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SOLAR DRYING AND GASIFICATION OF
SEWAGE SLUDGE TO OBTAIN BIOENERGY
(LIFE-DRY4GAS)
Virginia Pérez López



CEDER-CIEMAT



Forestry and Habitats Online Knowledge Exchange Workshop
18/04/2024





**Ministerio de Ciencia, Innovación y
Universidades. OPIs**

**CIEMAT. Centro de Investigaciones Energéticas,
Medioambientales y Tecnológicas.
Departamento de Energía.**

**CEDER.
CEntro de Desarrollo de Energías
Renovables**

CEDER - CIEMAT
Autovía A15, salida 56
Lubia (Soria)





Waste Water sludge solar **DRY**ing **FOR** energy recovery through gasification **GAS**

- 1. Problem it solves**
- 2. DRY4GAS solution**
- 3. Benefits**





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Problem it solves

Increasingly stringent
legislation

- Increasingly strict microbiological limits
- Upcoming update of Directive 86/278/EEC



High logistics and
management costs



**Conventional sludge
management
LIMITED AND COSTLY**



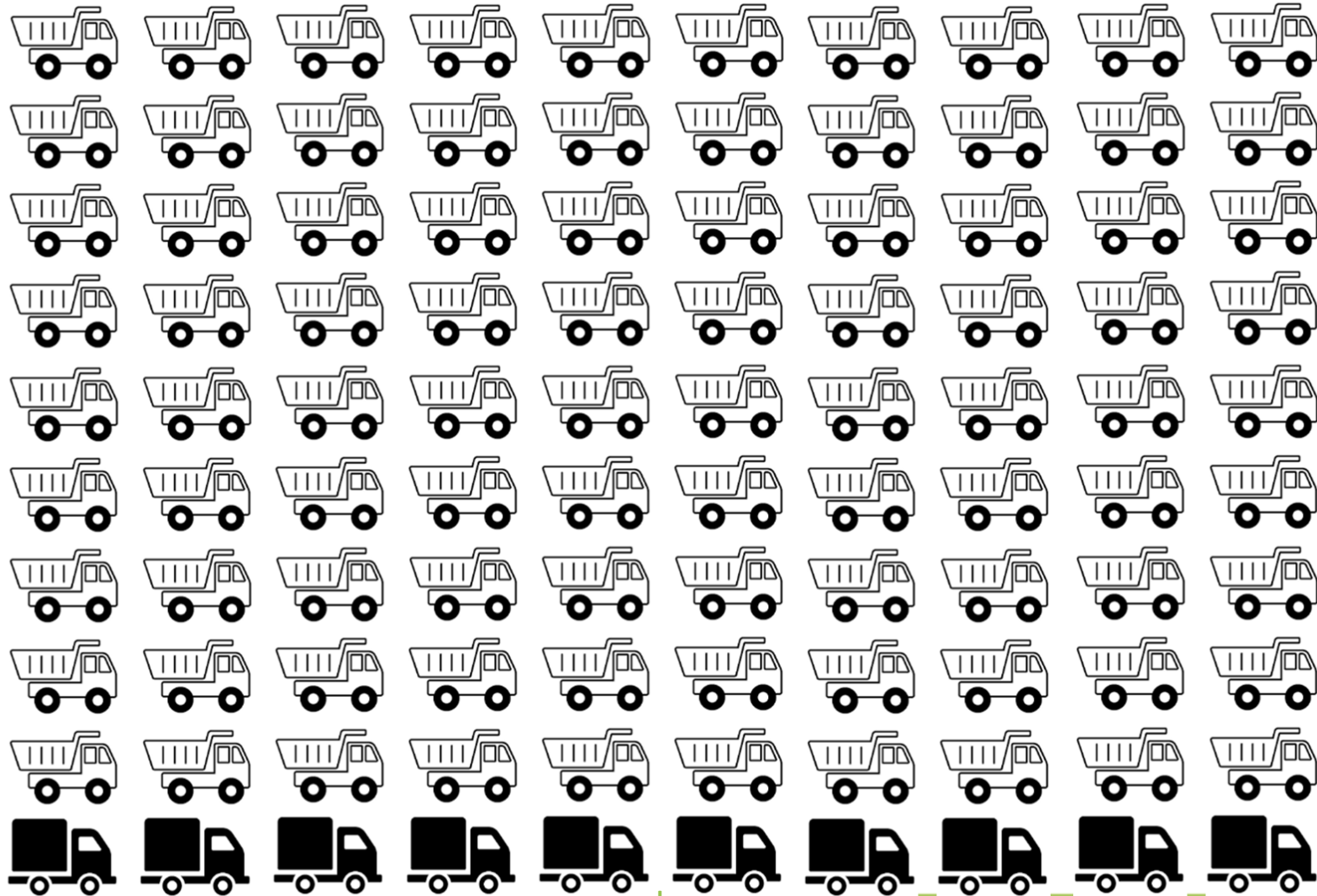


Problem it solves





Conventional management



Water

Sewage
sludge



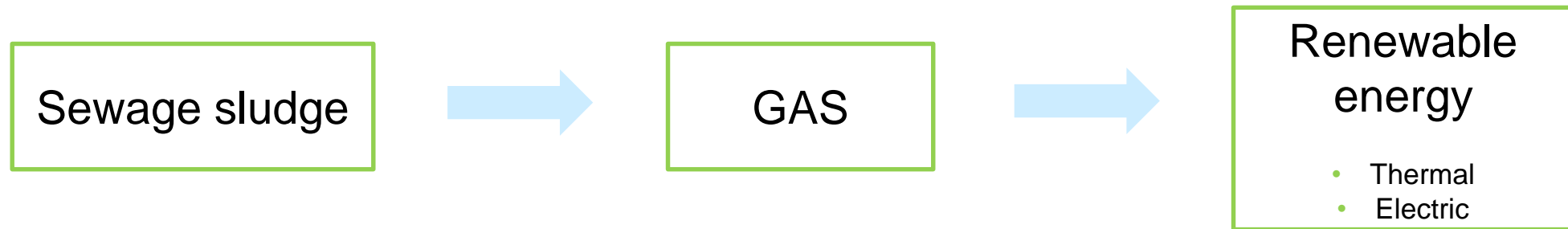
Waste Water sludge solar **DRYing** **FOR** energy recovery through gasification **GAS**

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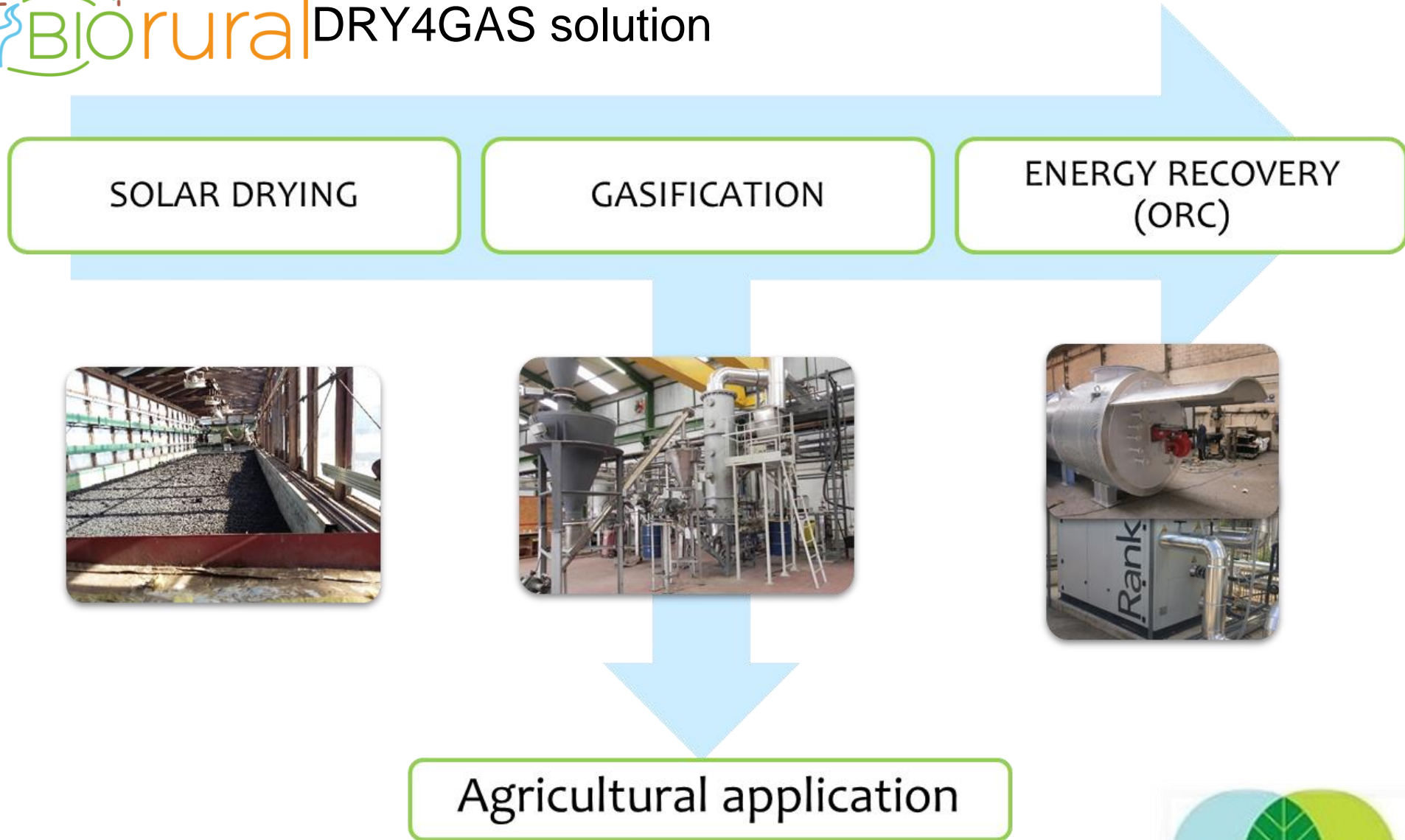


