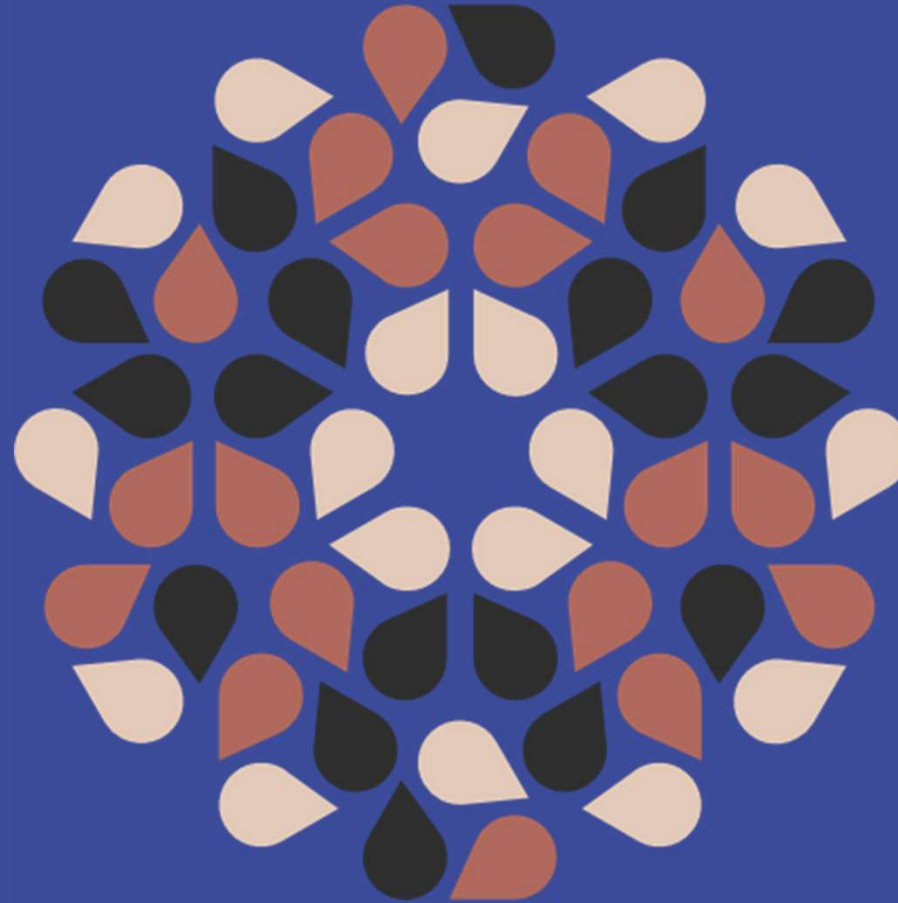


www.lifereplay.eu



LIFE REPLAY

Unveiling a recycling-sourced of heavy metal-based solids component and organic effluent for use in the ceramic industry

WEBINARIUM LIFE
February 25th, 2022

TABLE OF CONTENTS

1. BACKGROUND AND CONTEXT
2. ENVIRONMENTAL PROBLEM TARGERED
3. OBJECTIVE AND SCOPE
4. PROJECT CONSORTIUM
5. ACTIONS
6. EXPECTED OUTCOMES





BACKGROUND AND CONTEXT



Inkjet Printing is a **digital** and **non-contact** transfer of **liquid droplets** into specific locations on a substrate.



Droplets flow through the air and land on paper, plastic, glass, metal or **ceramic**. No mechanical contact is involved.



Inkjet Printing deals with droplets from **10 μm to 1 mm**.





BACKGROUND AND CONTEXT

ADVANTAGE 01

Achievement of a greater level of end-product customisation, ultimately prevailing over and, almost completely, replacing the other decorating techniques (screen printing, flexography, rotogravure).



ADVANTAGE 02

Obtaining high resolution images, firing around 2,000-5,000 drops/cm in a strictly controlled ejection mode.



ADVANTAGE 03

Great versatility. Adaptation to any topography and relief on the surface. Ejection up to 250 g/sq-m of ceramic ink.



