



The World Environment Center
Greening Alcoa Fujikura's Supply Chain in Romania
July 2006 – May 2007
Final Project Report

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Executive Summary

For its Romanian Greening the Supply Chain initiative, the World Environment Center (WEC) trained the small and medium sized enterprises supplying Alcoa Fujikura Romania (AFL) with goods and services to become more competitive by reducing energy, water and raw material consumption per unit of output. Throughout the project, many companies made major capital investment using financial analysis techniques introduced by WEC. These commercial successes significantly reduced the environmental impact of each product and service delivered to AFL.

The World Environment Center (WEC) has completed its capacity building project *Greening Alcoa Fujikura's Supply Chain in Romania*. The project was funded by the United States Agency for International Development (USAID) and involved in-kind participation from Alcoa Fujikura (AFL). The goal of the project, which occurred from July 2006 to May 2007, was to assist Romanian small and medium sized enterprises (SMEs) supplying Alcoa Fujikura with goods and services to become more competitive by reducing energy, water and raw material consumption per unit of output. The commercial successes documented in this report simultaneously reduced the environmental impact for each product and service delivered to AFL from participating suppliers.

The Capacity Building Approach of the World Environment Center

1. About the World Environment Center

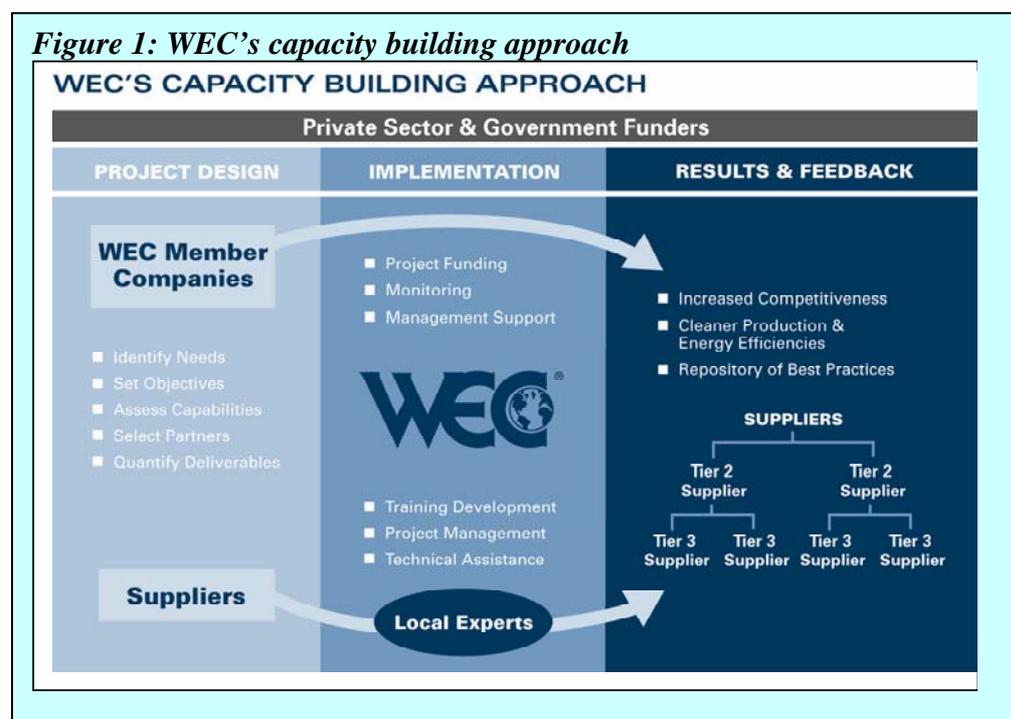
The World Environment Center is an independent, not-for-profit, non-advocacy organization that advances sustainable development and the responsible use of natural resources through the business practices of its member companies in partnership with stakeholders, including business partners, government, non-governmental organizations and universities. The WEC was founded in 1974 with a grant from the United Nations Environment Programme. It is headquartered in Washington, DC, in the USA. The Greening Alcoa Fujikura's Supply chain in Romania project was developed and managed by WEC's European office located in Augsburg, Germany.

