PLATFORM MEETING

L'esperienza dei Progetti LIFE per la sostenibilità ambientale dell'industria Ceramica e dei Laterizi

Nuovo concetto di economia circolare che promuove l'uso di materiali di scarto anche in altre industrie

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LIFE ECLAT (LIFE15 ENV/IT/000369)

Sassuolo – 11 aprile 2017

FEDERAZIONE CONFINDUSTRIA CERAMICA E LATERIZI

MINISTERO DELL'AMBIENTE E DELLA TUTELA DEL TERRITORIO E DEL MARE

CENTRO CERAMICO Bologna

LIFE 2015

LIFE Environment and Resource Efficiency project application

LIFE ECLAT

2016-2019

FONDOVALLE

UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Dipartimento di Scienze e Metodi dell'Ingegneria

Dipartimento di Ingegneria "Enzo Ferrari"

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Prof. Cristina Siligardi
Prof. Paolo Veronesi

MINISTERO DELL'AMBIENTE

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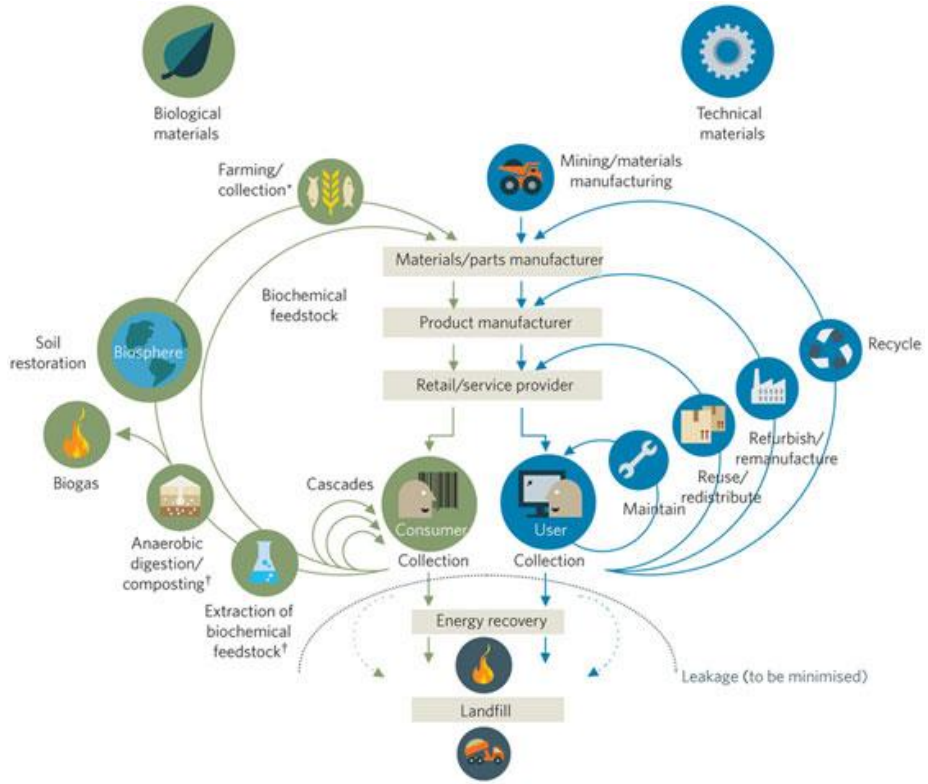
THE CIRCULAR ECONOMY DIAGRAM



A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems and business models.

