Co-funded by the Eco-innovation Initiative of the European Union

PROGETTO WINCER: SINERGIA TRA I RIFIUTI
PER LA PRODUZIONE DI PIASTRELLE CERAMICHE INNOVATIVE

WINCER Project: Waste synergy in the production of innovative ceramic tiles

CONFERENZA FINALE

FINAL CONFERENCE

Mercoledì, 13 dicembre 2017

Confindustria Ceramica – Sassuolo (MO), Viale Monte Santo 40

Overview di progetto

Project overview

Dr. Elisa Rambaldi, Centro Ceramico

Project details

PROJECT NAME:
Waste synergy in the production of INnovative CERamic tiles

PROJECT ACRONYM:
WINCER

PROJECT REFERENCE:
ECO/13/630426/WINCER

PROGRAMME ACRONYM:
CIP-EIP-Eco-Innovation

SECTOR:
RECYCLING

START/END:
Jan 2015 – Dec 2017

PROJECT WEBSITE:
www.wincer-project.eu

3 years
Duration

2015
Starting year

3
Partners

1,489,312 euro
Total Cost

744,656 euro
EU Contibution

Project partners

From month 1(January 2015)
Till month 18 (June 2016)

From month 19 (July 2016)
Till month 36 (December 2017)

Project Background

The European regulations encourage and boost industries towards a green and circular economy in which the "reuse" and "preparation for reuse" are the key words to reach an Innovating-to-Zero, ideal future at zero emission, zero waste, zero not-recyclable products.

NEW CONCEPT OF CERAMIC MIX:

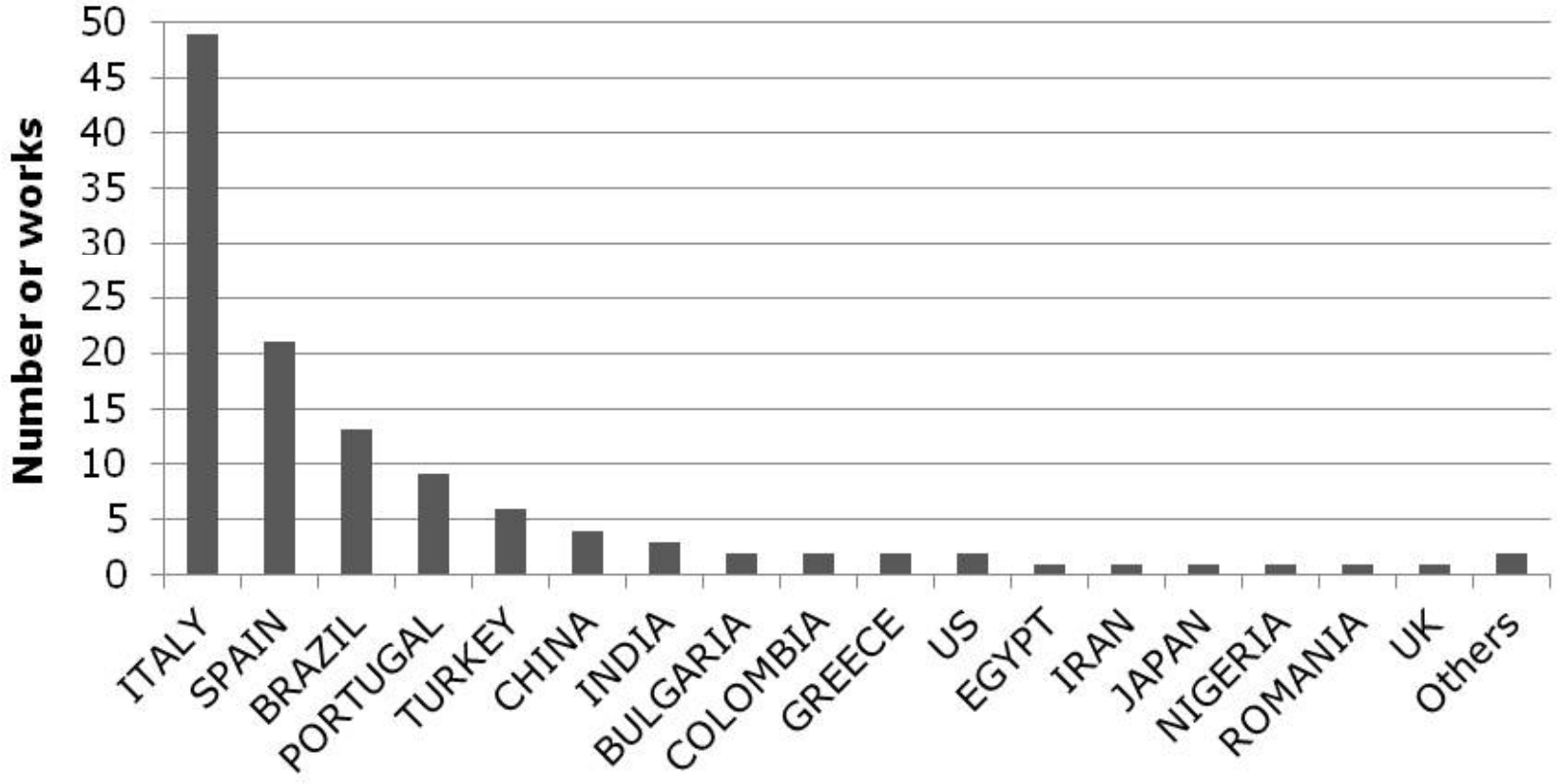
Natural raw materials PLASTICIZER, FLUXING AND TEMPERIG are substituted by:

1. New glassy raw materials for traditional ceramics coming from vitrification of different wastes able to crystallize during firing

2. Different type of wastes opportunely balanced to obtain a sort of "wastes synergy" during firing

Scientific research

Geographical provenience of scientific papers on waste recycling in porcelain stoneware mixes (from 2000 till 2017). Source: SCOPUS database.



Market analysis

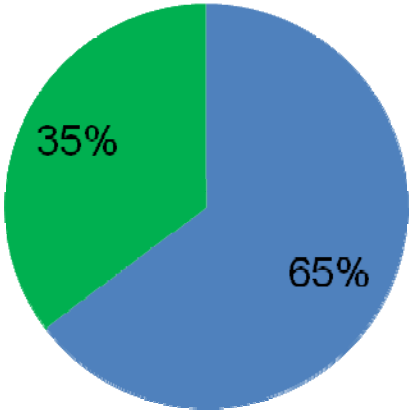
Statistical analysis 2017 – EU market

Percentages of sellers and shops in which **“sustainable” ceramic tiles**

are **recognizable**

(LEED, EPD, Ecolabel, ...)

or **not recognizable**



Recognizable

Not recogniable

Products on the MARKET

	TRADITIONAL CERAMICS	SUSTAINABLE TILES ON THE MARKET
Sand and feldspar coming from national and foreign mines and quarries	60%	25% - 50%
Clays coming from national and foreign mines and quarries	36%	25% - 36%
Soda lime glass waste coming from urban collection (or similar)	0%	3% - 10%
Unfired green scrap tiles generated during the industrial ceramic process	4%	4% - 20%

Project AIM

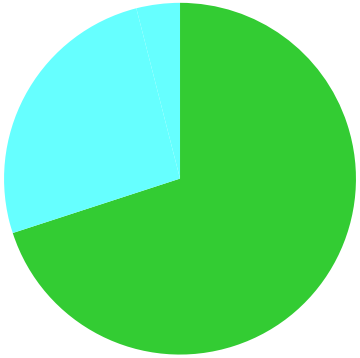
Industrial production of porcelain stoneware tiles containing 70% of pre and post consumer wastes.