2. WEC Members

WEC members represent a variety of business sectors and conduct operations in all regions of the world. Members are selected based on their practice of sustainable development in their own operations and their commitment to advance sustainability globally in partnership with stakeholders. Current members include more than forty enterprises from diverse industry sectors. For this Romanian project, the WEC partnered with Alcoa which had already participated in another similar WEC project with Mexican suppliers.

3. Approach to Capacity Building

WEC has developed an approach to capacity building that integrates the roles of global companies, multi-lateral/government organizations, suppliers/business partners and local technical support providers. The diagram below illustrates the roles and relationships for participants in WEC capacity building initiatives.



The Romanian capacity building project benefited from a 50,000 USD grant from the United States Agency for International Development (USAID). Alcoa Fujikura Romania dedicated time from one of its senior executives, AFL Romania’s Purchasing Manager, and her team. In addition, AFL hosted all project meetings in its Arad facility.

The Romanian context

1. Sustainable Development culture and practice in Romania

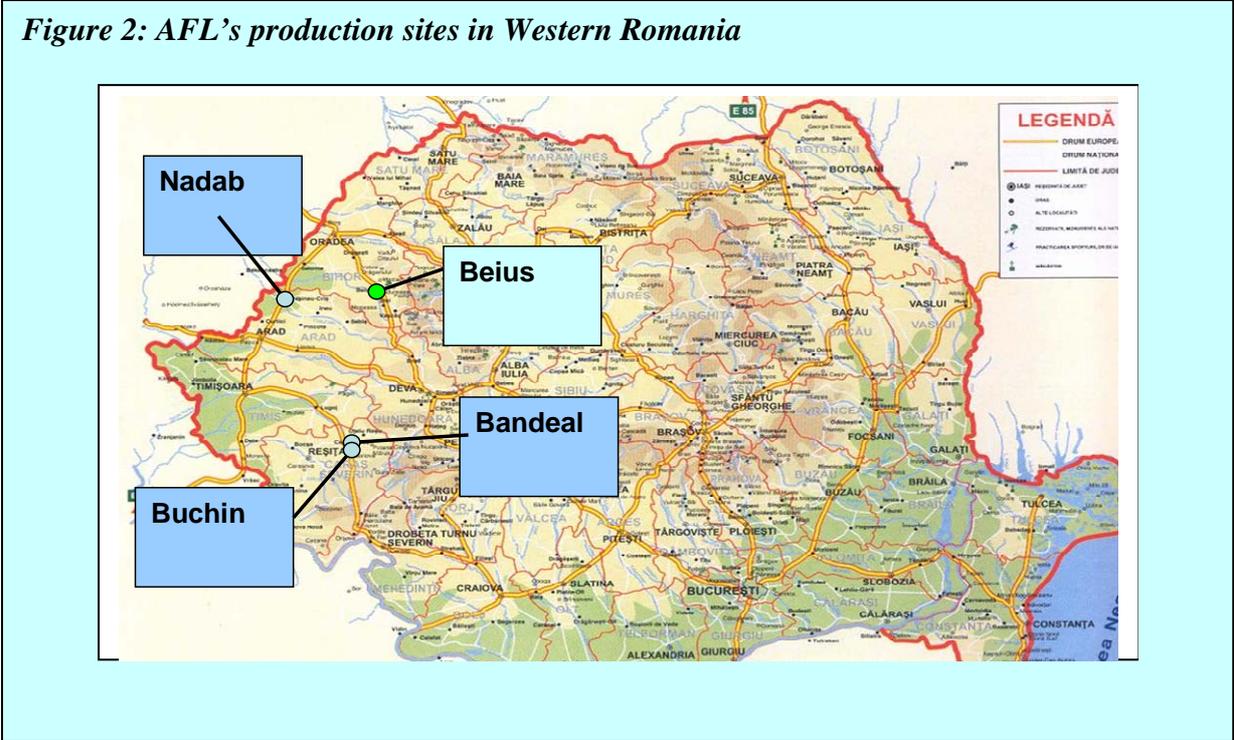
Approximately 40% of Romania’s electricity generation derives from the use of coal, and this practice creates a number of negative environmental impacts. Energy losses in the grid and heating systems are substantial. Waste and wastewater management also is a substantial sustainable development issue. The proper disposal of industrial waste properly still is very costly in a country that only treats/recycles about 1% of its total waste. As a result, the majority of Romanian small and medium-sized enterprises (SMEs) didn’t define their WEC project strategy in terms of triple bottom line (environmental, economic and social) concerns. Expertise in this field is emerging.

