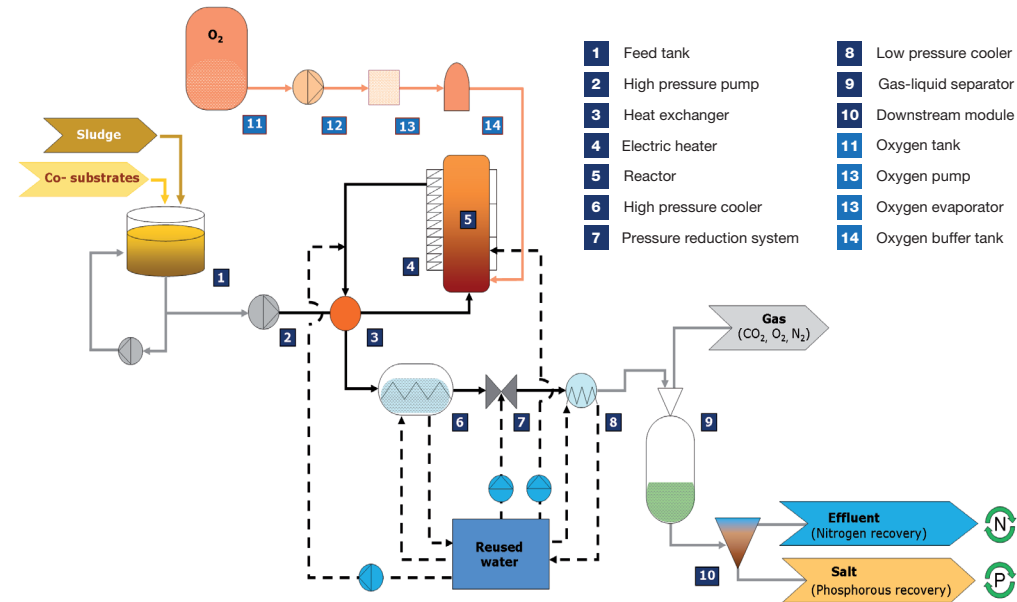


## OBJECTIVE

To demonstrate the environmental and socio-economic benefits of a **synergic co-treatment of sewage sludge and wastes** (olive mill wastewater, drencher wastewater, landfill leachates, cow manure and pig slurry) with energy and phosphorus recovery through **supercritical water co-oxidation** (SCWcO).

## SCWcO

Technology based on the particular properties of **water at temperature and pressure conditions above its critical point** ( $T > 374^{\circ}\text{C}$  and  $p > 221$  bar) and the presence of **oxygen**. Prototype with a treatment capacity up to 1 tone dm/day.



## PROJECT PARTNERS

**ainia**  
centro tecnológico

**AINIA** | Project coordinator  
Contact: Andrés Pascual – apascual@aina.es  
Website: [www.ainia.es](http://www.ainia.es)

**IMECAL**

**IMECAL**, Industrias Mecánicas Alcaudia, S.A.  
Website: [www.imecal.com](http://www.imecal.com)

**IVEM**

**IVEM**, Ingeniería de Verificaciones Electromecánicas y Mantenimientos, S.L.  
Website: [www.ivem.es](http://www.ivem.es)

**Scfi**

**SCFI**, Supercritical Fluids International, Ltd.  
Website: [www.scfi.eu](http://www.scfi.eu)

**urbaser**

**URBASER**  
Website: [www.urbaser.es](http://www.urbaser.es)

visit us  
[www.lo2x.com](http://www.lo2x.com)

**Lo2x**  
project

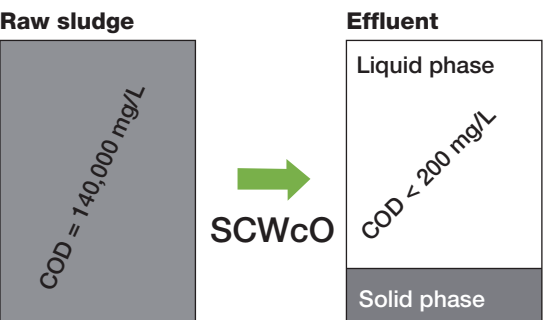
**Supercritical water  
co-oxidation (SCWcO)  
of urban sewage sludge  
and wastes**



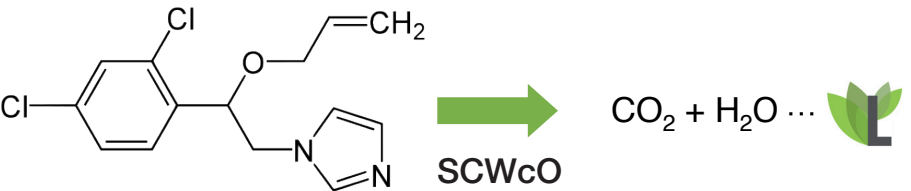
Project co-financed by European  
Union through LIFE programme  
LIFE+12 ENV/ES/000477

## BENEFITS

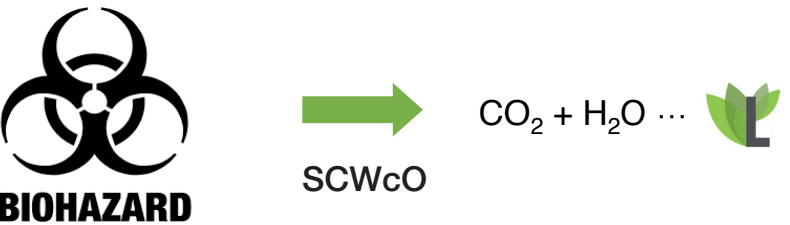
- **>99% elimination of organic matter.** The COD of SCWcO effluent is in average lower than 200 mg/L, reaching lower values than 25 mg/L.



