"Cradle-to-Cradle: An effective tool for the sustainable development of Ports in the Americas?"

Ing. Kevin de Cuba, MSc.
Energy and Climate Change Mitigation

Department of Sustainable Development

Secretariat of Integral Development
Advancing Sustainable Development in Ports “Questioning the Status-Quo”
Visual Indicators of Pollution
Environmental Issues in Ports

- Solid Waste
- Waste Water and Sludge
- Oil/Chemical Spills
- GHG emission -> consumption of bunker fuel
- Etc.

- All these issues hamper the ability of Ports to achieve sustainability -> what leads to these environmental problems?
Example: PV - Cradle to Grave

Extraction ➔ Manufacturing ➔ Distribution ➔ Application & use ➔ Disposal
Re-thinking -> Cradle-to-Cradle design?

Modern business jargon for Sustainable Manufacturing:
- Eco-effective design
- **Cradle-to-Cradle design**
- Industrial Ecology
- Product Stewardship
- SMART production
- Lean Manufacturing
- Green Business
- Corporate Social Responsibility
- Sustainable Consumption and Production
- Circular Economy

A call for the transformation of the manufacturing industry through the eco-intelligent design of products

Braungart & McDonough (2002)
Tackling the problem at the core:

**Biological cycle**

- Material con menor capacidad de uso
  - Reciclaje
  - Diseño y producción

**Technical Cycle**

- Diseño y producción
  - Empaque y distribución
  - Uso y manutención
  - Extracción de recursos naturales

"Cradle-to-Grave"

- Deshecho (incineración y vertederos)
  - Uso y manutención

"Cradle-to-Cradle"

- Re-absorción en el medio ambiente
  - Re-inserción de materia prima

"Cradle-to-Grave" and "Cradle-to-Cradle" refer to two different approaches in the context of sustainability. "Cradle-to-Grave" focuses on the lifecycle of a product from raw material extraction to disposal, aiming to minimize environmental impact. "Cradle-to-Cradle" emphasizes the continuous cycle of a product, where resources are continuously reused and recycled, aiming for zero waste and zero toxicity.
Example: PV - Cradle to Grave

Extraction  Manufacturing  Distribution  Application & use  Disposal
Example: PV - Cradle to Grave

Extraction
Manufacturing
Distribution
Application & use
Disposal

Eco-Intelligent Design
What are the benefits of C2C?

(1) **Reduction** of dependency and continuous extraction of increasingly scarce commodities,

(2) Significantly **lower energy and water requirements** and **GHG emissions** for manufacturing processes;

(3) **Reduced solid waste**, **waste water generation** and other environmental impacts;

(4) **Improved health** and working environment;

(5) Promote **renewable energy** use during product processing, and

(6) **Increased profits** for SMEs through cost savings and enhanced **marketability of products**.
Overarching Programmatic Goal: Increase efficiency, productivity, competitiveness and sustainability of Small and Medium size Enterprises (SMEs) in the production sector of nations in the Americas via the application of the Closed Looped Cycle Production philosophy.

Closed Looped Cycle Production in Ecuador:

- Introduce and showcase the viability and applicability of the C2C design method;
- Focus on the production sector of Ecuador;
- Introduce as an innovative business development tool;
- Improve energy efficiency and environmental performance;
- Increase the productivity, competitiveness and sustainability of businesses, in particular Small and Mediums size Enterprises (SMEs)
Component 4 – Business Development (Assessing C2C applicability)
Aiming to certify the first packaging product “C2C-Silver” in Latin America and the Caribbean.
<table>
<thead>
<tr>
<th>SUMMARY OF CRADLE TO CRADLE® CERTIFICATION CRITERIA</th>
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<tbody>
<tr>
<td>Basis</td>
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<tr>
<td>1. Material Health</td>
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<tr>
<td>All materials certified (own the 100% plan only)</td>
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<tr>
<td>Defined as biological or chemical nutrient</td>
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<td>All materials assessed based on their intended use and impact on human/environmental health according to the following criteria: Environmental Health, Ecological Health, Toxicity, Human Health, Product Chemistry, Product Design &amp; Manufacturing, Product Use, Waste Management, Product End of Life</td>
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<td>2. Energy Efficiency</td>
</tr>
<tr>
<td>Defined a plan (including goals and budget) for developing the logistics and recovery systems for the case of product recovery, recycling, and reuse</td>
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<tr>
<td>Product has been designed or manufactured for the technical or biological cycle and has a sustainable utilization score = 90</td>
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<tr>
<td>3. Resource Efficiency</td>
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<tr>
<td>Characterized energy use and source(s) for product manufacture/assembly</td>
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<tr>
<td>Developed a strategy for using current solar income for product manufacture/assembly</td>
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<tr>
<td>Using 50% current solar income for product manufacture/assembly</td>
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<td>Using 50% current solar income for entire product</td>
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<td>4. Water Stewardship</td>
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<tr>
<td>Defined or adopted water stewardship principles/guidelines</td>
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<tr>
<td>Characterized water flows associated with product manufacture</td>
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<tr>
<td>Implemented water conservation measures</td>
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<tr>
<td>Implemented innovative measures to improve quality of water discharges</td>
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<tr>
<td>5. Social Responsibility</td>
</tr>
<tr>
<td>Activity available corporate ethics and/or labor statement(s) adopted across the company</td>
</tr>
<tr>
<td>Identified third party assessment system and began to collect data for that system</td>
</tr>
<tr>
<td>Accessible third party social responsibility assessment, accreditation, or certification</td>
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Bolt brand secondary packaging (paperboard) granola bars from Batery Alimentos, S.A.
We believe that a real solution to environmental problems and achieve sustainable development in the Americas and beyond arises from:

(1) Re-thinking the way we go about designing and manufacturing products as the starting point of finding a structural solution to environmental problems; and

(2) Create awareness and set-up a proper reverse logistics to re-cover future Closed Looped Cycle Products (C2C-designed) products
C2C and the Lima Action Plan (2012 -2013)?
1. Integrate C2C in Ports Management Vision

- Requires long term vision
- Requires thinking about what is being done and how this is done
- Requires strategic decisions – impacting investments
- Requires continuous learning and improvement
- Multi-stakeholder and demand driven

- Build a long term vision that incorporates the principles of the C2C design philosophy
2. Launch C2C infrastructural projects

- Introduce ("Cradle") the C2C concept in construction and expansion of Ports and business parks.
3. Promote Green procurement

- Market based approach to Economic, Social and Environmental integration
- Competitive for business, increases profits, enhances business image and grow the business
- Improves human health and increase productivity
- Prevent pollution

C2C Certified Products
4. Be part of the optimization of C2C product imports & exports
5. Apply C2C to your business

The first C2C Vessel ➔ 100% Re-usable components
5. Apply C2C to your business (2)

100% RECICLABLE Y RE-USABLE
Just Imagine!

- Buildings in Ports, that just like trees, produce more energy than they consume, and contribute with the purification of the water used.
- Manufacturing facilities in the business parks of Ports of which their effluent water is potable.
- “Solid Waste” generated in Ports that after their use can decompose and function as a nutrient for plants, animals and soil in the surroundings.
- Obsolete ship products that can re-enter the industrial process and become new basic components for the creation of new products.
- Highly efficient and cost-effective maritime transportation that improve performance and profitability of Ports while providing critical services and creating benefits to the general community.
Thank you!

ing. Kevin de Cuba, MSc.
Program Manager,
Closed Looped Cycle Production in the Americas

T: +1-202-458-6467
E: kdecuba@oas.org

Director DSD
Cletus Springer
cspringer@oas.org

Chief – ECCM
Mark Lambrides
mlambrides@oas.org

Ruben Contreras
rcontreras@oas.org

Carolina Pena
cpena@oas.org

Juan Cruz Monticelli
jmonticelli@oas.org

Charlene Solozano
csolozano@oas.org

Rosy Arbieto
rarbieto@oas.org

Alejandra Henao
ahenao@oas.org

Energy and Climate Change Mitigation - ECCM
Department of Sustainable Development - DSD
Executive Secretariat for Integral Development - SEDI
Organization of American States
1889 F St. N.W. Washington, D.C. 20006, USA
www.oas.org/dsd
www.sepa-americas.net
Welcome To ECPA

The leaders of the Americas recognize that clean energy is fundamental to the Hemisphere's sustainable development and the prosperity of our citizens, and they are committed to expanding cooperation to address the intertwined challenges of energy security and climate change. To strengthen Inter-American collaboration on these issues, U.S. President Obama invited all countries of the Western Hemisphere to join in an Energy and Climate Partnership of the Americas (ECPA). ECPA is comprised of initiatives that focus on one or more of its seven pillars. Those are: renewable energy, energy efficiency, energy poverty, infrastructure, cleaner and more efficient use of fossil fuels, sustainable forests and land use, and climate change adaptation.