

SAPICO2: UK and French Waste Processing and Development

INTERREG IV Project



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Areas encompassed by SAPICO2

Table 1: Geographical areas and population relevant to the Project

| | | AREA [km²] | POPULATION [M] |
|--------|----------------------|------------------------------|-----------------------|
| UK | London | 1,570 | 8.2 |
| | SE area (part) | <u>13,330</u> | <u>5.4</u> |
| | | 14,900 | 13.6 |
| France | Picardie | 19,400 | 1.9 |
| | Haute Normandie | 12,300 | 1.8 |
| | Nord-Pas-de-Calais | 12,400 | 4.0 |
| | Île-de-France (part) | <u>12,000</u> | <u>11.8</u> |
| | 56,100 | 19.5 | |

Developments and Achievements

- Chemical and physical characterisation of wastes
 - Establish CO₂ reactive minerals
 - Risk assessment on wastes
- Produced eco-construction materials
 - Reduce hazardous land fill

Collection of waste

| Category | EWC Code | Description |
|------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Municipal Solid Waste Incinerator Bottom Ash | 19 01 12 | Residue from the incineration of domestic and commercial waste. Comprising the material remaining in the grate after burning including glass, metal, char and ash. May contain alkalis, chloride and heavy metals. |
| Municipal Solid Waste Incinerator Fly Ash | 19 01 13 | Fine dust residue from the incineration of domestic and commercial waste. Comprising the material carried in the flue gas from the grate which are removed by precipitation/filtration. May contain alkalis, chloride and heavy metals. |
| Municipal Solid Waste Incinerator Air Pollution Control Residue | 19 01 07 | Fine powder residue from the incineration of domestic and commercial waste. Arising from the flue gas cleaning system (air pollution control). May contain alkalis, chloride and heavy metals. |
| Cement Kiln/Bypass Dust | 10 13 06 | By-products from the manufacture of cement. Comprising fine dusts which are rich in alkalis and chloride. |
| Biomass Ash Fly Ash/ Bottom Ash | 10 01 03 10 01 13 | Ash residue from burning organic material (biomass) for energy generation |
| Steel Slag | 10 02 01 | By-product from steel manufacture, comprising impurities removed from the production process. |
| Pulverised Fuel Ash | 10 01 02 | Fine grained ash remaining after burning coal for power generation |
| Furnace Bottom Ash | 10 01 01 | Coarser fraction of ash produced in coal burning power stations resulting from the fusion of pulverized-fuel ash particles which fall to the bottom of the furnace |
| Sewage Sludge Ash | 19 01 11 | Fine grained ash from the incineration of wastewater treatment sludge |
| Metalliferous Residues | 10 03 09 | Group of residues (including slags, drosses etc) from the manufacture/processing of metals |

Characterisation of wastes

- Characterised over 100 French and UK derived wastes
 - CO₂ uptake
 - Total Organic Carbon
 - X-ray fluorescence
 - X-Ray diffraction
 - Particle size distribution

CO₂ Uptake of waste materials



Developments and Achievements

- Produced aggregate from 10 waste groups
 - Municipal Solid Waste Incineration residues (MSWI)
 - Cement Bypass Dust (CBD)
 - Biomass
 - Steel slag
 - Pulverised Fuel Ash (PFA)
 - Sewage Sludge Ash (SSA)
 - Metalliferous residues
- Identified two French biomass ashes with development potential

