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Project Executive Summary

(October 2008 – September 2010)

“Cleaner Production Private Sector Partnerships”

“Partnerships with Wal-Mart El Salvador and Guatemala, ANPROLAC and APEHGUA”

Sponsored by:
United States Department of State (DoS)

Prepared by:
World Environment Center (WEC)

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Executive Summary

The report presented below summarizes the activities carried out between October 2008 and September 2010 within the framework of the project “Cleaner Production Partnerships with the Private Sector,” sponsored by the United States Department of State (DoS) and executed by the World Environment Center (WEC).

This initiative encompasses two countries, El Salvador and Guatemala, and includes a global analysis of the accrued results in both countries and in the four partnerships developed. For further consultation see the report of each partnership.

Project Management

The Project was developed in two countries, El Salvador and Guatemala, and through two working models: Supply Chains and Sector Partnerships, applying WEC’s initiative or methodology “*Greening the Supply Chain*” in each partnership.

In both countries the supply chains were developed in conjunction with the multinational enterprise, Wal-Mart, while the sector partnerships were, in El Salvador, with the Dairy Sector in the Dairy Processors Association (ANPROLAC) and, in Guatemala, with the Association of Small Hotels of Guatemala (APEHGUA).

Although most of the participating companies are Small and Medium Enterprises (SME's), the size of companies varied, a situation that significantly influenced the type of technical assistance provided and the economic and environmental outcomes achieved. Below is a brief description of the variation:

- Hotel Sector partnership: Can be divided in two sizes: small (<60 rooms) and micro (<5 bedrooms), both sizes typically had low average occupancy rates (<40%) and old facilities.
- Dairy Sector Partnership: Micro enterprises that sell traditional processes in informal markets.
- Supply Chain of Wal-Mart El Salvador: Midsize mostly well-established and organized with partially automated processes.
- Supply Chain of Wal-Mart in Guatemala: Can be divided into two types, micro with traditional processes, and well-established medium/large enterprises with partially automated processes.

The project can be divided into three stages for the purpose of this report: induction, technical assistance and monitoring.

The induction process and training took place from the period between December 2008 and July 2010, as well as the outreach visits to companies, in order to identify the technical assistance needs of each company.

The technical assistance process was constant throughout the life of the project. However, the evaluation process, which required greater involvement of the technical team, concluded in July 2009 with the delivery of diagnoses to the companies and the preparation of individualized action plans for implementation. The formal process of implementation began thereafter. Although the work plan had envisioned to deliver the Analysis in June 2009, the development and timing of these stages differed in each project, following is a summary.

Table 1: Summary of the Action Plan implementation progress.

Project	Analysis delivery	Implementation Start Up	Observations
Hotel Sector Partnership	September 2009	October 2009	The process was delayed slightly due to the lack of historical information, such as water consumption rates and average occupancy so data had to be generated first. Furthermore, as seasonal businesses with high and low seasons, a complete cycle had to elapse first before an estimation could be made.
Dairy Sector Partnership	May 2009	June 2009	The process was finished on time, however, many opportunities were not fully evaluated because of lack of information, often the estimates were adjusted to December 2009 as data was being generated.
Supply Chain of Wal-Mart El Salvador	July 2009	March 2009	Reports were delivered on time, and since these companies are proactive and have qualified personnel and keep records, the implementation was almost immediate and began even before completing the baseline assessment.
Supply Chain of Wal-Mart Guatemala	September 2009 / January 2010	June 2009	Worked with two groups. First, with a group of micro businesses that often lacked data so the diagnosis was delayed slightly. Subsequently a group of medium and large businesses joined the project until the process ended in 2010.

By: WEC technical team.

The monitoring and recording of results began in March 2009, with most results available by October 2009 after a full trimester of implementation had elapsed.

Overall, the participation of companies was strong and the companies that withdrew from the project did so for reasons not directly attributable to the project. Some withdrew due to economic problems (companies temporarily closed or went bankrupt), legal problems

(closing to remodel and comply with government requirements) and others due to local safety issues in their areas of operation.

Below is a summary of the of business involvement indicators.

Table 2: Participation of companies classified by Project.

Indicator	Participating Companies	Implementing companies	Dropout rate [%]
Hotel Sector Partnership	9	9	0%
Dairy Sector Partnership	14	9	36%
Wal-Mart El Salvador Supply Chain	8	8	0%
Wal-Mart Guatemala Supply Chain	13	9	31%
Total	44	35	20%

By: WEC technical team.