ADVANTAGE 04

An important raise in process productivity and reduction in manufacturing costs (around 300,000-500,000 €/year).



ADVANTAGE 05

Development of new textures, finishes and, in short, providing a finished ceramic product with new qualities.























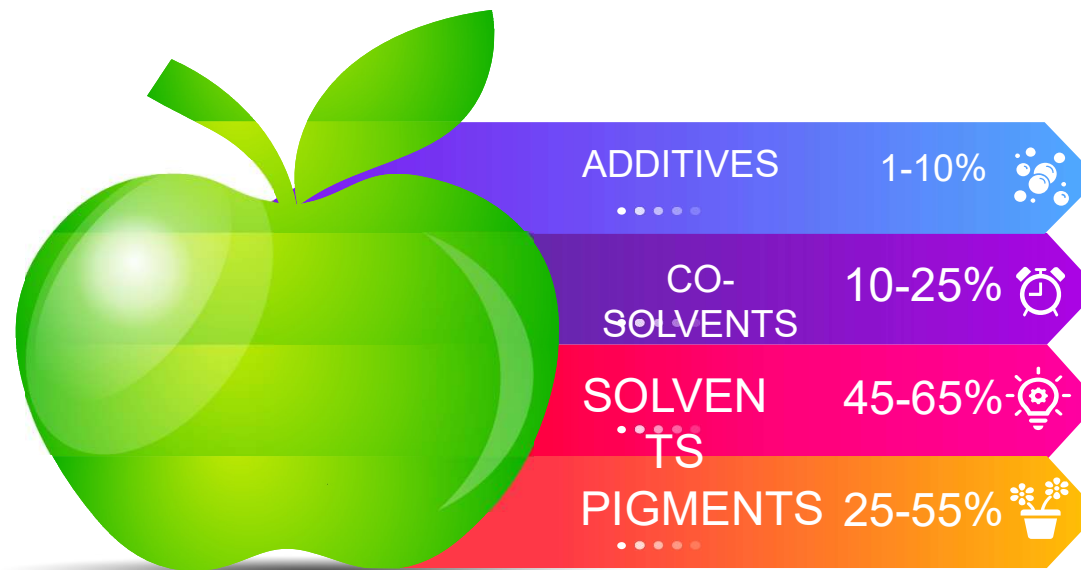






ENVIRONMENTAL PROBLEM TARGETED

Precisely, the current growing need to increase the digitalization of the ceramic tile production (“FULL DIGITAL” objective) and the manufacture of larger slabs lead not only to an adaptation of inkjet technology to these new formats, but also to the reformulation of new inkjet ink compositions. These new products required the deposition of larger amounts of inkjet inks, which irremediably contribute to the generation of hazardous wastes from ceramic inkjet ink production and use.



The presence of heavy metals (Ni, Pr, Cr, Co) in the solid component and the organic nature of the solvents (paraffinic oils, ester, glycol) entail important environmental problems increasing risks to health and safety (soil and water contamination)



ENVIRONMENTAL PROBLEM TARGETED

Around 2,399 tons/year of waste were generated in 2020 from the ceramic inkjet inks at EU level (without being reused nor recycled). Their treatment and disposal induced costs of 14.4 M€/year.

