Cradle to Cradle® Design Innovations

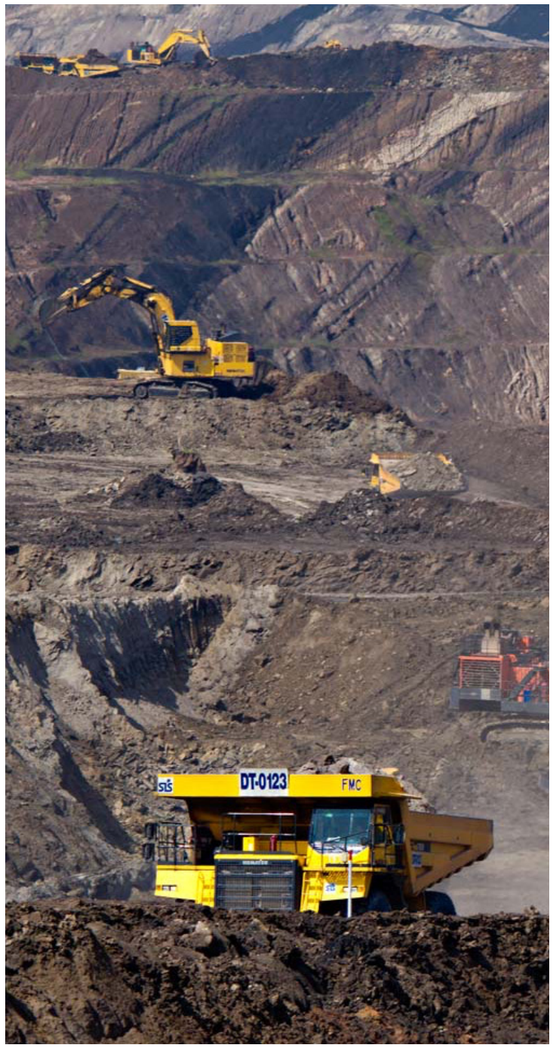
Rethinking the way we make things

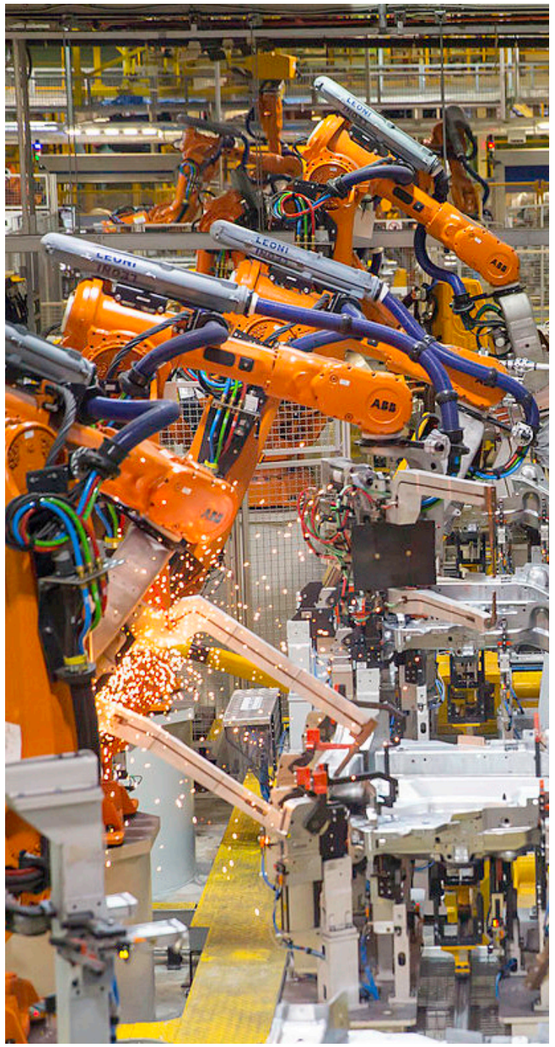
26th February 2020, HSLU, CH-Luzern

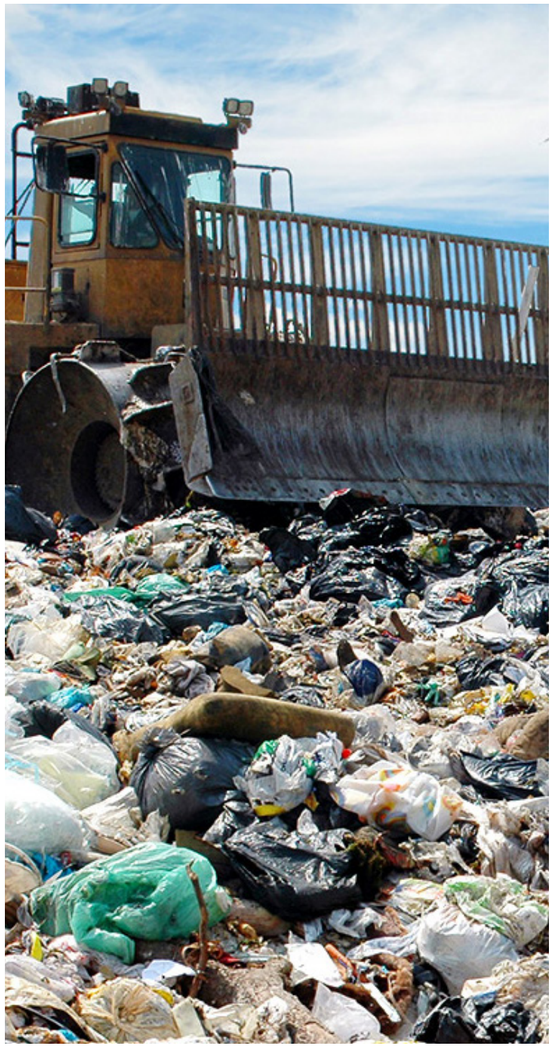
EPEA Switzerland GmbH
Albin Kälin (CEO)

CRADLE TO GRAVE DESIGN PARADIGMA

Take → Make → Use → Waste







EPEA Switzerland GmbH

Environmental Protection Encouragement Agency

CORE COMPETENCES

→ Partner for Business & Industry
→ Knowledge Trustee
→ Innovation Trustee
→ Acting as coaches
→ Accredited Assesment Body for Cradle to Cradle Certified™ Certification

4 PERSPECTIVES

→ Material Health Science by accredited Material Health Assessor
→ Management of Confidential Information in Production and Supply Chains
→ Business and Industry Implementation
→ Audits, Site Visits

CERTIFIED™
cradle to cradle
ACCREDITED ASSESSMENT BODY

EU COMMISSION - CIRCULAR ECONOMY

Presentation 01-02.12.2014, LYON/F

EPEA Switzerland GmbH

European Commission

01.-02.12.2014

17 th European Forum on Eco-innovation

11:30 - 12:45

Session 2: The practical challenges and opportunities of transformation

Keynote presentations highlighting:

- Barriers to be o vercome
- Old industry , new industry and disruptive technologies
- Example of holistic analysis of transf ormation within a sector
- ***Policy and financial supports***

Stéphane Hocquet[6], Deputy Sub-director of Integration of Sustainable Development by economic actors, Ministry of Ecology, Sustainable Development and Energy

Albin Kälin[7], *Chief Executive Officer,* Environmental Protection Encouragement Agency (EPEA) International Research, Switzerland GmbH

Cyril Kretzschmar [8], Vice-president for social and solidarity economy,Rhône-Alpes Region

CLOSING THE LOOP:

An EU-Action Plan For The Circular Economy 2. Dec 2015
EU PARLIAMENT 14. March 2017

