

# **GHG Reduction Through Industrial Energy Efficiency in the Developing World: The GERBI and CBLA Projects – Variations on a Theme**

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## **ABSTRACT**

Cleaner Production is essentially about ‘producing more with less’. The promise of Cleaner Production in developing countries has fallen short of expectations and there remains a need for urgent action to reduce unsustainable patterns of production and for support to transfer environmentally sustainable technologies. In many developing countries, industry represents 30%-50% or more of total energy consumption and a similar proportion of related air emissions. This paper elaborates how two industrial energy efficiency projects being delivered in Brazil and South Africa offer variations on a model for sustainable energy efficiency investments, generating GHG emission reductions and promoting cleaner production.

## **Introduction**

In 2000, the Canadian government launched the Canada Climate Change Development Fund (CCCDF) as part of Canada's International Strategy on Climate Change. The goal of the CCCDF is “to contribute to Canada's international objectives in climate change by promoting activities in developing countries that address the causes and effects of climate change while at the same time contributing to sustainable development and poverty reduction” (Canadian International Development Agency). The CCCDF provides a platform in which various applications have been implemented to foster an effective convergence of development goals and climate change mitigation. Two of the CCCDF funded projects are the focus of this paper: Greenhouse Gas Emissions Reduction in Brazilian Industry (GERBI), and Capacity Building, Leadership and Action (CBLA), implemented in Brazil and South Africa respectively.

The location of the GERBI and CBLA projects is strategically important because both countries represent significant emerging “players” at the table, both in terms of their GHG profiles and as emerging economic and political powers. Among all countries, South Africa and Brazil rank 14<sup>th</sup> and 16<sup>th</sup>, respectively, in aggregate GHG emissions (Baumert and Pershing, 2004). Regionally, the importance of these GHG profiles is more striking...Brazil's emissions represent about a third of all Latin America, South Africa's emissions represent an even greater proportion of Africa's emissions. The results and replication implications of these projects are all the more important as we anticipate how the ratification of the Kyoto Protocol will play out, as we see efforts by the international community to bring both countries to the table with respect to emission reductions during the Second Commitment period and, finally, as these countries begin to grapple with the practical realities of implementing the Millennium Development Goals.

GERBI and CBLA are both focused on achieving sustainable GHG emissions reduction through energy efficiency in the industrial sector. Both projects are delivered in partnership with key local institutions and organizations. GERBI's key allies are the Confederation of National

Industry (CNI), which is the primary institutional representative of Brazilian industry and SEBRAE, which is a non-profit agency whose mandate is to develop and strengthen small enterprises. CBLA's partners vary across the project's activity areas, and are outlined as appropriate elsewhere in this paper.

The organizations, companies and individuals involved came to these projects knowing that the highway is littered with failed efforts to ensure an enduring and sustainable foundation for energy efficiency investments in industry....investments that would lead to a sustainable GHG emission reduction market. The hard reality is that industrial energy efficiency has achieved only limited market penetration in these and most newly developing countries, due to a myriad of ongoing barriers including a lack of access to energy efficient technologies, lack of adequate management systems, a lack of a supportive policy environment and inappropriate energy pricing. The challenge facing both projects was all the more daunting because of a considerable time constraint. GERBI and CBLA both received approval to become operational in late 2002, with an accepted timeframe of less than three years.

Notwithstanding these challenges, both projects have helped to establish a foundation for continuing future industrial energy efficiency investments.<sup>1</sup> In some respects, GERBI and CBLA share similar approaches, in other ways the projects are strikingly different. Nevertheless, the underlying concept of both projects is captured as follows: *“Development of a sustainable industrial energy efficiency market through a multi-faceted support program addressing the barriers on the demand and supply side of the energy efficiency market.”*

## Overview of Core Elements

The GERBI and CBLA project goals and results have been achieved by implementation of activities in three areas. These areas are described below.

- **Building Capacity.** Within target industries, the energy management supply industry, the banking community and other key allies, to plan for, develop and implement energy efficiency activities that will result in verifiable GHG emissions reduction. This includes building capacity to develop and demonstrate Clean Development Mechanism (CDM) projects based on industrial energy management.
- **Development and Implementation.** Fostering the development and implementation of GHG emissions reduction projects based on energy efficiency to showcase to the market and also to provide a platform for “live training” to project developers and clients.
- **Structures and Relationships.** Establishing the structures and relationships with which industry can become self-empowered to take a long-term positive role in managing energy with positive engagement of industries and their representatives – syndicates, federations etc. The successful Canadian Industry Program for Energy Conservation (CIPEC) has been used as one model.