Participation varied during the implementation phase, largely influenced by special circumstances. There were companies that started implementing with significant encouragement; this was especially the case for most companies in the Dairy Sector Partnership. Others delayed implementation (January 2010) largely due to the low potential of non-investment recommendations, as was the case with Wal-Mart Guatemala and the Hotels. In the case of Wal-Mart companies in El Salvador, where the participants were larger (medium-sized) enterprises with skilled personnel and more resources than their Guatemalan counterparts, there was more constant participation throughout the project, .

Project Technical Assistance

Technical assistance needs were covered by ten local and international consultants under the supervision of the project coordinator. The work focused on product recovery, electricity and thermal energy, drinking water and wastewater, while the recovery of materials and inputs, air emissions and waste were considered minor issues.

As for the level of technical assistance, good housekeeping measures, process control and equipment modification practices were commonly recommended, a situation that reflects that companies are still in the early stages of development in terms of both environmental management and competitiveness. Following is a summary of the main environmental aspects on which each partnership focused.

Table 3: Major potential environmental impacts of recommendations on environmental issues.

Project	Direction of the opportunities in environmental technical assistance (Analysis)	Main impact of the environmental recommendations implemented
Hotel Sector Partnerships	<ol style="list-style-type: none"> 1. Water 2. Energy (electric) 	<ol style="list-style-type: none"> 1. Wastewater 2. Air emissions
Dairy Sector Partnerships	<ol style="list-style-type: none"> 1. Materials 2. Products 3. Power 	<ol style="list-style-type: none"> 1. Wastewater 2. Solid wastes 3. Products 4. Materials
Wal-Mart El Salvador Supplier Chain	<ol style="list-style-type: none"> 1. Product 2. Energy (electric and thermal) 3. Water 	<ol style="list-style-type: none"> 1. Wastewater 2. Solid wastes 3. Product
Wal-Mart Guatemala Supplier Chain	<ol style="list-style-type: none"> 1. Thermal energy 2. Materials 3. Product 	<ol style="list-style-type: none"> 1. Air emissions 2. Wastewater 3. Solid wastes

By: WEC technical team.

Implementation of action plans

The implementation of recommendations by the companies has been successful, especially considering the size of businesses and the economic conditions that many were experiencing during this timeframe. **A total of 225 recommendations were implemented (63%) of 360, and at the end of the project we were able to confirm that 34 additional recommendations (9%) were in the process of implementation (most had already purchased materials and/or equipment, and were ready to install).**

Of the suggested recommendations, 71 (20%) would be implemented after the close of the project. These recommendations were mainly those that required significant investment, but with a high profitability potential (>1 year).

Finally, 30 of the recommendations (8%) were rejected by the companies. All of these pertained to the Dairy sector (less formal companies) and many of the recommendations involved not only heavy investments but also strong technological changes such as refitting facilities and/or process lines.

The table below provides a summary of progress in the assimilation of technical assistance. (Implementation).

Table 4: Summary of progress in implementing action plans.

Indicator	Hotel Sector partnership	Dairy Sector Partnership	WM El Salvador Supply Chain	WM Guatemala Supply Chain	Totals
Total recommendations	52	108	134	66	360 (100%)

Indicator	Hotel Sector partnership	Dairy Sector Partnership	WM EI Salvador Supply Chain	WM Guatemala Supply Chain	Totals
Implemented Recommendations	25	73	98	29	225 (63%)
Recommendations under implementation	3	0	19	12	34 (9%)
Recommendations left for the future	24	5	17	25	71 (20%)
Not implemented recommendations	0	30	0	0	30 (8%)

By: WEC technical team.

It is important to highlight that mainly non-investment opportunities were implemented and that many of the companies have committed to implement all such non-investment recommendations that they received through the project. The expectation to implement all of the project recommendations might be unrealistic due to the degree of investment required. Additionally, the “implementation pressure” and guidance invoked by project follow-up and monitoring no longer exists. In many cases, these investments were not carried out due to the existing economic situation. However, several companies have sought other less costly solutions to achieve similar results by modifying the action plans on the initial audits in 20% of the cases. This underscores two facts that should be considered for future similar projects. First, firms in these categories tend to implement the “less costly or less investment required projects” over the “most profitable” recommendations, which can result in neglecting possible technological change opportunities and, second, the limited capacity of the firms can present certain hurdles for the technical team to proceed with follow-up and technical assistance – two components of the project that are necessary to achieve optimal success. Without this strong monitoring, we estimate that the successful implementation rate would be less than half.

As for the economic indicators, the baseline (diagnoses as of July 2009) projected a potential savings of US\$ 992,000 per year assuming *all* recommendations were implemented. By the end of the project term, 63% of the recommendations had been implemented, from which the participants collectively achieved **US\$ 621,400** in savings (the original project goal was to achieve collective savings US\$ 240,000).