European Commission

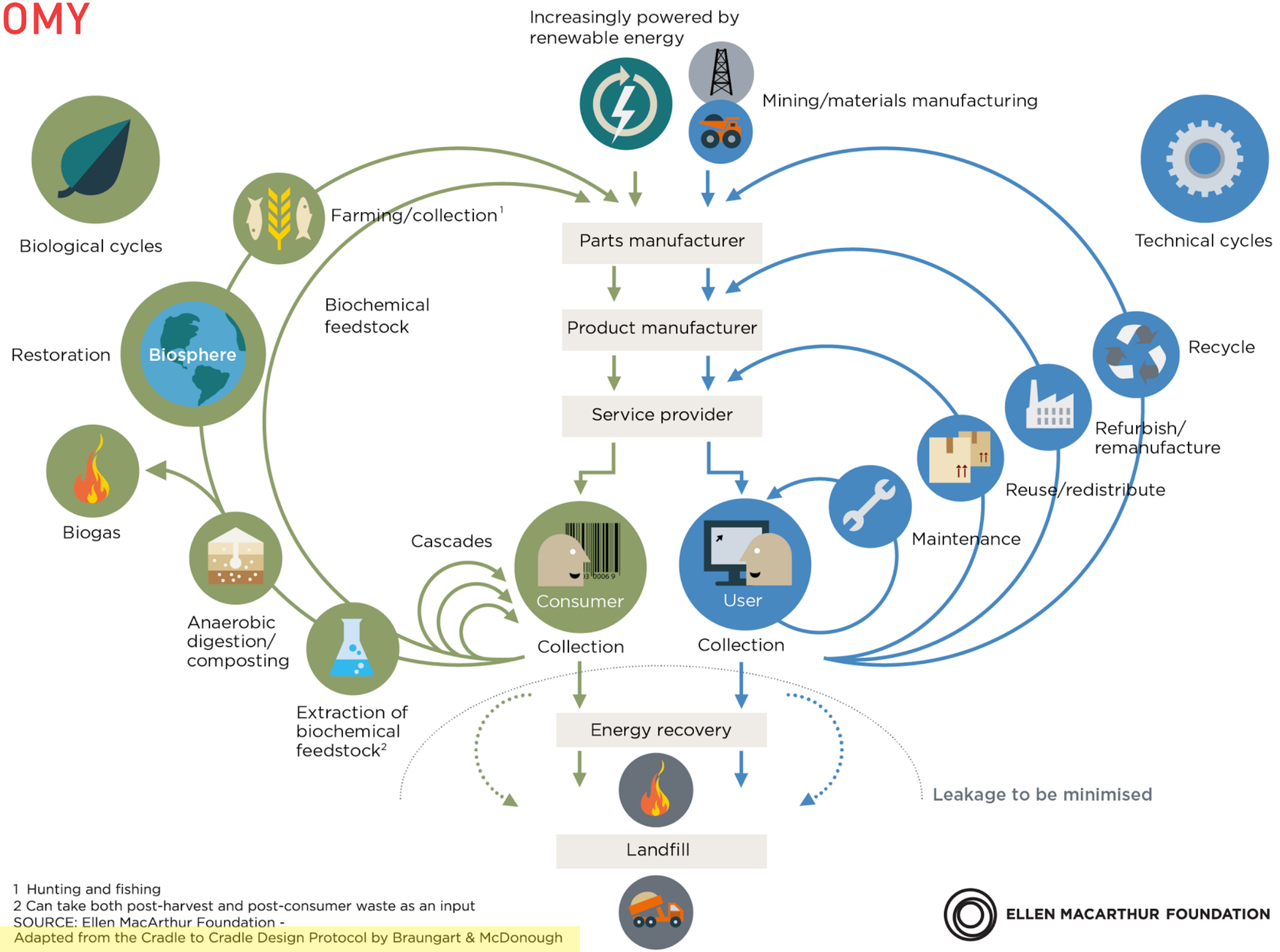
The revised legislative proposals on waste set clear targets for reduction of waste and establish an ambitious and credible long-term path for waste management and recycling. Key elements of the revised waste proposal include:

- A common EU target for recycling 65% of municipal waste by 2030;
- A common EU target for recycling 75% of packaging waste by 2030;
- A binding landfill target to reduce landfill to maximum of 10% of all waste by 2030;
- A ban on landfilling of separately collected waste;
- Promotion of economic instruments to discourage landfilling ;
- Simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;
- Concrete measures to promote re-use and stimulate industrial symbiosis - turning one industry's by-product into another industry's raw material;
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes (eg for packaging, batteries, electric and electronic equipments, vehicles).

CIRCULAR ECONOMY POLITICS TRANSFORMATION WITHIN 5 YEARS!!

CONFERENCE ON ECODESIGN > THE NEW GREEN DEAL

CIRCULAR ECONOMY
FOR BUSINESS



1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input
SOURCE: Ellen MacArthur Foundation -
Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