1. Saving of natural resources

2. Reduction of thermal energy consumption

3. Valorisation and recovery of wastes

Post-consumer wastes: glass



Glass from urban separate collection
1,673,000 ton/year

~60,000 ton
4% yearly collection

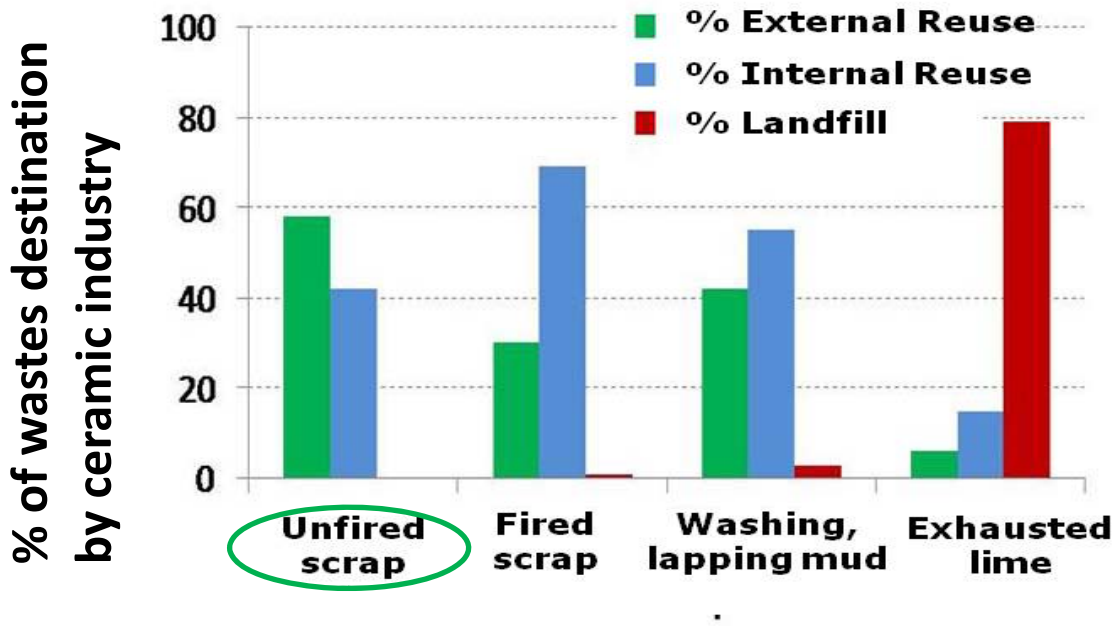
4.16 Mm² /year
1% Italian production

30% available (about 500,000 ton/year)
70% reused by glass industry

Glass SAVEL C

Glass coming from urban separate collection NOT suitable for the glass industry. It is produced in the MINERALI INDUSTRIALI's plant.