2. Banat

The Banat region is situated in Romania’s West, sharing a border with Hungary and Serbia. A former part of the Austro-Hungarian Empire, it was industrialized much earlier than other Romanian regions. In the mid-1990s, it attracted substantive foreign direct investments in industry and agriculture (e.g., automotive, metallurgy, banking and finance, food processing, heavy engineering, telecommunications, construction and consumer goods manufacturing).

3. Partnering with Alcoa Fujikura (AFL) Romania

Alcoa Fujikura is a joint venture which started operating in late 2001 in Nadab, Romania, producing wire harness for the automotive sector. The company grew so fast that new production sites opened in Caransebes (Bandeal and Buchin, see map below) in January 2003 and in Beius in May 2006. AFL Romania currently employs about 4000 people. Continued rapid growth in this region is foreseen for the coming years.



Greening AFL's Supply Chain in Romania

1. Rationale

WEC recognised very early that the supply chains of multinational enterprises (MNEs) represent one of the most challenging boundaries of corporate social responsibility. Many MNEs acknowledge today that they greatly depend upon their supply chain for conducting their business operations. Yet they also know that they do not have direct control of their supplier companies' environment, health and safety (EHS) performance.

Traditionally, suppliers had only been asked to deliver products at the right price, at the right time and at the right place. But delays in product deliveries to the market, product returns and withdrawals have exemplified that large and far flung supply chains can be a risky business.

Recently, some MNEs started to take a fresh look at their supply chains. They decided that they need fewer suppliers doing better work. One of their key objectives is to eliminate problem suppliers quickly. As a result, business and profits are shifting to those suppliers which understand and implement the requirements of MNEs operating within a culture of continuous improvement.

As the WEC develops and implements its *Greening the Supply Chain* initiative to further its mission, the MNEs which participate in this initiative not only do it to be "green", but also for clear business and risk management reasons.

2. Objective

The objective of the Romanian project was to promote cleaner production and energy efficiency at the suppliers' production sites in order to:

- raise the suppliers' competitiveness,
- reduce the environmental impact (and ultimately the cost) of a unit of purchased goods and services, and
- improve the business relationship between client and supplier.

For the suppliers' production processes, cleaner production and energy efficiency meant:

- reducing raw materials and energy inputs
- eliminating toxic materials use
- reducing the quantity and toxicity of emissions and waste outputs
- reusing and recycling materials and energy

Translated to the products, this signified:

- reducing environmental impacts
- improving the energy efficiency along the entire product life cycle (from raw material extraction, production and consumption to the ultimate disposal)
- designing "green" products and choosing "green" suppliers

3. Project partners

In collaboration with WEC's project manager, AFL Romania's Purchasing Manager reviewed her list of 900 local suppliers and selected a dozen of its most critical. Nine of them completed the whole project cycle. These small and medium sized enterprises included plastics manufacturers, some machine and metal parts producers, printers, measurement equipment producers, an EHS equipment

producer and even a large bakery operating AFL’s cafeteria. Annex 1 provides a detailed overview of the participants.

For its local technical assistance, WEC partnered with Mr. Vladimir Gheorghievici, who is leading the Romanian Cleaner Production Center (CPP). This Center had been created in the mid-1990s through a grant of USAID managed by the WEC. Mr. Gheorghievici already knew both organisations and was delighted to renew work relationships years after the end of the initial grant period.

4. Projects steps and timeline

Working collaboratively with AFL Romania’s Purchasing Manager and a local technical support provider, WEC provided information, training and continued technical guidance to the selected SMEs over the course of a year.

