (Stakeholder)

- Companies would benefit a lot if they got information on how to get financial assistance (Stakeholder)
- Companies first need to know the benefits of energy efficiency and thereafter the right technical expertise to support them in the implementation of options (Stakeholder)



Rank	Assistance Needed	Score
Training		
1	11c) Cleaner Production (CP) / Energy auditing	5.63
2	11b) Environmental / Energy management systems	5.56
3	11a) Energy efficient technologies	5.50
4	11d) Financing CP / energy efficiency projects	5.11
5	11f) Kyoto Protocol / Clean Development Mechanism	4.75
6	11e) Energy and greenhouse gas monitoring / targeting	4.43
Information		
1	11o) Benchmarking data	5.63
2	11j) Financing CP / energy efficiency projects	5.44
3	11i) Cleaner Production (CP) / Energy auditing	5.38
4	11g) Energy efficient technologies	5.33
5	11n) Government policies / legislation / \$ incentives	5.33
6	11m) Case studies of other companies	5.22
7	11l) Energy monitoring instruments	5.13
8	11h) Environmental / Energy management systems	5.11
9	11p) Kyoto Protocol / Clean Development Mechanism	4.25
10	11k) Energy and greenhouse gas monitoring / targeting	4.11
Others		
1	11q) Loans / subsidies for energy efficiency	5.22
2	11s) Energy monitoring instruments for hire	4.50
3	11t) Programmes to participate in / access	3.78
4	11u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	3.56
5	11x) Newsletters with energy developments	3.56
6	11y) “ Energy Fair” (with technology providers, advisors etc.)	3.56
7	11v) Software (for energy monitoring, benchmarking etc.)	3.44
8	11w) Industry networks	3.22
9	11r) Discounted / free expert’s advice	2.63

Appendix C: Industry sector results

This appendix includes the detailed results for industry sectors and is based on 77 completed questionnaires from companies. The Regional Stakeholders Workshop only worked out country barriers and not for industry, and therefore these results are based on the survey only.

C1. What are the Key Barriers?

The ranking of barriers (company responses only) by industry sector is shown in Table 20 below.

Table 20. Ranking of barriers to energy efficiency in industry by industry sector (the top 5 barriers are highlighted in grey)

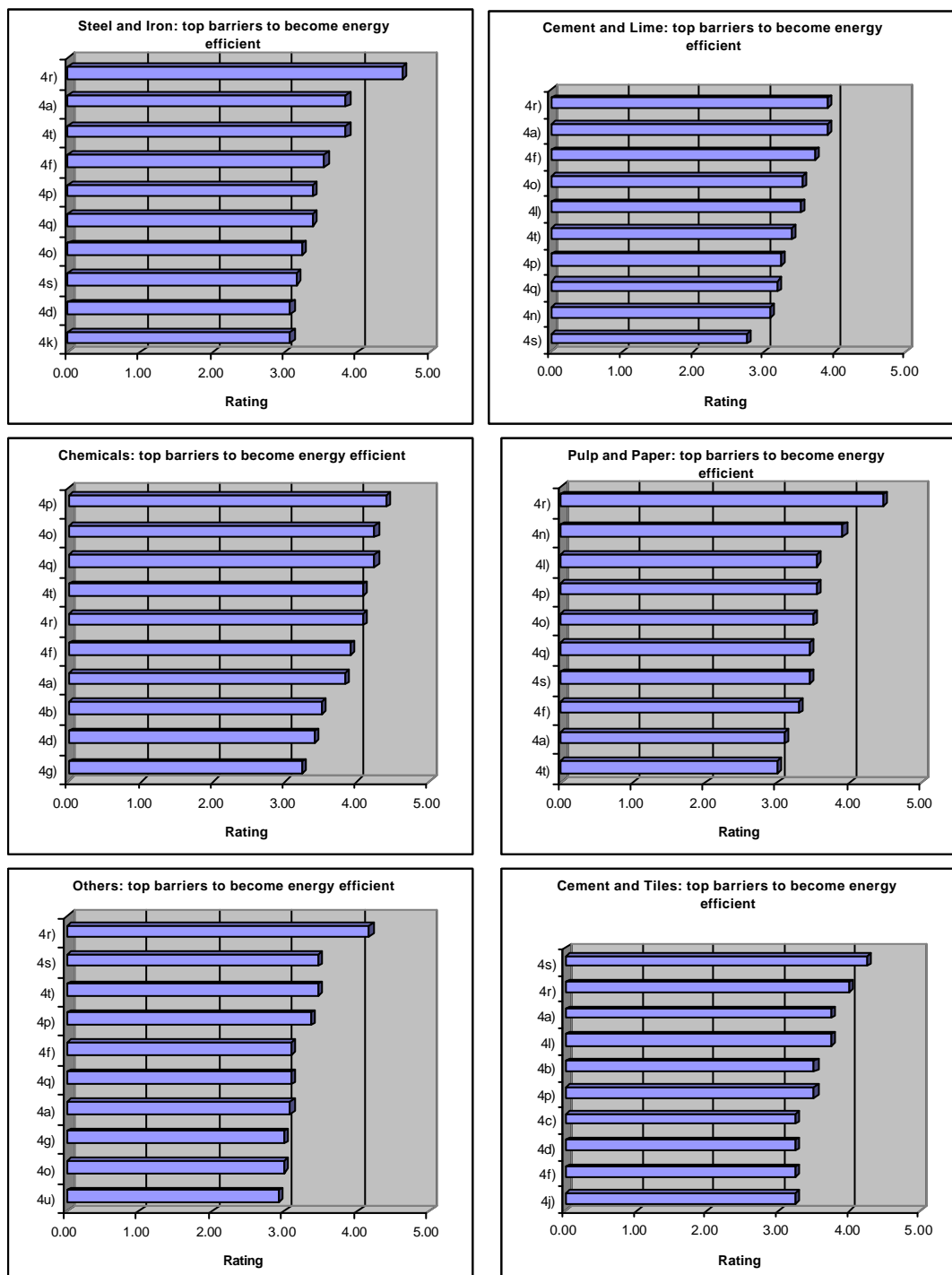
Barrier	Overall rank	Cement&Lime	Ceramic&Tiles	Chemicals	Pulp&Paper	Iron&Steel	Other
4r)	1	1	2	5	1	1	1
4f)	2	3	9	6	8	4	5
4a)	3	2	3	7	9	2	7
4p)	4	7	6	1	4	5	4
4o)	5	4	16	2	5	7	9
4t)	6	6	12	4	10	3	3
4q)	7	8	13	3	6	6	6
4s)	8	10	1	11	7	8	2
4l)	9	5	4	18	3	14	12
4n)	10	9	11	14	2	15	19
4g)	11	11	14	10	18	13	8
4d)	12	19	8	9	12	9	16
4b)	13	18	5	8	17	11	18
4v)	14	13	22	13	14	16	11
4k)	15	17	15	17	11	10	15
4c)	16	20	7	16	13	12	14
4u)	17	22	21	15	15	18	10
4i)	18	12	17	12	22	17	17
4w)	19	14	23	20	16	20	13
4j)	20	16	10	19	21	19	21
4h)	21	15	20	22	19	21	22
4m)	22	21	18	21	23	22	20
4e)	23	23	19	23	20	23	23

The top 5 barriers from the overall results appear in the top 10 of all industry sectors. Therefore there is a large degree of consensus amongst industry sectors on what the most important barriers to energy efficiency are. Four sectors identified barrier **4r) The Government does not give financial incentives to become energy efficient** as barrier number 1. It is noted though that the differences in average scores between barriers is small.

