



Closed-Looped Cycle Production in Ecuador

Final Narrative Report (Phase II)



Ministerio Coordinador
de **Producción, Empleo
y Competitividad**



Organization of
American States

August, 2013

Closed-Looped Cycle Production in Ecuador

Final Narrative Report (Phase II)

Under the framework of the Closed-Looped Cycle Production in the Americas Initiative



Ministerio Coordinador
de **Producción, Empleo
y Competitividad**

Ministry of Coordination of Production,
Employment and Competitiveness

Project Partners:



Organization of
American States



Centro Nacional de
Producción Más Limpia



C2C EXPO **LAB**
ENJOYING DEVELOPMENT

 **MBDC**



Organization of American States

Disclaimer

© (2013) General Secretariat of the Organization of American States (GS/OAS). Published by the Department of Sustainable Development of the Executive Secretariat for Integral Development (DSD/SEDI). All rights reserved under International and Pan-American Conventions. Any part of the contents may not be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or by any information storage or retrieval system without prior written permission of the publisher and the General Secretariat of the OAS (GS/OAS).

ISBN: 978-0-8270-6056-2

Department of Sustainable Development
Executive Secretariat for Integral Development
Organization of American States
Washington, D.C., August 2013

Translated and Edited by Mr. Jesus Eduardo Huayane

This publication has been prepared by Kevin de Cuba and Ruben Contreras-Lisperguer from the Department of Sustainable Development and DSD/OAS Consultant Walter Araya and is commissioned by the U.S. Department of State under the framework of the Energy and Climate Partnership of the Americas (ECPA). The opinions expressed in this report are solely the views of its authors and do not represent the opinions or official positions of any donor, the Government of Ecuador, the project partners, the Organization of American States, or its Member States.



“Closed-Looped Cycle Production in Ecuador”

Project Partners:



Organization of
American States



Centro Nacional de
Producción Más Limpia



C2C EXPO LAB
ENJOYING DEVELOPMENT



Within the framework of:



ECPA

Energy and Climate
Partnership of the Americas

Donor:



August, 2013



Addressed to:

His Excellency, Minister Richard Espinosa Guzmán
Ministry of Coordination of Production, Employment and
Competitiveness (MCPEC) Government of the Republic of
Ecuador

Presented by:

Ms. V. Sherry Tross,
Executive Secretary
Executive Secretariat for Integral Development (SEDI)
Organization of American States (OAS)

Mr. Cletus Springer
Director
Department of Sustainable Development (DSD)
Executive Secretariat for Integral Development (SEDI)
Organization of American States (OAS)

Mr. Mark Lambrides
Chief
Division of Energy and Climate Change Mitigation
Department of Sustainable Development (DSD)
Executive Secretariat for Integral Development
Organization of American States (OAS)

Authors:

Mr. Kevin de Cuba
Program Manager
Closed-Looped Cycle Production in the Americas
Department of Sustainable Development (DSD)
Executive Secretariat for Integral Development (SEDI)
Organization of American States (OAS)

Mr. Ruben Contreras-Lisperguer
Chief Technical Advisor
Closed-Looped Cycle Production in Americas
Department of Sustainable Development (DSD)
Executive Secretariat for Integral Development (SEDI)
Organization of American States (OAS)

Mr. Walter Araya
Project Coordinator (DSD Consultant)
Closed-Looped Cycle Production in Ecuador
Department of Sustainable Development (DSD)



Index

Acknowledgement	5
List of acronyms	7
Prologue	8
1. Introduction to the closed-looped cycle production program in Ecuador	9
2. What does closed-looped cycle production mean?	11
3. Description of the clcp program in ecuador	14
4. Objectives of phase ii (2011 – 2013)	18
5. Actions developed and activities implemented in phase II	19
5.1 <i>Development of work plan by the clcp program in ecuador (jul 2011 – nov 2011)</i>	19
5.2 <i>Priority objectives during phase ii (dec 2011 – mar 2013)</i>	24
5.3 <i>Implemented activities during phase ii (dec 2011 – mar 2013)</i>	25
5.4 <i>Granting of the cradle-to-cradle certification and definition of the steps to follow</i>	37
6. Monitoring and evaluation	42
7. Conclusions and recommendations	48
8. References	52
Annex A: Ecuador production sector diagnostic report	
Annex B: Copies of the correspondence between the OAS and the MCPEC	
Annex C: Description of the Work Plan of the CLCP Program in Ecuador 2011-2015	



Acknowledgement

The Executive Secretariat for Integral Development of the Organization of American States would like to thank his Excellency, Richard Espinosa Guzmán, Coordination Minister of Production, Employment and Competitiveness (MCPEC) and former Minister Santiago León Abad from the Government of Ecuador for his trust, commitment and support in the implementation of this innovative project in Ecuador. A special thanks to Mrs. Marisol Nieto from the Permanent Mission of Ecuador to the OAS for facilitating the interactions with the Government of Ecuador.

Thanks are expressed to representatives from the National Secretariat of Planning and Development (SENPLADES), the Ministry of Industries and Productivity (MIPRO), the Ministry of Electricity and Renewable Energy (MEER), the Ministry of the Environment (MAE), the Chamber of Industry and Productivity (CIP) and a large number of experts and professionals from different fields, including the private sector, the civil society, academics and public officials of the Government of Ecuador who contributed to this project. Thank you to everyone who provided comments, feedback and continuous dialogue concerning the Closed-Looped Cycle Production issue.

A special thanks to Mr. Millan Ludeña from the MCPEC for his role as the main focal point for the Ministry and his continuous commitment towards the successful implementation of the National Closed-Looped Cycle Production Program in Ecuador. Thanks to our colleagues from the Department of Sustainable Development, in particular to Charlene Solozano (OAS) and

Rosangela Arbieta (OAS) for their unconditional support during the project.

Special gratitude to the colleagues from the project consortium, including Mr. Bjorn Sanders, Executive Director of the Cradle-to-Cradle Expo Laboratory (C2C Expo Lab) in the Netherlands; Mr. Howie Fendley, Business Development Director of McDonough Braungart Design Chemistry (MBDC) in the USA; Mr. Carlos Arango, Executive Director of the National Center of Cleaner Production of Colombia (CNPML) and corresponding colleagues and/or team.

Thanks to our colleagues from Ecuador, Mr. Carlos Jácome (OAS Consultant), Mr. Patricio Gallardo (OAS Consultant) and Mr. Mario Brito (OAS Consultant) for their friendship, and technical and professional contributions. Thanks also to Mr. Roy Vercoulen, Vice President of the Cradle-to-Cradle Products Innovation Institute (C2C-PII) in Europe, for his collaboration during Phase I and for creating opportunities to work with experts in the topic of Cradle-to-Cradle. Special thanks to Mr. Ricardo Diaz Martin and his colleagues of the Environmental Engineering and Technologies for Sustainable Development Research Group of the San Pablo CEU University of Madrid, Spain, for preparing and executing the training courses on life cycle, production in closed-looped cycle and other related topics.

Thanks to the Company Batery Alimentos for being the host for piloting the first Cradle-to-Cradle basic certification of its products for Latin America and the Caribbean. Special thanks to Mr. Gabriel



Lemarie, Manager, and Mr. Andres Vázquez, Business Manager, for their vision and contribution to the process. Many thanks to all the suppliers involved in the supply chain of Batery Alimentos, including Centro Grafico and Neyplex who contributed and shared valuable information, which proved to be a key factor in achieving the goal of certificating the first packaging products in Latin America and the Caribbean at the Cradle-to-Cradle level.

Lastly, this project would not have been possible without the support of the U.S Government through its Department of State (US/DOS) Bureau of Western Hemispheric Affairs (WHA) under the framework of the Energy and Climate Partnership of the Americas (ECPA). The authors wish to thank Mr. Andrew Griffin (US/DOS) for his understanding, contribution and tireless efforts in obtaining the necessary support to enable the successful execution of this project.



List of Acronyms

BPM	Good Manufacturing Practices
CNPL	National Cleaner Production Center (Centro Nacional de Producción Más Limpia de Colombia)
C2C-PII	Cradle to Cradle Products Innovation Institute
EPEA	Environmental Protection Encouragement Agency
NIAP	National Autonomous Institute of Agricultural Research (Instituto Nacional Autónomo de Investigaciones Agropecuarias)
MBDC	McDonough Braungart Design Chemistry
MCPEC	Ministry of Coordination of Production, Employment and Competitiveness (Ministerio de Coordinación de la Producción, Empleo y Competitividad)
MIPRO	Ministry of Industries and Productivity of Ecuador (Ministerio de Industrias y Productividad del Ecuador)
OEA/DDS	Organization of American States, Department of Sustainable Development
PCC	Closed-Looped Cycle Production
SENPLADES	National Secretariat for Planning and Development (Secretaría Nacional de Planificación y Desarrollo)
10 YFP on CPS	10 Year Framework Program on Sustainable Consumption and Production



Prologue

Ing. Kevin de Cuba, MSc.
Program Manager
Closed-Looped Cycle Production in the Americas
Department of Sustainable Development
Organization of American States



Producción en Ciclo Cerrado (Closed-Looped Cycle Production) is the term in Spanish we chose to describe the sustainable product manufacturing process that is based on the Cradle-to-Cradle design philosophy. When we started out in 2010, the term Cradle-to-Cradle was still the intellectual property of McDonough Braungart Design Chemistry (MBDC) and since there had been few activities in this field in Latin America, the terminology in Spanish for Cradle-to-Cradle design did not exist.

After reading the book titled "*Cradle to Cradle: Re-making the Way We Make Things*" by William McDonough and Michael Braungart, published in 2002, I had my Eureka moment. I realized that many of the professionals who work on sustainable development issues, have been trained to solve environmental and socio-economic problems caused by others, and are focusing more on mitigating the effects and improving the conditions rather than just thinking about how to prevent the emergence of environmental and socio-economic problems.

The Cradle-to-Cradle design philosophy opened my eyes and made me see that if someone manufactures something according to the *Cradle-to-Cradle* design principles; it is possible to eliminate the notion of waste from the beginning. In other words, the starting point must be to design and manufacture products that create an added value to the environment and contributes to the consumer's health and meets the human needs.

With my colleagues and friends, Rubén Contreras-Lisperquer and Walter Araya, we decided to assume the difficult task of educating ourselves in the field of *Cradle-to-Cradle* design and on raising funds and establishing strategic alliances to try to convince more people about the benefits and the feasibility of the Cradle-to-Cradle design philosophy for many of the productive activities in the Americas as a method used to stimulate the innovative design, improve the financial and socio-environmental performance and competitiveness, especially in the small and medium-sized enterprises (SMEs). This report summarizes the activities made in Ecuador between 2010 and 2013 with the support of a group of enthusiastic professionals, with whom we are pleased to work as partners in the consortium.



1.

Introduction to the Closed-Looped Cycle Production Program in Ecuador

The Closed-Looped Cycle Production (CLCP) program in Ecuador responds to a request issued from the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC) of the Government of Ecuador in 2010 to the Department of Sustainable Development of the Executive Secretariat for Integral Development (SEDI) of the Organization of American States (OAS). This request focused on making the productive sector of Ecuador more competitive by improving the use of energy efficiently and by using fewer resources; in this way, leading to less waste material and environmental pollution.

During Phase I, the OAS and the MCPEC developed a work plan with the goal of designing and preparing a proposal on the issue of Closed-Looped Cycle Production (CLCP). This CLCP concept was introduced by engineers Ruben Contreras-Lisperquer and Kevin de Cuba as an innovative business development tool to help improve energy efficiency and the environmental performance in the industrial sector and to increase the productivity, competitiveness and sustainability of the companies involved. The CLCP concept is based on the Cradle-to-Cradle innovative design paradigm introduced in the book "Cradle to Cradle: Remaking The Way We Make Things" published by McDonough and Braungart (2002) using a biomimetic approach for the design of products and systems.

This work plan was financed by the Special Multilateral Fund of the Inter-American Council for Integral Development (FEMCIDI) in order to gain access to efficient technical support that, at the same time, could help facilitate the access to financing from cooperation agencies and international financial institutions for the further development of the CLCP concept.

The activities and results included: (1) the preparation of a Diagnostic Report of the Ecuadorian Production Sector for a better understanding of the conditions and opportunities in the country in order to design and implement a proposal regarding Closed-Looped Cycle Production; and (2) identify the donors / financial mechanisms to secure future funding.

As a result of Phase I, the OAS-MCPEC team identified the need to design a program at a national level involving different activities, intended to eliminate the technical and legal gaps found, and to face the challenges identified and described in the Diagnostic Report of the Ecuadorian Production Sector (**see Annex A**).