ELLEN MACARTHUR FOUNDATION

NETHERLANDS TAKE THE LEAD

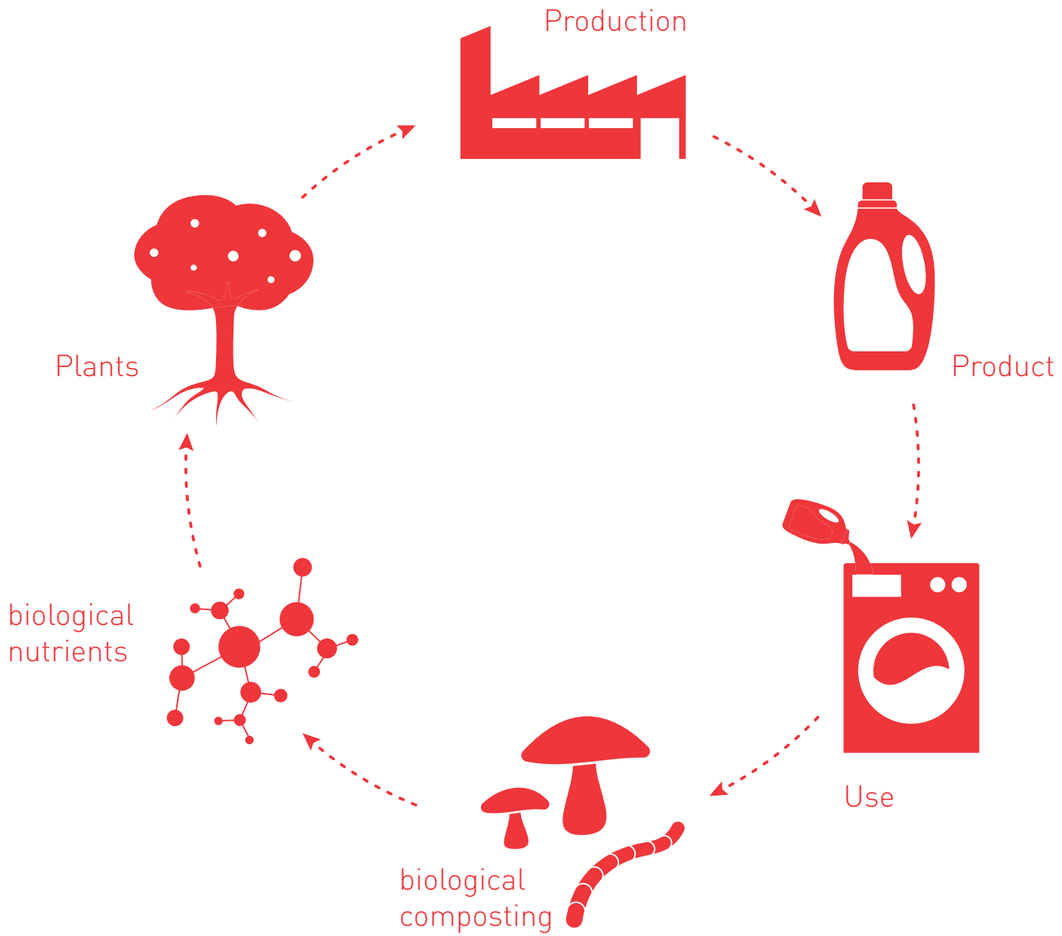
WORLDWIDE FIRST CRADLE TO CRADLE REGION

INDOOR AIRQUALITY FOR OUR CHILDREN

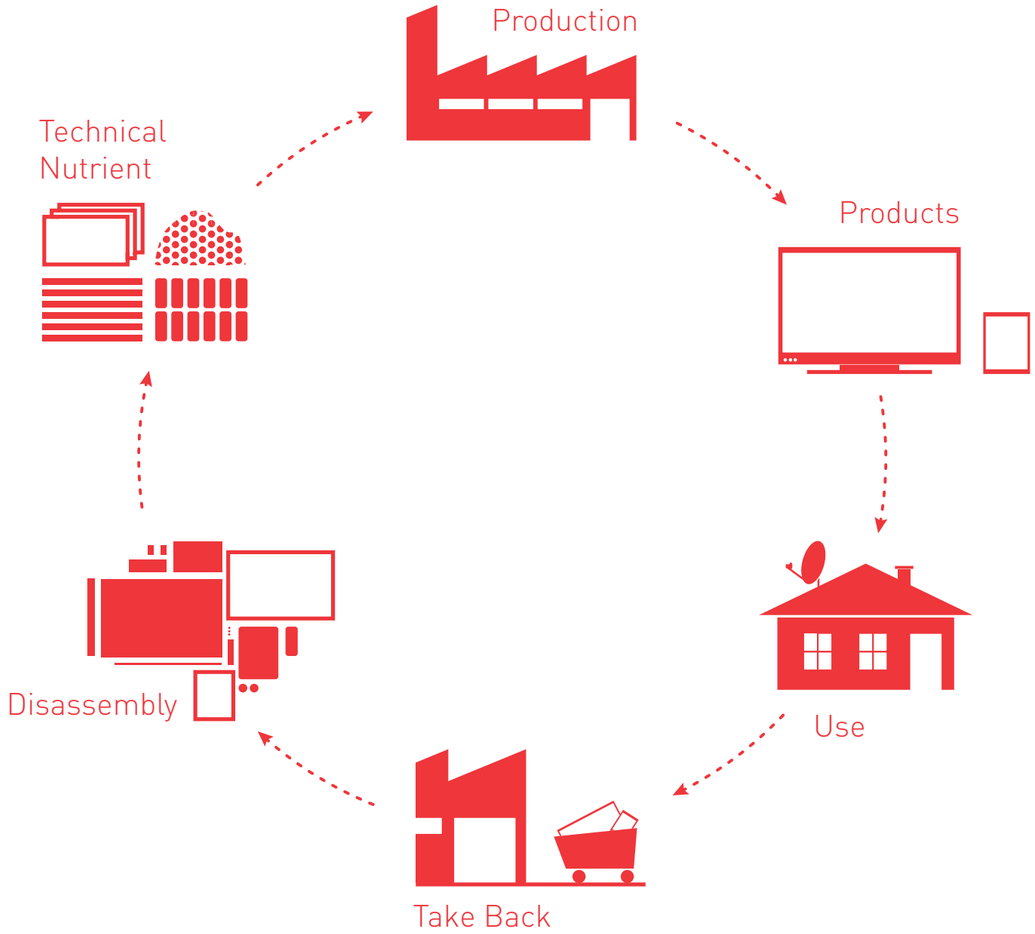
http://www.detail.de/artikel/kleeblatt-im-gruenen-kindergarten-in-muntlix-12395/