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<sup>1</sup> In both countries, other projects and initiatives have also worked in the area of industrial energy efficiency. In South Africa, for instance, information on some of these initiatives can be found at [www.3e.uct.ac.za](http://www.3e.uct.ac.za), [www.dme.gov.za/energy/energy\\_planning.htm](http://www.dme.gov.za/energy/energy_planning.htm), [www.southsouthnorth.org.za](http://www.southsouthnorth.org.za), and [www.sanea.org.za](http://www.sanea.org.za) .

Each of these activity areas is discussed in turn in the following sections of this paper.. Further detail on each of these areas and on the projects in general be found on the project websites: GERBI: [www.programagerbi.com.br](http://www.programagerbi.com.br) and CBLA: [www.cbla.org.za](http://www.cbla.org.za).<sup>2</sup>

## **Building Capacity**

GERBI and CBLA have operated on the premise that capacity building is a process that enhances the capacity of individuals, builds the capacity of organizations and strengthens the overall policy, legal, and institutional context in which the organizations operate. In this sense all activities of GERBI and CBLA are capacity building activities.

Within this broad framework the two projects have focused a significant effort on training activities that have addressed the needs of industry managers, technical personnel, and energy efficiency service providers to develop energy efficiency and GHG emission mitigation projects. The GERBI project has also worked to increase the awareness, commitment and support among the banking community to finance industrial energy projects.

### **The GERBI Model**

GERBI developed four training streams, targeted to industry managers, energy efficiency service suppliers, the banking community and, finally, to fostering CDM projects. All four training streams encompassed a “train-the-trainers” approach to ensure that a locally-based training capacity is established. GERBI used its web site as a nexus for the training streams, whereby some training participants were given a password to access the training section of the web site and encouraged to use the training materials and engage in peer-to-peer discussions and learning.

**Industry managers training.** Figure 1 illustrates a “competency map” reflecting the overall vision for training industrial managers. The goal is to build capacity within specific “organizational competencies” that are associated with effective industrial energy management practices, with the overriding objective that energy management becomes an inherent part of the day-to-day corporate planning and operational framework and activities. The competencies are organized within three key functional areas: Energy Management; Financial Management; and Awareness and Information.


Brazil offers a relatively open ended market for training. GERBI opted to work with “for profit firms” who brought expertise and experience in three key areas: energy efficiency hands-on experience, training experience, and a proven ability to market and deliver training to industry. GERBI developed and delivered 3 training modules through 7 workshops in 3 states: i) an introduction to energy management; ii) corporate energy management planning; and iii) energy monitoring/targeting/reporting.<sup>3</sup>

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<sup>2</sup> Many of the outputs described in the following pages are now available on the websites, and additional outputs will be posted as they become available. In lieu of repetitive references in the following pages, readers are directed to the websites for copies of project documents, including those mentioned in this paper. Reports concerning the audits and feasibility studies undertaken at individual companies contain confidential business information, and as such will not be available on the project websites or from GERBI and CBLA.

<sup>3</sup>At the time of writing this paper, a survey of training participants had not yet been completed. Over 200 participants attended the training sessions.

**Figure 1. GERBI Industry Management Training Competency Map**

Functional Area	Organizational Competency	Low Capacity	Evolution to			High Capacity
			"Energy Managing Organization" 			
Energy Management	Energy Policy					
	Organizational Structure for EM					
	Skills/Knowledge					
	Energy Information					
	Communications					
Financial Management	Investment Practices					
	Opportunity Identification					
	Opportunity Exploitation					
	Management Information					
	Appraisal Methods					
	Human Resources					
Awareness And Information	Project Funding					
	EM Responsibilities					
	EE Awareness					
	Reporting					
	Energy Performance Review					
	Training					
	Market Awareness					