In this context, the CLCP program in Ecuador was executed with the active participation of the OAS and MCPEC staff, whose general objective is to introduce and apply the Closed-Looped Cycle Production (CLCP) philosophy focused on the design of Closed-Looped Cycle Products in the productive sector of Ecuador; and to show the positive effects of this method of stimulating innovation and improving the financial and socio-environmental performance as well as competitiveness, especially in small and medium-sized enterprises (SMEs).

The program included a strategy defined by four components: (1) Capacity-building; (2) Cooperation and Dialogue; (3) Policy development; and (4) Business development.

This final report reflects the activities implemented and the results obtained during Phase II (2011-2013) of the CLCP program in Ecuador financed by the U.S. Department of State under the framework of the Energy and Climate Partnership of the Americas (ECPA) and approved by the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC). For copies of the correspondence between the OAS and the MCPEC, **(see Annex B)**.



2.

What does Closed-Looped Cycle Production mean?

The concept of a Closed-Looped Cycle Production (CLCP) is based on the Cradle-to-Cradle innovative design concept as a paradigm of manufacturing (see the text box **Cradle to Cradle design** on the next page). This new paradigm means asking a basic question: "Am I doing the right thing?"

The CLCP concept is based on the desire to move away from the current linear process of producing products by which, after extracting the resources, manufacturing the products, consuming or using them, they are finally disposed of in a landfill. The difference between this linear process and a process in "closed-looped cycle" is a system in which resources are kept in continuous use, since they are never eliminated as waste. The concept has been, perhaps, more developed in the context of "industrial ecology", including the exchange of 'waste' from one company to another, where they consider waste as useful raw materials.

An important criterion to optimize the use and/or exchange of "waste" between companies is to ensure that the design of the product is made in a way to ensure the continuous use of resources or components included in the product. This approach was developed in the context of sustainable product design where for example, Edwin Datchefski of *Biothinking International* suggests three principles to judge a design as sustainable.

Products should be:

- Cyclic – the products should be made from biodegradable materials or minerals which are continuously cycled in a closed loop;
- Solar – the products should use solar energy or other forms of renewable energy that are cyclic and safe during manufacture; and
- Safe – no emissions to the air, water, earth or space that are toxic.

These principles are based on what we observe in nature, which leads to a very different approach known as "**eco-efficacy**": a theme developed by McDonough and Braungart. This new concept is different to the "**eco-efficiency**" term since the latter tries to minimize and reduce the environmental impacts of products and not to eliminate that impact. "**Eco-efficacy**" captures efforts to maximize industry's capacity to truly support the natural and human world around it, eliminating, from the beginning, the impacts to the environment while we continue meeting human needs.

1. <http://www.ecomii.com/ecopedia/cradle-to-cradle>

2. <http://www.gdrc.org/sustdev/concepts/04-e-effi.html>

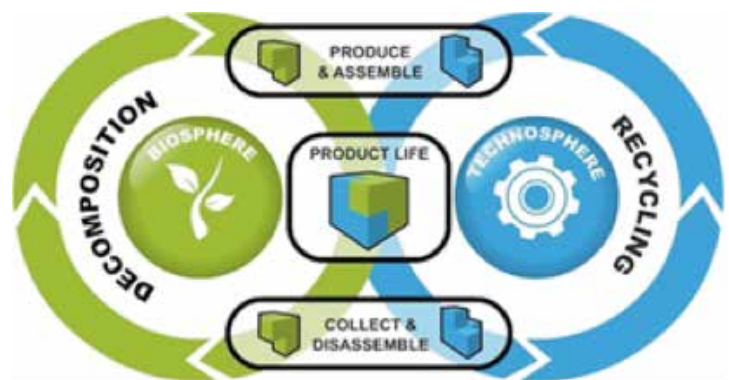


Figure 1 C2C Product Cycle ³

3. <http://liberstilo.com/wp-content/uploads/2012/04/C2C-scheme.jpg>



Something fundamental in the **Closed-Looped Cycle Production** methodology is the sorting and separation of materials in order to discard those that are toxic or harm the environment. Figure 1 shows the cycles that define this concept; these are the biological and the technical cycles. The biological cycle consists of "biological nutrients" that can go back to the environment and become nutrients in nature since they are non-toxic and biodegradable. In the "technical cycle", there are "technical nutrients" such as metals and certain polymers that are distributed in closed-looped cycles of materials or fluids. Harmful materials and products are eliminated. It is necessary to point out that the products resulting from this approach are sophisticated and functional. The approach is not against progress or technology; however, the aim is to develop products that meet a wide range of design criteria, including material health considerations among other.

The Cradle-to-Cradle design (also known as C2C or the regenerative design) is a biomimetic approach for product and system designs. This is modeling the human industry based on nature processes considering materials as nutrients that circulate in healthy and safe metabolisms. The way products have been manufactured in the last century, has generated severe impacts in nature. For this reason, it is important that the industry protects and helps to enrich the ecosystems and not the other way around. In this sense, the biologic metabolism of nature uses all waste as material to continue with the production of organic matter. Additionally, the biological life cycle in a closed-looped cycle seeks to copy that same quality nature has, while the technical cycle seeks to re-cycle complex materials (e.g. metals, plastics). This is only possible when the products are designed with these cycles in mind, and the idea of reusing what we can consider organic and technical nutrients.

In short, it is a comprehensive economic, industrial and social framework that seeks to create systems that are not only efficient, but also, essentially, zero waste. The model is not limited to the industrial design and manufacturing, it can be applied to many aspects of human civilization, as in urban environments, buildings, the economy and social systems.

The "Cradle to Cradle" terminology is a trademark of the McDonough Braungart Design Chemistry (MBDC) consulting firm. The "Cradle to Cradle" products certification started as a proprietary system; however, in 2012 MBDC granted the certification rights to an independent non-profit organization called "Cradle-to-Cradle Products Innovation Institute" (C2C-PII). Independence, open-mindedness and transparency are the main objectives of the Institute for certification protocols. The "Cradle to Cradle" phrase was defined by Walter R. Stahel in the 70's. The current model is based on a "life cycle development" system started by Michael Braungart and colleagues at the Environmental Protection Encouragement Agency (EPEA) in the 90's and explored through the publication of a technical framework for the life cycle assessment.

In 2002, Braungart and William McDonough published a book called "Cradle to Cradle: Remaking The Way We Make Things", a declaration in favor of the Cradle-to-Cradle design giving specific details on how to achieve the model. The model has been implemented by a number of companies, organizations and governments around the world, especially in the European Union, China and the United States. Cradle to Cradle has also been the subject of numerous documentaries, including the acclaimed documentary "Waste".⁴

⁴ https://en.wikipedia.org/wiki/Cradle-to-cradle_design (retrieved July, 2013)



Sustainable Production and Consumption

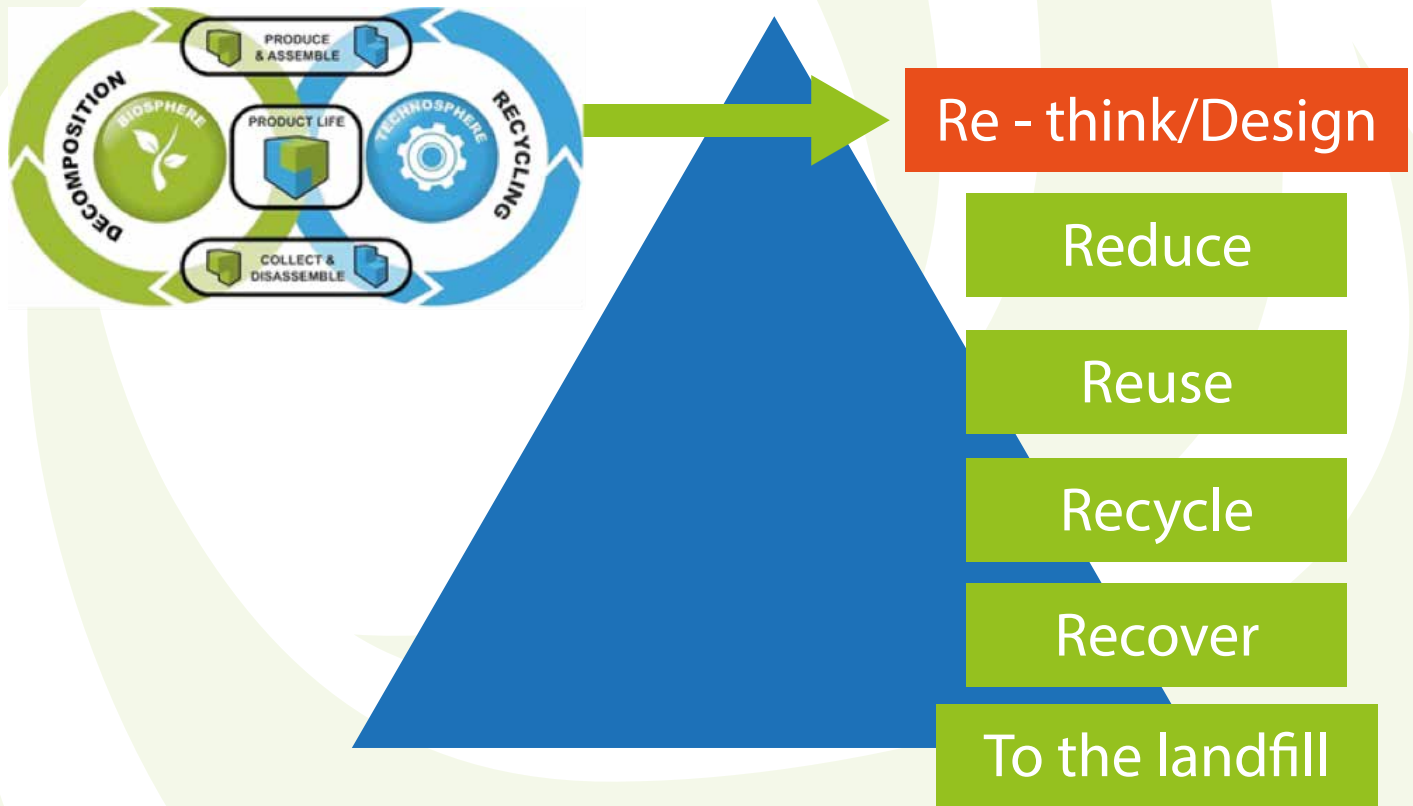


Figure 2: Paradigm shift to sustainable production and design

Currently, almost all of the products that are no longer useful end up in a landfill. This paradigm shift intends to change the way of thinking so that the material that is disposed off in a landfill, will be recovered in time in a closed-looped cycle as a biological and/or technical nutrient, to maximize the use of resources and not to be filled up with garbage; a product of our current consumer society. First, we have to re-think the way we do things in order to eliminate toxic materials from the industrial system. These concepts presented through a closed-looped cycle are translated into a benefit for the local industry, i.e. the SMEs, and applied on a global scale, thus transforming the way in which the economy uses the resources and facilitates the development of circular economies.



3.

Description of the CLCP Program in Ecuador

Objective: To increase energy efficiency, productivity, competitiveness and sustainability of small- and medium-sized enterprises (SMEs) from the productive sector of Ecuador through the application of the closed-looped cycle production philosophy.

C2C is a critical and innovative component within the closed-looped cycle production philosophy and its introduction and application in the productive sector of Ecuador may help to generate innovative design and improve financial and social-environmental performance and competitiveness especially in small- and medium-sized enterprises (SMEs).

Program strategy:

The program strategy has been designed in three phases and is defined by four main components of the program.

Phase I (Preparation) – Completed:

This phase included the following activities: (i) analysis and preparation of a Diagnosis of the Ecuadorian Production Sector to identify and define the scope of the closed looped cycle production in Ecuador; and (ii) identification of financial sources for the application of the CLCP in Ecuador.

⁵ Based on the SME definition in Ecuador

Phase II (Application) - Completed in March 2013:

The CLCP program in Ecuador was designed and implemented, and included the following objectives: (i) facilitate the demonstration of CLCP in Ecuador, for which a pilot project has been implemented in the country and to certify a C2C product (first in Latin America); (ii) institutional arrangements for its execution; (iii) the building of capacities at a national level on the topic of closed looped cycle production; and (iv) the dissemination of lessons learned in third countries.