The practical project steps were taken as follows:

Figure 3: Project timeline

DATE	PROJECT STEP
May-June 2006	Supplier Selection by AFL Romania Purchasing Manager and WEC
July, 6, 2006	Kick-off meeting with AFL and selected suppliers
July 7-14, 2006	Half-day visits of suppliers’ production sites
July – October, 2006	Self-Diagnosis of change opportunities by suppliers
October 4-5, 2006	Two day training in cleaner production, energy efficiency: strategy, data evaluation, financial and technical tools to manage change
October 2006	Suppliers elaborate action plan
November 2006	AFL’s Purchasing Manager, local technical assistance provider and WEC project manager visit supplier sites
November 2006 – February 2007	Suppliers implement first actions
February 6, 2007	Suppliers exchange on first changes implemented and remaining challenges during a workshop at AFL
February 7-9	Suppliers’ site visits by local technical assistance provider and WEC project manager
February – May 2007	Suppliers review and implement more difficult actions
May 3, 2007	Reporting meeting with presentation of results by each supplier in front of AFL Romania’s management.

Results

1. Aggregated results & individual highlights

The participating suppliers implemented changes that resulted in increased energy efficiency, cleaner production, improved worker safety and health and optimised process flow. Capital investments were made to achieve these results. Figure 4 documents the aggregated results by individual supplier.

Figure 4: Type of actions undertaken by AFL suppliers

	PS	A	G	MP	C	GL	A	F	P	Total
Increased energy efficiency			X	X	X	X		X	X	6/9
Achieved cleaner production	X	X	X	X	X					5/9
Improved worker's health & safety	X	X			X	X		X		5/9
Optimised process flow	X	X		X	X		X	X		6/9
Made a major capital investment	X	X		X			X	X		5/9

The following individual highlights exemplify the excellent return on time, knowledge and capital invested in this project:

Advancing cleaner production:

At Gutenberg , a printer (60 employees)

The Gutenberg printing company has been operating in the same building since 1975 and has a poor energy efficiency record. The owner of the company, however, plans to move out of this rented building within a year or two. So it was not economically sound to undertake capital intensive changes.

As a result, all the cleaner production and energy efficiency measures implemented there had to be either at no or very low cost. One example of such measures is the washing of the black plates. After having served the printing process, these alumina plates are being washed with a solution which is then washed away with water. Gutenberg used to wash these plates with a water tube. WEC suggested assembling a power washing spray at the end of the tube in order to use the water more efficiently. Such a simple measure saved the enterprise 125 EUR worth of water in a year.

At Argis, a cardboard boxes producer (15 employees)

This company is AFL Romania's exclusive supplier of cardboard boxes used to ship AFL's products to parent companies and clients throughout Europe. Regarding process efficiency and cleaner production, Argis was able to save 1000 EUR a year by reducing the amount of waste cardboard, and substituting the glue used to stick the cardboard.

Moreover, Argis also invested 100.000 EUR in a new processing machine that will allow the company to honour additional orders. During the training workshop, Argis was a candidate to test "in live" the financial analysis software introduced by WEC, a useful program for SMEs considering major capital investments. It indeed allows the calculation of different scenarios and provides printable summaries that can be shared with bankers when applying for a loan. Argis calculated that this machine would be amortized within 2 years.

Raising energy efficiency:

At Contor, a measurement equipment producer (364 employees)

This company's in-house EHS and energy managers welcomed the Greening the Supply Chain project as a perfect opportunity to coordinate their efforts.

By fixing the leaks in the compressed air system and reducing the unnecessary high pressure used on some compressed air guns, thus reducing the total compressed air consumption, Contor saved 38000 EUR in a year for a total investment of 300 EUR in a leak detector and employee time. Before the first site visit of the WEC, the EHS manager had not identified the compressed air system as a potential hotspot for energy savings.

The company also took a fresh view at its ventilation and air conditioning systems, thus improving worker's health and saving another 3000 EUR of electricity per year.