Total investments, based on the original projections (analysis as of 2009) and assuming all recommendations would be implemented were estimated at U.S. \$501,400. By the end of the project term, 63% of the recommendations had been implemented with total investments of **US\$ 293,500**. Of these investments, 64% was undertaken by a single company (Industrias La Popular), which was the largest company in the project. If we do not take this into account, the low business investment becomes even more evident, since most have only implemented the recommendations that did not require any investment, or partially implemented recommendations so as not to invest or looked for other less expensive solutions to reach similar results.

The following table summarizes the financial results achieved to date.

Table 5: Summary table of Project's economic performance

Indicator	Hotel Sector partnership	Dairy Sector Partnership	WM El Salvador Supplier Chain	WM Guatemala Supplier Chain	Totals
Savings forecasted based on implementation of all recommendations [USD/year]	27,300	323,500	336,800	304,400	992,000
Savings throughout Project life [USD]	4,600	190,700	206,400	219,700	621,400
Investment forecasted based on implementation of all recommendations [USD]	102,100	148,800	100,700	149,800	501,400
Investment by Company [USD]	7,400	63,300	19,800	203,000	293,500

Source: Project Closing Reports.

By: WEC technical team.

From the above table, it becomes apparent that the hotel partnership had the lowest economic potential detected (analysis), while the most profitable one was the Wal-Mart Supply Chain in El Salvador (4 months). The other partnerships have similar return rates of less than 6 months.

The hotel sector participants' lower potential is largely due to the size of their businesses (micro) and low occupancy rates. Additionally, the nature of hotel service, unlike product manufacturing, does not lend itself as well to process redesign and waste minimization practices. This partnership employed a great deal of creativity to incorporate greener practices into their sector.

Conversely, the dairy partnership, which consisted primarily of small and micro enterprises, were able to achieve successes similar to the larger companies participating within the other partnerships. This is due partly to the fact that the dairies implemented project recommendations sooner than the other partnerships (4 months before), and that significant opportunities to reduce product waste in the dairies were discovered through this project.

The first two indicators in the table below include all companies that have participated since the launch events. This includes those companies that subsequently withdrew from the project due to economic conditions and closures, as well as companies that only partially implemented the action plans. These are important indicators to include and to consider in designing future projects because it implicitly demonstrates the effect of participation retention rates on the final results of the project..

The second indicators provide information on the potential implementation by company or average savings per company and reflect the success of the project in each company.

Below is a summary of project economic indicators:

Table 6: Summary table of Project economic indicators.

Indicator	Amount	Observations
Average savings achieved by participating company	US\$ 14,123	Averaged among the companies that participated in the project (44) including those that closed, those who dropped out and those that still do not generate savings.
Investment by participating company	US\$ 6,671	
Average savings achieved by companies that implemented	US\$ 17,754	Averaged among the 35 companies that effectively implemented
Investment by companies that implemented	US\$ 8,386	

Source: Company Monitoring Reports.

By: WEC technical team.

Significant environmental benefits (both large and a diverse range) were obtained as a result of the pollution prevention strategies implemented within the various projects. The chart below summarizes these environmental achievements :

Table 7: Summary table of Program's environmental indicators.

Environmental aspect	Forecasted annual Benefits (June 2009)		Benefits gained as of June 2010		Observations
Materials /Inputs (solids)	3.25	ton/year	1.62	ton	Various materials, mainly food
Materials /Inputs (liquid)	134,358	liters/year	77,291	liters	Milk and other inputs with the highest savings
Product (solids)	1,892	ton/year	1,165	ton	Different types of food products (Cheese, hams, etc.)
Product (liquid)	64,932	liters/year	5,125	liters	Different types of dairy-derived products)
Water (volume)	9,511	m ³ /year	16,876	m ³	Drinking water
Wastewater (volume)	6,991	m ³ /year	5,036	m ³	
Wastewater	87,004	kg	14,217	kg DBO	

Environmental aspect (quality)	Forecasted annual Benefits (June 2009)		Benefits gained as of June 2010		Observations
		DBO/year			
Savings in electric energy	554,918	kWh/year	64,712	kWh	
Savings in power demand	15.14	kW	2.00	kW	Reduction in electric systems power use
Thermal energy	497,796	gallons/year	185,890	gallons	Represents all types of fuels
Air emissions	2,212.42	ton CO ₂ /year	1,162.17	Ton CO ₂	Correlation with saved electric and thermal energy
Minimization of solid wastes generation	29.93	ton/year	30.12	Ton	
Production time	17,556	man-hours/year	5,744	man-hours/year	Change in production process

Source: Business monitoring reports.

Prepared: WEC Technical Team

Environmental benefits are a reflection of the type of projects undertaken and of the investments made. Noteworthy here is that measures related to the recovery of inputs and the recovery, reclamation and development of subproducts/products were almost completely implemented, mainly due to their high profitability rate (i.e. non-investment opportunities with high economic benefits).

