The LIFE Programme: Over 20 years up-scaling waste and wastewater management in the EU

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LIFE Programme - Communications Team

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The LIFE Programme

LIFE = L'Instrument Financier pour l'Environnement

The only EU funding tool exclusive for the Environment

- **Born in 1992**
- **4 171 projects approved**
- **3.4 billion euros for 2014-2020**
- **Two sub-programs:**

  - LIFE Environment

  - LIFE Climate Action

Structure: LIFE 2014-2020

Sub Progrogramme
Environment
2,6 billion € (75%)

Resource efficiency

Water | Res. eff. | Waste | Health | Air

Nature & Biodiversity
min 1,15 billion € (55%)

Habitat & species | Biodiv. strategy 2020

Governance & Information

Sub Progrogramme
Climate Action
864 mio € (25%)

Climate change Mitigation

Climate change Adaptation

Governance & Information

VALUVOIL (LIFE09 ENV/ES/000451)

ES, CARTIF private research institution + FR, ES, PT
2006 – Jul 2009
€1.04 million € (Total) – €0.5 million (EU)

ENVIRONMENTAL PROBLEM

Biodiesel production from WVO still produces by-products which pose concerns both for the environment (**water pollution**) and human health.

OBJECTIVES

Improved system for **valorising residues** from WVO biodiesel production and **sludge** as:

- **organic amendments** for agriculture
- **biogas**

VALUVOIL website

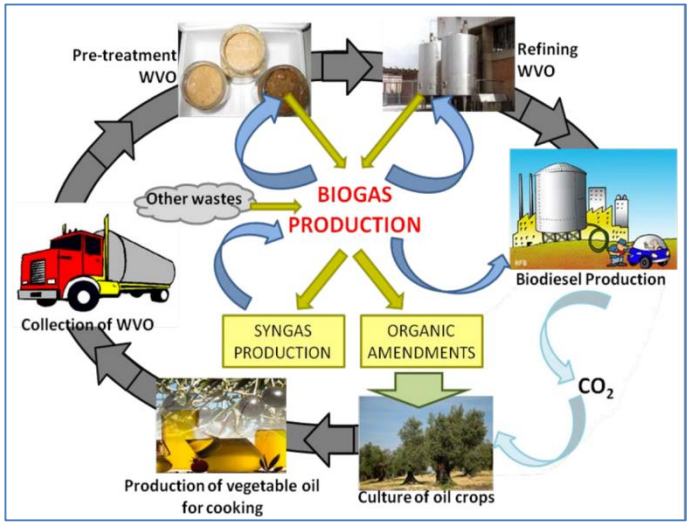
METHODOLOGY

1.Improved **anaerobic digestion** of the residues from:

WVO { Pre-treatment
Refining

2. Valorisation of the final digestates:

- **plant biostimulants**
- **soil biofertiliser**
- **syngas** production



VALUVOIL website

METHODOLOGY (II)

Improved anaerobic digestion of residues:

1. Development of a semi-industrial two-phase **anaerobic digester**:
   - Hydrolisis / Acidification
   - Methanogenesis
2. Development of the **optimal digestion mixture**:

Sludge (inoculum)

+

Pre-treatment/refining waste
+
Pig manure

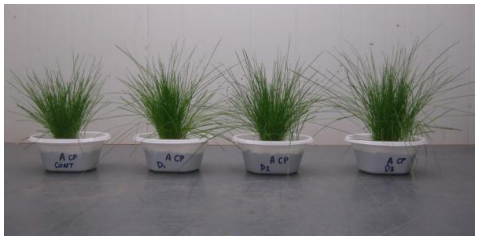
VALUVOIL website

METHODOLOGY (III)

Valorisation for:

- Plant biostimulant and soil microbial biomass enhancer. Tests in:
  - . Rye grass
  - . Barley

- Production of Syngas. Mixing of the final digestate (over 90% water) with:
  - . Sunflower stover
  - . Pre-treatment residues
  - . Glicerol
  - . Dehydrated digestate



VALUVOIL website

RESULTS

Development of a **integral waste management** system that:

- Digests the by-products from WVO biofuel production, reducing:
  - . **Chemical Oxygen Demand** by **86.4%**
  - . **Total Dissolved Solids** by **81.9%**
- Able to produce up to 2 234 L/day of biogas with a methane concentration of 65% → saving 484 kWe/year
- Final digestate showed beneficial not as fertilizer but as:
  - . Plant growth **biostimulant**
  - . Increasing **soil's microbial activity**
- **Cost reduction of oil-polluted water treatment by 2,4€/l**

VALUVOIL website

ECOFATTING (LIFE10 ENV/IT/000364)

IT, Chem. Ins. of Organometallic Compounds of CNR
Jan 2012 – Dec 2014
1.6 M € (Total) – **0.76 M € (EU)**

ENVIRONMENTAL PROBLEM

Chloroparaffin is widely used in the fattening phase of leather-tanning. The EU produces about 235 000 tonnes/year of leather.

Chloroparaffin in **wastewater** pose significant environmental problems due to its **low biodegradability** and a **high chlorine content**.

OBJECTIVES

Develop **eco-friendly fatliquoring agents** capable of substituting chlorinated paraffins.