Contor mainly produces water meters made of cast iron. During the suppliers' workshop organized in February 2006, Contor's energy manager explained that his main concern consisted in flattening the daily energy consumption peaks to reduce the amount of fines paid to the company supplying them with electricity. One of the other suppliers who had been responsible in the past for the automatization of Banat's steel Kombinat, the region's biggest industrial complex, was able to provide him with some bold technical advice on how to optimize the operating temperature of the casting oven which is the biggest energy consuming point in the company.

Overall, the company invested 20.000 EUR during the project cycle which paid back 60.000 EUR this same year and will continue to bring steady revenue through energy savings. Just as a comparison, these savings are equivalent to the cumulated monthly wage of more than half of the company's employees. In other words, these measures paid for the wages of the entire company for 15 days.

At Minu Pan, a baker (40 employees)

Minu Pan is daily supplying AFL's cafeteria with freshly baked snacks. During the project cycle, the company managed to construct a new building connected to the operating production area so as to double its baking capacity and comply with newly enforced EU hygiene regulations.

A former accountant, the bakery's director examined different investment scenarios and balancing the costs and benefits of more energy efficient options. She chose Romania's best-in-class insulation materials for the building's external and internal insulation, thus guaranteeing a cold room for the storage of wheat flour that will never need any air conditioning, even in the summer.

Minu Pan also optimized the efficiency of its baking ovens. By changing the direction of the oven's heat ventilation, the company will now save 90% of its heating needs for a room of 45 square meters. In addition, Minu Pan is installing a water tank on the top of its oven. This water which will be heated by the oven's energy losses will be used for the employees' shower rooms.

With a great attention to details, Minu Pan seized opportunities to invest in water saving devices. All toilets are double flush (and this is not standard in Romania yet), and the lavatories are to be used with a pedal instead of a tap. This step will also save additional 70 EUR per year.

Improving worker's health & safety

At Filiera, a metal construction company (6 employees)

Filiera is a small metal construction company which officially started its activity in early 2006, having AFL Romania as major client. The action plan that Filiera implemented improved the air quality through installation of a ventilation system. In the past the practice was to simply open the door, even in the winter. Lighting quality and efficiency in the production area were also improved. In addition to these measures, Filiera's director built a solar panel to supply the shower rooms of his employees with hot water.

All these investments contributed to worker's health and safety and will be amortized within 2,5 years.

At Contor

One measure implemented by Contor contributed to minimize the risks of fire in the company. The electrical panels spread throughout the company had never been maintained since 1993. After having acquired an infrared camera, the company's energy manager was able to identify all the wrong electrical contacts on the panel. He then fixed them with an electrical screw. Investment and time amounted to 612 EUR for total energy savings of more than 3000 EUR per year. Given this high return, this maintenance will now be performed once a year.

Lessons learned for future developments

Gaining suppliers' and client's buy in

AFL's direct support throughout the project cycle was invaluable. Mrs. Andreea Hotaran, AFL Romania's Purchasing Manager, viewed this project as a great opportunity to train herself on EHS issues and to get to know her suppliers from another perspective. She participated twice in the suppliers' site visits that, in turn, greatly motivated the suppliers. She also frequently called the participants to ask for their progress. As the deadline for the reporting meeting approached, she offered her help and that of her team to suppliers which had never made Powerpoint presentations.

Figure 5: Project team at reporting meeting, May 3, 2007



The two companies that were the least responsive to the WEC initiative were those for which top management could not participate in the kick-off meeting and training workshop. The sales director and the chief accountant were representing the company. Especially in Romania where command lines are very hierarchical in small companies, it would be sound to require the engagement of the company's director to participate in future activities. This remark does not apply for medium-sized companies that have in-house managers responsible for energy and/or EHS issues.

Adjusting the technical assistance

At the project beginning, AFL and WEC tried to search for cleaner production and energy efficiency experts operating from the Timisoara or Arad districts and could not find any references. The Romanian Cleaner Production Center was eventually chosen to provide the local technical assistance, and continuous follow up was based in Bucarest, meaning that Mr. Gheorghievici had to travel a long time to perform the suppliers' site visits. More than the travel time, the fact that Mr. Gheorghievici was often perceived as "the man from the capital" by the suppliers did not ease the familiarity of our technical discussions.