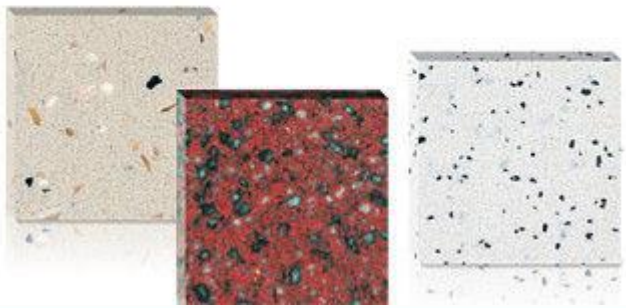
Ellen MacArthur Foundation, 2013b, p.7

PROJECT INTRODUCTION

Ceramic tiles

VERSUS

Engineered Stone



polymeric resin + stone

APPLICATIONS

Commercial

Living

Outdoor

Bathroom

Custom made

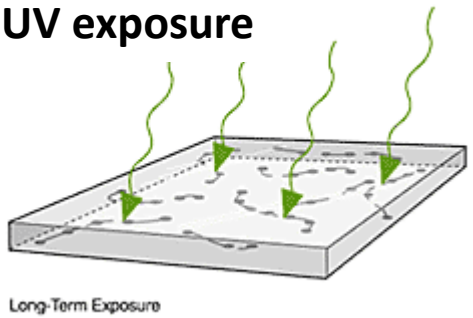
Environmental Problems:

Engineered Stone

Recycling

Intrinsic problems related to environmental issues, like recycling (it is a hybrid material, difficult to separate into components and hence recycled).

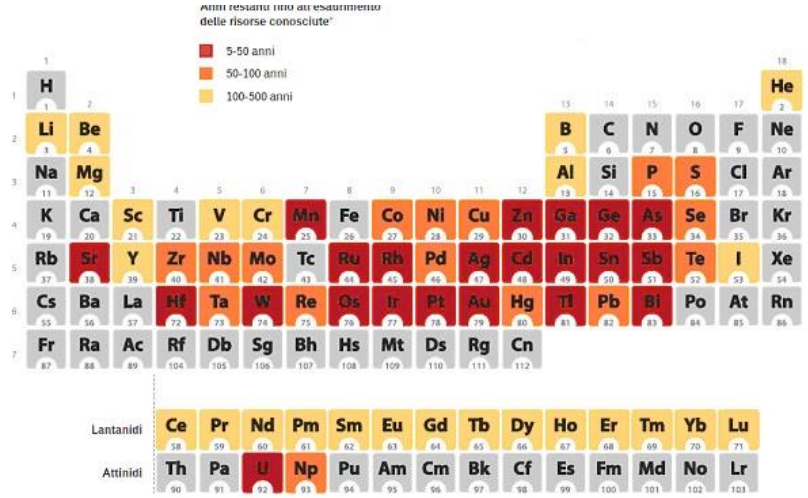
The polyester resins are not completely UV stable and this can cause discoloration of the stone, and breakdown of the resin binder; the material is also damaged by direct application of heat, a situation often happening in kitchens.

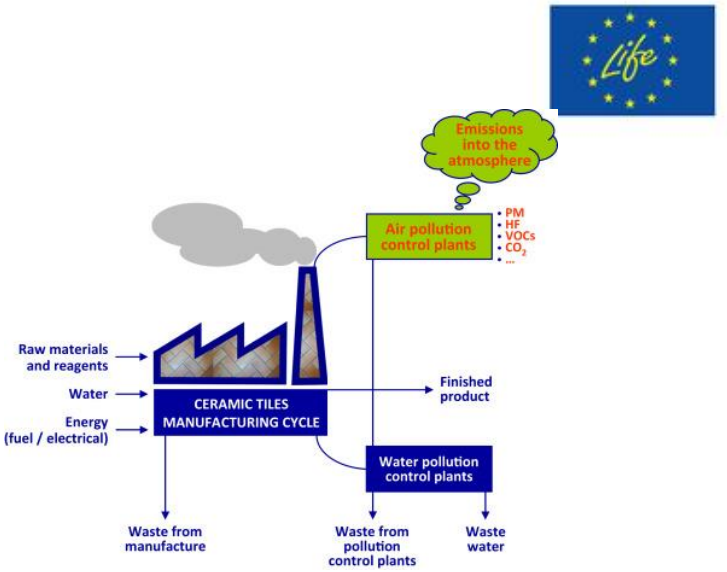


Environmental Problems:

Ceramic tiles

Non renewable resources as raw materials





Emissions: magnifying at a local level the environmental problems

Waste produced by the Italian district:

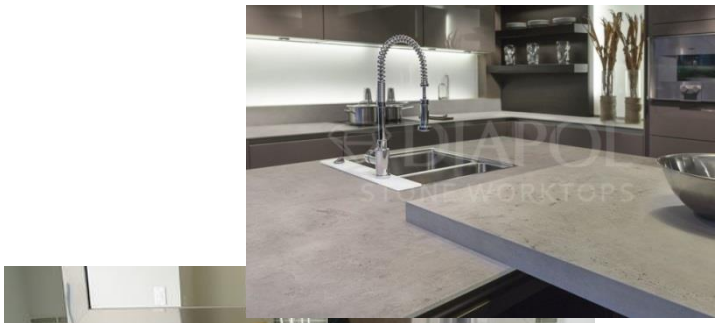
1'077'265 tons of waste per year to manufacture 729'000 tons of ceramic products, with an hazardous waste generation of more than 12'700 tons/year

EMAS Case Studies – Tiles industry district of Modena and Reggio Emilia, Italy

EPD Italian Ceramic Tiles - ECO EPD Ref. No. ECO-00000444

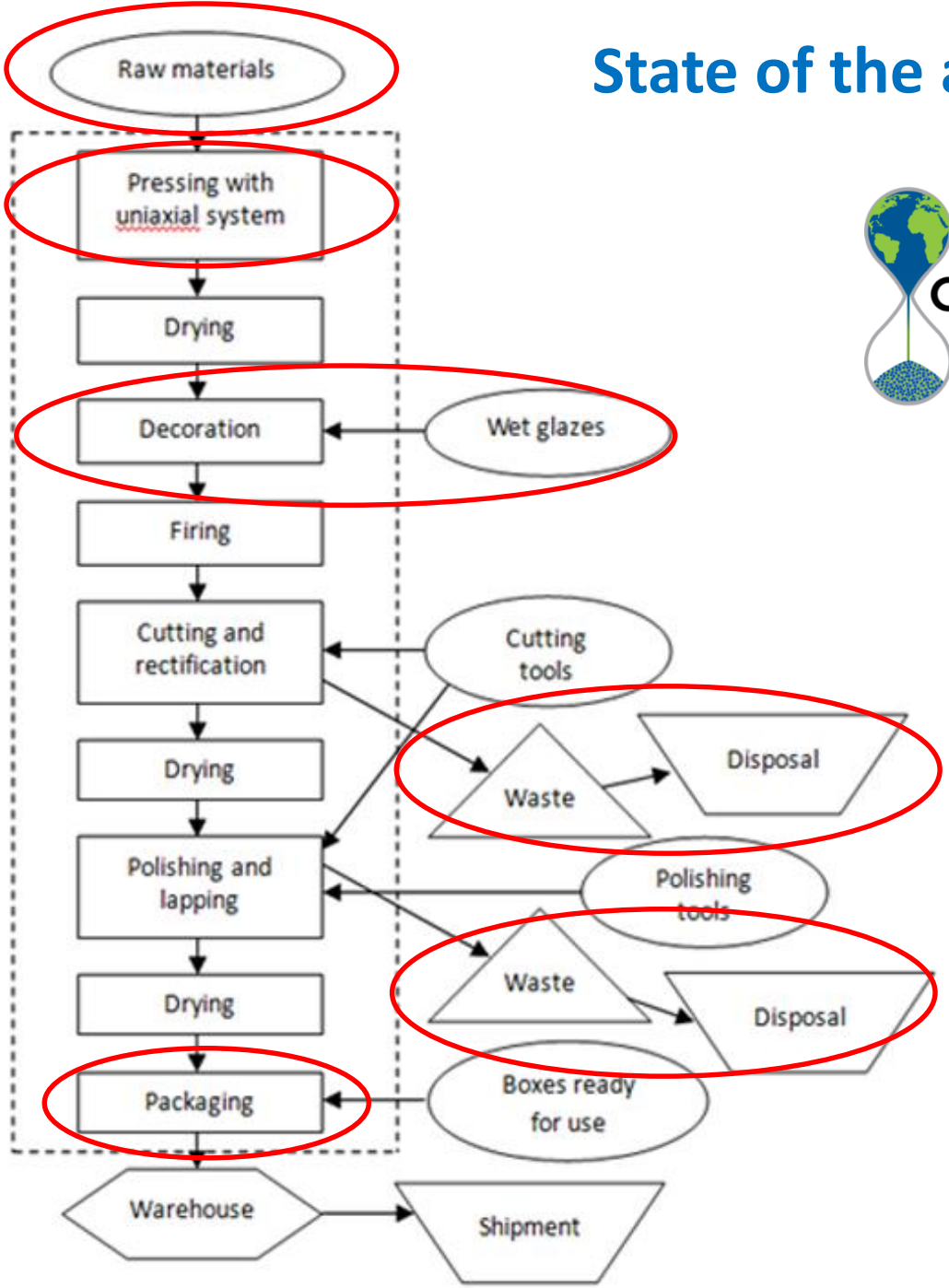
ECLAT – Project objectives

Realize and validate the principles of the circular economy approach to the manufacturing of endless ceramic slabs for tiles, kitchen tops, bathroom countertops.