Environmentally **sustainable** treatment for **any** sewage sludge from Waste Water Treatment Plants (WWTP)





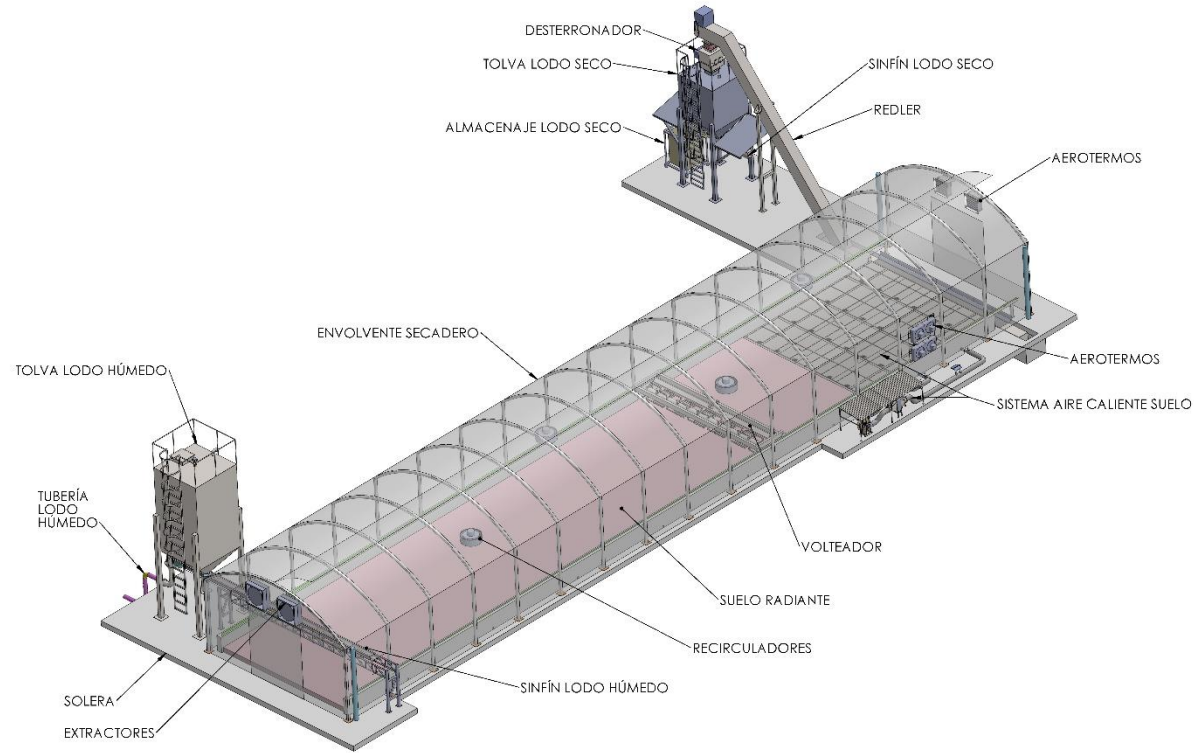
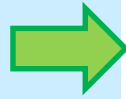
Biorural DRY4GAS solution