The most notable exceptions are:

- **Pulp and paper sector.** Respondents from this sector have highlighted the importance of the barriers: **4 n) The process to obtain approval from top management for investments is long** as their second most important barrier, but none.

- **Cement & Lime, Pulp & Paper, Ceramics & Tiles.** These sectors ranked the barrier *4l) Management is concerned about time required to improve energy efficiency* in their top 5 but the other sectors gave it a much lower rank.
- **Ceramics & Tiles and “Other” sectors.** The barrier *4s) It is difficult to access external technical information and expertise* was ranked number 1 and 2 respectively, whereas for other sectors this barrier is ranked much lower.



C2. What are the main reasons for implementation?

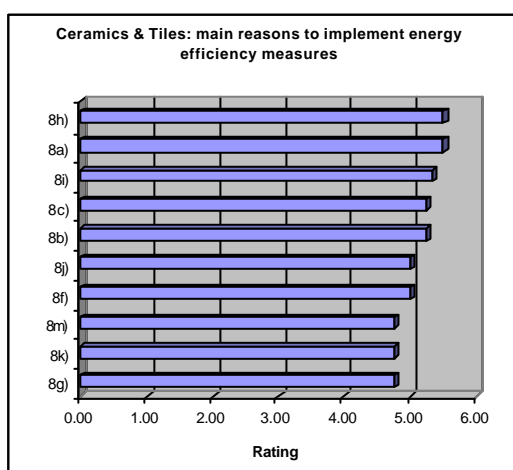
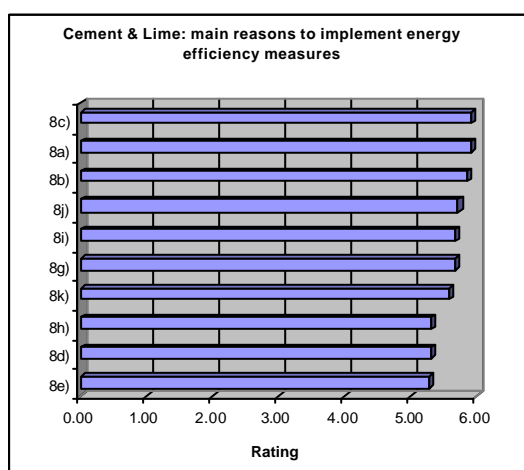
The ranking of reasons (companies' responses only) for the different industry sectors is shown in Table 21 below. The main results are:

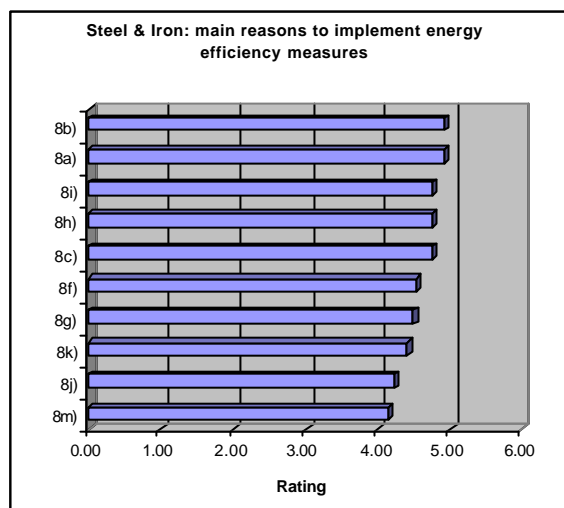
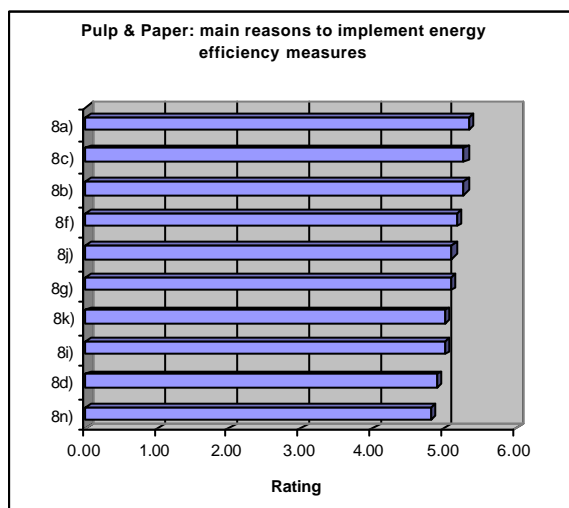
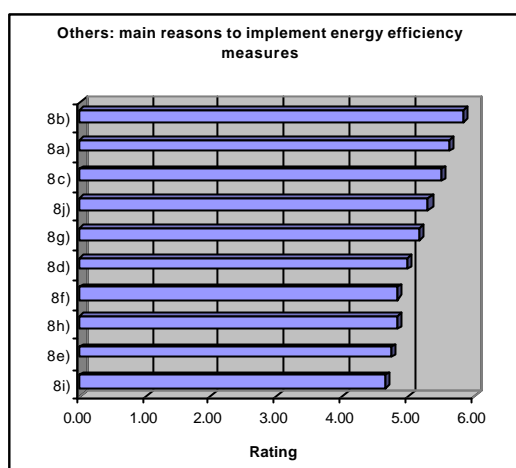
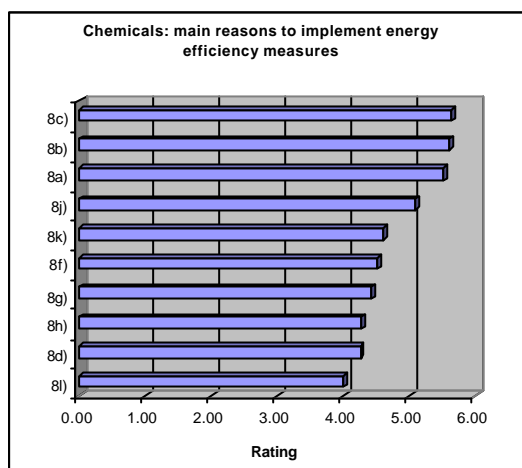
- The most important reasons for industry to become more energy efficient are the same for all industry sectors are: reduced production costs, reduced energy consumption and reduces energy costs.
- The Iron & Steel industry sector (and also Ceramics and Tiles – but this category is only represented by 2 companies) highlights the importance of **8 i) Improved staff health and safety**.

For more sector specific results, please refer to Appendix B.