Key success factor for Phase II:

The Diagnosis of the Production Sector in Ecuador, prepared in Phase I, served as the baseline study of the current composition of the major public policies that affects the production sector within the Ecuadorian economy. In addition, it described the macro socio-economic and environmental performance of the different productive sub-sectors based on a set of previously determined criteria. These criteria are established to differentiate between the sub-sectors and to identify the sub-sector(s) considered as the most appropriate to introduce and apply the closed-looped cycle production philosophy in Ecuador.

Phase III (Diffusion) - To begin in 2013:

Incorporate the lessons learned into new pilot projects in other sub-sectors in Ecuador, and through the Government, facilitate the creation of private – public partnerships and diffusion of knowledge by “coining” the insertion of the production method in a closed-looped cycle in the manufacturing industry of Ecuador.

Components of the CLCP Program in Ecuador (for Phase II and III)

Component 1 – Capacity Building

Goal: Creating or improving the capacity of the Government and public/private companies, especially small and medium-sized enterprises in priority subsectors to encourage the creation and implementation of pilot projects on the subject of design and production of products based on the closed-looped cycle model (Cradle-to-Cradle design) in the Ecuadorian production sector.



The program will promote the introduction, integration, and the Ecuadorian capacity in relation to the C2C methodology through the existing research and the academic programs, where the training capacity is available, and will build on existing initiatives and avoid duplication of efforts. In this way, the creation of capacities in C2C and other innovative design and production methods can be accelerated through sustainable consumption and production initiatives that are being implemented in Ecuador.

Component 2 – Cooperation and dialogue

Goal: Establishing an institutional framework of public and private stakeholders to facilitate cooperation, dialogue and appropriate design and implementation of development projects based on the closed-looped cycle model (Cradle-to-Cradle design) in the production sector of Ecuador.

Another important component of this program is to establish or strengthen a discussion forum, share knowledge and networking among public and private sectors. For a program to succeed, all the stakeholders must be able to interact among themselves and with others, in particular, with Government representatives in order to ensure that knowledge is shared and that C2C initiatives are aligned with the government policy and the relevant regulations. At this point, the presence of appropriate government departments within the public-private dialogue process is crucial for the success of this process.

Component 3 – Policy development

Goal: Establishing an appropriate regulatory and policy framework that addresses the market barriers in order to encourage and facilitate the design and the production and introduction of products based on the closed-looped cycle model (Cradle-to-Cradle design) in Ecuador.

The governmental role on market conditioning to encourage and facilitate the application of initiatives in C2C in the production sector is critical and, along with supporting the market, they need

the establishment of an appropriate regulatory and policy framework.

Component 4 – Business development (Productivity and performance)

Goal: Show and/or improve the profit margin and the business sustainability (including those of small and medium-sized enterprises) in the production sector by applying the production methodology in a closed - looped cycle.

A crucial part of the program is to obtain and keep the interest and knowledge of the C2C methodology within the Ecuadorian industry in order to assess the feasibility of the production application, according to the C2C methodology and at the same time generate and increase the business profits.

In addition, it is essential to design an appropriate and useful business exchange platform with alliances of existing businesses or associations (such as chambers of commerce) to facilitate the exchange of good practices. The integration between the continuous innovation and the new business development efforts is very important, so companies can see continuity between the activities of a cleaner production towards a C2C-based production, so that it is not perceived as a non-profitable additional burden.

The following figure includes a diagram which represents the relations between the different program components and the chronological order of Phases I, II and III of the program.



Phase I → **Phase II** → **Phase III** →

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 1. Capacity development | 1. Capacity development | 1. Capacity development |
| 2. Dialogue and cooperation | 2. Dialogue and cooperation | 2. Dialogue and cooperation |
| 3. Policies development | 3. Policies development | 3. Policies development |
| 4. Business development | 4. Business development | 4. Business development |




As a result:

- | | | |
|---|--|--|
| Diagnosis of the production sector of Ecuador | Design and start implementation of Closed looped cycle production program in Ecuador | Launching public- private business initiatives in C2C |
| Evaluating donors and assuring funds for phase II | Conceptual Design and implementation of a pilot C2C program in Ecuador | Sharing experience and good practices in C2C design and application |
| | Assure funds for Phase II | Complete implementation of the Closed-Looped Cycle Production Program in Ecuador |

Objective: Introduce and show the feasibility and application of the C2C design method (in a closed looped cycle) in the productive sector of Ecuador as an innovative business development tool to increase the productivity, competitiveness and sustainability of enterprises, especially, small = and medium = sized enterprises.

Image 3: Diagram of the CLCP program in Ecuador strategic map



A close-up photograph of a yellow flower, likely a daisy, with its petals and center clearly visible. The background is blurred. A solid blue rectangular overlay covers the bottom half of the image, containing white text.

Did you know that there are just **10,000** products in the world with C2C certification and/or inspired with the same sustainable design principles?



4.

Objectives of Phase II (2011 – 2013)

For the execution of Phase II, funds from the U.S. Department of State were secured; this initiative is incorporated as part of the umbrella of the Energy and Climate Partnership of the Americas (ECPA).

The main objectives of the Phase II included:

- (1) Present the results of the Phase I during a mission to Ecuador that included individual meetings with different relevant ministries (MCPEC, MAE, MEER, MIPRO, etc.) and a multi-sectoral meeting where all the relevant actors in Ecuador (including NGOs, the Academia and the Private Sector) were invited and participated;
- (2) Initiate an awareness raising and training process about Production in a Closed-Looped Cycle and the C2C concept in Ecuador;
- (3) Develop and assure the approval of a Work Plan to implement the National Program on Closed-looped Cycle Production in Ecuador; and
- (4) Initiate the implementation of this Program based on the Work Plan with the funds available.



For further information about available C2C products, visit: <http://www.c2c-centre.com/>



5.

Actions Developed and Activities Implemented in Phase II

The activities implemented and described in this report are presented in two sub-sections: (1) the description of activities that were carried out during the period **July - November 2011** including the activities relating to objectives 1-3 as described in section 4. The primary objective is to develop and approve a Work Plan to implement the *CLCP program in Ecuador 2011-2015*; and (2) Upon approval of the Work Plan and availability of funds, specific objectives were developed and activities implemented during the period **December 2011 - March 2013**.

5.1 Development of Work Plan by the CLCP Program in Ecuador (Jul 2011 – Nov 2011)

Step 1:

During the first months of Phase II, from July to August 2011, a consortium between the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC), the C2C Expo Lab of the Netherlands, the National Centre of Cleaner Production of Colombia (CNPL), and the Department of Sustainable Development of the Organization of American States (OAS/DDS) was established.

Given the C2C Expo Lab's reputation as a well renowned center of excellence in the topic of Cradle-to-Cradle (C2C) design and given its access to information, experts and best practices in the C2C subject of projects implemented in Europe a partnership was created .

Visit: www.c2cexpolab.eu



National Centre of Cleaner Production of Colombia

The National Centre of Cleaner Production of Colombia (CNPL) has been in operation for 14 years and has vital experience in the field of cleaner production. During the past few years, it has carried out several projects and activities in Ecuador and in other countries in the Americas. The CNPL is a center with technical capability to assist in the implementation of the activities in the topic of closed-looped cycle production.

Visit: www.cnpl.org



The CNPL is part of the Latin American Network of centers of cleaner production (see: <http://www.produccionmaslimpia-la.net/>). This Network represents 16 centers in the region whose main objective is to facilitate the creation and dissemination of innovative production solutions and technologies to ensure sustainable development in the region.

The CNPL recognizes the Cradle-to-Cradle design method as a new, pragmatic and innovative instrument to help improve the profile and sustainability of SMEs. They were incorporated as a strategic partner to share their experiences and capacities on the topics of cleaner production, which include, for example, life cycle analysis, get training on the Cradle-to-Cradle product design to become one of the first centers in the region with experience in this field of study thus adding this area of expertise to its portfolio of services.

Step 2:

During the period August - November 2011 (Phase II), the consortium started the dialogue exchange with the different stakeholders and partners in Ecuador; included was a mission to meet with different relevant ministries (MCPEC, MAE, MEER, MIPRO, etc.), a multi-sectoral meeting with NGOs, the Academia and the Private Sector, a separate meeting with possible contributors (UNIDO, USAID, etc.) and donors (US Embassy, Netherlands Embassy, etc.). The MCPEC received assistance for the development of a Work Plan to implement the Program.

Step 3:

The consortium, under MCPEC's guidance, organized a mission to Quito, Ecuador, which took place in November 2011, to: (1) introduce the consortium to different actors and key partners in the production sector in Ecuador and explain the objectives of the Closed-looped Cycle Production project and the details of the concept of C2C design and production; (2) present the results of the Diagnosis of the production sector in Ecuador during a multi-sectoral meeting and a meeting with international organizations and possible donors that operate in Ecuador; (3) organize a workshop to prepare the Work Plan to implement the National Program of Closed-Looped Cycle Production in Ecuador 2011-2015 (CLCP in Ecuador 2011-2015).





Figure 4: Lecture offered by Walter Araya (OAS/DSD) (left) and lecture offered by Carlos Jácome (OAS-Ecuador) (right) during the multisectoral meeting (Source: OAS)



Figure 5: Lecture offered by Roy Vercoulen (C2C Expo Lab) and Ruben Contreras (OAS/DSD) during the multisectoral meeting (Source: OAS)



During the multi-sectoral meeting, all the relevant ministries were requested to present and/or share a list of prioritized subsectors for each ministry to help the Project Team or Consortium in selecting the subsector to implement the first activities and launch the pilot project of C2C certification.

Another key result of the multi-sectoral meeting was information sharing between different governments and business organizations on the need to create a political and institutional framework with a scope in cleaner production solutions. The shared proposals included the following:

- **MIPRO/MAE**, considered performing actions through a future Center for Production and Sustainable Consumption to promote clean development in the industry. Currently, through these ministries, there are initiatives aimed at SMEs together with the business platform as a key partner.
- The Academic Sector along with the SMEs Observatory will serve as an analysis information center for the Ecuadorian productive sector.
- Business chambers will strengthen a similar institution to facilitate the management of clean development in the industry.
- **MIPRO, MEER, MAE, MCPEC** and other public-private organizations could become part of a possible Board of Directors of a future institution aimed at providing sustainability solutions in the Ecuadorian industry, as an outcome of the CLCP initiative and as a capacity development platform at a local level.

Having this framework as a reference, there is a clear opportunity to participate and to validate one or more pilots focused on research and development solutions applied along with the main partners of the CLCP-Ecuador project. This process leads to the harmonization and integration of the project in the current policy instruments, taking a framework for the continuous application of cleaner and Cradle to Cradle production as the base, which are currently referenced in the different national planning and policy instruments.

There is an inter-institutional consensus for the development of a knowledge management program (research and development), focused on the production and industry for the sustainable use of goods and services. The following instruments are included in the reference framework:

- **National Plan for Good Living**
- **Production Code (incentives and regulations)**
- **Code and Agenda for the Productive Transformation**
- **National Plan of Science, Technology, Innovation and Knowledge.**

In conclusion the CLCP – Ecuador components and work plan should be reviewed to assess the elements that would facilitate the integration of action lines, with different programs currently in progress, together with contributors, potential allies and partners in order to strengthen the process and avoid duplicating efforts. This will be achieved by working together within an impact monitoring and assessment framework, to promote the strength, transparency and execution of the various phases of the project. To successfully implement Phase II and III of the CLCP program in Ecuador and to create and strengthen local capacity all available resources would need to be used.





Figure 6: Meeting with Mr. Ballén Mancero, Deputy Minister and Undersecretary of Commerce and Investments, Production and Industry Ministry (MIPRO) staff and the CLCP Ecuador project team in the MIPRO offices (Source: OAS)

Based on the exchange with each stakeholder/partner and the data collected during the mission, the Work Plan preparation process was initiated for the implementation of the CLCP Program in Ecuador.



Figure 7: From left to right: Mr. Carlos Jácome (OAS -Ecuador), Mr. Patricio Gallardo (OAS-Ecuador), Mr. Kevin de Cuba (OAS / DSD), Mr. Roy Vercoulen (C2C Expo Lab), Mrs. Adriana Alzate (CNPL), Mr. Rubén Contreras (OAS / DSD), Mr. Walter Araya (OAS) and Mr. Carlos Arango (CNPL)

During the workshop, a “route map” was discussed together with the ministerial authorities of Ecuador. Where establishing the C2C protocol as a reference framework to facilitate a productive transformation for sustainable businesses was considered critical. With focus on a range of products meant to meet the needs of the local market and that may be exportable while taking in mind the country's current political agenda and cultural makeup for integrating sustainability into a green economy.