**Competency  
Descriptions**

Source: GERBI Project

**Energy efficiency service providers.** An assessment of Brazilian energy efficiency service providers determined a considerable need to reorient the suppliers’ corporate culture from a utility demand-side management (DSM) “welfare” mentality, to that of a full service, productivity-oriented solutions provider to industry. With the support of international institutions, the traditional utility DSM “business model” has taken hold in Brazil, initially through PROCEL, the national energy efficiency agency of Eletrobras (the national electricity utility) and now at the regional level through distribution utilities. This business model achieved some success, most notably in reducing electricity demand in the residential sector and, to a lesser degree, in the commercial and industrial sectors. Not surprisingly, the evolving corporate culture among the energy efficiency service providers was heavily oriented to taking advantage of the financial incentives available to curb electrical demand, not particularly conducive to closing deals in industry where thermal energy solutions are a considerable part of the productivity improvement solution.

Consequently, in collaboration with the Brazilian Association of Energy Service Companies (ABESCO), the training for energy efficiency service providers focused on the business side of developing and closing projects, together with a smaller emphasis on increasing technical skills associated with assessing and delivering energy performance improvements. The GERBI approach is to reorient “willing” energy service providers in Brazil towards a business model designed to build and offer comprehensive energy performance solutions based on guaranteed savings, on an energy performance contracting platform. The necessary starting point was to show the service providers how to sell value to the key decision-markers in the

industrial market, how to create a desire to buy the services.<sup>4</sup> Together, in working with a small core group of energy efficiency service providers, we have seen there are three dimensions to achieving the customer go-ahead: i) provide evidence that energy efficiency solutions pay off; ii) get access to the key decision-makers, namely, the strategic (CEO), the financial (CFO), and the technical (plant manager); and iii) sell them on the mantra of positive cash flow.

Drawing on experience elsewhere, it is possible to structure the projects so that the customer never needs to be in a negative cash flow situation. In Brazil, where energy management is being sold in a risk averse market due to prevailing economic conditions, this was a hugely important driver to bringing the industrial decision-makers on board.

GERBI has developed and delivered two modules comprising an introductory program and a more intensive curriculum with the following topics: i) establishment of credible baselines, ii) how to calculate savings, iii) monitoring and verification, iv) how to build a financial business case, v) how to build and negotiate a master contract agreement and vi) thermal solutions for productivity improvement. A total of 70 participants attended these sessions, of whom about half represented industrial energy management service providers. Ten Brazilian industrials signed agreements with GERBI and the service providers to investigate and develop projects. This has resulted in three performance contract deals in four plants.

**The banking community.** The goal of this training stream is to advance the understanding and knowledge among Brazilian bank middle and senior management of the fundamentals and benefits of financing energy efficiency projects.<sup>5</sup> The idea is to build on the core competencies and standard due diligence procedures of bank officials so that the transaction costs of energy efficiency project financing can be reduced to acceptable levels. Ultimately, the goal is to move towards non-recourse financing, but the path needs to be one of small incremental steps forward.

A two-phase approach was undertaken. Initially, two seminars were delivered to senior bank officials, with the goal of helping them better understand why the energy efficiency market is large and viable and how value is derived from individual energy efficiency projects. Over 200 participants attended these seminars which were used to get banking industry input to the best approach of achieving desired learning competencies, as the basis for curricula development. The next step is for the GERBI local training partner, Fundacao Getulio Vargas (FGV), to develop and roll-out the training based on the initial assessment phase.

**CDM.** The CDM training component was focused on building competencies related to the development of acceptable CDM projects based on an energy management platform. CDM hands-on training has been delivered to service providers who are actually developing industrial energy management projects. The energy efficiency service providers are viewed as the key drivers for CDM projects. A separate training seminar was delivered to industry managers, some of whom had participated in other GERBI training functions, others who are engaged in energy management project development.

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<sup>4</sup> The GERBI team includes several consultants who have been involved in the development and operation of Energy Service Companies (ESCOs), both in Canada and internationally. This experience base informed the design of the positive cash flow approach to selling projects.

<sup>5</sup> Over 150 participants attended two seminars in Sao Paulo and Rio de Janeiro. At the time of writing this paper, the follow-up training approach had not yet been formulated.

## The CBLA Model

In broad terms the CBLA and GERBI projects have focused on very similar market needs for capacity building and training. However, the South African context differs from the Brazilian context, and as a result the approach taken differs in important ways.