Close the manufacturing cycle, which starts from the incoming atomized powders, up to the recycling of end of life products claimed by deconstruction operations.

State of the art



Earth Overshoot Day 2016

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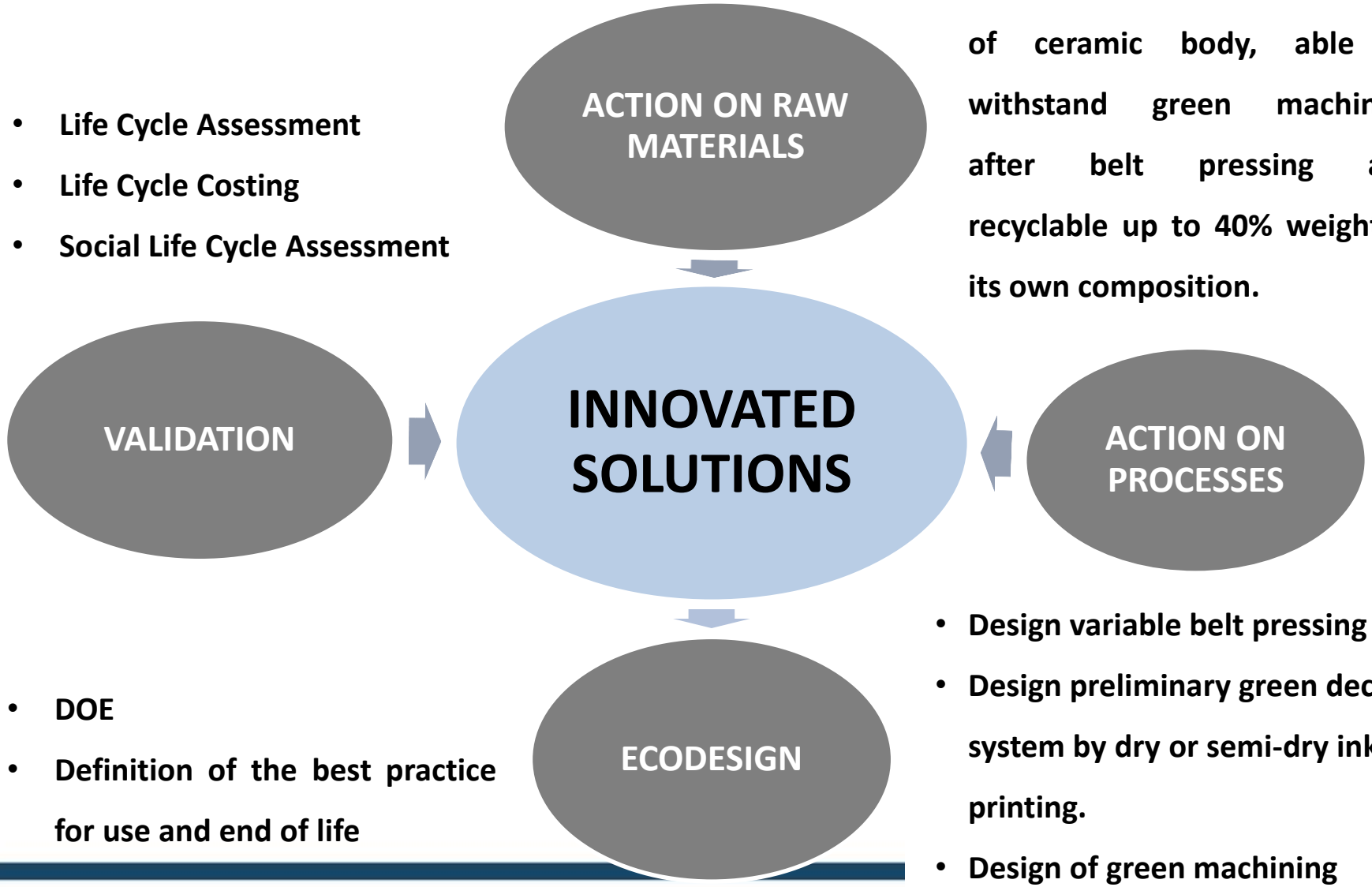
ECLAT - Approach