Step 4:

During the mission, the Work Plan was finished and delivered to the MCPEC to be revised and to secure its approval for deployment. **See Annex C**



5.2 Priority objectives during Phase II (Dec 2011 – Mar 2013)

While acknowledging that the available funds for Phase II (implementation of the Work Plan) were not enough to cover all the activities set out in the Work Plan for the implementation of the 2011-2015 CLCP Program in Ecuador, the MCPEC along with the relevant partners decided to focus on specific priority objectives during Phase II for the December 2011 – March 2013 period, that were in line with the Program's main components.

To implement the Work Plan of the National Closed-Looped Cycle Production Program the MCPEC, OAS/DSD and partners, identified the following objectives and activities that were in line with the Program's components.

Component 1 - Training:

a. Design and execute a customized training course in Closed-Looped Cycle Production (including methodologies and concepts such as Life Cycle Analysis, C2C design methodology) for key personnel of partner institutions and project counterparts (in line with component #1 of the CLCP Program in Ecuador).

Component 2 – Dialogue and Cooperation:

a. Continue to facilitate multi-ministerial dialogue and create an inter-institutional platform to define priority sub-sectors for the Government of Ecuador to justify the launch of a C2C product certification pilot project in the defined sub-sectors. The MCPEC, as the coordinating ministry, will take the lead to facilitate future relations between the different ministries relevant to the Closed-Looped Cycle Production program.

b. Obtain political support and ensure the MCPEC/MIPRO leadership together with the other

stakeholders in each sector. Therefore, it was essential to prepare a draft agreement (memorandum of understanding) between the different partners of the project, in order to: (1) define the roles and responsibilities of each party or partner, (2) ensure the confirmation, appropriation and extension of the 2011-2015 PPC Program in Ecuador. This objective is in line with component 2 of the Program.

Component 4 - Business Development (productivity and performance)

a. Prepare an invitation to bring together the SMEs which operate in the priority sub-sector in order to participate in the project and to develop the criteria to select an Ecuadorian SME as a possible host for the pilot project, together with the guidance of the C2C Expo-Lab and Colombia's National Center for Cleaner Production.

b. Carry out a technical visit and quick analysis of the CLCP /C2C "basic/silver" certification potential for a pre-selected SME product of the priority sub-sector. The reason for this technical visit to the facilities of the company is to inspect conditions and required documentation and to evaluate the compliance with the requirements to obtain the CLCP/C2C "basic/silver" certification of a product.

c. Through a pilot initiative in a SME, ensure the first CLCP/C2C certification of a product in the priority sub-sector.



5.3 Implemented activities during Phase II (Dec 2011 – Mar 2013)

Step 1:

Facilitate a multi-ministerial dialogue to define the priority sub-sectors for the Government of Ecuador (related to component 2)

After the November 2011 mission, follow-up with each ministry to identify and confirm the common sub-sectors and to determine the sub-sector prioritized by most of the ministries was undertaken. The “food and beverages” sub-sector was selected, together with the ministries and business chambers, to conduct the pilot in a SME focused on product packaging.

Step 2:

Company’s selection criteria, CLCP Pilot Project (related to component 4)

In January 2012, having selected the Food and Beverage sub-sector by MCPEC, MIPRO, MAE and partners, the CLCP-Ecuador team gathered to exchange inputs, offer feedback, adjust and redefine the path across the phases of the Program. Similarly, selection criteria were designed to identify and select a company from the proposed sub-sector to be the host of the pilot project to introduce the Closed-Looped Cycle Production concept and prove the feasibility of certifying a C2C Ecuadorian product.

The following criteria were developed by the project team in consultation with the C2C⁶ Expo Lab and Colombia's National Center for Cleaner Production to consider the requirements to ensure the C2C certification for the selection of the potential companies as candidates to the CLCP Pilot Project.

Table1. Summary and Description of the criteria to select a host SME the C2C certification Pilot Project

Criterion	Description
1	The product must comply with the demands of the subsector and government institutions such as the MCPEC, MIPRO, MAE and MEER.
2	The product, production process and the packaging must be certified by the corresponding entities which regulate the product manufacturing and packaging in Ecuador.
3	The most convenient products must contain a small amount of nutrients, preferably with a maximum of 5 materials (nutrients) at a 100-ppm level. (A quick verification list might be created to evaluate the process. It is also necessary to define who will be in charge of monitoring the process, for example, the chambers, CNPL, etc.).
4	The candidate company must prove it has already taken initiatives in sustainability practices and better social and environmental performance, such as the international social responsibility guides and certifications: CSR, SA 8000 & ISO 26000. Furthermore, the company must prove it goes beyond the legislation and holds management systems and certified processes such as ISO, LEED, FSC, SA 8000, etc.



- 5 The production systems must use new machinery or machinery in good conditions, not obsolete. In addition, the companies must have a technology transformation or improvement plan in place. (For example, energy consumption indicators, documents indicating machinery depreciation, whether the production process uses heavy machinery or not).
- 6 The company must be small or medium; this is defined by Ecuadorian standards (as suggested in CLCP diagnosis of Phase I).
- 7 The company must have a manager with the technical capacity to assume the project responsibilities and also an entrepreneur convinced that CLCP will facilitate a cleaner production with a great social and environmental impact.
- 8 The company has identified all its suppliers in order to work together and minimize the social and environmental impacts through the CLCP process.
- 9 The product must be directly associated with Ecuador (everybody knows it is Ecuadorian) to maximize the impact of this new production philosophy (for example, expressed (X% of) the suppliers of the main nutrients need to be local/national).
- 10 The company is willing to share information about the PPC Project development process, so other companies can learn from this.
- 11 The company must be located in an area with high technology potential and renewable energy. The area must show progress or initiatives in the topic of renewable energy (for instance, implementation of an energy management system, energetic efficiency investment, reduction of water consumption and other supplies related to the infrastructure maintenance and operation).

SME selection (related to component 4)

After creating the selection criteria, , an invitation was sent to the SMEs within the Food and Beverage sub-sector, and with participation of the Quito Chamber of Commerce and the Pichincha Small- and Medium-Sized Enterprises Chamber of Commerce (CAPEIPI), from January –March 2012, inviting them to participate in the evaluation and selection process in accordance with the selection criteria. With the joint cooperation of the MCPEC, MIPRO and business chambers, five SMEs were identified and interviewed by the project team with a possibility of extending future actions to start a product certification in a pilot phase, which will positively impact the supply chain.

During this process, many companies that comply with the selection criteria were identified and brought over including:

⁶ http://c2ccertified.org/product_certification



- **Pacari:** this organization produces a line of high quality organic chocolate made entirely in Ecuador.
- **Prodel, S.A.:** an organization working directly with USAID comprising of forty SMEs that manufacture and produce chocolate with organic cocoa. This is a key sector for the Ecuadorian economy with a potential to share a joint venture with the CLCP-Ecuador (e.g. Kallari organic chocolate).
- **Nutrivital ACP:** manufactures soy milk and granola products.
- **Epacem, S.A:** business group that processes African palm and manufactures various sub-products.
- **Batery Alimentos, S.A:** manufactures granola energy bars.



The companies were asked to provide a brief business profile including general characteristics, such as product and service lines, type of infrastructure, business plan, brochure, website, key financial indicators, etc.

In **April 2012**, **Batery Alimentos, S.A** and its granola energy bar products of the Bolt brand was selected based on the criteria prepared and presented to the counterpart institutions, and partners of the program. Visit <http://www.batery.com.ec>



Step 3:

Develop new strategic alliances

After the process of selecting a host SME for the CLCP/C2C pilot project, *McDonough Braungart Design Chemistry (MBDC)* and the *Environmental Protection Encouragement Agency (EPEA)* were approached to participate in the project.

Since MBDC and EPEA are the founders of the C2C methodology and have the adequate experience to lead the project team in the process of certifying an Ecuadorian product and the potential collaborators within the consortium, not only for the initial commitments related with the Closed-Looped Cycle Production project in Ecuador, but also considering MBDC and EPEA as partners for the future expansion of the activities in the Americas as well it was important to add them as partners and after many exchanges and meetings, MBDC confirmed participation to project in **May 2012**.

McDonough Braungart Design Chemistry (MBDC)



MBDC created the “Cradle-to-Cradle” design concept and has over 17 years of experience in helping customers minimize the damages and create a positive impact on the planet. MBDC partners with innovative customers in different sectors and industries to stimulate creativity, differentiate their brands, acknowledge their leadership in the market, attract and retain customers, increase their competitive advantage and reduce risks in the long term. MBDC takes companies towards a sustainable growth path by helping customers optimize their corporate strategy, communications, operations, supply chain and product designs.

Visit: <http://www.mbdc.com>.

Step 4:

Agreements and coordination for implementing activities

With the inclusion of MBDC in the program consortium, the action plan was adjusted and updated to achieve two main objectives, (1) design and execute a training course in Closed-Looped Cycle Production (in line with component 1, objective a), and (2) ensure the first C2C certification of a product in the prioritized sub-sector (in line with component 4, objective c).

Step 5:

Training course in Closed-Looped Cycle Production (CLCP)

As a result of the exchanges with MBDC’s partner in Hamburg, the cost to carry out a training course at a technical level in the Netherlands, Germany or Ecuador, organized by EPEA (training institution in the C2C topic) was beyond the scope of the project budget. Therefore the Research Group in “Environmental Engineering and Technologies for Sustainable Development” of the San Pablo CEU University was approached, which offered a fairly reasonable and competitive price for the design and execution of the training program.



The research group in environmental engineering and technologies for sustainable development of San Pablo CEU University in Spain has PhD candidates who are performing investigations in the topics of Closed-Looped Cycle Production and Cradle-to-Cradle. They are part of a network of universities with specializations in eco-design, industrial ecology, cyclic economy and sustainable production and consumption.

Visit:

http://www.uspceu.com/pages/investigacion/ingenieria_ambiental/investigacion-grupos-ingenieria-ambiental.html



In **May 2012**, the services of San Pablo CEU University were confirmed and the preparation of an intensive training course was started. The main goal was to train and certify people in C2C in the future, to connect them with the evolution, development and expansion of the program in Ecuador and the rest of the region. The participants included personnel assigned to the project, from Ministries, chambers, business organizations, the OAS/DSD team, and organizations who have subscribed to a joint cooperation agreement for the development and implementation in the institutional and inter-sectorial field.

Under the guidance of the San Pablo CEU University professors, the MBDC and the C2C Expo Lab agreed to offer technical lectures during the intensive training course on Closed-Looped Cycle Production in order to complement the course content with examples of better practices in C2C and to deliver a detailed explanation of the process and the benefits of the C2C certification. Mr. Ruben Contreras (Principle Technical Advisor with the OAS/DSD) made a presentation focused on how to integrate the life cycle analysis as an instrument for the materialization of the C2C design concept to achieve a Closed-Looped Cycle Production. The training took place from July 11-13, 2012.

Step 6: Mission to Ecuador on July 2012

From July 11 to 15, 2012, a mission was organized to Quito for the following: (1) organize and co-host an intensive training course, and (2) advise on the conditions and define the activities for implementing the pilot project.



Training course on Closed-Looped Cycle

Professors from the San Pablo University (CEU) of Madrid oversaw the training course. It covered topics such as “Cradle to Grave”, “Cradle to Cradle”, Life Cycle Analysis and other relevant elements for the SMEs in the production sector in Ecuador.



Figure 8: Left to Right, Mr. Howie Fendley (MBDC) and Mr. Kevin de Cuba (OAS/DSD), Mr. Rubén Contreras (OAS/DSD) explaining the concepts of Closed-Looped Cycle Production.

The objective of the training course was to promote the C2C as an instrument to achieve a sustainable business development, integrating the certification requirements in the course material and the syllabus in order to facilitate the data collection process and obtain the product certification in the selected SME through the pilot.



Picture 9: From left to right: Dr. Ricardo Díaz Martín (CEU San Pablo) and Dr. Gastón Sanglier Contreras (CEU San Pablo) explaining concepts of Life Cycle Analysis.

El C2C PII es el ente auditor y el MBDC/EPEA quién certifica, para más detalle favor consultar los siguientes sitios: i) <http://c2ccertified.org>; ii) http://epea-hamburg.org/fileadmin/downloads/allgemeines/Outline_CertificationV2_1_1.pdf; iii) <http://epea-hamburg.org/index.php?id=165>



Instructors included Engineering Professor Dr. Ricardo Díaz Martín, Assistant Professor Dr. Gastón Sanglier Contreras, Associate Professor Engineer Esperanza Batuecas Fernández, Engineer Rubén Contreras Lisperguer (OAS / DSD), Mr. Howard Fendley, Business Director (MBDC), and Mr. Roy Vercoulen, Director (C2C Expo Lab).