South Africa has a complex and highly developed qualifications and skills development structure that is guided by an overarching National Qualifications Framework (NQF), an outcomes-based system which ensures that training programmes are developed to meet the needs (skills) required by employers. Key bodies involved in implementation of the NQF include the South African Qualifications Authority, a number of Sectoral Education and Training Authorities (SETAs), and a wide range of established education and training providers (including universities and technical colleges). While it is beyond the scope of this paper to describe the NQF and the various players in detail, suffice to say that the system provides a framework and very substantial resources for skills development and training at all levels.

Accordingly, early in the project CBLA took the decision to work primarily through the framework and structures established by the NQF. In this regard, it differs from training activities originated by most other donor-funded programmes, which have often set goals for training which may be unrelated to local needs. While the CBLA approach presents many challenges, in the end maximum impact and maximum sustainability can be achieved by working within this established framework. Moreover, for training needs not addressed within the formal system, CBLA decided to work exclusively with established training providers to help develop their program offerings and capacity to deliver. In any jurisdiction, this approach of working with established providers should provide maximum impact and sustainability. Based on these concepts, the core CBLA capacity building activities have been as follows.

**Industrial energy auditing.** Working within the SAQA system, and in particular working with the Energy Sectoral Education and Training Authority (ESETA), CBLA has developed unit standards and a skills development programme for industrial energy auditing. This process has included close collaboration with several established training providers in South Africa to co-develop and pilot the required training materials, and support for initial delivery of the course by these providers.

**CDM project development.** In a similar manner, CBLA is developing unit standards and a skills development programme for CDM project development (including analysis of GHG emissions and the specific requirements of the CDM process). As with industrial energy auditing, this process is being undertaken in partnership with the ESETA, with active involvement of a number of established training providers.

**Climate change policy and planning course.** In addition to work within the NQF framework, CBLA has worked closely with the Minerals and Energy Education Training Institute (MEETI), a well-established training organization that focusses on policy analysis and industrial management in the South African minerals and energy sectors. CBLA has assisted in the development of a course on climate change policy and planning, including initial delivery. MEETI now delivers this course as part of its regular course offerings, and has begun to deliver a customized program in-house to senior personnel in individual companies.

**GHG Clearinghouse.** To support other CBLA activities in the areas of training and awareness, CBLA has developed and launched the Southern Africa GHG Clearinghouse. This is Africa's first internet-based GHG clearinghouse, designed to assist in the transfer of GHG mitigation knowledge and experience. The site was launched in April 2005, and development will continue over the coming months. At present, participation from project developers has been limited at the outset due to issues of confidentiality; but strong interest has been shown from service providers, who also have an opportunity to list on the site. Several local CBLA partners have now expressed interest in taking over the clearinghouse at termination of the project.

At the time of this writing, it is premature to assess the success of the CBLA approach to capacity building. However, available indicators suggest that the CBLA-generated training programmes are indeed being institutionalized within the qualifications system, and established training providers are creating and delivering courses based on the CBLA outputs. Because of its recent launch, the Clearinghouse is not yet a widely used tool, but interest is strong and CBLA partners want to sustain and build on this now established resource.

## **Development and Implementation of GHG Emission Reduction Projects**

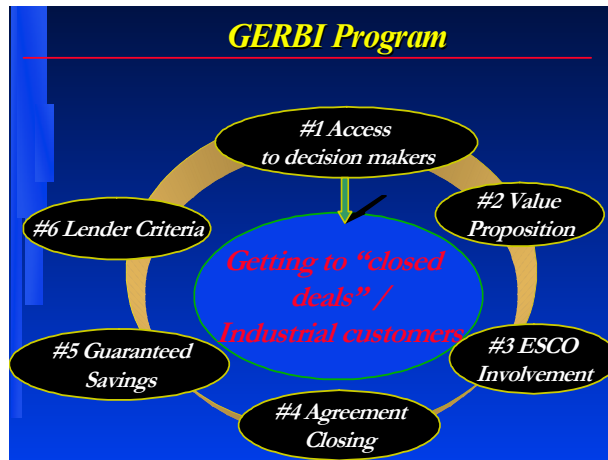
The objective of this project stream was to help establish a foundation for market-based energy efficiency investments that would generate GHG emission reductions, including in some cases accredited projects under the Clean Development Mechanism (CDM). Recognizing the economic challenges involved in reaching the GHG reduction targets, the Kyoto Protocol established the CDM as one of three market-based flexibility mechanisms to assist countries (and subsequently entities within countries) to meet their targets (UNFCCC, n.d.). CDM projects generate certified emissions reduction (CERs) that can be used to achieve compliance in the first commitment period. The GHG emission reductions must be real, long term, provide measurable benefits to mitigate climate change and additional to what would have otherwise occurred.