Table 21: Ranking of reasons for companies to implement energy efficiency measures by industry sectors (the top 5 reasons are highlighted in grey)

Reasons to implement	Overall rank	Cement&Lime	Ceramic&Tiles	Chemicals	Pulp&Paper	Iron&Steel	Other
8a)	1	2	1	3	1	1	2
8b)	2	3	4	2	2	2	1
8c)	3	1	5	1	3	5	3
8j)	4	4	7	4	5	9	4
8g)	5	5	8	7	6	7	5
8i)	6	6	3	12	7	4	10
8k)	7	7	9	5	8	8	11
8f)	8	11	6	6	4	6	7
8h)	9	9	2	8	13	3	8
8d)	10	8	13	9	9	14	6
8e)	11	10	14	11	14	11	9
8l)	12	14	11	10	12	12	14
8m)	13	13	10	13	11	10	12
8n)	14	12	12	14	10	13	13





C3. Who are the key stakeholders?

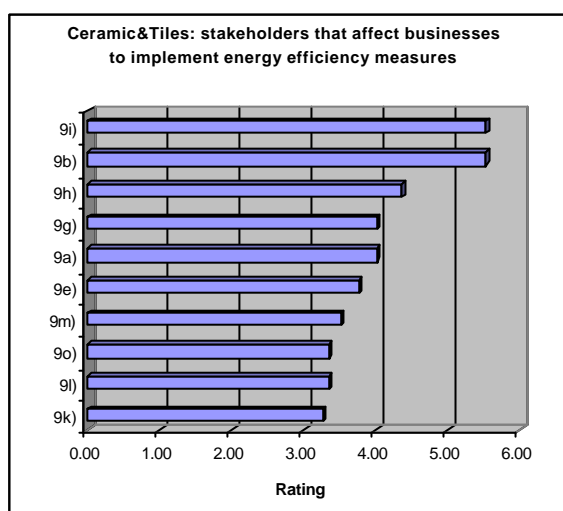
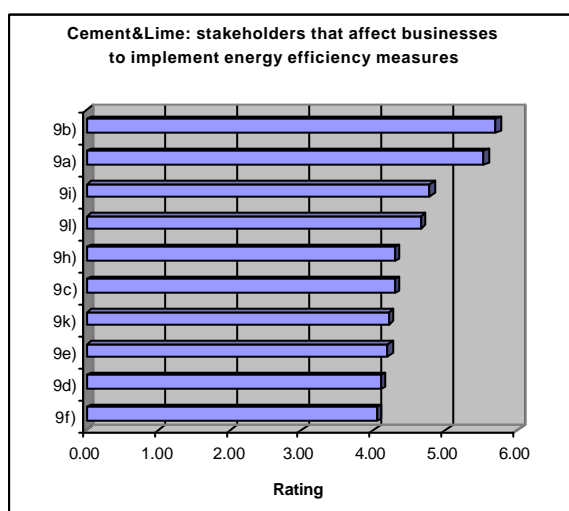
The ranking of stakeholders (company responses only) that are important for companies to implement energy efficiency measures as ranked by industry sectors is shown in Table 22 below.

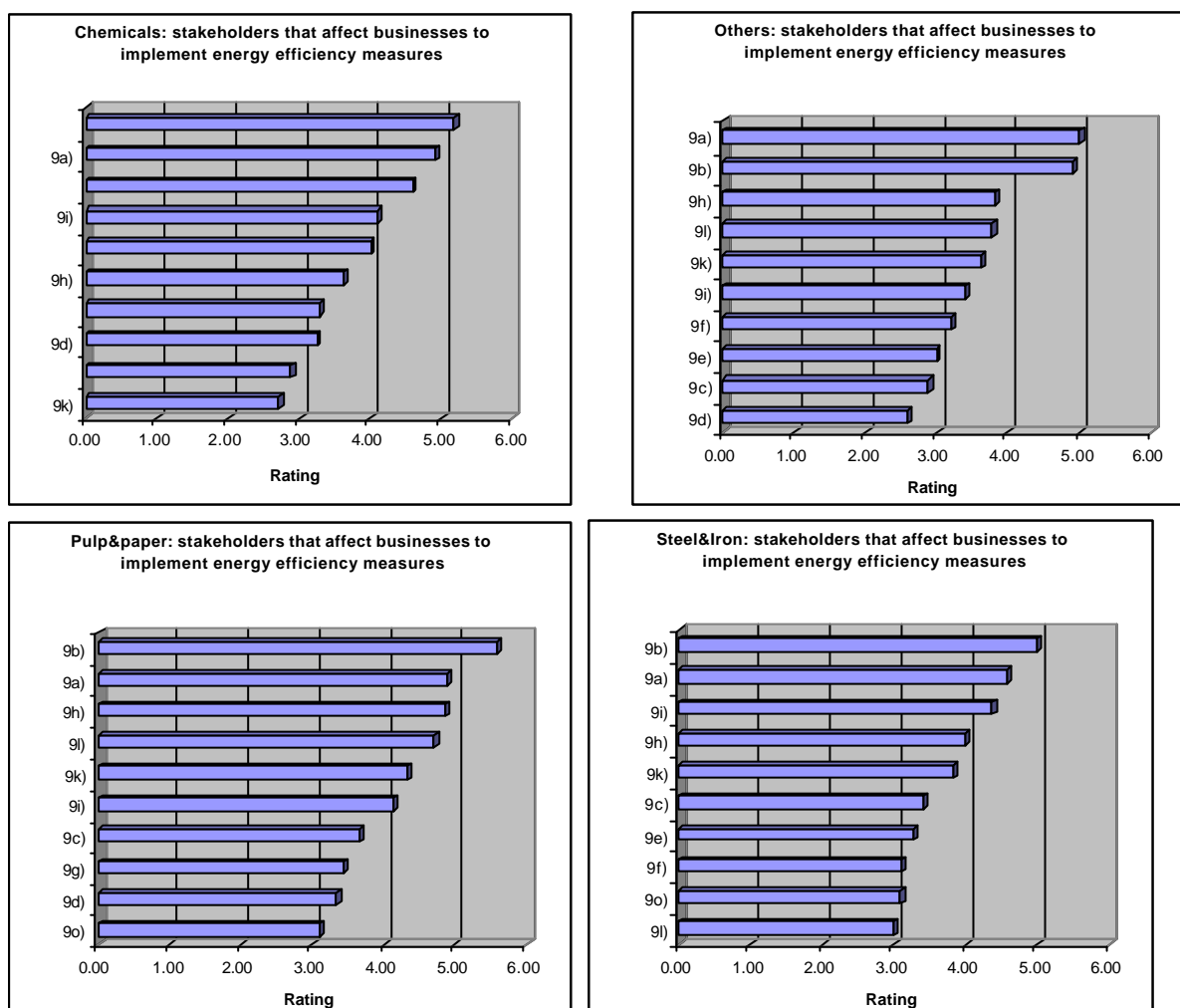
The most important results are:

- Most industry sectors agree about the importance of stakeholders that affect business to implement energy efficiency measures. Especially the internal stakeholders, **9b) Plant Management** and **9a) Corporate Head Office** are listed on the top.
- The Cement & Lime sector has given a relatively higher ranking of the stakeholders: **9d) State/Local government agencies** and **9e) Industry / business associations** compared to other sectors.
- The Ceramics & Tiles sector has ranked **9g) universities and research institutes** in its top 5, although it must be noted that only two companies in this sector responded to the survey.