641,088
Kg/year

SPAIN

503,194
Kg/year

ITALY

405,216
Kg/year

TURKEY

1,652,314
Kg/year

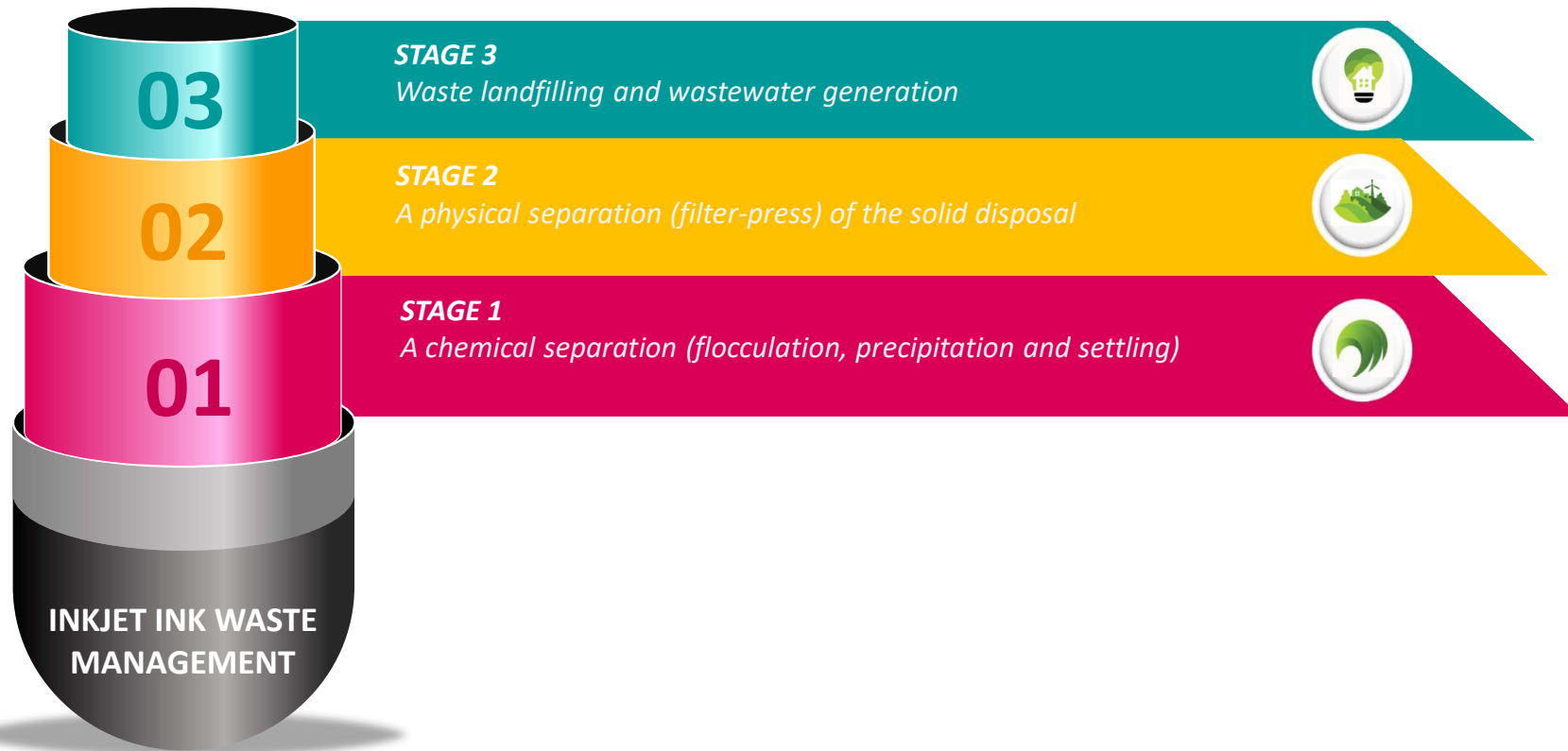
EU (28 countries)

2,399,846
Kg/year

EUROPE



ENVIRONMENTAL PROBLEM TARGERED





OBJECTIVE AND SCOPE

TO DEMONSTRATE THE TECHNICAL FEASIBILITY OF USING CERAMIC INKJET INK WASTES AS A NEW RAW MATERIAL FOR THE CERAMIC INDUSTRY, PRIOR SEPARATION OF THOSE, RESULTING IN A SOLID COMPONENT (BASED ON HEAVY-METAL INORGANIC PIGMENT) AND IN A LIQUID COMPONENT (BASED ON AN ORGANIC SOLVENT).



01

To develop a prototype for the separation procedure in a simple and low-cost process.



02

To assess the environmental impact of brand-new ceramic products reusing and recycling wastes on the ceramic production, eco-ceramic tiles and eco-inkjet inks.



03

To implement a value chain pilot based on circular economy pillars through industrial symbiosis amongst SMEs.