### **The GERBI Model**

In the project development and implementation activity, GERBI focused on two key areas: deal development/closing, and project financing.

**Deal development/closing.** As previously noted, GERBI emphasized a reorientation of energy efficiency service providers to an energy performance contracting based, guaranteed savings solution. GERBI developed a "deal closing model" involving several steps as illustrated in Figure 2. Using this model, GERBI introduced senior industrial decision-makers to the concept of working with ESCO's to develop, finance and implement energy efficiency/greenhouse gas reduction projects under an integrated process that results in implementation. To address the barrier of **access to decision-makers** and thereby increase the potential for contracts to be signed, GERBI increased the number of interactions with customers' top management level decision makers. GERBI better articulated the project **value proposition** presented to senior executive decision makers (including the positive cash flow proposition). GERBI accelerated and strengthened the engagement and integration of the energy efficiency service providers into the process of project development, including development of a strict screening process for selection and project engagement of ESCOs through the development of a Qualified Bidders List (QBL). Ten Brazilian service providers engaged in the QBL from which two ESCOs have developed successful projects.

**Figure 2. GERBI's Model for Closing Deals**



Source: GERBI Project

As a result of these project activities, GERBI has achieved a foundation for market-based EE projects to generate carbon credits. As noted, we have seen the closing of the first three Energy Performance Contracts signed in the Brazilian Industrial Sector. GERBI secured agreements from 10 industries to engage in a process of development and implementation of energy efficiency projects with ESCO's as long as the projects meet agreed upon "minimum" financial criteria. GERBI created a pool of qualified ESCO companies that were pre-qualified for work on pilot contracts with industries and developed guidelines to assist ESCO's in conducting quality feasibility studies, addressing both the thermal and electrical industrial energy systems. These developments have been backstopped by the development of the transactional infrastructure necessary to support project development, financing and delivery.

The 8 projects in the GERBI pipeline are focused on plants with an annual energy operating cost exceeding R\$ 40 million, with simple paybacks in the 3-4 year range. Table 1 summarizes these projects.

**Table 1. GERBI Energy Efficiency Project Development Pipeline**

Signed Implementation Agreements										
Project	State	Industry Type	Annual Energy Costs (RS)	Annual energy savings (GWh/yr)	Project Capital Costs (RS)	Project Capital Costs (US\$)	Annual Cost Savings (SR)	Annual Cost Savings (US\$)	Simple Payback (yrs)	CO2 Reduction (Tonnes/Year)
1	SC	Steel	3,986,670	6.86	1,862,710	\$653,582	970,940	\$340,681	1.92	1,898
2	SC	Ceramic	11,383,337	33.40	2,220,000	\$778,947	1,446,580	\$507,572	1.53	8,871
3	RGS	Steel	3,010,860	4.54	1,060,000	\$371,930	467,880	\$164,168	2.27	848
4	SC	Glass	7,684,803	5.35	1,281,616	\$449,690	383,577	\$134,588	3.34	1,474
5	RGS	Food	1,185,260	0.50	376,248	\$132,017	106,221	\$37,271	3.54	66
6	Rio	Textile	2,221,113	2.40	2,418,122	\$848,464	731,528	\$256,676	3.31	521
7	Rio	Chemical	4,262,405	4.16	950,000	\$333,333	545,000	\$191,228	1.74	582
8	RGS	Steel	2,049,848	6.79	857,000	\$300,702	960,020	\$336,849	0.89	1,567
<b>TOTAL</b>			<b>35,784,296</b>	<b>64.00</b>	<b>11,025,696</b>	<b>\$3,868,665</b>	<b>5,611,746</b>	<b>\$1,969,034</b>		<b>15,827</b>
<b>Annual CO2 Reductions TPY</b>										<b>14,260</b>
<b>10-year CO2 Reductions TPY</b>										<b>142,600</b>

Source: GERBI Project



**Project financing.** GERBI has addressed the financing barrier in three significant respects. First, there has been considerable effort to brief and consult with the Brazilian private and public sector banking community. This has been an ongoing process through one-to-one meetings and participation in seminars and conferences. The outcome is a small critical mass of private bank interest to finance these projects but on a case-by-case basis.