ECOFATTING website

RESULTS

- Managed to develop and demonstrate a new series **eco-fatting agents (palm oil based)** with **high market uptake potential**

- Performance:

  .**Similar fatliquoring properties** as chloroparaffins

  .40% more biodegradable

  .More strongly fixed to the leather substrate → **less dispersed in the wastewater**

  .Heavy metal content complies with the European Eco label for footwear

  .**More cost-effective**: 0.91-1.23 €/kg compared to Cl-paraffins 1.05-1.35 €/kg

  .Still some environmental concerns → Palm oil → possible to replace it by waste vegetable and animal fats

ecofatting

ECOFATTING website

WGF-PP (LIFE07 ENV/ES/000802)

ES, Befesa Abengoa
2009-2011
5.9 Mio € (Total) – **2 652 262 € (EU)**

ENVIRONMENTAL PROBLEM:

150 000 tonnes/yr of glass fiber waste produced in EU

OBJECTIVES

Production of **reinforced recycled** plastic using

- Plastic from out of use cars and automotive sector
- Glass fibre waste from:
  - .glass fibre production
  - .consumption markets

WGF-PP website

PROCESS

- **Mixture components**:

  .30% Glass fibre waste

  .Polypropylene mix:

  55% recycled
  15% virgin

- **New process developed**:

  .Grinding and homogenising the glass fibre

  .New mixing machinery:

  .resists the high abrasion of the glass fibre

  .flexibility to adapt to different ingredients

  .Extrusion and cutting machine

  .Final results → Pellets

WGF-PP website

RESULTS

- **New product**:

.Performance: **mechanical properties** and 95% of virgin materials

.Can be used in the **automotive** and appliance sectors

- **Environmental benefits**:

.Cut 2 920 tonnes/yr of CO_2 emissions

.Produce energy savings of 2,5 million GJ/yr

WGF-PP website

More information

New Regulation 2014-2020 :
Regulation (EC) No 1293/2013

National Contact Points:
Information on eligibility and project preparation
http://ec.europa.eu/life/contact/nationalcontact

EU Communication tools and services :

- LIFE website
- Project database
- Thematic publications

Thank you for your attention!

Questions?

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UPGAS-LOWCO2 (LIFE08 ENV/IT/000429)

IT, Florence University
2010 - Nov 2009
0.6 M € (Total) – **0.3 M € (EU)**

ENVIRONMENTAL PROBLEM

The EU has set ambitious waste production and treatment goals for 2020.

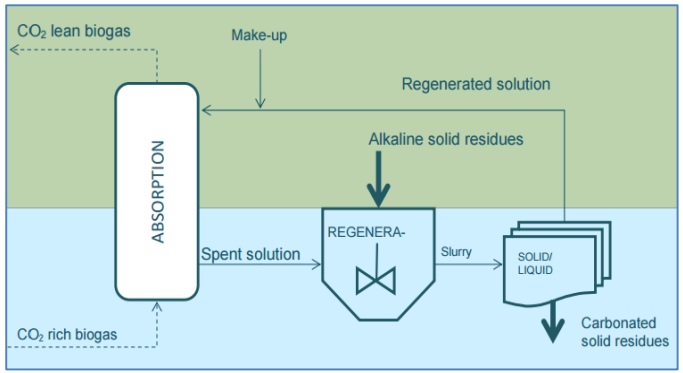
OBJECTIVES

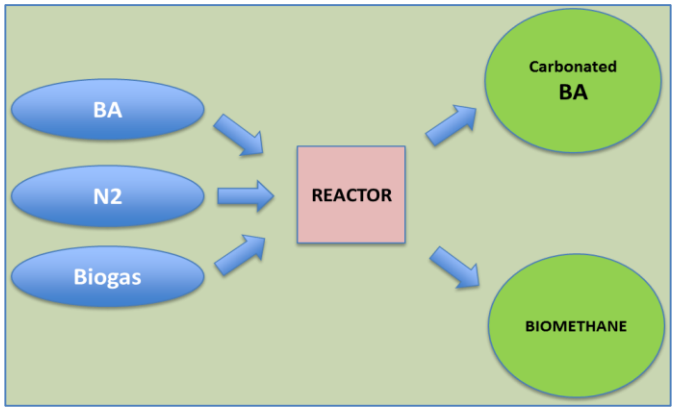
Demonstration of two innovative methods for valorising **waste incineration residues** for **landfill biogas upgrading**:

- Alkali absorption with Regeneration (AwR)
- Bottom Ash Biogas Upgrading (BABIU)

UPGAS-LOWCO2 website

METHODOLOGY





Alkali absorption with Regeneration (AwR)

- CO2 chemical absorption by an alkali aqueous solution using KOH or NaOH
- Solution regeneration with Air Pollution Control (APC) residues → precipitate CaCO3 and recover KOH/NaOH.

Bottom Ash Biogas Upgrading (BABIU)

- Direct carbon dioxide adsorption on bottom ash by direct contact process
- Formation of calcium carbonate in the bottom ash

UPGAS-LOWCO2 website

RESULTS

Both technologies:

- Effective in **absorbing CO2**
- Effective in upgrading biogas → **high purity methane (>90% vol.)**

Alkali absorption with Regeneration (AwR)

- Max size for the biogas plant → 250 Nm3 /h of biogas input.
- Unfavorable economic feasibility → upgrading cost 0.21-0.24 €/kWh of produced biomethane (using NaOH) conventional technologies 0.1 €/kWh

Bottom Ash Blogas Upgrading (BABIU)

- Max size for the biogas plant → 100 Nm3 /h of biogas input.
- Good economic performance → upgrading cost 0.14 €/kWh but compensates with savings from **avoiding disposal costs**

UPGAS-LOWCO2 website