Pre-consumer wastes: by-products of the ceramic industry

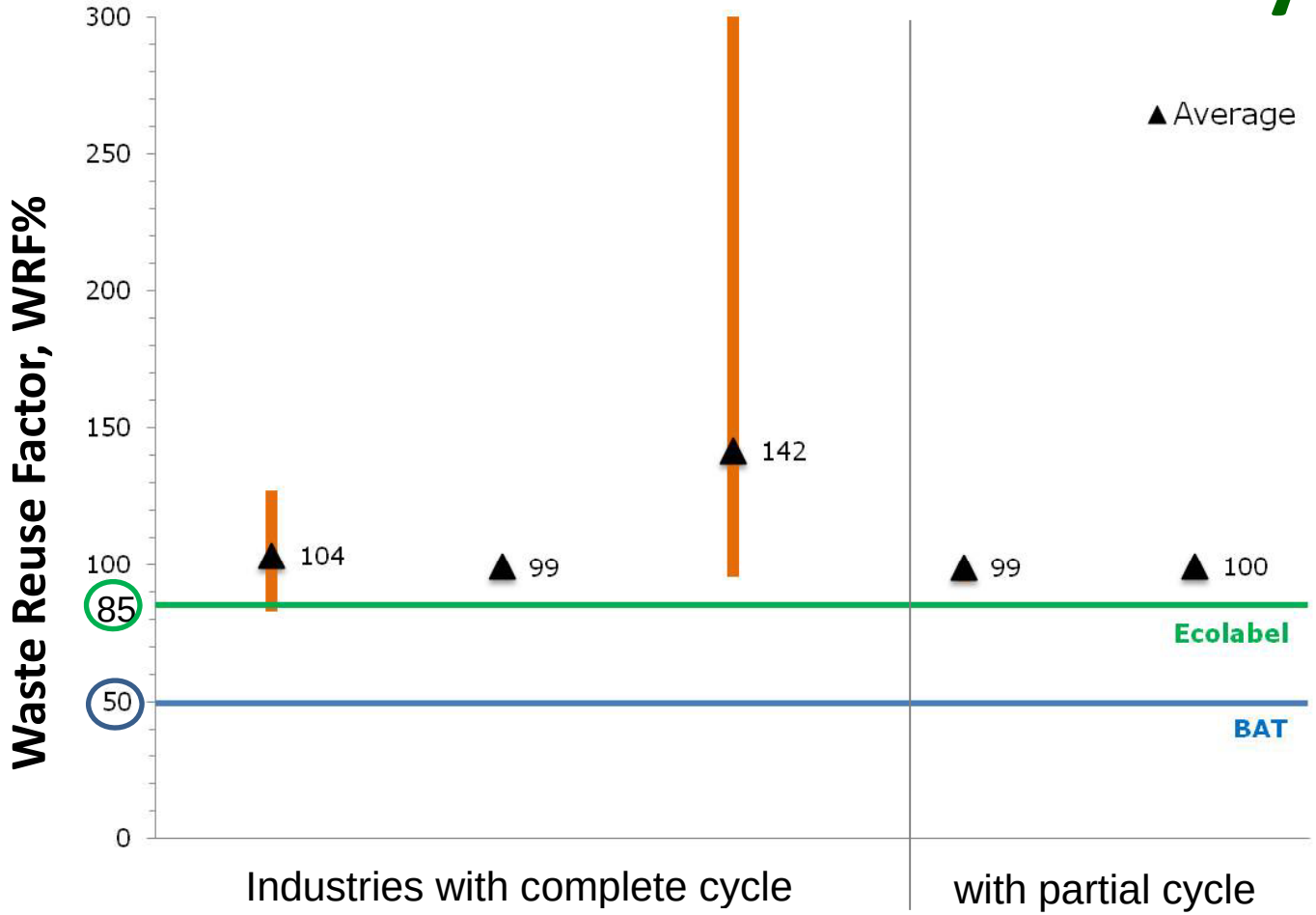


Data 2015
Integrated Report 2017

Unfired scrap tiles

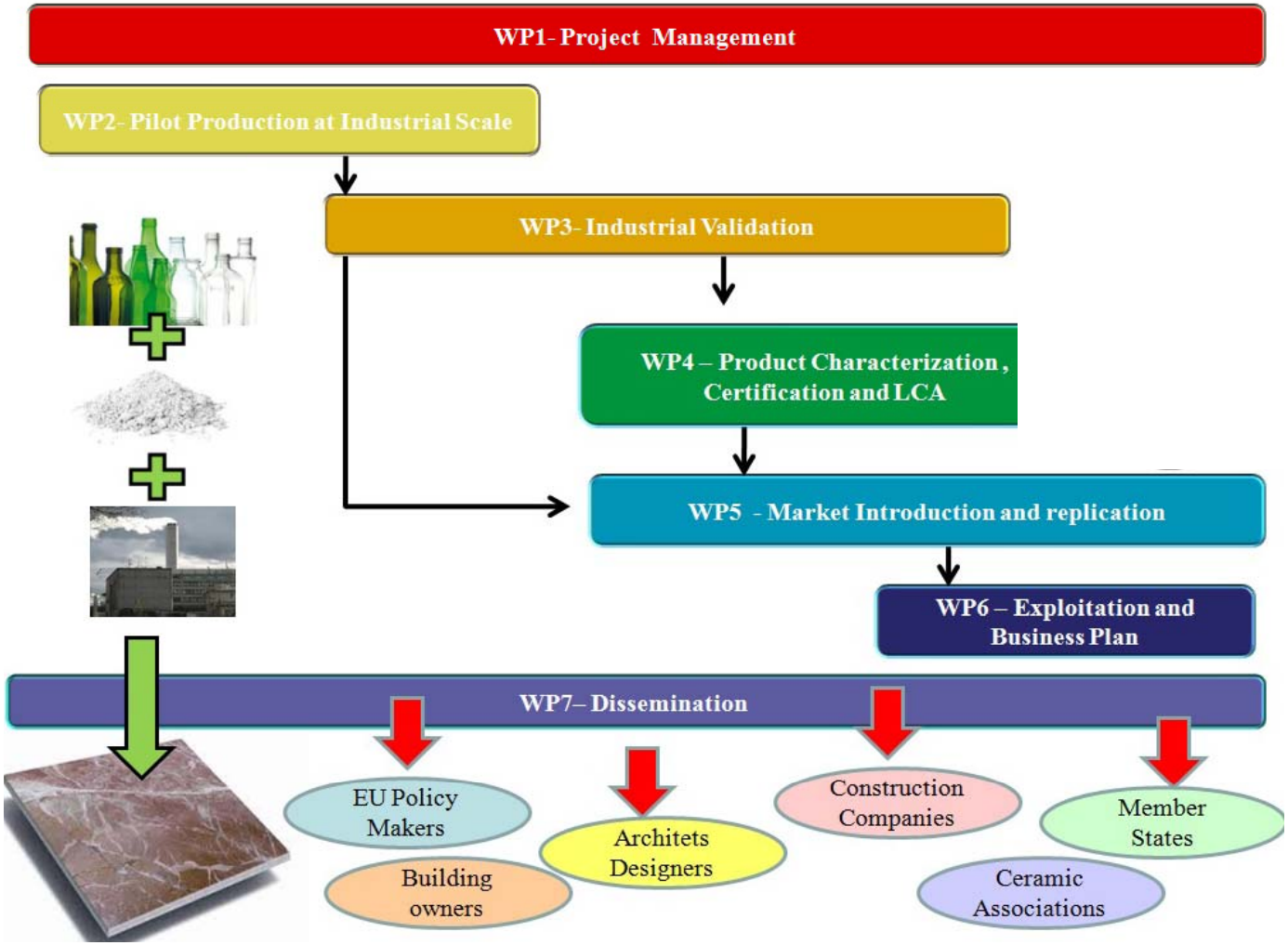
It represents about 4% of the total production and usually it is reused in the same production in a close cycle.

Pre-consumer wastes: by-products of the ceramic industry



Data 2015
Integrated Report 2017

Project activities



Results at month 18

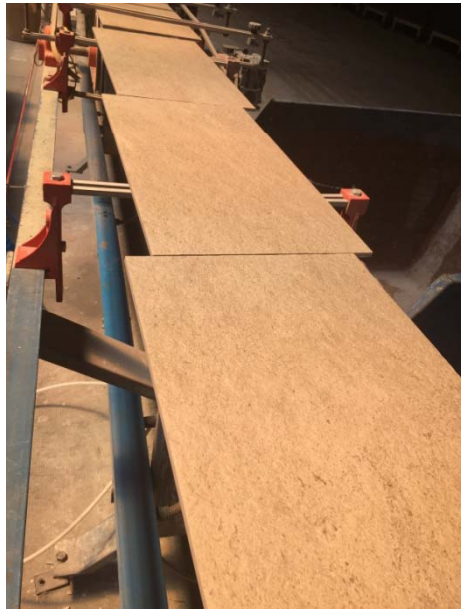
***FINCIBEC's Industrial Production**: sustainabel ceramic tiles (25x25 cm) containing **96% of recycled materials**. This product, in accordance with EN 14411, belongs to class BIIb (water absorption 6 < E ≤ 10%)*

Project final results

MARAZZI's Industrial production:
Porcelain stoneware tiles (class BIa) containing 85% of recycled materials

Format 30x60 cm glazed and not glazed

MARAZZI



Project final results

MARAZZI's Industrial production:
Porcelain stoneware tiles (class BIa) containing 85% of recycled materials