Table 22. Ranking of stakeholders that affect business to implement energy efficiency measures by industry sector (the top 5 stakeholders are highlighted in grey)

Stakeholder	Overall rank	Cement&Lime	Ceramic&Tiles	Chemicals	Pulp&Paper	Iron&Steel	Other
9b)	1	2	1	1	1	1	2
9a)	2	1	4	2	2	2	1
9i)	3	9	2	4	6	3	6
9h)	4	8	3	6	3	4	3
9c)	5	3	10	3	7	6	9
9k)	6	11	11	10	5	5	5
9l)	7	12	8	12	4	11	4
9f)	8	6	13	5	13	8	7
9e)	9	5	6	9	11	7	8
9d)	10	4	12	8	9	10	10
9o)	11	15	9	7	10	9	12
9g)	12	7	5	11	8	12	14
9n)	13	14	14	13	14	15	15
9j)	14	9	15	14	12	13	11
9m)	15	13	7	15	15	14	13





C4. What is needed to improve energy efficiency?

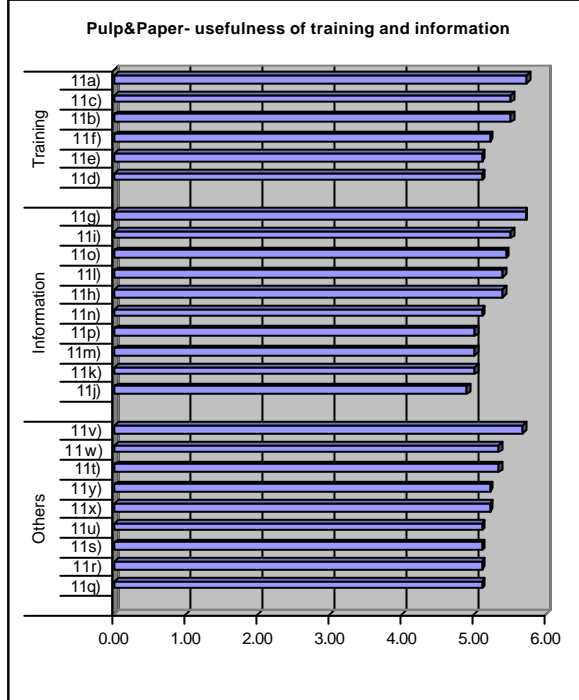
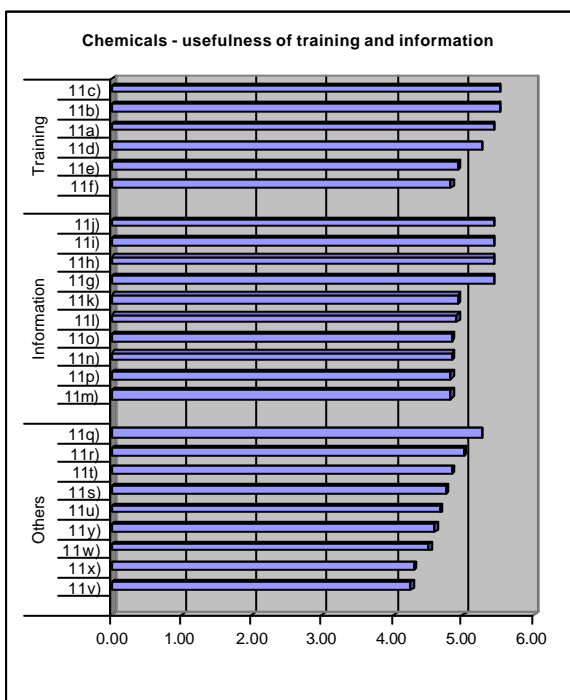
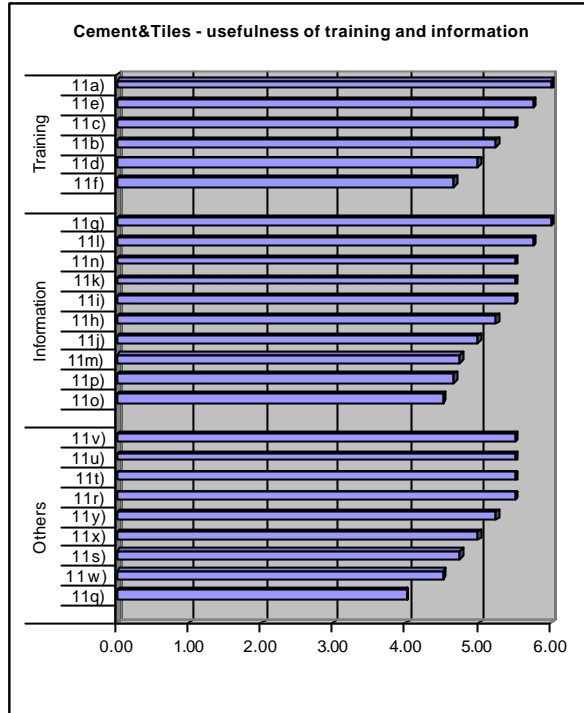
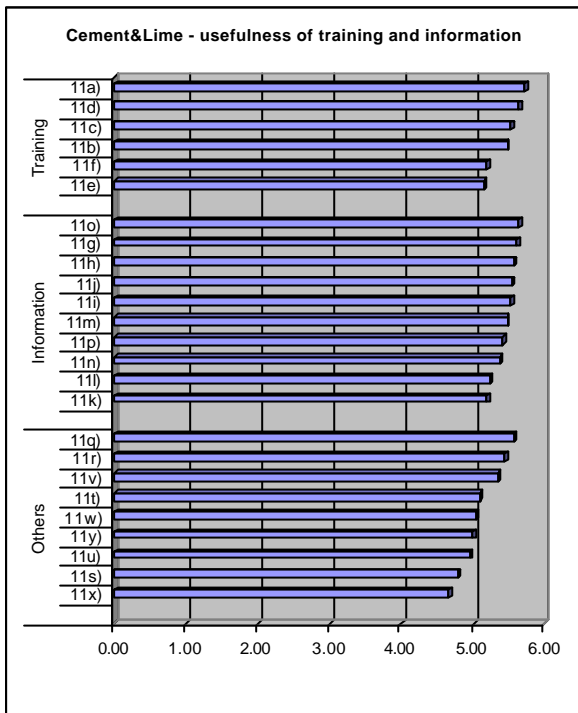
The activities (company responses only) that are useful for companies to improve their energy efficiency as ranked by the different industry sectors is shown in Table 23 below. The main results are:

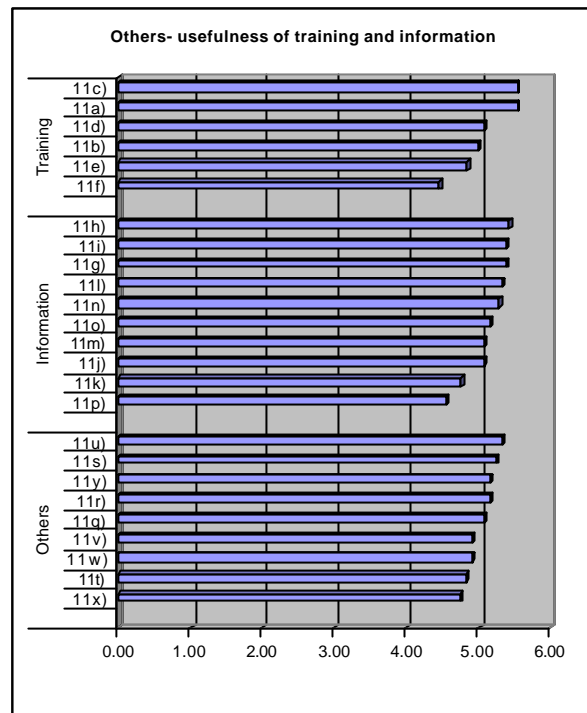
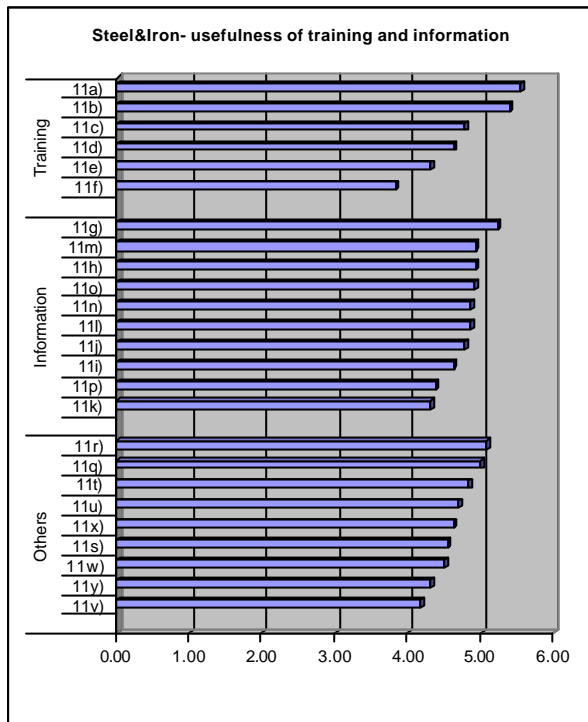
- Results are very similar compared to the companies overall results, particularly for the Training and Information categories.
- The Pulp & Paper sector ranked the overall highest rated other activity *11r) Discounted / free expert's advice* only as number 7 and ranked the other activity *11v) Software (for energy monitoring, benchmarking etc.)* as number one, much higher than other sectors.
- The Ceramics & Tiles sector ranked the overall second highest rated other activity *11q) Loans / subsidies for energy efficiency* only as number 9.
- The “Other” sector ranked *11s) Energy monitoring instruments for hire* as number 2 but this was given a much lower ranking by all companies combined
- The Ceramics & Tiles sector and the Chemicals sector ranked the information topic *11k) Energy and greenhouse gas monitoring / targeting* within their top 5, but it ranked almost lowest in the overall results.

- The Iron & Steel sector and the Pulp & Paper sectors ranked the other activity 11x) *Newsletters with energy developments* within the top 5, but this activity came last in the overall ranking for all companies combined.

Table 23: Ranking of activities that can be useful to companies to improve their energy efficiency by industry sector (top 5 activities under each category are highlighted in grey)

Assistance	Overall rank	Cement&Lime	Ceramic&Tiles	Chemicals	Pulp&paper	Iron&Steel	Other
TRAINING							
11a)	1	1	1	3	1	1	1
11b)	2	4	4	1	2	2	4
11c)	3	3	3	2	3	3	2
11d)	4	2	5	4	5	4	3
11e)	5	6	2	5	6	5	5
11f)	6	5	6	6	4	6	6
INFORMATION							
11g)	1	2	1	1	1	1	3
11h)	2	3	6	2	4	2	1
11i)	3	5	3	3	2	8	2
11l)	4	9	2	6	5	5	4
11o)	5	1	10	8	3	4	6
11j)	6	4	7	4	10	7	8
11n)	7	8	5	7	6	6	5
11m)	8	6	8	9	8	3	7
11k)	9	10	4	5	7	10	9
11p)	10	7	9	10	9	9	10
OTHERS							
11r)	1	2	1	2	7	1	4
11q)	2	1	9	1	6	2	5
11t)	3	4	2	3	2	3	8
11u)	4	7	3	5	9	4	1
11v)	5	3	4	9	1	9	6
11y)	6	6	5	6	5	8	3
11s)	7	8	7	4	8	6	2
11w)	8	5	8	7	3	7	7
11x)	9	9	6	8	4	5	9





Appendix D: Company questionnaire

We would like to find out why some companies improve their energy efficiency, and why other companies don't. Please complete this 15-minute questionnaire, most of which are multiple choice. The outcome will be used to decide what activities will be undertaken to help companies become more energy efficient. Answers will remain anonymous. Thank you for participating!

1. We would like to know a little about yourself and your company

(Note: if you are not a manufacturing / industrial company, please complete the *Questionnaire for Stakeholders*)

a) Contact details (optional)	Name:
	Position:
	Company name:
	Address:
	Country:
	Tel number:
	Fax number:
	Email address:
	Website:
b) Position in company:	<input type="checkbox"/> Management <input type="checkbox"/> Production / technical staff <input type="checkbox"/> Administrative
c) Role in energy and climate change issues /management	<input type="checkbox"/> Direct / major part of role <input type="checkbox"/> Indirect / minor part of role <input type="checkbox"/> Advisory / supervisory role <input type="checkbox"/> No direct role
d) Company sector:	<input type="checkbox"/> Pulp & paper <input type="checkbox"/> Cement & lime <input type="checkbox"/> Steel /Metal <input type="checkbox"/> Chemicals (fertilizer, distillery, paint) <input type="checkbox"/> Other:
e) Number of employees	<input type="checkbox"/> Less than 20 <input type="checkbox"/> 20 – 50 <input type="checkbox"/> 50 – 100 <input type="checkbox"/> 100 – 500 <input type="checkbox"/> More than 500
f) Type of business	<input type="checkbox"/> Family business <input type="checkbox"/> Privately owned <input type="checkbox"/> Government owned <input type="checkbox"/> Part of international corporation
g) First year of operation	
h) Company main product(s):	
i) GERIAP company	<input type="checkbox"/> Yes <input type="checkbox"/> No

2. We would like to know about energy efficiency activities at your company.

	YES	YES, partially /somewhat	NO	Don't know
a) Has your company taken measures to become more energy efficient?	?	?	?	?
b) Does your company have a program / process to identify energy savings on a continuous basis?	?	?	?	?
c) Has your company established an energy baseline from which to measure progress?	?	?	?	?
d) Does your company measure results of implemented options (e.g. the amount of energy reduced / costs saved)?	?	?	?	?
e) Does your company have an Environmental Management System?	?	?	?	?
f) Is your company certified to ISO 14001?	?	?	?	?
g) Does your company have a committee or person responsible for energy issues?	?	?	?	?
h) Does your company provide training on energy to employees?	?	?	?	?

