



## Project Information Sheet

### Waste synergy in the production of INnovative CERamic tiles (WINCER)

<b>Programme area:</b>	Materials recycling and recycling processes
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<b>Website:</b>	www.wincer-project.eu
<b>Benefits:</b>	Innovative ceramic tiles containing about 70 wt% of recycled materials; resource and energy efficient production process of porcelain stoneware
<b>Keywords:</b>	Urban and industrial wastes recycling, ceramic tiles
<b>Sector:</b>	Ceramic
<b>Type of solution</b>	Product, process
<b>Duration:</b>	01/01/2015 – 31/12/2017
<b>Budget:</b>	€ 1.489.312 (EU contribution: 50%)
<b>Contract number:</b>	ECO/13/630426

#### Summary

The project was aimed to develop innovative ceramic tiles containing more than 70 wt% of recycled materials from urban and industrial wastes. The specific objectives are related to:

- contribution to sustainable waste management by recovery of the amount of soda lime glass (SLG) cullet waste that today is not re-introduced in glassware (about 30% of the total glass waste);
- reduction of the use of natural resources thanks to: the use of SLG, coming from urban collection, and the reuse of green scrap tiles, generated during the industrial process;
- improvement of the environmental performances of the ceramic tiles sector by reducing CO<sub>2</sub> emissions, energy consumption and methane use.

The combination of these different wastes with natural clays enables the production of innovative ceramic tiles with similar or improved mechanical properties respect to the traditional ones.

#### Benefits

The main forecast Environmental benefits respect to a traditional production include: reduction of Green house gas emissions, reduction of energy consumption, saving of natural resources, contribution to sustainable waste management in terms of the recovery of the amount of glass cullet waste, reuse of industrial waste (green scrap tiles).

#### Achieved results

Achieved results go far beyond the initial objective of 70%, reaching 85% of recycled materials (urban and industrial wastes). This product was produced at industrial level in several sizes (15x15 cm, 30x60 cm) both glazed and unglazed. The glazed series (30x60 cm) already obtained the UNI Keymark and LEED certifications.

This is an important milestone enabling the European ceramic industry to acquire the world leadership in waste-based ceramic materials and widening the ceramic product spectrum by including more sustainable ones in substitution to other materials.

Improvements of the environmental performances of the ceramic tile sector are achieved through:

- Recycling of waste and saving of natural resources (save of 100% of feldspars and sand and save of 63% of clays)
- Reduction of energy and methane consumption (minus 10% of energy for milling step and minus 10% of methane due to the decreasing of maximum firing temperature of about 200°C)
- Reduction of Green house gas emissions: Global Warming Potential is 1.1 kg CO<sub>2</sub>-eq. (for a traditional porcelain stoneware tile production it is 24-25 kg CO<sub>2</sub>-eq.)

As a consequence, economic benefit is reached due to the lower industrial expenses for the ceramic production (minus 33% of costs for raw materials and minus 10% of total costs production, respect to traditional porcelain stoneware tiles).

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