Figure 10: Participants to the intensive course on Closed-Looped Cycle Production

The participants were from governmental institutions and the industry, including directors, managers and consultants, with engineering and business background. The specific objective was to have participants learn about the evolution, development and extension of the program in Ecuador and in the Americas.

The vision shared among institutional stakeholders was to ensure the training of staff involved in the project, as an essential step towards the evolution of the pilot and later to extend it as a program in the rest of the region. As it is a complex process, certification is presently only valid for products reviewed by MBDC / EPEA⁷ as the auditing bodies and C2C PII as certifier. They are in the process of training and certifying consultants, service suppliers and auditors helping companies in meeting certification requirements. As counterpart partners, the former present the audit assessments to the Institute, the latter issues a certificate if the product meets the prerequisites.

Additionally, the objective of this training is to start an optimization process in line with the C2C design protocol in a SME from the sub-sector of food and

beverages. Attention has been given to the packaging material for certification as the first C2C packed product in Latin America. The intention is to extend this experience in the Americas from the lessons learned, and invite the evaluator/certifier agency to join the consortium as a partner to expand the scope of the CLCP.



Visit to SME Batery Alimentos SA

During the week of July 11, 2012, a technical site visit was made to Batery Alimentos premises. This company serves as the host for the C2C certification pilot project. This company falls under the food and beverage sector and was selected based on the criteria prepared and presented to the partners of the program. The focus was set on the packaging material used for granola energy bars. Mr. Andres Vasquez, Batery's Commercial Director, explained the whole production process and provided information on Batery's goals and policies.



Figure 11: Visit to the Batery production plant located in Quito, Ecuador

7. The C2C PII is the auditor body and the MBDC/EPEA which certifies, for further information, visit the following sites: <http://c2ccertified.org>; ii) http://epea-hamburg.org/fileadmin/downloads/allgemeines/Outline_CertificationV2_1_1.pdf; iii) <http://epea-hamburg.org/index.php?id=165>



During this visit to Batery, a representative of McDonough Braungart Design Chemistry (MBDC)⁸ Mr. Howell Fendley, Business Development Director, and Mr. Roy Vercoulen, C2C Expolab Foundation Managing Director made a brief "quick-scan" analysis to assess the potential certification success at an early stage of the program. The Cleaner Production Centre of Colombia (NCPC) also participated. The center boasts Life Cycle Analysis (LCA) complementary skills and competencies, cleaner production methodologies, and a continued growing experience in the Ecuadorian market and interest to learn more about the C2C certification.

Main findings, pilot start-up

During the field visit, the Batery production plant was evaluated, where the primary packaging (made of polypropylene) was identified as the priority for the certification of Bolt energy bars. This package is expected to produce a technical nutrient. The MBDC representative recommended extending the certification for secondary cardboard packaging (paperboard), as it represents a potential biological nutrient containing and/or packing 8 units of granola bars.

It is important to note, as mentioned above, that it is also possible to consider the tertiary paperboard packaging (cardboard), which stores about 24 pieces of secondary packaging (paperboard). In such case the price difference would be minimal, to certify three kinds of packaging at the same time.

The following are the elements the company has to start the C2C product certification (packaging), which were mentioned in an interview with Mr. Christian Freile, Batery Alimentos Chief Executive:

- **Certification:** In the meantime the company is planning to move to a new plant, which will be built taking into account the infrastructure parameters required to be certified with the HACCP and GMP protocol. This will facilitate future process mapping. Currently, there is control of the

types of raw materials (RMs), as is the case of the packages that are purchased through two different suppliers. There are no ISO certifications as yet, but they are expected to start under a program facilitated by the Pichincha Chamber of Small Industries.

- **Sustainability:** Bolt granola bar packaging is made of polypropylene (e.g. Biaxially Oriented Polypropylene (BOPP) flexible film) with attributes to maintain the organoleptic properties of the product. There is a secondary cardboard packaging (paperboard) that 8 units of product / bars, along with other tertiary packaging cardboard (cardboard) that stores approximately 24 units of secondary packaging cardboard / paperboard (100% natural, recycled cartons).

- **Production Process:** i) The equipment and machinery used in the production process is mostly stainless steel ii) Diesel ovens iii) Gas Ovens iv) Power Consumption, v) industrial gas consumption / Diesel vi) XX MT Monthly Production vi) Organic waste, plastics management.

- **Pending Topics:** Run a comparative analysis of energy efficiency diesel vs. gas, other.

- **Certification:** Currently a protocol designed by the MCPEC/MIPRO/MAE driven jointly with the supermarket chain La Favorita is under way. This protocol promotes ethical practices and corresponds to "Sello Hace Bien" (Do Good Seal) and "Sello Hace Mejor" (Do Better Seal) (e.g. "Silver / Gold"), with an estimated time to get certified of 6 months.

- **N° of Employees:** There are six (6) people in the plant and three (3) working in administration. Focal Points: General Manager, Commercial Manager and Production Manager.

- One of the main features of the company is its government program focused on school feeding. This has allowed Batery Alimentos to build capacities and strength towards product diversification and market access as a side effect.

8. MBDC: www.mbdc.com



- The main features of the company operation are:

- The area of the production plant is approximately 200 m².

- As a result of the mixture of raw materials in the production area, there is a shrinkage and / or waste handling ratio that correspond to the process in process that can be measured.

- **Main equipment identified:**

- Diesel and gas ovens
- Electric engine
- Packing machine
- Sealing machine.
- Label Printer

- No ISO certifications (e.g. 9000, 14000, OHSAS 18001, 26000, 50001) have been achieved, but a program facilitated by the Pichincha Chamber of Small Industries will be started as soon as they have moved to the new facilities. If they had an implemented management system, the internal and external audits could show the main findings.

Step 8:

Access and gather information and technical data:

At this point, we shared with Batery a Disclosure Agreement (NDA) form regarding the information required by them and their suppliers. Basically, it is a complete and detailed statement of the ingredients directly related to the packages, including the basic material (polypropylene, cellulose), inks, adhesives, and other additives. The CLCP focal point in Ecuador and Batery agreed to work together with other company representatives on the balance of the mass, water and energy, with an appropriate follow-up to complete satisfactorily detailed data and information as specified.

The Spanish and English version of all the documents have been received from the certifying body and completed satisfactorily by the

company to obtain certification. With the list of ingredients and raw materials, MBDC developed an economic proposal for the first certification of C2C packaging in Latin America along with a schedule of activities and deliverables for the review group.

In conclusion, the strong teamwork between the project members/partners has made it possible to advance and to focus actions towards the expected outcomes in March 2013 upon conclusion of Phase II. This outcome proved to be a suitable justification for securing the additional budget to start the next phase III. The intention has been to emphasize the appropriate institutional setting to ensure that the partners and sectorial-counterpart institutions take the lead in identifying the initiative. This will meet the target for Phase III: "Incorporating learned lessons from ongoing regional efforts through the government, the creation and dissemination of knowledge and strengthening the insertion of closed-looped cycle production method in the Ecuadorian manufacturing industry".

Step 9:

C2C Certification Process Guide (related to component # 4)

According to the conditions set by MBDC, we decided to include them in the audit process and the C2C Product Innovation Institute (C2C PII) in the Batery Alimentos packaging certification. Since 2012, the C2C international community agreed to separate the responsibilities to carry out audits and certification, which had initially been included in MBDC services. With the introduction of C2C PII, a separate entity was created to review and certify C2C products globally.



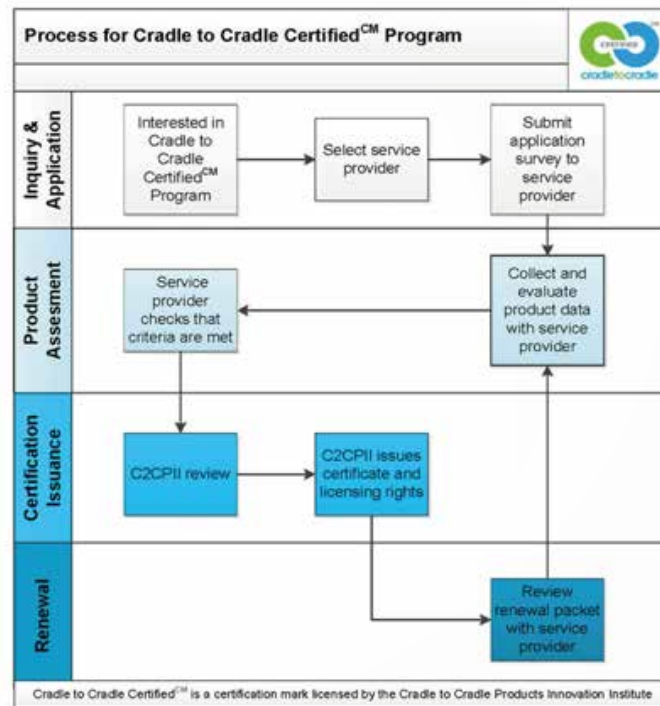


Figure 12: Certification Process Summary Cradle to Cradle⁹

To move forward, it has been key for Batery Alimentos and its supply chain (Neyplex and Graphic Center, among others), to follow the share guidelines "Certification Packet 2010" which provides each one of the steps to follow to obtain technical data reference documentation and the chemical formulation of both packaging material that MBDC needed to analyze, to start the continual improvement process to obtain the certification of the first C2C packaging product in Latin America.

Through the MBDC, the data corresponding to the Chemical Abstract Service Number (CAS #) and concentration percentage indicated in the Technical Data Sheets of the raw materials ingredients provided by the suppliers of Batery Alimentos packaging were revised.

⁹ Visit: <http://www.c2cproducts.com/images/C2C%20Certified%20Process%20Map%20-%20Public%20-%20Branded%202.9.12-website.jpg>





Figure 13: Composition of ingredients in packaging material and its supply.

Hence, the deadline for collecting the data from the raw materials used in the two types of packaging (e.g. polypropylene flexible packaging and cardboard box for eight units) was March 29, 2013. Meetings between CLCP-Ecuador and the different suppliers were held. Efforts have been committed in order to gather data and information through the means at hand.

The benefit and added value offered by the CLCP Program for packaging material suppliers, is directly related to the increasing high impact improvements in business as usual attitude regarding production and marketing of packaging material, besides obtaining the certification. Through the Cradle to Cradle Products Innovation Institute (C2C PII) as certification body, and the McDonough Braungart Design Chemistry (MBDC) as auditor / assessor, there is a packaging formulation internationally approved by the certifying agency for type of packaging used for the Bolt granola energy bars.

Therefore, the C2C Certification (Certification Packet 2010 Basic) requirements have been

completed to advance to the next level and the documentation required by MBDC as a basis for the supply of services which has started the improvement process to obtain the certification of the first C2C packaged product in Latin America have been met.

Step 10:

Explain the use of the Cradle to Cradle (C2C) logo in Batería Alimentos products.

In order to minimize the risk of making false statements clear to the consumer, it is recommended that the product packaging material show that only the packaging is C2C certified.

As stated in the marking book, the guidelines are:
 - "If only the product wrapping is certified and not what is packaged as a product, the packaging must include a description next to the brand image indicating that only the wrapper is Cradle to Cradle Certified CM."



In short, when using the C2C logo on the wrapper, it must be clear that the certification mark applies only to the container, and not the food. The certification mark is not responsible for any claim related to the food or the safety with respect to food packaging.

productivity and competitiveness and the generation of economic resources through the reduction of production costs.

5.4

Granting of the Cradle-to-Cradle certification and definition of the steps to follow

Cradle to Cradle certification granting ceremony.

Batery Alimentos SA, the host SME of the certification pilot project, became the first company in Latin America and the Caribbean to obtain a Cradle to Cradle (C2C) basic certification for the packaging of its Bolt products. This prestigious certification was granted in a ceremony held on Tuesday March 19th, 2013 at the Radisson Hotel in Quito, Ecuador. The event was organized by the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC) and the Executive Secretariat for Integral Development of the Organization of American States (OAS).

During the ceremony, Mr. Massuh, Vice Minister in charge of the Ministry of Coordination of Production, Employment and Competitiveness, commented that the "Closed-Looped Cycle Production" initiative (CLCP in the Americas), led by the MCPEC and the OAS Department of Sustainable Development, led to the development of an innovative instrument by enhancing the reusing of inputs in industrial production cycles, resulting in an improvement in energy efficiency and a reduction of the environmental impacts. The application of this tool allows for the development of the micro and SME's business, an increase in





The certification is a confirmation that the Battery production practices are compatible with the C2C standards. This mode of production combines the promotion of energy efficiency, the non-use of harmful chemical substances and the use of recyclable materials.