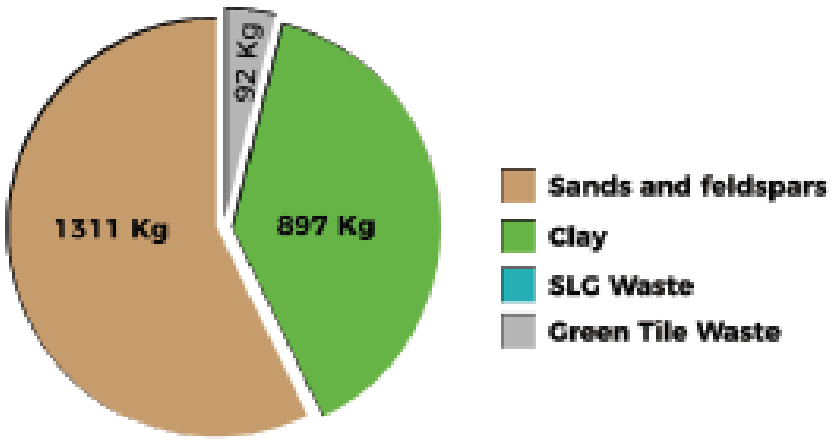
Format 15x15 cm glazed

MARAZZI

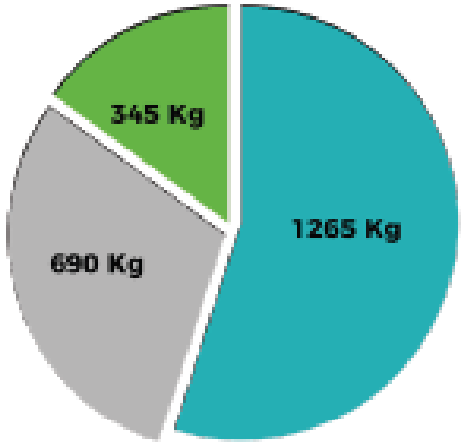
Raw materials

To produce 100 m^2 of tiles, it is necessary:

TRADITIONAL stoneware tiles



WINCER tiles



Saving of natural resources:
feldspars and sands: 100%
clays: 62%

The process

WINCER tiles
are obtained with **traditional process** in which the maximum firing temperature if **1025°C** is sufficient to reach a **water absorption below to 0.5%.**

WINCER tiles
belong to **group BIa** and have to fulfill with the requirements of annex G of EN 14411.

Model of production and offer

*Due to technical reasons, these tiles are produced in a **dedicated production line**, not shared with other type of production.*