Second, considerable effort has been invested in development of a “made in Brazil” contractual infrastructure to support the commercial and non-commercial agreements embedded in the GERBI project development model. The intent of this “transactional” infrastructure is to provide the financing community with the necessary degree of comfort to finance projects using acceptable, standardized documentation for the transactions. The output includes development of a “made-in Brazil” Energy Performance Contract” Master Agreement for project contracts as well as audit and templates.

Third, GERBI has developed a pilot energy savings insurance product for the Brazilian EE markets. The project has worked closely with the ESCO industry to generate a business model under which the service suppliers would offer solutions through a guaranteed savings-energy performance contract. GERBI plans to pilot the energy savings insurance product to test whether it can successfully backstop the ESCO guarantees and bring the banks to the table with more attractive financing. The alternative will be to consider using the Energy Savings Insurance product to enable insurance companies to pool funds for competitive project financing, considering that the technical risk is being mitigated through the insurance product.

## **The CBLA Model**

Like GERBI, CBLA has focused significant effort on the project development stream. However, unlike GERBI where financing issues have been central, CBLA has responded to a different set of needs in South Africa.

For many industries in South Africa, access to project financing is not a primary constraint. Rather, the greatest barriers are at the “front end” of the project development process – generating the initial decision to look for energy efficiency and GHG mitigation opportunities, assessing opportunities, and developing the project. There are also challenges in bringing the project to implementation, including challenges specifically related to CDM. Such challenges include lack of familiarity with the CDM, the complexity of the process, transaction costs, and delays in the creation of South Africa’s Designated National Authority. Further discussion can be found in the *Development of an Investment Strategy to Implement the Clean Development Mechanism in South Africa* (Chamber Department of Trade & Industry, S.A., 2004). Based on this analysis, the CBLA has employed a number of strategies designed to impact on the key barriers and challenges:

**Working through industry associations.** In keeping with the project philosophy to work with established local organizations, CBLA entered into agreements with five local industry associations. Three of the partner associations are sectoral (Chemical and Allied Industries Association, Chamber of Mines, and the Textiles Federation) and two are geographic (Durban Chamber of Commerce and Industry and a separate program in the neighbouring country of Mozambique).<sup>6</sup>

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<sup>6</sup> In addition CBLA has worked directly with leading companies in the food and beverage industry, where there is no sector-wide industry association.

The object of these agreements was to work through the associations to increase the involvement of member companies in energy efficiency/GHG mitigation projects. This has involved two key activities. First, CBLA worked with the associations to identify interested member companies who would participate in project development with assistance from CBLA. Second, the project worked with the associations to develop feedback mechanisms to transfer the experience of the participating companies to the membership at large (through reporting mechanisms and planned workshops).

Through the engagement of the associations, the reach of the CBLA project is expected to go well beyond what would have been possible through direct engagement with individual companies alone.

**Providing technical support including walkthrough energy audits and feasibility studies.** Interested companies identified through the association partnerships embarked upon a process with CBLA. This process included initial confirmation of interest and orientation, followed by walkthrough audits performed by CBLA personnel accompanied by company staff. In total 34 audits were performed, in companies and facilities ranging from small to extremely large, and a specific opportunity was assessed in another facility. Savings were identified and quantified for electricity (kW and kWh), fuel, coal, and LPG. The resulting carbon savings ranged from less than 100 tonnes annually to in excess of 1 million tonnes annually per facility, with total carbon savings in excess of 3.3 million tonnes annually. Table 2 provides a summary of audit results, aggregated for reasons of confidentiality.

**Table 2. Summary of CBLA Audit Results**

Sector	# of facilities	Carbon Savings Range (tonnes CO <sub>2</sub> e per year)
Textiles RSA	9	110 - 20,972
Chemicals RSA	5	1,612 - 600,000
Mining and related RSA	3	55,827 - 1,253,306
Food and beverage RSA	6	1,358 - 160,325
Other RSA	6	2,866 - 125,902
Mozambique	6	38 - 35,517
<b>Totals</b>	35	3,373,863 total

Source: CBLA Project

The audit reports were presented back to company management and technical personnel for consideration. Many companies acted quickly on operational and smaller capital recommendations of the audits, in some cases yielding substantial savings. These activities are currently being tabulated via a survey of participating companies, and a summary of the results will ultimately be posted on the CBLA website.