Figure 15: The partners' representatives of the Ecuador CLCP Project, the OAS, Batery Alimentos SA and the MCPEC during the ceremony (Source: OAS)



Mr. Zúñiga-Brown, Deputy Head of the U.S. Mission in Ecuador, also attended to this event as well as the representative of the Embassy of Holland in Ecuador, Mr. Coors; the OAS representative in Ecuador, Mr. Vuskovic; and other senior officials of the Government of Ecuador. **See the Agenda here.**



Figure 16: (left) Mr. Zúñiga-Brown, Deputy Head of the U.S. Mission in Ecuador, (right) Mr. Munir Massuh, Vice Minister in charge of the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC), (Source: OAS).



Figure 17: (left), Mr. De Cuba, Program Manager, Closed-Looped Cycle Production in the Americas, (middle) Mr. Munir Massuh, Vice Minister in charge of the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC), (right) the Executive Secretary Tross granting the Cradle to Cradle certificate to Mr. Lemarie (Batería Alimentos), (Source: OAS)



Figure 18: Mr. Massuh, Vice Minister in charge of the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC), Mrs. Sherry Tross, Executive Secretary for the Integral Development of the OAS, and Mr. Lemarie, General Manager de Batery Alimentos, answering questions of the press (Source: OAS)



Figure 19: Observations shared by Mr. Bjorn Sanders, Executive Director of the Expo C2C Lab, and Mr. Carlos Arango, Executive Director of the National Cleaner Production Center of Colombia (Source: OAS)

Please, refer to the related press releases:

<http://www.ecpamericas.org/News/default.aspx?id=516>

<http://www.youtube.com/watch?v=WcJr0qpFpgk>

<http://www.produccion.gob.ec/empresa-ecuatoriana-batery-alimentos-sa-recibe-la-primera-certificacion-cradle-to-cradle-de-america-latina/>

Work Team to define the steps to follow (Phase III)

The day after the ceremony, the workshop “Sustainable Production in Ecuador” was held to exchange ideas, suggestions and recommendations with the partners and other participants on the gains that have been obtained during the implementation of the project. **See the Agenda here.**





Figure 20: Photos from the Sustainable Production Workshop in Ecuador (Source: OAS)

Different entities shared the activities and programs that were held and which are related to the matter of Sustainable Production. The objective of this was to identify the different efforts in the country that will contribute in the framework of the National Program of Closed-Looped Cycle Production in Ecuador. There were interventions by representatives of the Ministry of Industries and Production (MIPRO), the Ministry of Environment (MAE), the Ministry of Coordination of Production, Employment and Competitiveness (MCPEC), the National Secretariat of Planning and Development (SENPLADES), the Chamber of Industries and Production (CIP), representatives of the private sector and other partners.



Figure 21: Photos from the Sustainable Production Workshop in Ecuador (Source: OAS)

In chapter 7, you will find a summary of the conclusions and recommendations shared by the partners during this workshop.

6.

Monitoring and Evaluation

To measure the impact and effectiveness of the *Closed-Looped Cycle Production Program in Ecuador*, the following indicators have been established as the four key components of the program.

Component 1 - Capacity Building

Create / improve the capacity of the personnel from ministries, institutions, agencies, and public and private companies, particularly small and medium enterprises in the sub-sectors prioritized by the government to carry out projects of C2C(s) design, development and manufacture in the Ecuadorian production sector.

- Up to two (2) partnerships between universities and the private sector in relation to C2C / R & D and the development of technical skills were established at the end of the CLCP Program / CLCP Ecuador;
- Up to two (2) capacity building C2C workshops are held aimed at public and private entities at the end of CLCP Program Ecuador, and;
- Up to one (1) non-governmental organization has been created and officially registered with the mandate to promote and monitor the proper knowledge about C2C products in Ecuador.

Component 2 - Dialogue and Cooperation

Set / establish an institutional framework between all stakeholders to facilitate cooperation, dialogue and the proper design, development and implementation of C2C project(s) in the Ecuadorian production sector.

- Up to two (2) public-private partnerships have been established to facilitate the continued exchange of best practices and cooperation on C2C initiatives CLCP closing Ecuador Program;
- Up to one (1) annual national consultation meeting takes place on Sustainable Consumption and Production (including topics C2C) in Ecuador;
- Up to one (1) regional annual event is organized in collaboration with the Latin American Network of Cleaner Production Centers (CPM + L NETWORK).



Component 3-Policy Development

Establish an appropriate policy framework to address market barriers in order to promote and facilitate production and introduction of C2C products in Ecuador.

- Introduction and approval of Sustainable Production and Consumption instruments with a C2C critical approach.

Component 4 - Business Development (productivity and performance)

1. Show the profitability and sustainability of enterprises (including SMEs) in the production sector by applying the C2C method.

- Establish one (1) dedicated agency (e.g. the revitalization of Cleaner Production Center of Ecuador) lawfully, with the mandate of collecting, analyzing, managing and sharing information about the primary business performance at the end of CLCP Program Ecuador ;
- Present the results of the anticipated pilot C2C(s) in terms of profitability, socioeconomic and environmental sustainability at the end of CLCP Program Ecuador, and
- Up to two (2) C2C integral initiatives are identified and presented by the SMEs.

Monitoring activities scheduled and executed according to indicators

Component # 1 – Strengthening of Capacity Strategic Objective

Create / improve the capacity of the personnel from ministries, institutions, agencies, and public and private companies, particularly small and medium enterprises in the sub-sectors prioritized by the government to carry out projects of C2C(s) design, development and manufacture in the Ecuadorian production sector.

Key factors for success:

- The capacity of government and the private sector (including SMEs) to implement CLCP tools and / or business models (e.g. environment and energy, resource productivity).
- The economic and social sustainability, effectiveness and efficiency of the initiatives / projects CLCP.

Indicators:

- Up to two (2) university-private sector partnerships regarding C2C R & D and development of technical skills at the end of the CLCP Ecuador Program;
- Up to two (2) Capacity Building Workshops in C2C focused on public and private entities running at the end of CLCP Ecuador Program, and
- Up to one (1) non-governmental organization has been created and officially registered with the mandate of promoting and monitoring the correct knowledge of C2C products in Ecuador.



- The need to have in Ecuador a model entity in Cleaner Production solutions under the umbrella of the CLCP has been identified by the stakeholder partners, with the hope it can be met in the short term by the Cleaner Production Centre of Colombia (NCPC). Similarly, in the medium- and long term, possible joint actions will be integrated through different ministries, universities and chambers of commerce;

- There were experiences of programs in the field of cleaner production, with strong participation of stakeholders from the industry and the academia. However, the organization (the former Centre for Cleaner Production of Ecuador) responsible for carrying out the program was shut down due to financial and institutional problems;

- The Eco-Efficiency program in the industrial sector, executed by MIPRO with UNIDO funds includes a component of closed-looped cycle production. It is advisable that the CLCP project in Phase II-III join this national program that emphasizes primary data collection, capacity building, developing the framework and an appropriate institutional appropriation process, established to guarantee successful results / with positive impact;

- Develop the capacity of people or companies potentially interested in Cradle to Cradle (C2C) to incorporate and implement the lessons learned from various pilot projects implemented in other companies abroad;

- An alliance between the various program partners and Batery Alimentos, SA has been achieved with the intention of replicating future actions in about 3 and / or 4 pilot countries regarding particular issues to be defined. This will happen after achieving C2C Silver / Basic certification for Batery, and can serve as an opportunity to justify and commit resources from MIPRO / MCPEC, USAID, SENPLADES, among others; and

- Three missions, including working and consultation workshops were successfully executed, and tangible results have been obtained and can be shared with the donor to show progress of the project in Phase I and II.



Component # 2 - Dialogue and Cooperation Strategic Objective

Set / establish an institutional framework between all stakeholders to facilitate cooperation, dialogue and the proper design, development and implementation of C2C project (s) in the Ecuadorian production sector.

Key factors for success:

- The proper agency cooperation and mutual understanding among institutions involved regarding C2C initiatives.
- The appropriate dissemination of cost-benefit C2C national / regional.

Indicators:

- Up to two (2) public-private partnerships have been established to facilitate the continued exchange of best practices and cooperation on C2C initiatives at the end of the CLCP Program in Ecuador.
- Up to one (1) annual national consultation meeting takes place on Sustainable Consumption and Production (including C2C topics) in Ecuador.
- Up to one (1) regional annual event is organized in collaboration with the Latin American Network of Cleaner Production Centers (CPM NETWORK + L).

- There are two public-private partnerships, one (1) signed between the OAS / DSD, MCPEC and Batery Alimentos, and the other (2) independently agreed to between OAS / DSD, MCPEC, the National Centre for Cleaner Production of Colombia (NCP), C2C Expo Lab and MBDC. This served as the first pilot project with Batery, and has also opened the possibility of carrying out 3-4 additional pilots with the potential of receiving perspective funding options with the City of Knowledge Program from MIPRO / MCPEC, USAID and / or SENPLADES.

- This will directly insert the topic of innovation / biotechnology for input production / manufacture, that from a high value-added productive chain will place the final product in the domestic or export market (e.g. a) Grains, cereals, Andean potato; b) biopolymers, packaging, nano materials, c) fibers, fabrics, cellulose, protein synthesis, glucose, tannins, etc).

- Three (3) workshops and missions were carried out with partners of the CLCP-Ecuador program for Phase I and II of the program. (See press releases: <http://www.ecpamericas.org/initiatives/default.aspx?id=63>).

- We participated in the annual meeting of the P+L Latin American Network in Brazil in 2010 and in a second annual meeting in 2013; this has enhanced CLCP-Ecuador's results. Similarly, several university networks in the United States and Europe have invited us to join forces on topics of mutual interest related to Sustainable Consumption and Production, Circular Economy, Green Growth, Clean Production and C2C.

- There is great interest in governmental institutions to implement programs in the industrial sector to promote the use of clean technologies, reduce environmental impacts and contribute to improving business competitiveness.

- Adequate institutional organization of any closed-looped cycle production project is the key to ensuring the sustainability of the project, which will also facilitate the governmental contribution to this program to ensure continuation and avoid extinction.

- As part of Phase II and III program in Closed-Looped Cycle Production (CLCP), it is recommended to emphasize the institutional



settings in order to guarantee the leadership and participation of national institutions such as MCPEC, MIPRO and MAE.

- Due to the involvement of different projects in the production sector, funded by international organizations such as UNIDO, UNEP and others, a donor roundtable to coordinate the scope of support for each organization is highly recommended.

- Another important lesson learned is the need to implement an adequate knowledge management program, along with a framework of identification with the CLCP program to prevent the loss of valuable information and data at the end of the project life cycle.

- The role of MCPEC is very important for the sustainability of the C2C initiative, because of its mandate to propose policies and coordinate the activities of the various ministries and sectors.

Component # 3 - Policy Development Strategic Objective

Establish an appropriate policy framework to address market barriers in order to promote and facilitate production and introduction of C2C products in Ecuador.

Key factors for success:	- Introduction of Production Instrument and Sustainable Consumption approved by the counterpart Ministries and / or parliament at the end of the CLCP Ecuador Program.
--------------------------	--

Indicators:	- Introduction and approval of Sustainable Production and Consumption instruments with a C2C critical approach.
-------------	---

- Meanwhile, political and regulatory instruments from Phase I and II were identified and introduced to help guide CLCP Ecuador on how to become integrated into the agendas of the various ministries (e.g. partners and / or counterparts: MCPEC, MIPRO and SENPLADES).

- The results of the pilot with Batery Alimentos may allow for future actions in Phase III to support a possible Cleaner Production Centre (NCPC) in Ecuador, that will facilitate and implement the C2C / P + L methodology in the policy tools agenda and in concrete action in collaboration with the productive sector (e.g. other possible pilots in SMEs through Prodel, Pacari Nutrival, Epacem, among others) with MCPEC, MIPRO, SENPLADES, INIAP, universities and different donors (e.g. South Korea, USAID, others).

- A consultation workshop was organized in March 2013, through a joint collaboration between MCPEC, MIPRO, SENPLADES and CLCP. As program facilitator, the principles of "Circular Economy" were included in public policy instruments, such as target 6 of the Plan for Good Living (objective 6: Guarantee the rights of nature, and promote territorial and global sustainability). This instrument promotes innovative programs such as C2C / P + L, through a joint effort between the government sector, the civil society, the academia and the business sector.