CLOSING THE LOOP
DESIGN BEYOND PRODUCTDESIGN

Consumer Goods in BIOLOGICAL SYSTEMS



Service Products in TECHNICAL SYSTEMS



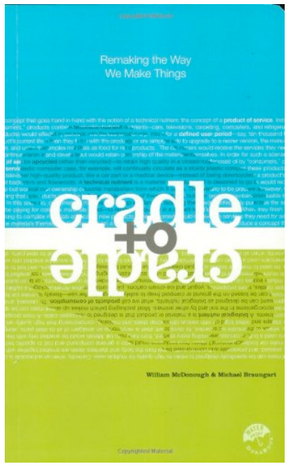
CRADLE TO CRADLE
CREATES TRANSPARENCY IN THE SUPPLY CHAIN (>100 PPM (0.01%))
1000 PPM (0.1%)
SAFETY DATA SHEETS (SDS)
100PPM (0.01%)
CRADLE TO CRADLE CERTIFIED™

IDENTIFING THE BEST MATERIALS
ABC-X CATEGORISATION

Goal: Best quality of raw materials, chemicals and ingredients

Category	Description
A	The material is ideal from a Cradle to Cradle perspective for the product in question.
B	The material supports largely Cradle to Cradle objectives for the product.
C	Moderately problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The material is still acceptable for use.
X	Highly problematic properties of the material in terms of quality from a Cradle to Cradle perspective are traced back to the ingredient. The optimization of the product requires phasing out this ingredient or material.
GREY	This material cannot be fully assessed due to either lack of complete ingredient formulation, or lack of toxicological information for one or more ingredients.
Banned	BANNED FOR USE IN CERTIFIED PRODUCTS This material contains one or more substances from the Banned list and cannot be used in a certified product.

CRADLE TO CRADLE CERTIFIED™
EVOLUTION OF AN IDEA



2002 — Publication of Cradle to Cradle: Remaking the Way We Make Things

2005 — MBDC creates certification programme **Version 1.0**

2009 — **Version 2.1 launched**

2010 — Institute founded

2012
- Certification Standards Board created
- Additional assement body trained

2013 — **Version 3.0 launched**

2014 — Public standard revision process launched

2018 — **Version 4.0 launched**

CRADLE TO CRADLE CERTIFIED™ CERTIFICATION
CATEGORIES BASED ON PRINCIPLES

EPEA SWITZERLAND

CERTIFIED cradletocradle ACCREDITED ASSESSMENT BODY

	Material Health	Material Reutilization	Renewable Energy	Social Fairness	Water Stewardship
	Select safe and healthy materials and chemicals	Eliminate the concept of waste and design for endless re-use	Power operations with abundant clean and renewable energy	Support and celebrate human and natural systems	Protect and steward water as a precious resource
CERTIFIED CM cradletocradle	PRODUCTS PROGRAM				
CERTIFIED TM cradletocradle	BASIC				
CERTIFIED TM cradletocradle		BRONZE			
CERTIFIED TM cradletocradle			SILVER		
CERTIFIED TM cradletocradle				GOLD	
CERTIFIED TM cradletocradle					PLATINUM