04

To guarantee a closed process and product life circle, recycling and reusing wastes at the end of the lifetime for avoiding landfilling and wastewater generation.





PROJECT CONSORTIUM



PRIVATE NON-PROFIT
RESEARCH INSTITUTE

CERAMIC TILE
MANUFACTURER

AUTHORISED WASTE
MANAGER

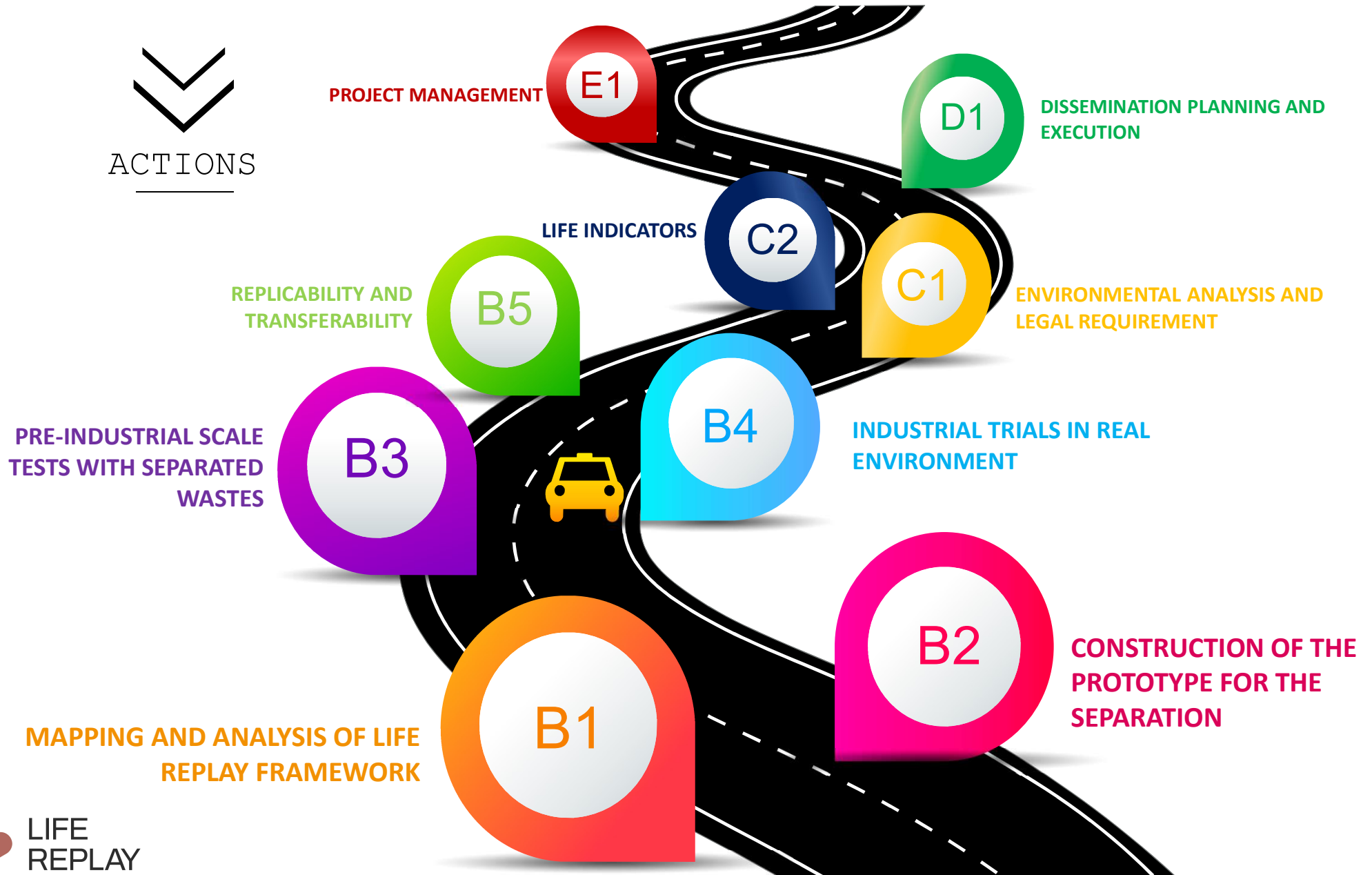
MACHINERY
MANUFACTURER

PIGMENT AND INKJET
INK MANUFACTURER



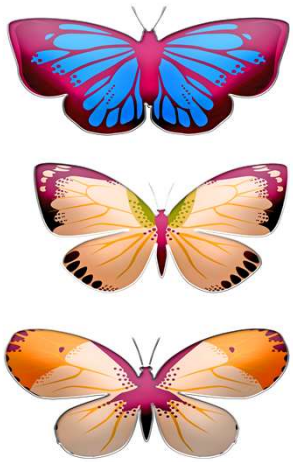


ACTIONS





EXPECTED OUTCOMES



Performance



Energy savings



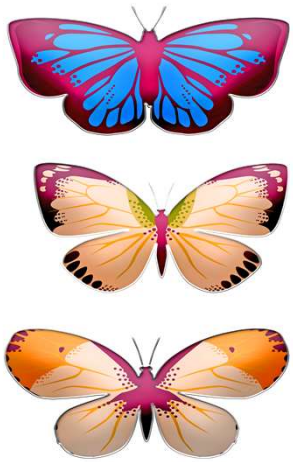
Wastewater



Green products



EXPECTED OUTCOMES



Performance

90-98%

Separating capacity of 0.5 tons/h.



Energy savings



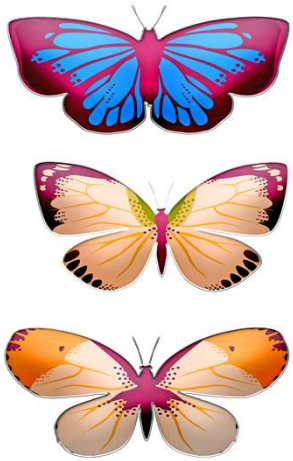
Wastewater



Green products



EXPECTED OUTCOMES



Performance



Energy savings

40-50%