Comments:

3. In what context does your company try to improve energy efficiency?

- ? As stand-alone energy projects
- ? As part of the GERIAP project only
- ? As part of a Cleaner Production programme
- ? As part of an Environmental Management System
- ? As part of a Health, Safety and Environment Management System
- ? As part of a Quality Management System
- ? As part of production improvement / expansion projects
- ? As part of maintenance activities
- ? As part of risk management
- ? Not applicable (no energy efficiency projects implemented)
- ? Other (please describe):

Comments:

4. We would like to understand what makes it difficult or easy for your company to become more energy efficient. Please rate these statements on a six point scale where 1 is “strongly disagree” and 6 is “strongly agree”. **Improving energy efficiency at our company is difficult because...**

	Strongly disagree						Strongly agree		Don't know
a) Management finds production more important	1	2	3	4	5	6	?		
b) There is a lack of information on energy consumption within the company	1	2	3	4	5	6	?		
c) There is a lack of technical knowledge within the company	1	2	3	4	5	6	?		
d) There is a lack of awareness of the importance of energy efficiency	1	2	3	4	5	6	?		
e) Energy is cheap	1	2	3	4	5	6	?		
f) Management is concerned about the investment costs of energy efficiency measures	1	2	3	4	5	6	?		
g) There is a lack of policies, procedures and systems within the company	1	2	3	4	5	6	?		
h) Management believe there is no/little scope for improvement	1	2	3	4	5	6	?		
i) There is no specific person or committee dealing with energy	1	2	3	4	5	6	?		
j) Only new expensive technologies will improve energy efficiency	1	2	3	4	5	6	?		
k) There is a lack of coordination between departments within the company	1	2	3	4	5	6	?		
l) Management is concerned about time required to improve energy efficiency	1	2	3	4	5	6	?		
m) Our company culture does not encourage staff to give suggestions for improvement	1	2	3	4	5	6	?		
n) The process to obtain approval from top management for investments is long	1	2	3	4	5	6	?		
o) It is difficult to obtain financing for energy efficiency projects	1	2	3	4	5	6	?		
p) Environmental policies and legislation relating to energy are weak	1	2	3	4	5	6	?		
q) Authorities are not strict in enforcing environmental regulations	1	2	3	4	5	6	?		
r) The Government does not give financial incentives to become energy efficient	1	2	3	4	5	6	?		
s) It is difficult to access external technical information and expertise	1	2	3	4	5	6	?		
t) There is a lack of coordination between external organisations	1	2	3	4	5	6	?		
u) Our company does not have targets for energy (only for production)	1	2	3	4	5	6	?		
v) Employees in our company do not want to change the way they work	1	2	3	4	5	6	?		
w) Benefits of implemented energy efficiency	1	2	3	4	5	6	?		

	Strongly disagree			Strongly agree	Don't know
measures are not quantifiable					

5. For the barriers rated 5 or 6, can you explain why?

6. Is there anything else that makes it difficult for your company to become more energy efficient?

? YES (please describe):

? NO

? Don't know

7. Is there anything else that makes it easy for your company to become more energy efficient?

? YES (please describe):

? NO

? Don't know

8. Thinking of why your company has implemented energy efficiency measures, please rate the importance of the following reasons. If your company has not implemented energy efficiency measures, please rate how important they *would* be. Please rate on a six-point scale where 1 is “not important” and 6 is “very important”.

	Not important				Very important		Don't know
a) Reduced energy costs	1	2	3	4	5	6	?
b) Reduced production costs	1	2	3	4	5	6	?
c) Reduced energy consumption	1	2	3	4	5	6	?
d) Reduced greenhouse gas emissions	1	2	3	4	5	6	?
e) Reduced other emissions (e.g. SOx, Nox)	1	2	3	4	5	6	?
f) Improved overall environmental performance	1	2	3	4	5	6	?
g) Improved product quality	1	2	3	4	5	6	?
h) Improved reputation / recognition	1	2	3	4	5	6	?
i) Improved staff health and safety	1	2	3	4	5	6	?
j) Improved compliance with regulations	1	2	3	4	5	6	?
k) Improved compliance with corporate environmental targets	1	2	3	4	5	6	?
l) Preparation for Kyoto Protocol / Clean	1	2	3	4	5	6	?

Development Mechanism opportunities								
m) Improved staff pride / morale	1	2	3	4	5	6	?	
n) Improved relations with customers	1	2	3	4	5	6	?	
o) Other (please describe):	1	2	3	4	5	6	?	
p) Other (please describe):	1	2	3	4	5	6	?	

Comments:

Question 9 and 10 were combined

10. If your company has implemented energy efficiency measures, please rate **how important** the following stakeholders were. If your company has not implemented measures, please rate how important they *would* be. Please rate stakeholders on a six-point scale from 1 “not important” until 6 “very important”.

	Not important				Very important		Don't know
a) Corporate Head Office	1	2	3	4	5	6	?
b) Plant management	1	2	3	4	5	6	?
c) National Government (e.g. Ministry)	1	2	3	4	5	6	?
d) State/Local government agencies	1	2	3	4	5	6	?
e) Industry / busines associations	1	2	3	4	5	6	?
f) Financial institutions	1	2	3	4	5	6	?
g) Universities / Research institutes	1	2	3	4	5	6	?
h) Consultants	1	2	3	4	5	6	?
i) International organisations (e.g. UNEP)	1	2	3	4	5	6	?
j) Customers	1	2	3	4	5	6	?
k) Employees	1	2	3	4	5	6	?
l) Shareholders of company	1	2	3	4	5	6	?
m) NGOs	1	2	3	4	5	6	?
n) Local communities	1	2	3	4	5	6	?
o) Media	1	2	3	4	5	6	?
p) Other (please describe):	1	2	3	4	5	6	?

Comments:

11. Please rate the following activities on how useful they could be in assisting your company to become more energy efficient. On a six-point scale, 1 is “not useful” and 6 is “very useful”.

	Not useful						Very useful	Don't know
Training / courses on:								
a) Energy efficient technologies	1	2	3	4	5	6	?	
b) Environmental / Energy management systems	1	2	3	4	5	6	?	
c) Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?	
d) Financing CP / energy efficiency projects	1	2	3	4	5	6	?	
e) Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?	
f) Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?	
Information on:								
g) Energy efficient technologies	1	2	3	4	5	6	?	
h) Environmental / Energy management systems	1	2	3	4	5	6	?	
i) Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?	
j) Financing CP / energy efficiency projects	1	2	3	4	5	6	?	
k) Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?	
l) Energy monitoring instruments	1	2	3	4	5	6	?	
m) Case studies of other companies	1	2	3	4	5	6	?	
n) Government policies / legislation / \$ incentives	1	2	3	4	5	6	?	
o) Benchmarking data	1	2	3	4	5	6	?	
p) Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?	
Other:								
q) Loans / subsidies for energy efficiency	1	2	3	4	5	6	?	
r) Discounted / free expert's advice	1	2	3	4	5	6	?	
s) Energy monitoring instruments for hire	1	2	3	4	5	6	?	
t) Programmes to participate in / access	1	2	3	4	5	6	?	
u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	1	2	3	4	5	6	?	
v) Software (for energy monitoring, benchmarking etc.)	1	2	3	4	5	6	?	
w) Industry networks	1	2	3	4	5	6	?	
x) Newsletters with energy developments	1	2	3	4	5	6	?	
y) “Energy Fair” (with technology providers, advisors etc.)	1	2	3	4	5	6	?	
z) Other (please describe):	1	2	3	4	5	6	?	