Small series production

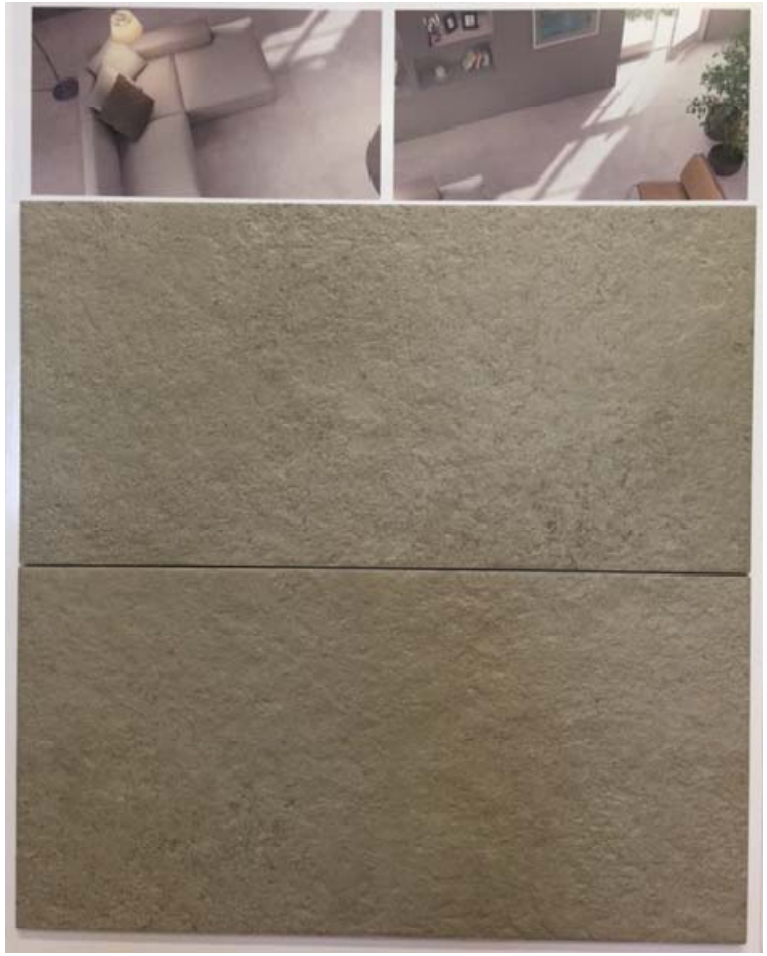
On-demand production

Just in time production

Production based on customer's needs

Huge type of formats and surface finishings

The most versatile format is the 30x60 cm. It can be included in the "large format" group, suitable both for outdoor and indoor destinations.



Series “STONEWORK GL SR, tipo WINCER, codice K1EH”

Technical PERFORMANCE

30x60 cm glazed tiles are compliant with the standard EN 14411 and obtained the UNI-Keymark certification

CERTIQUALITY

UNI

CONFORME ALLA NORMA
UNI EN 14411

Ecological BEHAVIOUR

➢**Lower environmental impact**

LCA STUDY (ISO 14040 e ISO 14044)

Environmental indicators (EN 15804)	**Tile 85% recycled**	Traditional tile
Global Warming Potential , GWP [kg CO_2-eq.]	**1.09%**	24-25%
Ozone Depletion Potential, ODP [kg CFC11-eq.]	**0.43%**	69-75%
Acidification Potential, AP [kg SO_2-eq.]	**2.80%**	54-56%
Eutrophication Potential, EP [kg $(PO_4)^3$-eq.]	**3.35%**	26-27%
Pothochem. Ozone Creation Pot., POCP [kg Ethen eq.]	**2.08%**	37-39%

ENVIRONMENTAL sustainability

Ecological BEHAVIOUR

WINCER tiles obtained the certification **LEED Certiquality** for the amount of recycled materials: 85% (30% pre-consumer and 55% post-consumer wastes).

Health in the WORKPLACE

SOCIAL sustainability

➢**Lower amount of quartz in the WINCER spray dried powder respect to a traditional spray dried powder: -55%**

➢**Lower Respirable fraction of Crystalline Silica (RSC):**

	RCS Potential
WINCER spray dried powder	1.9%
Traditional spray dried powder	5.2%

RCS values in WINCER production are lower of about 63%, respect to those of a traditional porcelain stoneware.

ECONOMIC sustainability

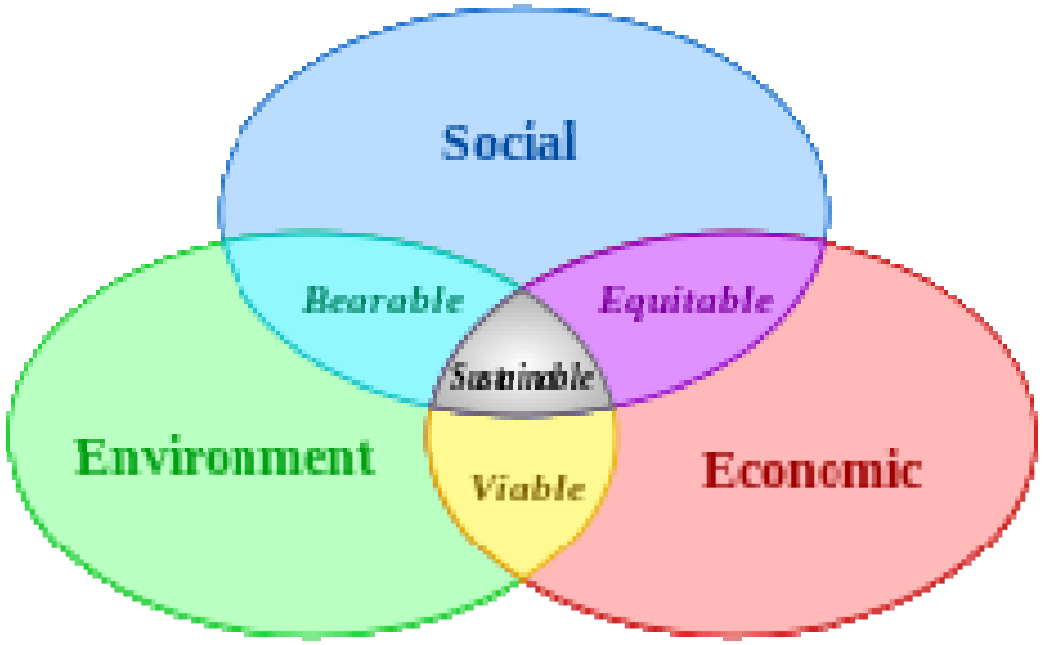
Traditional mix for per 1m² tile			
	Compos.	kg	Cost/m²
Clay	36%	7.92	0.55 €
Feldspar sand	64%	14.08	0.55 €
Chemical agents			0.002 €
Milling			0.66 €
TOTAL	**100%**	**22**	**1.76 €**