For those companies wanting to go further and willing to commit further resources and effort, CBLA entered into cost-sharing agreements to carry out detailed feasibility studies of major opportunities identified through the audits. As of this writing nine feasibility studies have been completed or are in progress. These studies have been contracted by the company to local service providers, normally taken from a list of qualified local providers developed by CBLA. Aside from financing, CBLA has provided technical support and guidance throughout this process. It is also interesting to note that certain companies have been able to secure non-CBLA financial support for feasibility studies of CBLA identified opportunities, e.g. through subsidies

from the national utility ESKOM's demand side management programme or through assistance from the national Department of Trade & Industry.

**Facilitating project implementation.** Finally, for companies that wish to move towards project implementation, CBLA is providing targeted assistance. Our role here is one of facilitation, not direct financial or technical support. In part this activity includes company-specific guidance on the implementation process, and in particular guidance on CDM and its requirements (for CDM-eligible projects). This facilitation process also includes substantial effort to create linkages between our partner companies and potential buyers of carbon credits. In addition, we have invested in development of resources such as the guide to carbon financing in South Africa, entitled "Business & Climate Change", which includes an Executive Briefing and four substantive technical modules.

An interesting additional CBLA activity is indirectly related to project development. The Durban (eThekweni) area is a major industrial centre in South Africa, with a concentration of industries ranging from textiles and food and beverage to chemicals and petroleum refining. Because of significant environmental and health issues associated with this concentration of industry, the various levels of government have initiated a Multi-point Plan to address these issues (South Africa Ministry of Environmental Affairs and Tourism, 2001). In collaboration with local stakeholders, CBLA has supported a process leading to the development of a Cleaner Technology Centre for the South Durban Basin (as outlined in the CTC Business Plan, to be available on the CBLA website). In collaboration with local stakeholders, CBLA has supported a process leading to the development of a Cleaner Production Centre for the Durban South area. Once established, this Centre is expected to assist industries to identify and implement cleaner production options that will contribute to reduced emissions, including reduced emissions of greenhouse gases. CBLA sees this type of initiative as a positive demonstration of the connection between energy efficiency, cleaner production, mitigation of GHG emissions, and local economic and social benefits.

At the time of writing the full impact of the CBLA approach to project development can only be partially assessed pending a full review of project implementation activity, including the impact beyond the directly participating companies. However, as a preliminary observation, it is evident that the CBLA contribution has stimulated interest and recognition of energy efficiency and GHG emission reduction opportunities; that projects have been implemented as a result; and that the key participants have developed skills, capability, and interest that are key pre-conditions for sustainability. A more robust examination of results will be completed by July 2005, and posted on the CBLA website.

## **Structures and Relationships**

The results achieved by the GERBI and CBLA initiatives described above are substantial, and the approach the projects have taken has been designed to ensure that many of these results are sustained after the project is complete. That said, the long term impact of these projects, and more generally the future of energy efficiency/GHG mitigation activities in Brazil and South Africa, can be strengthened through appropriate and ongoing structures and relationships. The two projects have deliberately contributed to such an "institutionalization" process, specifically by assisting in the development of ongoing programs to encourage and support efficiency/mitigation activities. These programs are described below.

## **The GERBI Model**

GERBI activities have focused on three states: Rio de Janeiro, Rio Grande do Sul and Santa Catarina, with some lesser involvement in the states of Minas Gerais and Ceara. The design and delivery has been accomplished through close collaboration with three organizations that represent the demand and supply sides of the market equation: the Brazilian Confederation of National Industries (CNI) through agreements with CNI state operations; the Instituto Euvaldo Lodi (IEL), which is the arm of CNI that focuses on technical development and solutions for industry; SEBRAE and the Brazilian Association of Energy service Companies (ABESCO).

## **The CBLA Model**

Early in the CBLA project, industry partners expressed strong interest in the development voluntary industry-led programmes for energy efficiency and GHG mitigation. The precise form of such programs was not initially clear, but was expected to involve voluntary commitments by companies to (1) monitor and report on efficiency and emissions, and (2) establish and work towards targets for improved performance.