Development of carbonated construction materials

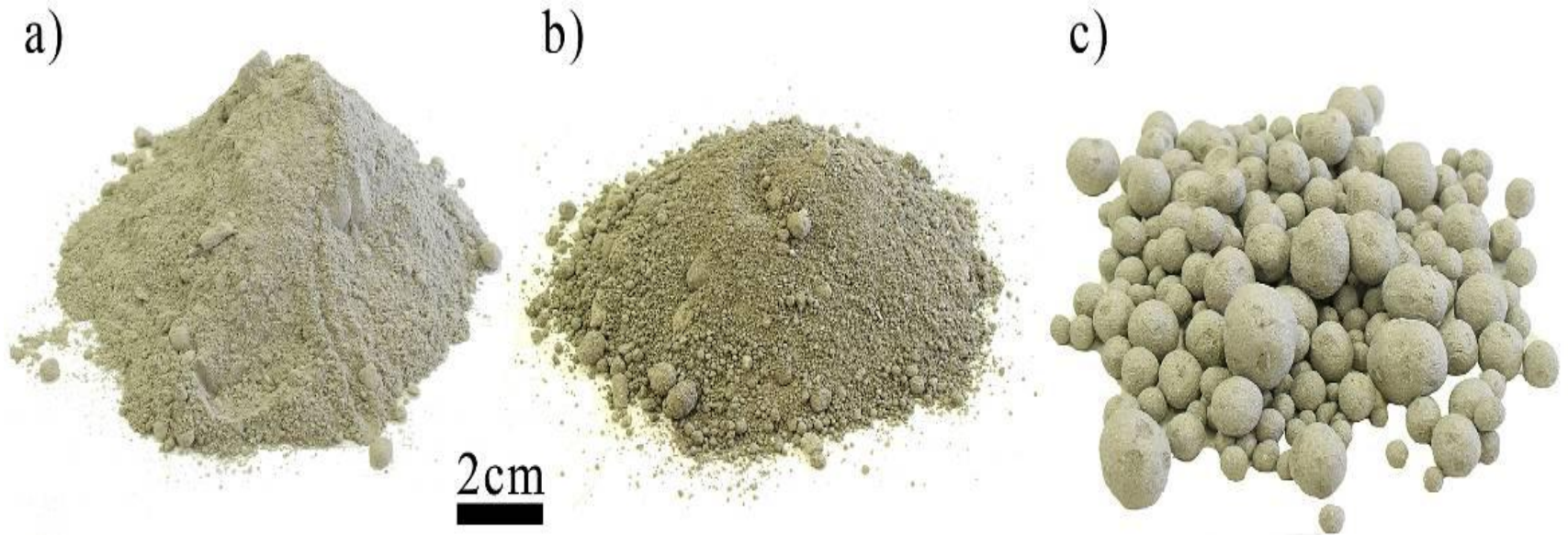


Figure 1: a) untreated fly ash. b) granulated fly ash. c) pelletised fly ash (MSWI)

Biomass ash aggregate (1)



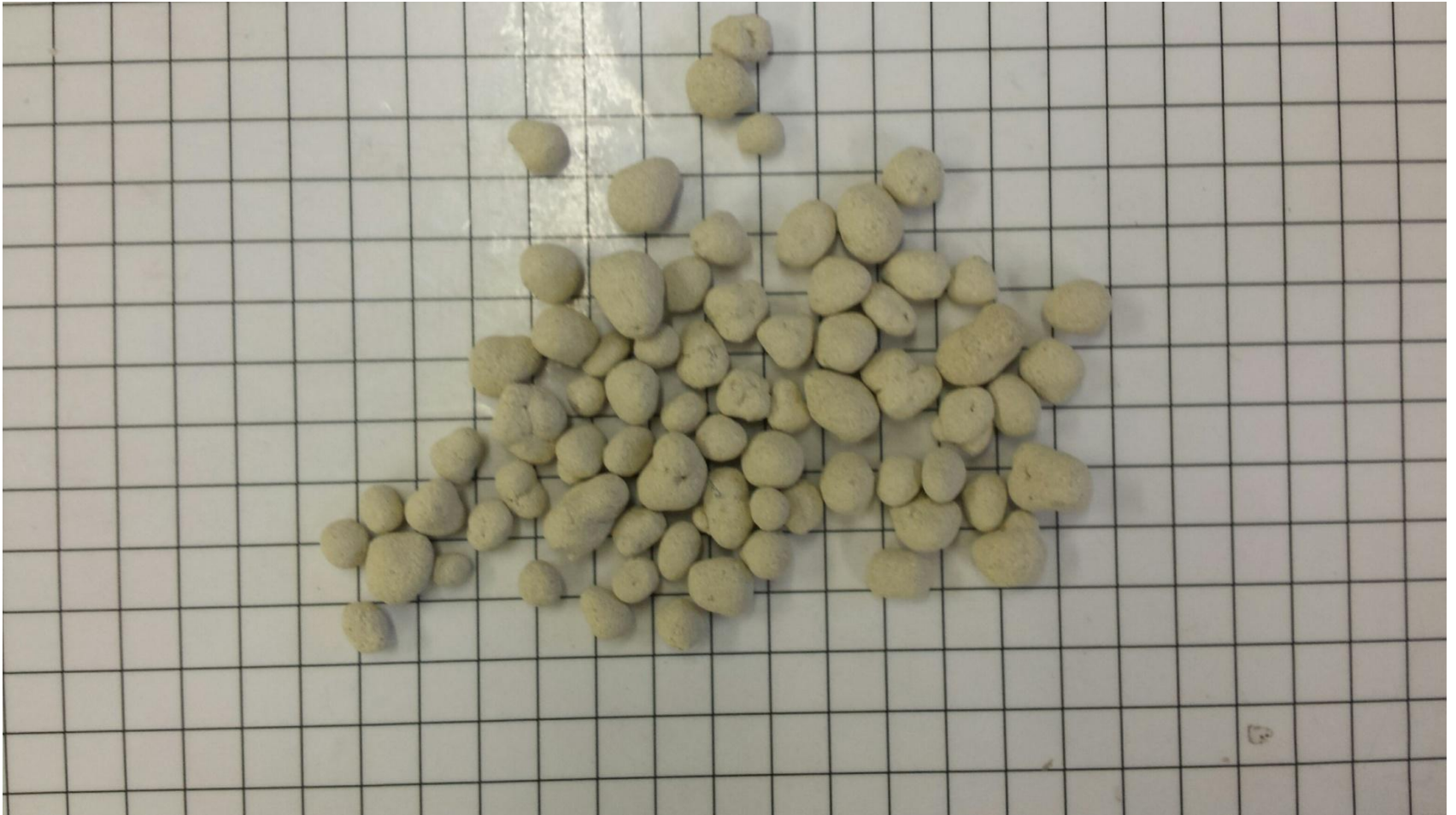
Biomass ash aggregate (2)