Now that WEC has completed this project and presented its results in front of the regional chamber of commerce and industry, and the regional and local environmental protection agencies, it is now acquainted with two really local experts who understand the nature, challenges and opportunities of our Romanian activities. However, one of these experts did not gather the broad field experience that Mr. Gheorghievici had. And the other, who is an engineering professor having performed consulting services for local enterprises on her free time, just registered her newly created private company. The local offer of technical services is still low, but finding an expert coming from the same region has proved to be crucial.

Change management for Romanian SMEs "in transition"

As previously noted, one of the participating suppliers (the bakery) had managed to build a new production building within ten months. In fact, seven suppliers out of nine had made plans to move out of their actual production sites in the near future, within one or two years. Indeed, many had been starting business in an improvised space. Now that the demand for their products and services is rapidly rising, they urgently need to scale up operations to meet clients' orders and expectations. This is the reason why change management related to investments in the building could not be justified with these SMEs in transition. The good news is that this move will allow Romanian SMEs to embrace opportunities regarding their process and factories' energy efficiency.

Future Opportunities

The production space in which most SMEs currently operate is not only too small, but it is also extremely wasteful of energy. Even if rising energy prices are hampering the SMEs' profits, several reasons explain why building energy efficiency has not improved. The record for the construction of energy efficient production sites in Romania is very limited. Public awareness about the importance of sound building design to achieve greater operational efficiency is low. So is the know-how available to provide guidance about the construction of energy-efficient production sites.

Because of the existing relationships with the companies having participated in this first Romanian supply chain project, WEC is ready to follow up on their needs while further promoting the local expertise in energy efficiency. WEC is developing a follow up project that will allow Romanian SMEs constructing their new factories to address site-related operational and environmental issues while increasing their long term production and energy efficiency.

Conclusion

This project produced success for AFL Romania, its suppliers and the WEC. AFL Romania's Purchasing Department was delighted to strengthen the ties with its most critical suppliers. The project played the role of a filter for AFL's Purchasing Department to assess suppliers in terms of innovativeness, flexibility, reliability, ability to honour additional contracts, cost-effectiveness and EHS performance. This experience will be valuable to the company as it grows its operations and thus supply needs in the region.

Cleaner production and energy efficiency were new concepts to many of the SMEs participating in then project. This had never been part of a corporate strategy, at best a by-product of internal innovation. However, by linking EHS performance to cost-effectiveness, they soon embarked with a genuine interest in this journey.

WEC learned that its Greening the Supply Chain approach (see Figure 1) could also be a very useful tool once adapted to the Romanian context. WEC is now ready to build on this first experience and on the contacts made to implement further initiatives in Romania and other Eastern European countries.

Financially speaking, this project also was a good investment. For 37000 EUR invested by USAID, increased energy and process efficiency at the suppliers' sites have achieved the double of savings. Also, one has to consider that the greatest majority of these savings and the related reduced impact on the environment will remain in the years to come.

Annex 1: List of participating suppliers

FIRST NAME	LAST NAME	ENTERPRISE	POSITION	TYPE OF ACTIVITY	CITY
Rogean	Adrian	Filiera	Director	Metal construction	Oradea
Szilagyi	Arpad	Gutenberg	Director	Printing	Arad
Gyula	Bereczki	G&L	Technical director	Metal design & construction	Salonta
Margareta	Colceriu	Argis Prodimpex	Director	Cardboard	Arad
Claudiu	Popescu	Practic Serv	Director	Machinery producer	Otelu Rosu
Luminita	Olari	Minu Pan	Director	Bakery	Arad
Ion-Stefan	Effler	Contor	Environment & Quality Manager	Measurement equipment producer	Arad
Ion-Stefan	Hettman	Polybag	Sales manager	Plastic bags	Arad
Alina	Cristea	Alpin	Accountant	Worker's safety equipment producer	Arad