Thermal energy was also an important environmental factor in the activities implemented because, despite its low potential, it is a prevalent issue in larger companies. Electric energy opportunities were not frequently implemented due to the high level of investments typically required to address them.

Water and wastewater recommendations were significant for several companies, resulting in considerable volume of savings/recovery in these areas. This is because many materials and product recommendations when implemented caused a double impact; on the one hand the material was recovered, and on the other, the same material did not have to be cleaned so intensely and, therefore, water consumption and wastewater generation decreased significantly.

Reductions in air emissions were due mainly to the reduction in energy consumption derived from energy efficiency measures. In addition there were also process and materials (mainly efficiency gains) recommendations that contributed to emissions reductions.

Waste reduction was higher than projected, and again this is due to the recommendations on materials, which were discarded when they could be retrieved and returned to the process.

Another issue worth noting is that, although several companies initially insisted on working on energy issues due to their direct impact on costs, they found that the greater economic and environmental potential was instead in their processes. A common misconception is that the greatest opportunities lie in the energy sector, but this is only true if the company has optimized its processes, and small companies tend not to be too sophisticated and to largely depend on the human factor.

Regarding technical assistance needs, it can be stated that the analysis clearly emphasizes *the need to train staff and improve business processes*, regardless of company size. The environmental analysis determined that companies are *concerned about optimizing those resources that require a significant cost, such as materials, energy and fuel; however, this also reflects the limited availability to invest in areas whose impact on cost is not so considerable, as is the case of water.*

The project's model and approach provides other benefits to the companies which are not measurable which are equally important to highlight, especially those listed below as they are the ones expressed directly by the participating company managers, owners and administrators and completed by consultants.

- ✓ Reduced operating costs
- ✓ Increased productivity and product quality
- ✓ New staff for environmental management / quality
- ✓ Creation of unit / committee / working group on CP
- ✓ Development of new products
- ✓ Quantification of the savings (performance indicators)
- ✓ Awareness building of General Management
- ✓ Continuous improvement (new CP options)
- ✓ Repeatability and Standardization
- ✓ Contact with Suppliers to optimize the use of equipment
- ✓ Seek funds for CP investments
- ✓ Changes in infrastructure and equipment Redistribution
- ✓ Better energy management and use of energy
- ✓ Pollution control
- ✓ Staff was made aware and trained staff
- ✓ Improved health management (food)

Hotels:

- ✓ Growth of hotel
- ✓ Free training of staff
- ✓ Improved efficiency and competitiveness
- ✓ Better understanding and control of processes
- ✓ Improved working conditions for workers
- ✓ Improved service quality
- ✓ Improved sanitation and hygiene practices
- ✓ To be recognized as an environmentally reliable hotel to both national and international clients
- ✓ A new way to manage the hotel (environmentally responsible)

- ✓ Contributes with the community and authorities in caring for the environment

According to our findings, we conclude that the project has been successful and expect that companies will eventually implement other recommendations suggested during the technical assistance process.

Despite these results, due to the economic crisis that exists in these countries, some companies, especially the smallest ones, were reluctant to make major investments, regardless of the potential savings. It is expected that the economic recovery of the countries will motivate companies to invest in these sustainable changes.

Comparing this project with earlier initiatives by other international organizations, there are several points to note. First, the project team worked mainly with very small companies (micro, in many cases) with traditional low tech processes, facing sector-specific situations such as closures and a highly variable and season dependant production; such characteristics directly affect the activity results and should be taken into account in future projects. Second, the project focused on measuring processes (such as using byproducts and wastes) more than on energy efficiency opportunities, contrary to that of previous initiatives which sought the leading role of energy issues instead of processes. Therefore, *for future programs and initiatives with these industry sectors, the review of environmental priorities should be considered.*

In terms of project sustainability, continuous improvement could be observed and verified in most companies, although many were reluctant to make large investments as noted in the economic performance results. That said, several participants nonetheless implemented the higher cost recommendations, either as recommended or by seeking less costly implementation alternatives or, in some cases, partially implementing the recommendation as far as financial resources permitted. Some companies provided approximately US\$ 2,000 to implement preventive/corrective actions, so it is expected that over time companies will continue implementing other recommendations suggested during the technical assistance process.

In conclusion, we can say that according to our findings the project was quite successful, despite the unfavorable market and economic factors of the sector assisted and the size of the companies supported, in addition to the closure and drop out of 20% of the companies. Notwithstanding, those companies that implemented the majority of recommendations were more empowered and some even grew, at a time when most companies in the sector decreased in the past year.