- Life Cycle Assessment
- Life Cycle Costing
- Social Life Cycle Assessment



- Design of an “eco” composition of ceramic body, able to withstand green machining after belt pressing and recyclable up to 40% weight in its own composition.

- DOE
- Definition of the best practice for use and end of life

- Design variable belt pressing system.
- Design preliminary green decoration system by dry or semi-dry ink jet printing.
- Design of green machining equipment and tools.
- Packaging on demand

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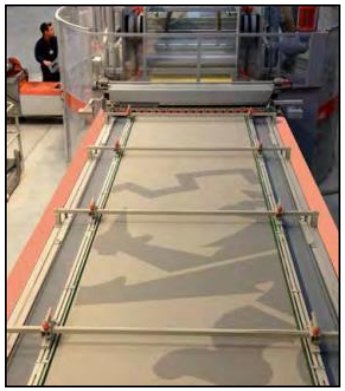
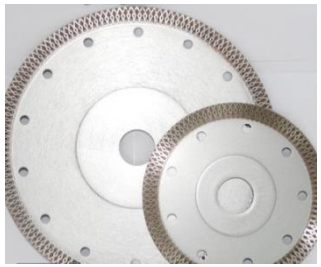
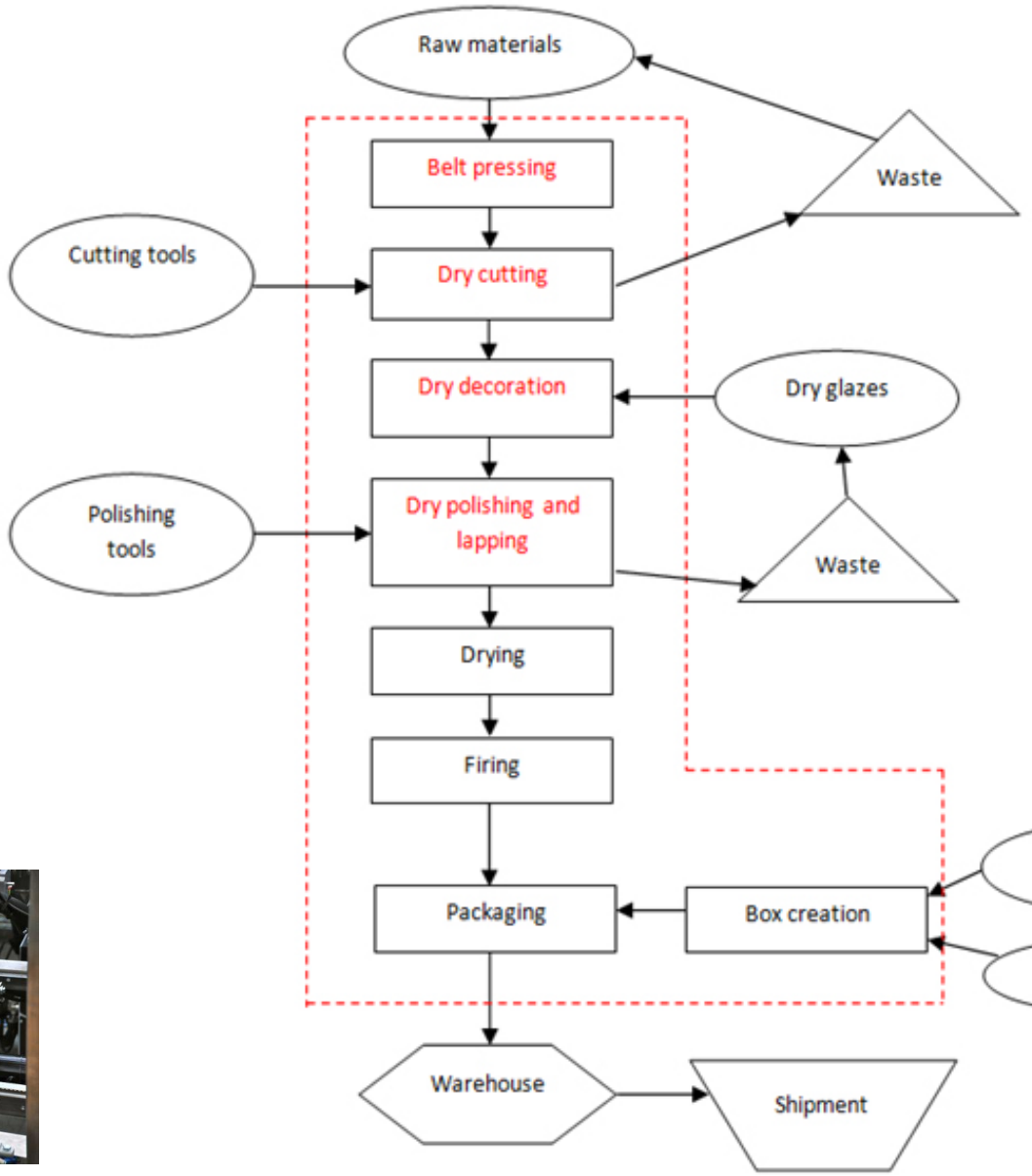
ECLAT PROCESS