Component # 4 - Business Development (productivity and performance) Strategic Objective

To show the profitability and sustainability of enterprises (including SMEs) in the production sector of production by applying the C2C method.

Key factors for success:	<ul style="list-style-type: none">- Implementation of expected C2C(s) pilot project.- Have an adequate data collection and analysis with measurable indicators to monitor and evaluate the performance of the business.- A better understanding / acceptance among companies of the ability to address topics of profitability, competitiveness and sustainability in an integrated / holistic manner.
Indicators:	<ul style="list-style-type: none">- Establish one (1) dedicated agency (e.g. the revitalization of Cleaner Production Center of Ecuador) lawfully, with the mandate of collecting, analyzing, managing and sharing information about the primary business performance at the end of CLCP Program Ecuador.- Present the results of the anticipated pilot C2C(s) in terms of profitability, socioeconomic and environmental sustainability at the end of CLCP Program Ecuador, and- Up to two (2) integral initiatives in C2C are identified and presented by SMEs.

- In April 2013, the Socialization Workshop organized by the Ministry of Industries and Productivity (MIPRO) took place to develop the plant for the Cleaner Production Center of Ecuador. UNIDO Environmental Management and a representative of CNPL of Nicaragua participated in the workshop.

This was as a result of the participation of the CLCP Americas Program in the annual meeting of the Latin American Network of Cleaner Production (CP) in Brazil in 2010, together with a shared concern in the diagnosis of Phase I and the development of the Phase II pilot, on the need to have a benchmark institution to ensure replication and sustainability of the Batery Alimentos experience by promoting the country's productive transformation.

- In order to shortlist the food and beverage subsector, and finally to select the company to carry out the Closed-Looped Cycle Production (CLCP) pilot project in Ecuador, different

stakeholders by subsector were invited to participate in a workshop. The workshop was used to present the methodology used in the diagnosis together with the use of multi-criteria software, and to create a participative selection process which could help guarantee a more widespread acceptance.

- Tremendous progress was achieved with the selection of Batery Alimentos to run the pilot. The main goal in Phase II is to be able to achieve the C2C Silver / Basic certification in March 2013, for the two types of packaging.

- Based on the experience stemming from the first pilot with Batery, the field visits and three missions conducted in December 2011, July 2012 and March 2013, three (3) to four (4) possible pilots have been identified in SMEs to extend future actions to be carried out in a Phase III of the program.



- The baseline analysis showed there was a lack of information related to the indicators or criteria to quantify water and energy consumption, greenhouse gas emissions and waste generation including wastewater and solid waste in different sub-sectors of manufacturing industry.

In order to benefit from other programs in Phase III, such as the Eco-efficiency project and to avoid duplicating efforts, it is recommended that data for consumption be , waste and by-products indicators in the area of application of these projects. However, due to its technical complexity, it is recommended to integrate undergraduate engineering students to consolidate this information.

7.

Conclusions and recommendations

Due to the significant progress made and the interactions with different national institutions during the implementation of Phase I and II of the Program, it is recommended to advance together with the planning and implementation of prioritized activities identified for Phase III of the 2013 - 2015 Program. Among key entities involved are: Representatives / Business Managers, the Coordinating Ministry of Production, Employment and Competitiveness (MCPEC), Ministry of the Environment (MAE), Ministry of Industry and Productivity (MIPRO), Ministry of Electricity and Renewable Energy (MEER), and other members of the Interagency Platform to provide strategic direction of the National Productivity Agenda.

The following sections reflect the main conclusions drawn from implementation of Phases I-II:

1) The main conclusion that can be drawn from implementation of Phases I-II is to showcase that based on an accurate diagnosis of the productive sector of Ecuador it was possible to identify and bring about the successful certification of the first C2C packaging product in Latin America. This milestone opens new opportunities for the productive sector of Ecuador, in particular the access to new international markets that promote products manufactured in a closed loop cycle.

Furthermore Ecuador is taking the first step towards a zero-waste society with non-polluting products, and has established the technical foundations for replication of such initiatives in the Americas. The interest of the authorities has been leveraged towards a new development paradigm where there is no garbage and all items are considered as food / nutrient for other processes, and therefore continue the manufacture of products without harming the environment.

2) The ministries, mainly MCPEC, MIPRO and MFA, have shown great interest in furthering the implementation of the project and reviving a Cleaner Production Center in Ecuador or a similar entity to achieve the transfer of knowledge. All ministries concluded that the project objectives are in line with the objectives of the National Development Plan (Plan para el Buen Vivir).

As a result of the concerns expressed in the diagnosis in Phase I and dialogues facilitated during the development of Phase II regarding the need for institutional capacity to promote and facilitate the productive transformation of the country, the Ministry of Industries and Productivity (MIPRO) took the initiative to organize in April of 2013 the "Multi stakeholder meeting to assess the development plan for the Cleaner Production Center of Ecuador".



The United Nations Industrial Development Organization (UNIDO) and representatives the Cleaner Production Centers of the region attended this workshop to exchange experience and possible configurations for the set-up of such center. This reflects the intention of the government of Ecuador to take concrete steps to create a cleaner production center for Ecuador.

One of the tasks of this future center will be to promote in close collaboration with the industry and the government, innovative programs such as C2C / P+L and offer advice in the development of public policy as has been the case through the joint collaboration between SENPLADES, MIPRO, MCPEC and the Closed-Looped Cycle Production Program (CLCP) in Phase II for the inclusion of the Circular Economy principles in public policy instruments, among other.

3) Interest and willingness to integrate the CLCP Ecuador program in the eco-efficiency program sponsored by MIPRO was shown in line with the vision of MCPEC. The same applies for the energy efficiency initiative promoted by MEER and UNIDO, and the Sustainable Consumption and Production initiative managed by MAE. In conclusion there are enough synergies among the different initiatives and responsibilities of different ministries where MCPEC as coordinating ministry has a critical role and added value to properly coordinate the collective efforts.

4) In collaboration with the Ecuadorian ministerial authorities, the CLCP was positioned in such a way to help facilitate a productive transformation (e.g. Productive Transformation Code and Agenda - MIPRO) for sustainable businesses through a range of products with export potential (e.g. PROECUADOR, Chambers of Commerce) to supply the local market, based on the country's current political agenda and cultural makeup for integrating sustainability into a circular economy.

5) In the course of Phase II, through the collaboration between MCPEC, MIPRO, SENPLADES and the CLCP program as facilitator,

the principles of "Circular Economy" were included in Goal 6 of the National Development Plan (Plan para el Buen Vivir) (Goal 6: Guarantee the rights of nature, and promote territorial and global sustainability). This makes it possible to promote and implement innovative programs such as CLCP, C2C and P+L, through a joint effort between the government, the civil society, academia and the business sector.

6) The "Awareness Raising Workshop on Public-Private Partnerships" was held in March 2013, to build consensus among key stakeholders of the program on the importance of exploring new opportunities through Sustainable Production. This event included presentations by experts from international institutions in the field of Sustainable Production, such as C2C Expo Lab of the Netherlands, the National Centre for Cleaner Production of Colombia (NCPC) and McDonough Braungart Design Company (MBDC) of the United States, private companies such as Cosentino, Bateria Alimentos, Neyplex, Centro Gráfico, Nutrival, the Chamber of Industry and Production of Ecuador, the Ministry of Environment, the Ministry of Industries and Production, and the National Secretariat for Planning and Development (SENPLADES). Their active participation enriched the dialogue between the different public and private stakeholders that attended, and highlighted the importance of new initiatives, and which also resulted in commitments of participating companies to evaluate their potential to achieve Cradle to Cradle certification.

7) During the visits carried out in Ecuador, the project team visited some supermarkets to find out and review the products offered by the companies identified and their characteristics, some samples were bought and analyzed. The brands identified are among other Kiwalife.com that produces "chips / snacks" from native Andean potatoes for the domestic market. Other brands were identified as well: Kallari / Prodel chocolate, also Pacari, Nutrival, and Epacem products as potential candidates to be certified.



If Epacem, Nutrivital, and Pacari have interest in certifying one of their products, they would be connected with MIPRO / MCPEC for them to start the process of securing access to possible cofinancing with the purpose of running a second pilot. With regard to Prodel, they are sponsored by a development cooperation institution, and if in case of interest to certify their products they would need to consult this partner to consider a possible third pilot under the umbrella of the Ecuador CLCP program.

8) An "Intensive Course on Production in Closed-Looped Cycle Systems" was designed and carried out to train a group of experts who received a certificate and are now part of the reserve of human resource adequately prepared to apply for the official CLCP/C2C accreditation program at MBDC, EPEA and C2C PII.

9) A Memorandum of Understanding (MoU) has been prepared to formalize the partnership between the Coordinating Ministry of Production, Employment and Competitiveness (MCPEC) and the OAS / DSD for future continuation and implementation of the CLCP Ecuador Program 2013-2015.

10) A draft Profile of the CLCP Program Ecuador was created, as a tool to be shared at various forums and high level international conferences, in order to reach out to potential allies, partners and counterparties. The objective is to extend the initiative based on the experiences gained from the pilot implemented in Ecuador to the rest of the Americas. Similarly, this type of instrument may also be used during possible future missions to the European Union, Asia and the Americas, for the purposes of exchanging experiences, best practices, and raising funds and / or resources.

11) Interest was leveraged from international organizations, including from USAID, which expressed their interest in combining this project with the current initiative to support SMEs under the umbrella of Prodel. At government level, both MCPEC and MIPRO have funds to finance

productive transformation and diversification projects, including matters related to clean energy. This creates the opportunity for both ministries to allocate funds and possibly expand actions through other pilot projects in SMEs in the Food and Beverage Subsector and / or other sub-sectors prioritized by the government through the support of the CLCP Ecuador Program (e.g. Epacem, Pacari Nutrivital, Prodel).

12) The main goal of Ecuador CLCP program is to show the necessary paradigm shift required to solve the waste problem, and make recommendations regarding the current government policies (e.g. especially if there is a political framework on Waste Management) and consider the possibility of introducing Sustainable Consumption and Production policies (e.g. CLCP Policies / Circular Economy).

13) The National Development Plan (Plan para el Buen Vivir) captures in itself the notion of respecting the need to ensure the socio-cultural conditions as a priority for the Ecuadorian population. This message emphasizes the importance of providing services and attention to the population in a sustainable manner, thereby ensuring proper management of key resources such as water, energy and materials.





Recommendations:

1) It is recommended to have a group of trained local consultants or experts under the C2C protocol managed by MBDC and other partners, to accompany companies and facilitate the process of pre-auditing and diagnosis of products, to the point of achieving certification under a framework that requires continuous improvement. This will allow for providing tailored solutions to the Ecuadorian industrial sector with potential for export.

2) It is recommended to continue programs for SMEs to drive innovation and good manufacturing practices in the design of products, services and processes, integrating elements of value creation in the social, environmental and economic spheres that will help small and medium enterprises finding more demanding markets that recognize and reward the attributes offered through sustainability.¹⁰

3) It is recommended to implement Cradle to Cradle as a paradigm of social and ecological development, of design, and as a business driving force in Ecuador. This approach considers that all the materials that flow through the industry as "nutrients" are beneficial to people and to the biosphere, applicable from raw materials to the finished product. Considering materials as assets rather than liabilities will allow making the necessary investment to innovate the distribution and recovery of products in the markets. If materials are optimized from the point of view of human health and the ecological environment, there is an incentive to recover them in multiple phases of use, through recycling, reuse, composting or to increase soil health. There will also be an incentive

tive to design "reverse logistics" systems to facilitate the recovery of nutrients in the materials efficiently and effectively.

4) The identification and assessment of sources of energy and fuel to obtain a clear picture of the current energy matrix is highly recommended. The results of this inventory will provide information on additional phases in the development of renewable energy, with carbon offset programs to explore, as a possible short-term solution for companies who wish to convert their energy supply through clean and renewable sources.

5) The management of water resources is a key component for industrial stakeholders in Ecuador. All large users should audit their facilities to analyze the amount of water used, as well as the quality of the effluent. Priority should be given to the manufacturing industry that generates effluents in water basin areas or aquifers that are about to disappear.

6) The benefit of building a national development strategy based on the Cradle-to-Cradle philosophy as a way of achieving a circular economy is that a strategic objective will need to be established to address the continuing need for the extraction of natural resources (e.g. metals, oil and other increasingly scarce resources leading to multiple negative social and environmental impacts for the national communities).