REMAKING THE WAY WE MAKE THINGS
MATERIAL INNOVATIONS

It exists, therefore it is possible

BIODEGRADABLE ELASTOMER ROICA V550	BIODEGRADABLE POLYMER INFINITO	BIODEGRADABLE 3 MM FILAMENT FOR 3 D PRINTING INFINITO	BIODEGRADABLE FLAMERETARDENT FIBER UNDER NDA	BIODEGRADABLE ADHESIVE FOR WOOD UNDER NDA	BIODEGRADABLE OUTDOOR TEXTILE WITHOUT MEMBRANE & TOXIC CHEMICLAS
AsahiKASEI	Lauffenmühle textile innovation	Lauffenmühle textile innovation	climatex®	BAUWERK® Parkett	Lauffenmühle textile innovation

Search Fields – Looking for Solutions

PET UPCYCLING THROUGH DEPOLYMERISATION GOAL: BETTER THAN VIRGIN MATERIALS	FLAMERETARDENT POLYMER FOR TECHNICAL CYCLES	FLAMERETARDENT BIODEGRADABLE POLYMER FOR BIOLOGICAL CYCLES	BIODEGRADABLE MATERIALS FOR FLOORING AND CLOSING THE LOOP CONCEPTS	WEEE SEARCH FIELD FOR CRADLE TO CRADLE SENS eRecycling

REMAKING THE WAY WE MAKE THINGS
CHEMICAL INNOVATIONS

Textiles

System Solutions for Textiles -	*Textilcolor*
VAT&Reactive Dyeing + Finishing Solutions -	*Tanatex*
Lubricant Solutions for sewing yarns -	*Dr. Petry*
Bleaching Solutions -	*under NDA*

Wood

Lacquer -	*Bauwerk Parquet*
Adhesives -	*Bauwerk Parquet*

Plastics

Lubricants -	*Clariant*
Additives -	*under NDA*
Katalysts -	*under NDA*

Paper

System Solutions -	*under NDA*
Integrated Paper Solutions -	*Vögeli, Gugler, KLS*
Hygenic Paper Solutions -	*in progress*

Metal

Galvanization -	*under NDA*
Criteria Material Health Solutions -	*defined*

Packaging

Sportsdrinking Bottle -	*Bayonix (C2CC GOLD)*
Solutions Packaging -	*Vögeli (C2CC GOLD)*
Flexible Packaging -	Werner&Mertz, MONDI

REMAKING THE WAY WE MAKE THINGS
COLOURS INNOVATIONS

Textiles

VAT, Reactive, Disperse, Indigo -	*Dystar*
Reactive, Disperse, Acid, Sulphur, Indigo -	*Archroma*
Reactive -	*Huntsman*
Reactive Printing -	*under NDA*
Disperse Printing -	*under NDA*

Wood

Colours -	*Bauwerk Parquet*

Plastics

Masterbatches for biological cycles -	*under NDA*
Masterbatches for technical cycles -	*under NDA*

Paper

Colour Solutions -	*under NDA, in development*
Colour Solutions -	*green 4 print (MHC GOLD)*

Metal

Coating Colours -	*under NDA*

Packaging

Colour Solutions -	*Siegwerk (MHC GOLD)*

ALPHA THEMES DEFINE OUR FUTURE

CRADLE TO CRADLE® PROVIDES SOLUTIONS

WATER

Chemicals in Water

SEWAGE SLUDGE

Toxiticy

SOIL EROSION

1/3 CO^2 tied up

NUTRIENTS

Raw Materials
Downcycling

RENEWABLE ENERGIES

PRODUCT INNOVATIONS

POLYMER SOLUTIONS FOR MICRO FIBERS & OCEAN PLASTICS

PRODUCT INNOVATIONS

POLYMER SOLUTIONS FOR MICRO FIBERS & OCEAN PLASTICS

→ Developing opportunities for innovative polymer plastics, fibers that are safe for biological or technical cycles >100ppm (0.01%) (polymer, additives, catalyst, masterbatch, marker)
→ Marker safe for biological systems
→ Integrate collecting systems, recycling + traceability technologies in product design for a circular economy
→ Industrial composting:
- Economical industrial composting is developed
- Integrate permission from authorities and legislation for industrial products

PROBLEM Biomass – 33% of soil is degraded or used unsustainable due to various reasons