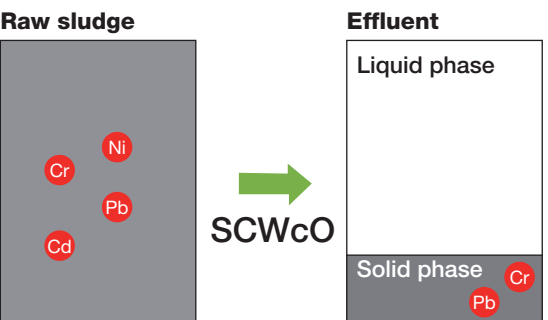
- **100% elimination of pesticides.** Imazalil is degraded up to 230 mg/kg dm, four orders of magnitude higher than anaerobic digestion.



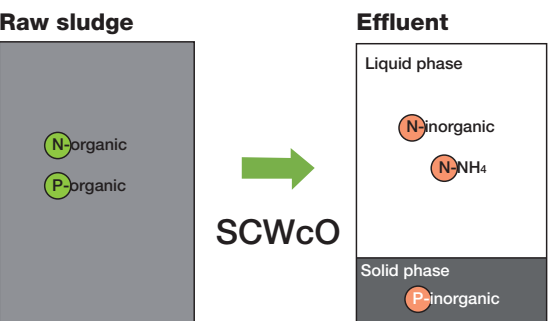
- **100% elimination of pathogens.** *Escherichia coli*, *Clostridium perfringens* and *Salmonella spp.* are completely eliminated. SCWcO leads to complete hygienization.



- **>85% heavy metals are recaptured for safe handling.** Heavy metals are mainly detected in inert solid of the SCWcO effluent.



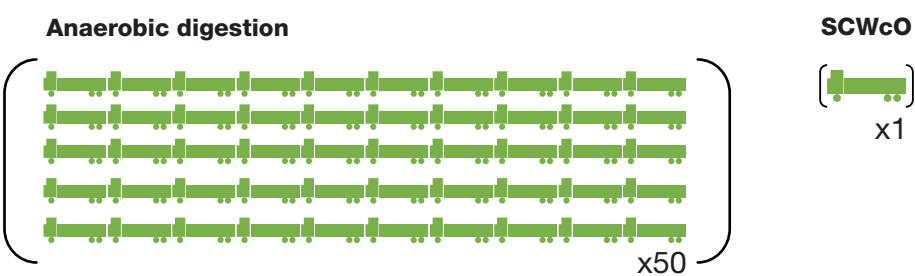
- **Recovery of nutrients.** Mineralization of nitrogen and phosphorus facilitates the nutrient recovery in order to be used as fertilizers. Nitrogen occurs in the liquid phase ( $\text{NH}_4 \sim 2 \text{ g/L}$ ) while phosphorus is present in the solid phase ( $\text{P}_2\text{O}_5 \sim 250 \text{ g/kg}$ ).



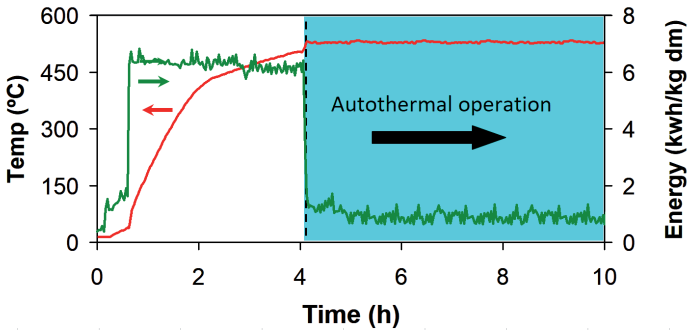
- **Disposable clean gases are produced.**  $\text{CO}_2$  is the main gas generated by SWcO.  $\text{NO}_x$  and  $\text{SO}_x$  gases, typical undesired by-products of combustion processes, are not formed.



- **>98% reduction of sewage sludge leaving WWTP.** Total solid reduction higher than 90%. Inert solid from SCWcO is a resource for phosphorus industry whereas wastes from anaerobic digestion may end up in landfills.



- **Zero heat consumption.** The heat produced under supercritical conditions (exothermic reaction) makes pumping the only energy-consuming step (1 kwh/kg dm).



- **>10% reduction in sludge treatment cost.** The gate fee of co-substrate treatment with SCWcO allows reducing the cost of sludge treatment below the cost of anaerobic digestion (DA).