12. For the activities rated 5 or 6, can you explain why these would be useful to your company?

13. Please rate the following on how your company prefers to receive or access information. On a six-point scale, 1 is “do not want” and 6 is “prefer”.

	Do not want			Prefer			Don't know
a) Hard copy	1	2	3	4	5	6	?
b) Via email	1	2	3	4	5	6	?
c) CD rom	1	2	3	4	5	6	?
d) Website / internet (with email notification)	1	2	3	4	5	6	?
e) Electronic database	1	2	3	4	5	6	?
f) Software	1	2	3	4	5	6	?
g) At training / information seminars	1	2	3	4	5	6	?
h) Posters	1	2	3	4	5	6	?
i) Other (please describe):	1	2	3	4	5	6	?

Comments:

14. Please rate the following on what organisation your company would prefer to receive information from. On a six-point scale, 1 is “do not want” and 6 is “prefer”.

	Do not want			Prefer			Don't know
a) National Government agency	1	2	3	4	5	6	?
b) State/Local government agency	1	2	3	4	5	6	?
c) Industry / business association	1	2	3	4	5	6	?
d) University / Research institute	1	2	3	4	5	6	?
e) Consultants	1	2	3	4	5	6	?
f) International bodies (e.g. UNEP)	1	2	3	4	5	6	?
g) NGO	1	2	3	4	5	6	?
h) Media	1	2	3	4	5	6	?
i) Other (please describe):	1	2	3	4	5	6	?

Comments:

15. We are developing a Cleaner Production / Energy Efficiency **Contact Database** on the internet (www.geriap.org). Could we have your permission to be included in this database?

? YES

? NO

? I am not in a position to approve

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!!!

Please return your questionnaire to Sophie Punte or Peter Repinski of the GERIAP Secretariat: punte@un.org, UNEP, UN Building, Rajadamnern Avenue, Bangkok 10200 Thailand, fax +66 (0)2 2803829

Appendix E: External stakeholder questionnaire

We would like to find out why some companies improve their energy efficiency, and why other companies don't. With "companies" we particularly mean large companies in the cement, pulp/paper, steel/metal and chemicals/fertilizer industries *in your country*. Please complete this 15-minute questionnaire, most of which are multiple choice. The outcome will be used to decide what activities will be undertaken to help companies become more energy efficient. Answers will remain anonymous. Thank you for participating!

1. We would like to know a little about yourself and your organisation

(Note: if you are a manufacturing / industrial company, please complete the *Questionnaire for Companies*)

a) Contact details (optional)	Name:
	Position:
	Organisation name:
	Address:
	Country:
	Tel number:
	Fax number:
	Email address:
Website:	
b) Position in organisation:	? Management
	? Project / regular staff
	? Administrative
c) Your role in energy and climate change issues /management	? Direct / major part of role
	? Indirect / minor part of role
	? Advisory / supervisory role
	? No direct role
d) Type of organisation	? National Government
	? State / Local government agency
	? Industry / business association
	? Financial institution
	? University / Research institute
	? Consultant
	? International organisation
	? NGO
	? Media
	? Supplier to industry
? Other:	
e) Number of employees	? Less than 20
	? 20 – 50
	? 50 – 100
	? 100 – 500
	? More than 500

f) GERIAP project partner	? Yes, National Focal Point
	? Yes, consultant / subcontractor
	? No

2. What activities is your organisation involved in with regard to the promotion of energy efficiency at companies?

	YES	YES, partially	NO	Don't know
a) Policies / legislation	?	?	?	?
b) Demonstration projects / programmes	?	?	?	?
c) Training / Seminars	?	?	?	?
d) Research	?	?	?	?
e) Information	?	?	?	?
f) Advice	?	?	?	?
g) Supply of technologies / instruments	?	?	?	?
h) Other (please describe):	?	?	?	?

Comments:

3. Which of the following is important for a company to have to improve its energy efficiency **continuously**.

	YES	YES, somewhat	NO	Don't know
a) Some energy efficiency measures have already been implemented	?	?	?	?
b) A program / process to identify energy savings on a continuous basis	?	?	?	?
c) An energy baseline from which to measure progress	?	?	?	?
d) Measurement of results of implemented options (e.g. the amount of energy reduced / costs saved)	?	?	?	?
e) An Environmental Management System	?	?	?	?
f) ISO 14001 certification	?	?	?	?
g) A committee or person responsible for energy issues	?	?	?	?
h) Training on energy to employees	?	?	?	?

Comments:

4. We would like to understand what makes it difficult or easy for companies to become more energy efficient. Please rate these statements on a six point scale where 1 is “strongly disagree” and 6 is “strongly agree”. **Improving energy efficiency at companies is difficult because...**

	Strongly disagree						Strongly agree		Don't know
	1	2	3	4	5	6		?	
a) Management finds production more important	1	2	3	4	5	6		?	
b) There is a lack of information on energy consumption within companies	1	2	3	4	5	6		?	
c) There is a lack of technical knowledge within companies	1	2	3	4	5	6		?	
d) There is a lack of awareness of the importance of energy efficiency	1	2	3	4	5	6		?	
e) Energy is cheap	1	2	3	4	5	6		?	
f) Management is concerned about the investment costs of energy efficiency measures	1	2	3	4	5	6		?	
g) There is a lack of policies, procedures and systems within companies	1	2	3	4	5	6		?	
h) Management believe there is no/little scope for improvement	1	2	3	4	5	6		?	
i) There is no specific person or committee dealing with energy at companies	1	2	3	4	5	6		?	
j) Only new expensive technologies will improve energy efficiency at companies	1	2	3	4	5	6		?	
k) There is a lack of coordination between departments within companies	1	2	3	4	5	6		?	
l) Management is concerned about time required to improve energy efficiency	1	2	3	4	5	6		?	
m) Our company culture does not encourage staff to give suggestions for improvement	1	2	3	4	5	6		?	
n) The process to obtain approval from top management for investments is long	1	2	3	4	5	6		?	
o) It is difficult to obtain financing for energy efficiency projects	1	2	3	4	5	6		?	
p) Environmental policies and legislation relating to energy are weak	1	2	3	4	5	6		?	
q) Authorities are not strict in enforcing environmental regulations	1	2	3	4	5	6		?	
r) The Government does not give financial incentives to become energy efficient	1	2	3	4	5	6		?	
s) It is difficult to access external technical information and expertise	1	2	3	4	5	6		?	
t) There is a lack of coordination between external organisations	1	2	3	4	5	6		?	
u) Companies do not have targets for energy (only for production)	1	2	3	4	5	6		?	
v) Employees in companies do not want to change the way they work	1	2	3	4	5	6		?	
w) Benefits of implemented energy efficiency measures are not quantifiable	1	2	3	4	5	6		?	