WINCER mix for 1m² tile			
	Compos.	kg	Cost/m²
Clay	15%	3.3	0.26€
Unfired scrap tiles	30%	6.6	0.0066 €
Scrap glass	55%	12.1	0.363 €
Chemical agents			0.002 €
Milling			0.55 €
TOTALE	**100%**	**22**	**1.18 €**

➢**Decreasing of cost production: -33%**

➢**Lower industrial costs for mix preparation:**

- Lower expenses for raw materials
- Recovery of pre and post consumer wastes
- Lower methane and energy consumption



TILES

ENVIRONMENTAL sustainability

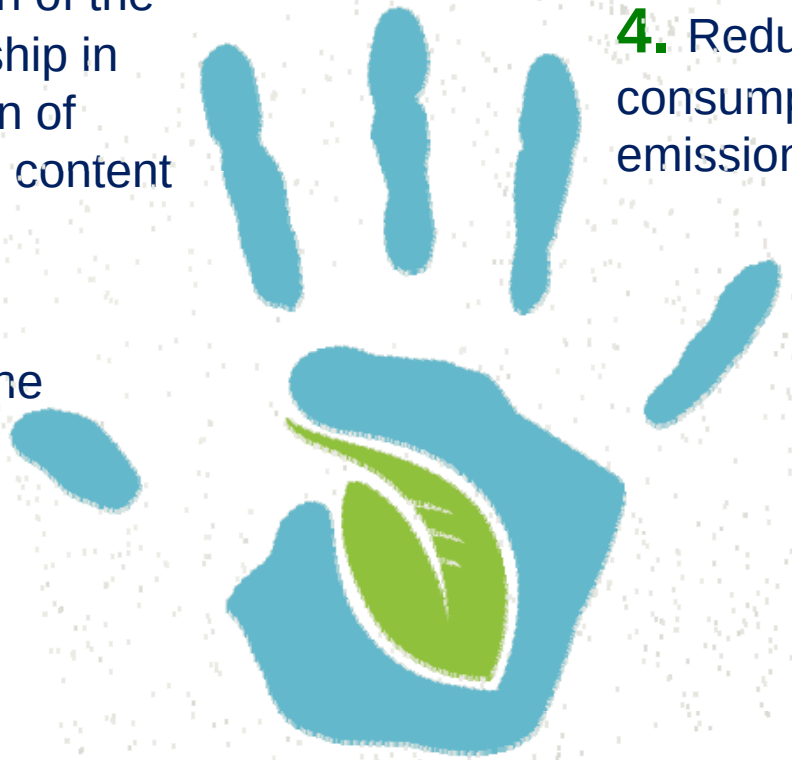
SOCIAL sustainability

ECONOMIC sustainability

EUROPEAN added value

3. Widening of the ceramic products market by including more sustainable ones in substitution of other materials.

2. Acquisition of the world leadership in the production of high recycled content ceramic tiles.



4. Reduction of energy consumption and CO_2 emissions.

5. Higher health in the workplace.

1. Promotion of the Circular Economy

EUROPEAN added value

WINCER TILES

WINCER tiles developed at national level represent:

- a model of **sustainable tiles** able to boost other ceramic company in Italy or in Europe;
- a **virtuous example** among marketable sustainable products, in line with the EU policies that will become more and more restrictive.

Acknowledgments

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