MSWI Air Pollution Control Residue



Quarry fines aggregate

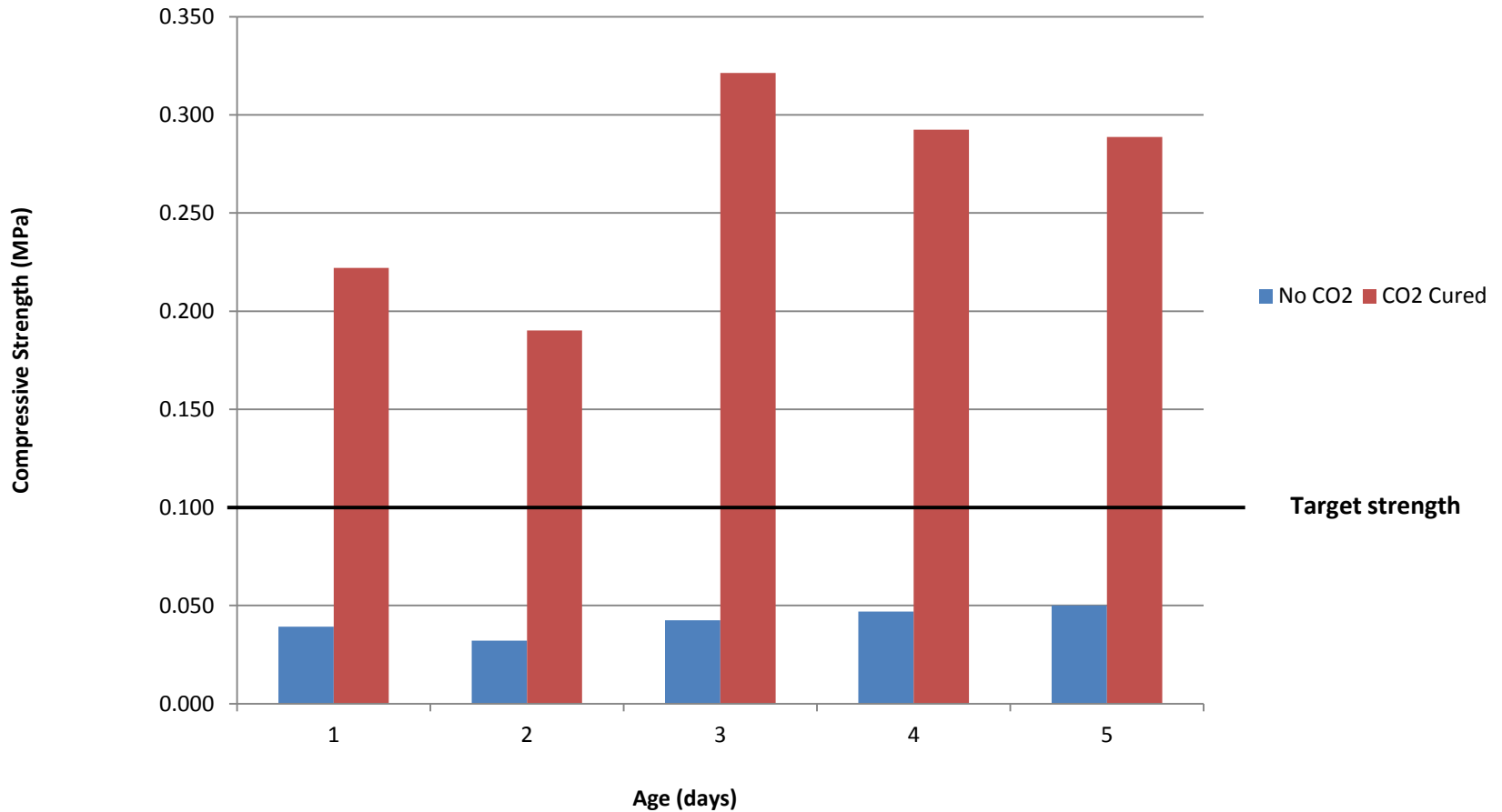


Post batch production testing

- Compressive strength testing



Compressive strength of CBD CO₂ cured and non-CO₂ cured aggregate



Post batch production testing (2)

- Leaching analysis



Latest developments

- Two UK derived 100kg bulk samples produced and successfully tested by UPJV
- Bulk production of two French biomass residues in development