5. For the barriers rated 5 or 6, can you explain why?

6. Is there anything else that makes it difficult for companies to become more energy efficient?

? YES (please describe):

? NO

? Don't know

7. Is there anything else that makes it easy for companies to become more energy efficient?

? YES (please describe):

? NO

? Don't know

8. Thinking of why companies have implemented or would implement energy efficiency measures, please rate the importance of the following reasons. Please rate on a six-point scale where 1 is “not important” and 6 is “very important”.

	Not important						Very important	Don't know
a) Reduced energy costs	1	2	3	4	5	6	?	
b) Reduced production costs	1	2	3	4	5	6	?	
c) Reduced energy consumption	1	2	3	4	5	6	?	
d) Reduced greenhouse gas emissions	1	2	3	4	5	6	?	
e) Reduced other emissions (e.g. SOx, Nox)	1	2	3	4	5	6	?	
f) Improved overall environmental performance	1	2	3	4	5	6	?	
g) Improved product quality	1	2	3	4	5	6	?	
h) Improved reputation / recognition	1	2	3	4	5	6	?	
i) Improved staff health and safety	1	2	3	4	5	6	?	
j) Improved compliance with regulations	1	2	3	4	5	6	?	
k) Improved compliance with corporate environmental targets	1	2	3	4	5	6	?	
l) Preparation for Kyoto Protocol / Clean Development Mechanism opportunities	1	2	3	4	5	6	?	
m) Improved staff pride / morale	1	2	3	4	5	6	?	
n) Improved relations with customers	1	2	3	4	5	6	?	
o) Other (please describe):	1	2	3	4	5	6	?	
p) Other (please describe):	1	2	3	4	5	6	?	

Comments:

Question 9 and 10 were combined.

10. For companies that implement measures to become more energy efficient, please rate **how important** the following stakeholders are in achieving this. Please rate stakeholders on a six -point scale from 1 “not important” until 6 “ very important” .

	Not important			Very important			Don't know
a) Corporate Head Office	1	2	3	4	5	6	?
b) Plant management	1	2	3	4	5	6	?
c) National Government (e.g. Ministry)	1	2	3	4	5	6	?
d) State/Local government agencies	1	2	3	4	5	6	?
e) Industry / business associations	1	2	3	4	5	6	?
f) Financial institutions	1	2	3	4	5	6	?
g) Universities / Research institutes	1	2	3	4	5	6	?
h) Consultants	1	2	3	4	5	6	?
i) International organisations (e.g. UNEP)	1	2	3	4	5	6	?
j) Customers	1	2	3	4	5	6	?
k) Employees	1	2	3	4	5	6	?
l) Shareholders of company	1	2	3	4	5	6	?
m) NGOs	1	2	3	4	5	6	?
n) Local communities	1	2	3	4	5	6	?
o) Media	1	2	3	4	5	6	?
p) Other (please describe):	1	2	3	4	5	6	?

Comments:

11. Please rate the following activities on how useful they could be in assisting companies to become more energy efficient. On a six-point scale, 1 is “not useful” and 6 is “very useful”.

	Not useful						Very useful	Don't know
Training / courses on:								
a) Energy efficient technologies	1	2	3	4	5	6	?	
b) Environmental / Energy management systems	1	2	3	4	5	6	?	
c) Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?	
d) Financing CP / energy efficiency projects	1	2	3	4	5	6	?	
e) Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?	
f) Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?	
Information on:								
g) Energy efficient technologies	1	2	3	4	5	6	?	
h) Environmental / Energy management systems	1	2	3	4	5	6	?	
i) Cleaner Production (CP) / Energy auditing	1	2	3	4	5	6	?	
j) Financing CP / energy efficiency projects	1	2	3	4	5	6	?	
k) Energy and greenhouse gas monitoring / targeting	1	2	3	4	5	6	?	
l) Energy monitoring instruments	1	2	3	4	5	6	?	
m) Case studies of other companies	1	2	3	4	5	6	?	
n) Government policies / legislation / \$ incentives	1	2	3	4	5	6	?	
o) Benchmarking data	1	2	3	4	5	6	?	
p) Kyoto Protocol / Clean Development Mechanism	1	2	3	4	5	6	?	
Other:								
q) Loans / subsidies for energy efficiency	1	2	3	4	5	6	?	
r) Discounted / free expert's advice	1	2	3	4	5	6	?	
s) Energy monitoring instruments for hire	1	2	3	4	5	6	?	
t) Programmes to participate in / access	1	2	3	4	5	6	?	
u) Directory with energy contacts (technology providers, energy experts, financiers, government agencies etc.)	1	2	3	4	5	6	?	
v) Software (for energy monitoring, benchmarking etc.)	1	2	3	4	5	6	?	
w) Industry networks	1	2	3	4	5	6	?	
x) Newsletters with energy developments	1	2	3	4	5	6	?	
y) “Energy Fair” (with technology providers, advisors etc.)	1	2	3	4	5	6	?	
z) Other (please describe):	1	2	3	4	5	6	?	

12. For the activities rated 5 or 6, can you explain why you believe these would be useful to companies?

13. Please rate the following on how you believe companies prefer to receive information. On a six-point scale, 1 is “do not want” and 6 is “prefer”.

	Do not want			Prefer			Don't know
j) Hard copy	1	2	3	4	5	6	?
k) Via email	1	2	3	4	5	6	?
l) CD rom	1	2	3	4	5	6	?
m) Website / internet (with email notification)	1	2	3	4	5	6	?
n) Electronic database	1	2	3	4	5	6	?
o) Software	1	2	3	4	5	6	?
p) At training / information seminars	1	2	3	4	5	6	?
q) Posters	1	2	3	4	5	6	?
r) Other (please describe):	1	2	3	4	5	6	?

Comments:

14. Please rate the following on what organisations you believe companies would prefer to receive information from. On a six-point scale, 1 is “do not want” and 6 is “prefer”.

	Do not want			Prefer			Don't know
j) National Government agency	1	2	3	4	5	6	?
k) State/Local government agency	1	2	3	4	5	6	?
l) Industry / business association	1	2	3	4	5	6	?
m) University / Research institute	1	2	3	4	5	6	?
n) Consultants	1	2	3	4	5	6	?
o) International bodies (e.g. UNEP)	1	2	3	4	5	6	?
p) NGO	1	2	3	4	5	6	?
q) Media	1	2	3	4	5	6	?
r) Other:	1	2	3	4	5	6	?

Comments:

15. We are developing a Cleaner Production / Energy Efficiency **Contact Database** on the internet (www.geriap.org). Could we have your permission to be included in this database?

? YES

? NO

? I am not in a position to approve

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!!!

Please return your questionnaire to Sophie Punte or Peter Repinski of the GERIAP Secretariat: punte@un.org, UNEP, UN Building, Rajadamnern Avenue, Bangkok 10200 Thailand, fax +66 (0)2 2803829