SOLUTION

SHIRTS
solution for micro fiber
biodegradable polymer

LUXURY FASHION
solution for biodegradable
Elastomer

PLASTIC BOTTLES
solution for (ocean-) plastic
biodegradable polymer

PRODUCT INNOVATIONS

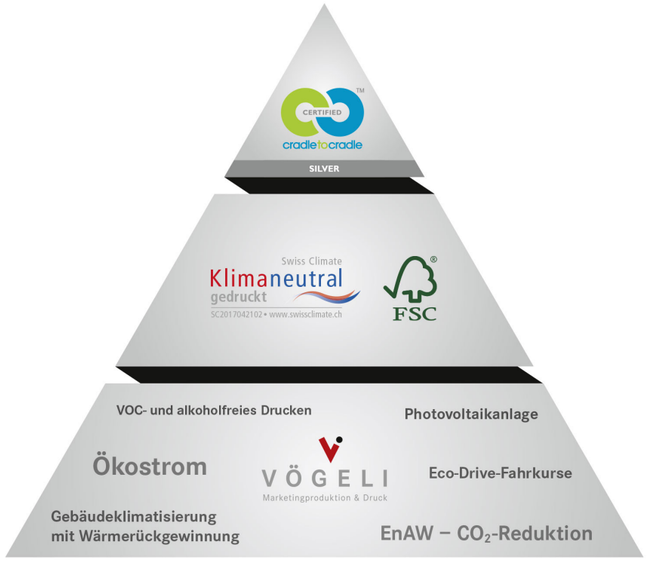
PAPER

PRODUCT INNOVATIONS
PAPER

PROBLEM Toxic Substances from Paper Manufacturing and Printing Inks.