Annex 2: Action plan of Contor

**NUMELE COMPANIEI SC Contor
Group SA
PROIECTUL AFL-WEC ELA**

Revizuit: 02.05.2007
Redactat de Ioan Stefan Effler
Arsenie Barastean

PLAN DE ACTIUNE

NR.CRT.	ZONA	DESCRIERE	ACTIUNEA INTREPRINSA	COSTURI EUR	BENEFICII EUR	PERSOANA RESPONSABILA
1	Intretinere, mentenanta productie	Reducerea pierderilor prin scurgerile de aer comprimat	Detectarea scurgerilor de aer comprimat, verificarea pierderilor pe tronsoane de retea de aer comprimat	1.000	30.000	Faur Cornel
2	Intretinere, mentenanta productie	Reducere consum energetic la compresor aer comprimat	Separator de apa sa functioneze numai la functionarea compresorului	22	80.000	Faur cornel
3	Intretinere, mentenanta productie	Reducerea consumului energetic prin contacte electrice imperfecte	Verificarea si Strangerea contactelor imperfecte din tablourile electrice cu surubelnita dinamometrica	2.000	10.000	Faur cornel
4	Administrativ	Scaderea temperaturii incaperilor prin supraincalzire de la soare	Ventilatia acoperisului pt scaderea temperaturii la instalatiile de aer conditionat	2.500	9.000	Barastean Nicolae
5	Administrativ	Sistemele de aer conditionat sunt splitate	Analiza inlocuirii sistemului splitat cu unul central, cuprinzator	20.000	9.000	Barastean Nicolae
6	Productie	Reducerea consumului energetic prin iluminare economica	Masurare iluminarii locurilor de munca. Aplicare senzori de miscare, comutatoare separate	270	500	Faur Cornel
7	Productie	Economisire energie electrica si evitarea penalizarii pt varf de sarcina	Limitare temporara a functionarii cuptorului TNT, la varfurile de sarcina	33.000	20.000	Barastean Nicolae
8			Total:	58.792	158.500	

Annex 3: Action plan of Filiera

NUMELE COMPANIEI **FILIERA**
PROIECTUL AFL-WEC ELA

Revizuit:

PLAN DE ACTIUNE

Redactat de Adrian Rogean

nr	ZONA	DESCRIERE	ACTIUNEA INTREPRINSA	COSTURI RON	BENEFICII RON/AN	PERSOANA RESPONSABILA	DATA FINALI- ZARII	OBSERVATII
1	ATELIER	Sistem de iluminare	Consultare program	1.000,00	500,00	ADRIAN ROGEAN	15.01.2007	6 corpuri * 120 cm
2	ATELIER	Apa calda - panou solar	Deviz de lucru	1.800,00	500,00	ADRIAN ROGEAN	20. Mai 07	1 panou solar 1000* 2400
3	ATELIER	Sistem ventilatie	Faza de proiect	2.200,00	500,00	ADRIAN ROGEAN	15. Feb 08	3 ventilatoare + 2 filtre
			Total:	5.000,00	1.500,00			

Annex 4: Certificate for project completion



**Professional Certificate in Commemoration of your Participation in the
Alcoa Fujikura/WEC Greening the Supply Chain Initiative**

July 2006 – May 2007



*The initiative comprised a training on materials accounting as well as financial analysis techniques for process-related cleaner production and energy efficiency. Follow up site visits of the company's production facilities provided additional technical support.
The participant developed a tailored action plan and implemented changes that raised the company's competitiveness while reducing the energy, water, and raw material consumption per unit of output.*

**Alina Cristea
ALPIN SA**

A handwritten signature in black ink, appearing to read 'Gordon Weynand'.

Isabelle Sécher
Director, Global Capacity Building
World Environment Center

Gordon W. Weynand
Energy Team Leader
USAID/EGAT/I&E/Energy

A handwritten signature in black ink, appearing to read 'Barry Worthington'.

Barry Worthington
Executive Director
USEA

Andreea Hotăran
Purchasing Manager
Alcoa Fujikura Romania