7) A CSR Guide sensitive to social and cultural aspects of the country should be prepared, taking into consideration the current elements of social equity and corporate responsibility to be

10 (i) Asian, American and European market; (ii) sustainable consumption and production programs; (iii) for a zero waste society and zero final disposal; (iv) for a proper management of end of lifetime of waste materials, through public-private cooperation programs which incorporate extended responsibility actions and differentiated from various stakeholders in the consumption chain; (v) integral policies of the product; (vi) less negative impact in the packaging valuing and secondary waste materials.



identified in a plenary session and prepared through multi-sectoral participation.

8) It is recommended to implement C2C in a broader perspective, focusing on the construction of an adequate industrial, commercial or infrastructural environment; along with an education and business processes system for the development of products and services that will result in a competitive long-term advantage; by generating local knowledge directed towards the needs of Ecuador; and using local resources in balance with society and the environment.

9) It is important to consider a variety of instruments for the transition process towards achieving the ultimate long-term goal of establishing a circular economy and green growth to (e.g. tools as clean production, carbon neutrality/carbon footprinting, renewable energy, corporate social responsibility, zero waste towards the recovery of materials, quality, productivity, competitiveness, etc).

10) Take advantage of the convening power of the OAS to conduct regional workshops about closed-loop cycle production (open to governmental officials, NGOs, the academia and business representatives) to showcase and promote new and innovative designs and sustainable production methods.

11) It is recommended to spread and extend the pilot experience in Batery Alimentos with similar companies in the sector, and market these products pointing out the packaging attributes and characteristics (currently unique in Ecuador), even with companies in the same C2C line internationally. The intention should be to repeat and extend similar actions in business organizations, emphasizing the importance of C2C certified packaging, among other.

12) There is consensus among the different institutions to develop a knowledge management program (research and development), focused on production and industry for sustainable use of

goods and services. The framework would be guided through the following instruments:

- National Development Plan (Plan para el Buen Vivir).
- Production Code (incentives and regulations).
- Code and Agenda for Productive Transformation.
- National Plan for Science, Technology, Innovation and Knowledge.

It is advisable to review the CLCP-Ecuador components and work plan in order to assess with donors, potential allies and partners the elements to be integrated with activities of various ongoing programs in Ecuador, with the aim of strengthening processes and avoid duplication of efforts. This can be achieved by working together on a framework of monitoring and impact assessment, to promote robustness, transparency and implementation of the different phases of the project.

13) The Ecuador CLCP platform provided by the OAS/DSD and MCPEC is a technical and political cooperation framework that may become a key program of added value to the Ecuadorian economy, promoting joint research, development and innovation, and facilitating the implementation of solutions for the various sectors of the economy, industry and trade.

Such is the case of the development of biotechnology and nanotechnology with high added value and positive impact for the food, medical, pharmaceutical industry among others (including e.g. patents development and specialized personnel; intelligent biopolymers, enzymes, tannins, protein synthesis and/or protein fibers, fabrics, purified collagen, etc.). This may lead to other potential CLCP pilots in Ecuador in different industries already identified, integrating the production chain of SMEs and activities under INIAP¹¹-Biotechnology¹² (R&D) in finding solutions tailored to the needs of the project regarding the design, use/application, development, and production of products to be commercialized, as is the case of:



- Development of new products by using different varieties of cereals, Andean potato, starches, among others (e.g. manufacturing and use of biopolymers in packaging for the food and beverage industry, natural or synthetic biopolymers, be it biomaterials or biomedical); and

- The use of varieties of cereals, cocoa, potato, Andean grains and other inputs as substitute to raw materials for manufacturing and production (e.g. Bateria Alimentos, S.A. energy bars).

Similarly, this provides the opportunity of integrating CLCP in doctoral curricula and/or dissertations in applied research and development, through a triangular collaboration among Latin American, American and European universities, together with international cooperation initiatives involving public and business institutions.

This will facilitate Ecuador to make effective progress in the future in topics of biotechnology applied to the productive matrix. It is essential to identify the best institutional framework to achieve the integration of biotechnology in the productive matrix to improve productivity and food security. The expected result is to generate productive innovation opportunities for exporting into bio markets. Therefore, it is easy to understand that the platform offered by the CLCP Ecuador initiative will be very useful and it is suggested to consider it as another partner in pursuing that goal.¹³

11 National Institute of Agricultural Research (INIAP) www.iniap.gob.ec

12 From a "Circular Economy" focus, consider the available applications developed at INIAP; nothing must be dismissed or lost, but transformed into a greater value input, for this, new designs, materials and business models should be identified.

(Upcycle with more efficiency: <http://www.youtube.com/watch?v=zkoSmXxFeoY>):

- Improved species of native cereals: quinoa with high nutritional levels against other imported cereals (incidence in food sovereignty and balance of trade, change of habits).
- Pest bio-controllers for potato plantings which replace imported chemical products demands with negative impacts for the environment.
- Inclusion in the production and the native products diet with nutritional benefits such as the camu-camu amazon fruit (30% more vitamin C than in a lemon and 50% more than in an orange).

13 Dr. Silvana Peña Herrera, Under-Secretary of Industries, Productivity and Technological Innovation.

14) It is important to align the particular subject of biotechnology/nanotechnology with existing institutional programs, in order to strengthen these without repeating efforts. It is important to identify the current applications with the potential to be linked to the productive¹⁴ sector.

With this purpose in mind, a work plan for a possible strategic approach could be developed (e.g. considering the Zoop methodology / PCM; tree problem/objectives) in three and/or four components where each of these respond to one or two specific objectives, activities, performance indicators and expected outcomes, with allocation of staff responsible for each activity or institution related to the plan or strategy aligned. Similarly, there must be a causal link between activities and components to be considered in one or more pilot projects with the participation of relevant government ministries, the academia and the industry (SMEs) within one or more public-private partnerships (e.g. incubation of pilot projects with productive potential).

15) Consider the CLCP Americas project as a platform for applied research through pilot initiatives in the theme of C2C/P+L, with a clear opportunity to develop knowledge within a framework of doctoral dissertations led by seven members of the advisory group together with the University San Pablo - CEU, and with direct participation of government, the business sector and the academia.



- Mr. Kevin De Cuba (Energy and Climate Change Senior Specialist. Department of Sustainable Development-DSD-and the Executive Secretariat for Integral Development-SEDI-of the Organization of American States - OAS).

- Mr. Walter Araya (Closed Cycle Production Program Coordinator in Ecuador, commissioned by the Department of Sustainable Development-DSD-and the Executive Secretariat for Integral Development-SEDI-of the Organization of American States - OAS).

The objective is to facilitate, through the promotion of an institutional platform, the development of knowledge, skills and actions about the development of case studies related to Circular Economy through triangular cooperation and networking with other programs and doctoral research centers, including for instance:

- Columbia University in New York;
- Illinois Institute of Technology;
- Yale University (Center for Industrial Ecology, Yale School of Forestry and Environmental Studies);
- Virginia Polytechnic Institute and State University (Virginia Tech);
- University of Cambridge (PhD Studentship: topic, long-term planning for industrial sustainability by systems thinking, led by the Center for Innovation Production in Industrial Sustainability, which is a collaboration among four universities in the UK (Cambridge, Cranfield, Imperial College, London and Nottingham, industrial sectors and network partners);
- Erasmus University in Rotterdam (International Off-campus PhD program in Cleaner Production, Cleaner Products, Industrial Ecology & Sustainability) and Delft University of Technology; and
- TU Delft, Utrecht University, and others.

14 In simple terms, the following roles per key institution are available:

- Conservation of the natural heritage/agro biodiversity (Ministry of Wild Life Environment/ Ministry of Agriculture)
- Regulation for biotechnology and biosecurity to control the introduction of elements or practices that are not compatible with the constitutional mandate: Genetically Modified Organisms (Ministry of Environment)
- Laboratory scale: public and private research institutions – SENESCYT (science and technology)
- Pilot project incubation with productive potential: MIPRO (productivity), MAGAP (agricultural), IEPS-MIES (popular economy and solidarity)
- Incentives for the use of processes and products derived from biotechnology; and at a business level through the insertion of new products at both national and international levels (MIPRO, MAGAP, MIES/MCPEC).

Therefore, it is recommended to run Phase III of Ecuador CLCP through a partnership between MCPEC, MIPRO, SENPLADES, MAE, MEER and the Chambers of Commerce focused on using available resources to build local capacity.

16) Use the Industrial Waste and By-products Exchange (www.borsi.org) already in place in Ecuador to encourage materials recovery transactions in the industry, to facilitate the establishment of agreements between generating companies and those who can value or use them (recovery, reintegration, transformation, processing, use, recycling, treatment and disposal).

The intention is to promote commercialization and exploitation of waste material flows within a circular economy environment (technical cycle / biological), supporting sustainable production, encouraging the development of new economic activities, and creating opportunities for new businesses in managing and reducing environmental impact.

17) An approach in relation to the necessary transition from the concept of waste to nutrients (waste = food) is considered key, but it needs to be interpreted within the context of the Americas. Basically, the next steps are as follows:



- Review the current status of waste management practices (e. g. pre-selected countries in the Americas, an example by sub-region, be it Central America, Caribbean and South America);
- Explain what CLCP is; and
- Assess how these two approaches or sectors can be linked to each other. For instance the transition from Waste Management towards Sustainable Consumption and Production, driven by the limited availability of land, increased danger and health risks, GHG emissions, soil and water pollution.



8.

References

Chamber of Industries and Production (CIP), Bolsa de Residuos Quito, see: www.borsi.org (Retrieved in July 2013).

National Centre for Cleaner Production of Colombia (NCPC), see: www.cnpml.org (Retrieved in July 2013).

Cubina, I. EcoIntelligent Growth, From Eco-efficiency to Eco-effectiveness, European Conference on Waste Reduction, Girona, November 2009, visit: <http://www.arc-cat.net/ca/publicacions/pdf/ccr/setmanapre-venccio09/ponencies/6%20pwp%20Ignasi%20Cubina.pdf> (in English) (Retrieved July in 2013).

Cradle-to-Cradle Expo Lab (C2C Expo Lab), visit: www.c2cexpolab.eu (in English) (Retrieved in July 2013).

Cradle-to-Cradle Knowledge Platform (C2C-Centre), visit: <http://www.c2c-centre.com/> (in English). (Retrieved in July 2013)

Cradle-to-Cradle Product Innovation Institute (C2C-PII), visit: http://c2ccertified.org/product_certification (in English) (Retrieved in July 2013).

Ecopedia (ECO Mii), "Cradle-to-Cradle" definition, visit: <http://www.ecomii.com/ecopedia/cradle-to-cradle> (in English) (Retrieved in July 2013).

Environmental Protection Encouragement Agency (EPEA), visit: <http://epea-hamburg.org/index.php?id=165> (in English) (Retrieved in July 2013).

Energy and Climate Partnership of the Americas, visit: <http://www.ecpamericas.org/?language=es-MX> (Retrieved in July 2013).

The Global Development Research Center (GDRC), SD Features, Sustainability Concepts, Eco-efficiency, visit: <http://www.gdrc.org/sustdev/concepts/04-e-effi.html> (in English) (Retrieved in July 2013).



Wikipedia, "Cradle-to-Cradle Design" definition, visit:
https://en.wikipedia.org/wiki/Cradle-to-cradle_design (in English) (Retrieved in July 2013).

The Global Development Research Center (GDRC), SD Features, Sustainability Concepts, Eco-efficiency, vea: <http://www.gdrc.org/sustdev/concepts/04-e-effi.html> (en inglés) (Obtenido en julio de 2013).

Wikipedia, definición de "Cradle-to-Cradle Design", vea: https://en.wikipedia.org/wiki/Cradle-to-cradle_design (en inglés) (Obtenido en julio de 2013).

ANNEX A: Diagnostic Report Production Sector Ecuador

ANNEX B: Copies of correspondence between the OAS and the MCPEC

ANNEX C: Implementation of the Work Plan in Ecuador CLCP Program 2011-2015





Organization of American States

División de Energía y Mitigación del Cambio Climático
Departamento de Desarrollo Sostenible
Secretaría Ejecutiva para el Desarrollo Integral

Organización de los Estados Americanos
1889 F St. N.W Suite 7.25 Washignton, D.C 20006
T. + 202-458-6467
F. + 202-458-3560





Ministerio Coordinador
de **Producción, Empleo
y Competitividad**



Organization of
American States

Department of Sustainable Development
Executive Secretariat for Integral Development
Organization of American States
Washington, D.C., August 2013

ISBN: 978-0-8270-6042-5

www.ecpamericas.org