Recyclability of the by-products
obtained in the ceramic
manufacturing process



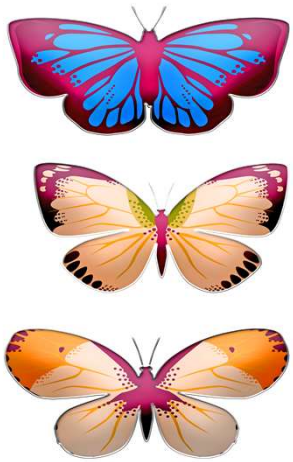
Wastewater



Green products



EXPECTED OUTCOMES



Performance



Energy savings



Wastewater

Zero

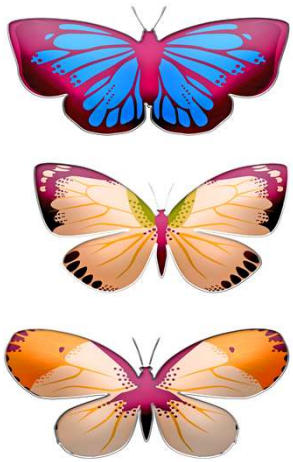
No wastewater generation during the separation process proposed.



Green products



EXPECTED OUTCOMES



Performance



Energy savings



Wastewater



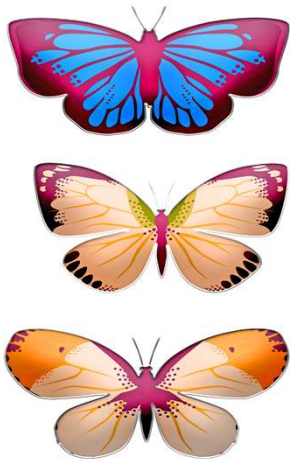
Green products

6 demonstrators

Traditional decorative tile,
Inorganic Pigment, Ceramic
inkjet ink, Coloured-body tile,
Coloured-glaze tile and Cleaner.



EXPECTED OUTCOMES



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MANY THANKS!!

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www.lifereplay.eu



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