The first industry association to actively engage with CBLA in the development of a voluntary program was the Chemical and Allied Industries Association (CAIA). Specifically, CBLA has assisted CAIA in the development of an energy efficiency monitoring protocol, which has now been integrated into the association's Responsible Care program (<http://www.caia.co.za/rescare.htm>).

Subsequently, other associations have become involved, and two groups are actively moving forward with CBLA assistance: the Chamber of Mines (COM) and the multi-sectoral National Business Initiative (NBI). The initiatives under development with these groups involve monitoring, targeting, and reporting, now with the active support and encouragement of the Department of Minerals and Energy. The result of this process has been extremely significant: on May 4, 2005 the Energy Efficiency Accord was launched with a formal signing ceremony involving the Minister of Minerals and Energy, leading industry associations, and leading companies (South Africa DME 2005). The signatories have made a voluntary commitment to report on and improve energy efficiency, working towards targets South Africa's national *Energy Efficiency Strategy*, launched in its final form in May 2005.

The launch of the Accord is a major accomplishment, but much remains to be done. Establishing the detailed mechanisms and expanding the participation beyond the initial signatories will be a priority focus over the coming year. But the momentum has been established, the commitments have been made at the most senior level, and a strong ongoing driver for industrial energy efficiency has been created.

## **Conclusions**

Despite a relatively brief project timeframe, less than three years, the CBLA and GERBI projects have made important advances in development of a foundation for a sustainable industrial energy efficiency market in both South Africa and Brazil.<sup>7</sup> What is interesting is that

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<sup>7</sup> At the time of writing, structured assessments of the impacts of GERBI and CBLA are pending. A performance measurement framework has been developed for each project, with expected results and indicators defined. The results of these assessments will be posted on the project web sites when complete, for review by interested parties.

the pathway to success has been different in both countries. The two projects have adopted noticeably different implementation strategies in a number of areas. In each case, these differences are a result of the unique local situation in the two countries – the industrial base, the barriers confronting industry, the institutional context, the existing capacity, and many other variables.

The underlying lesson is that project design must be adaptable and must be tailored to unique local conditions as well as the needs and capabilities of local counterparts. The results also suggest that projects such as GERBI and CBLA can only be successful if they involve effective partnerships with key players in industry, government, and various supporting organizations (e.g. energy service providers, training organizations, etc.). Sufficient time must be taken to design the project in collaboration with local partners. Even in a short project, this time will be time well spent.

On the demand side of the market equation, CBLA and GERBI have developed both institutional and private sector models for engaging industry in capacity development and project development. A sustainable platform to achieve key management and technical learning competencies will help industry operationalize energy management within their corporate culture and thereby either seek out project opportunities, or certainly be more open to the selling efforts of capable energy management service providers.

On the supply side, a critical mass of project development demonstrates that both GERBI and CBLA have effectively begun to help address key barriers. Project deals have been closed and a new energy management service culture has emerged. Industry eyes have been opened to the value proposition of energy management and carbon credits emerging from these projects. The banking community has begun to consider financing these projects.

Cutting across these dimensions of demand and supply perspective, the projects have engineered new institutional mechanisms that will help support a platform for ongoing collaboration among the private and public sectors, such as South Africa's Energy Efficiency Accord. The development of enabling institutional mechanisms and platforms has been implemented in an integrated manner, and as a result have been mutually re-enforcing, helping to build skill sets, momentum, and institutional drivers.

As we look into the future and ponder how to sustain the results of GERBI and CBLA, institutions, governments, development agencies, industry and other stakeholders need to consider the long view, namely, that market transformation requires “being in the game” for the long haul. The long view is a necessary condition to follow the pathway in which: i) an economic and environmentally sustainable industry is a necessary pre-condition to attaining the development goals of less developed countries; ii) a sustainable energy efficiency market is an important foundation to the generation of ongoing, sustainable GHG reduction projects and investments; and iii) the long-term sustainability of industrial energy efficiency investments requires a successfully operating energy efficiency market and necessary integration of stakeholders.

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It should be noted that this assessment will be based on short-term results; the longer term impact can only be examined in future years (a challenging exercise by definition, since attribution of impacts in the larger marketplace is extremely difficult).

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