large ceramic slabs manufacturing



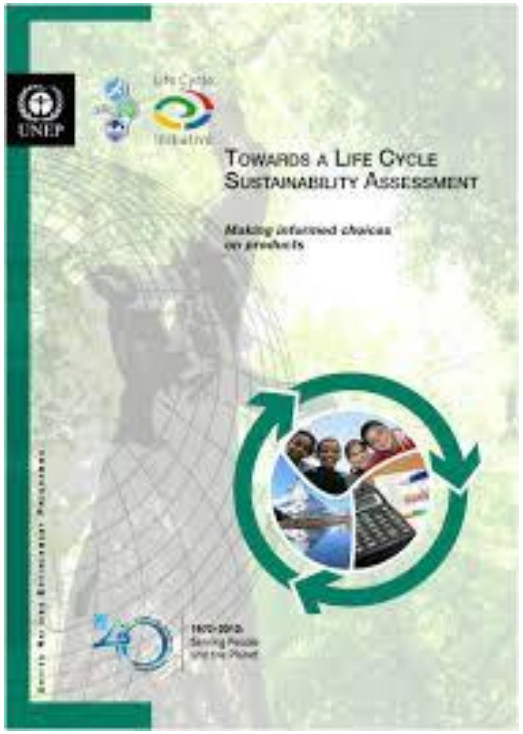




Life Cycle Sustainability Assessment

Methodological approach for the assessment of all environmental, economic and social impacts and benefits in decision making processes for improving the sustainability of a process or product throughout its entire life cycle.

«Towards a Life Cycle Sustainability Approach» UNEP-SETAC 2011



LCSA = E-LCA + LCC + S-LCA

W. Klöpffer (2008); Finckbeiner et al (2010)

ENVIRONMENTAL DIMENSION: Life Cycle Assessment (LCA)

ECONOMIC DIMENSION : Life Cycle Costing (LCC)

SOCIAL DIMENSION: Social Life Cycle Assessment (S-LCA)

ECLAT - Project challenges

Environmental indicators

Reduction of the packaging used	-60-70%
Utilization of recycled materials	40%
Reduction of sludge	0.9 kg/m^2
Reduction of fired scraps	2.5 kg/m^2
Water savings	0.8 m^3/m^2
Reduction of energy consumption	-50%
Recyclability of the final product	100%

Economic indicators

Direct economic value generated	%
Reduction of packaging costs	-40 %
Increase of productivity	+30%

Social indicators

New job position	+ 2
Training activities	120 h
Stakeholder involved in the project	+ 10

Ringraziamenti

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http://ec.europa.eu/environment/life/index.htm

- Si ringrazia la direzione e tutto il personale di ELLE3 - Modena - per il supporto nella formazione del parternariato, nella stesura, gestione e rendicontazione del progetto

- **http://www.elle3.it**

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