SOLUTION

Van Houtum NL:
Satino Black



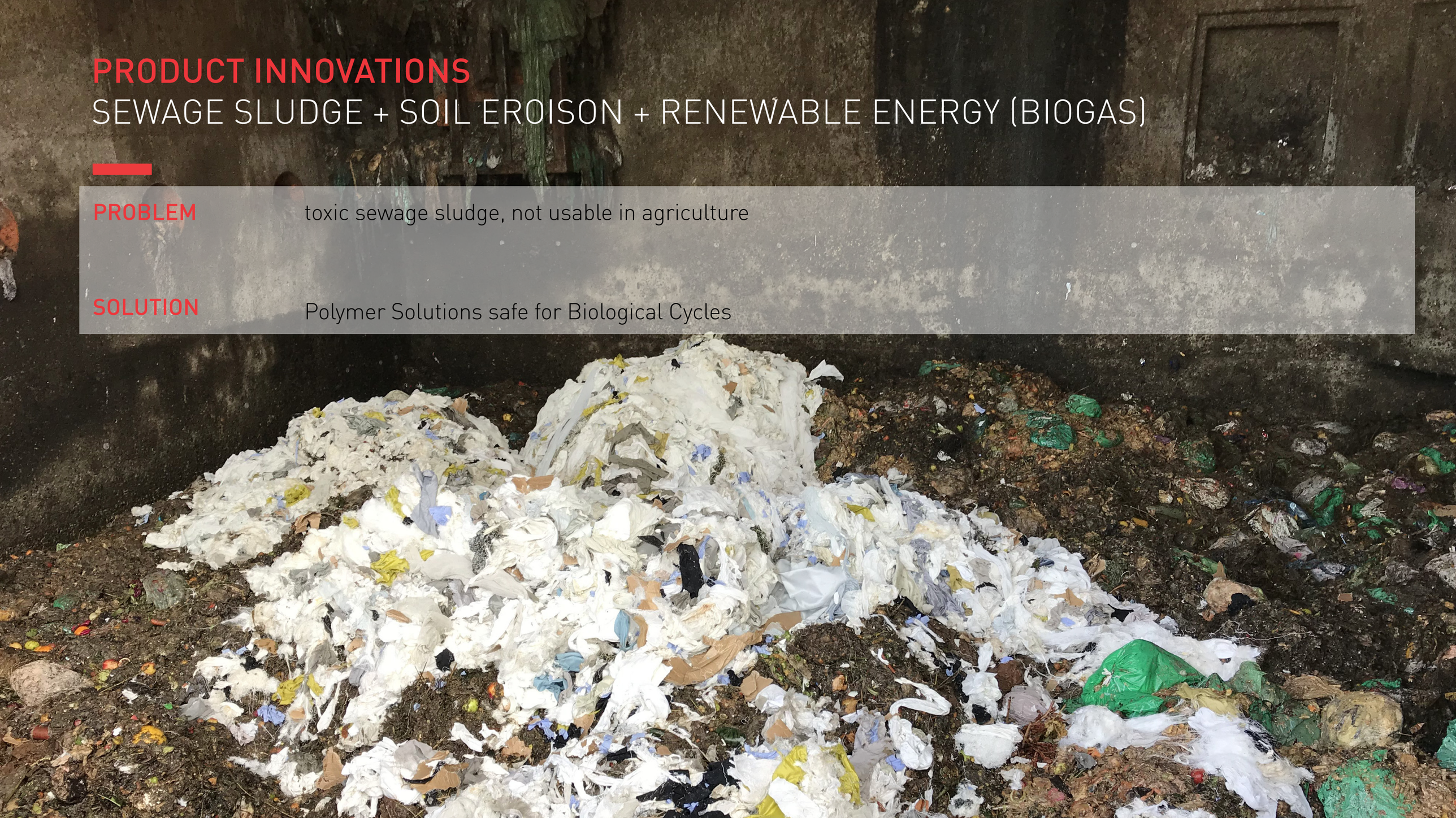
Vögeli Printing CH:
Healthy prints

Healthy Printing Initiative:
EPEA - Part of Drees & Sommer

PRODUCT INNOVATIONS

SEWAGE SLUDGE + SOIL EROISON + RENEWABLE ENERGY (BIOGAS)

PROBLEM	toxic sewage sludge, not usable in agriculture
SOLUTION	Polymer Solutions safe for Biological Cycles



PRODUCT INNOVATIONS

ECONOMICAL INDUSTRIAL COMPOSTING SOLUTIONS“CLOSING THE LOOP” A REALITY

PRODUCT INNOVATIONS

NUTRIENTS + WEEE: POLYMER SOLUTIONS FOR RECYCLING

PRODUCT INNOVATIONS

PACKAGING (LABEL & PRINTING

PRODUCT INNOVATIONS

PACKAGING (LABEL+PRINTING)

→ Material health positive list of plastics >100 ppm (0.01%)
→ Material health positive list of label + printing >100 ppm (0.01%)
→ Flexible packaging defined for recycling in a circular economy

PROBLEM Traceability of Plastics in Recycling - Label Materials, Printing Inks

SOLUTION

100% RPET:
Frosch Cleaning Detergents

Cradle to Cradle Certified™ Gold Level

100% RHDPE
Professional Cleaning at

Cradle to Cradle Certified™ Gold Level

FLEXIBLE PACKAGING
Product Development:
Sustainable pouch packaging

PRINTING INKS

Material Health Gold Level

SIEGWERK

WEEE

WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT

→ Effective use of RFID for instructions disassembly, reuse, recycling, upcycling, reintegration into the supply chain
→ Materials pooling for mass material streams
- Develop resources exchange + resources accounting
- Separate electric products in biological / technical cycles

→ Paradigma change (transformation of electronic industry)
- incentive premium for transformation electronic goods for a circular economy
  - financial streams
  - information streams
  - material streams

ELECTRONIC WASTE TODAY

CRADLE TO CRADLE DESIGN INNOVATION

ELECTRONIC GOODS:
SEARCH FIELD CRADLE TO CRADLE® MATERIAL CYCLE

SENS eRecycling

Education

RETAIL

Contract
Revision

Import Agent

Design- + Processmodificaton

Manufacturer

Component
Suppliers

Rawmaterial Processing

Design- + Processmodificaton

Rawmaterial Mining

Material Flow

SENS
Platform

CONSUMER

e-recycling.ch

Collection Point

Processmodificaton

Recycler / C2C

Recycler II

Destruction

Contract
Characteristics
Controling

CONCEPTS FOR PRODUCT IDENTIFICATION

→ Product passport
→ Environmental Product Declaration (EDP)
→ Certifications for circular products (Material Health Certificate, Cradle to Cradle Certified™)

PRODUCT PASSPORT

EDP:
ENVIRONMENTAL PRODUCT DECLARATION

CERTIFIED CM
cradletocradle
PRODUCTS PROGRAM

Material Health

NEW REQUIREMENTS WASTE LEGISLATION

→ Wording: Resources + waste legislation for a circular environment
→ Include resources in content and support circular concepts
→ Include recycling, upcycling + industrial composting for a closed loop concept

EPEA SWITZERLAND

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Cradle to Cradle® Products Innovation Institute
http://c2ccertified.org

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