Solar drying

Sewage sludge
M90

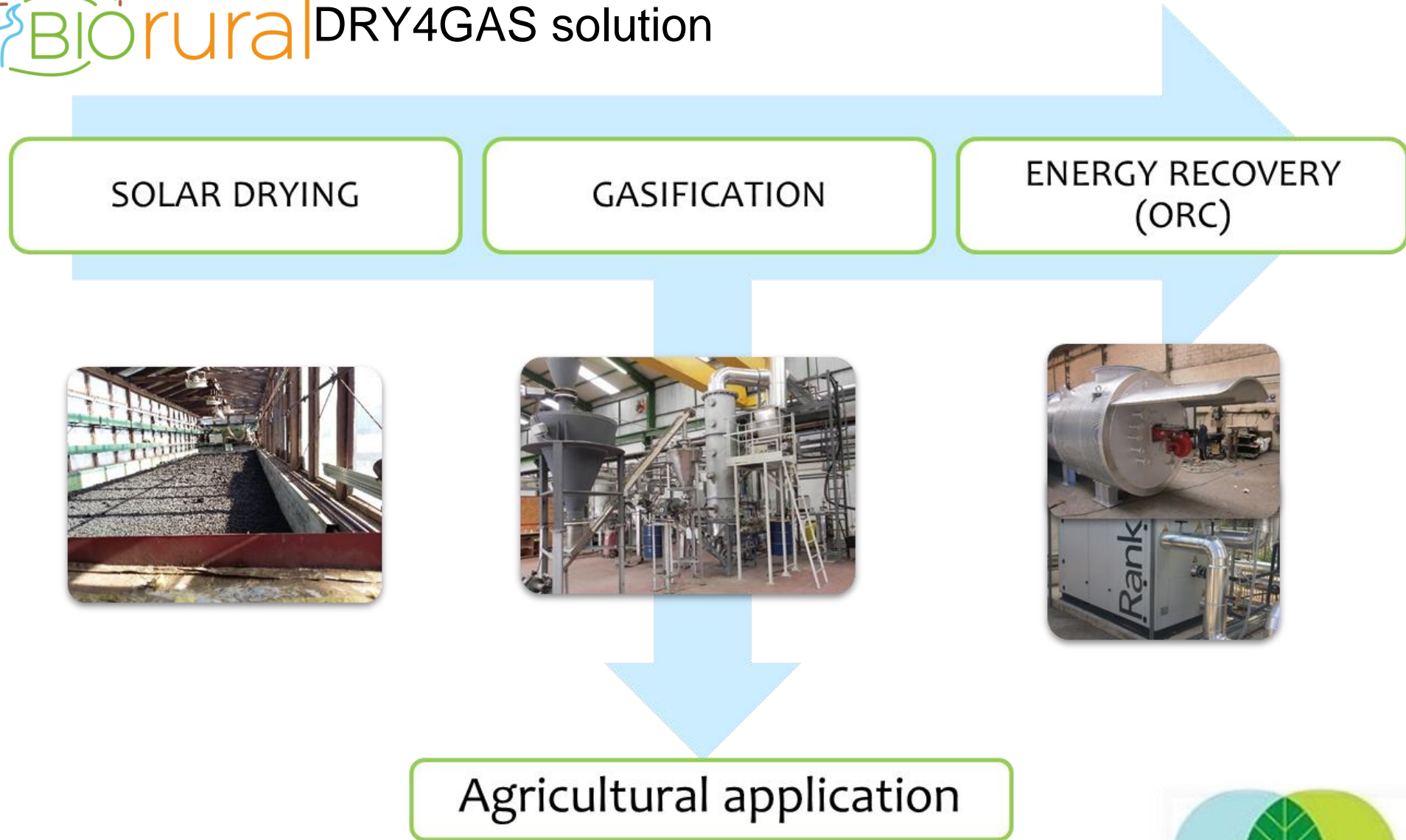


Sewage sludge
M20





Biorural DRY4GAS solution





Sewage sludge
M20



Syngas

Ash/
Biochar





Biorural DRY4GAS solution



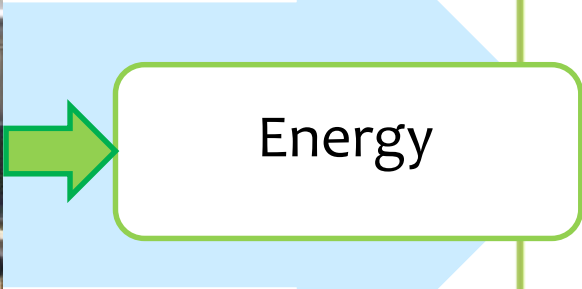
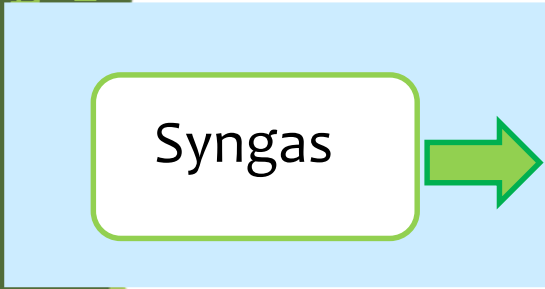
Agricultural application

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Energy recovery system: Combustion and ORC





Biorural DRY4GAS solution



Agricultural application

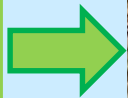
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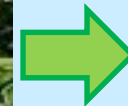


Agricultural application

Ash/
Biochar

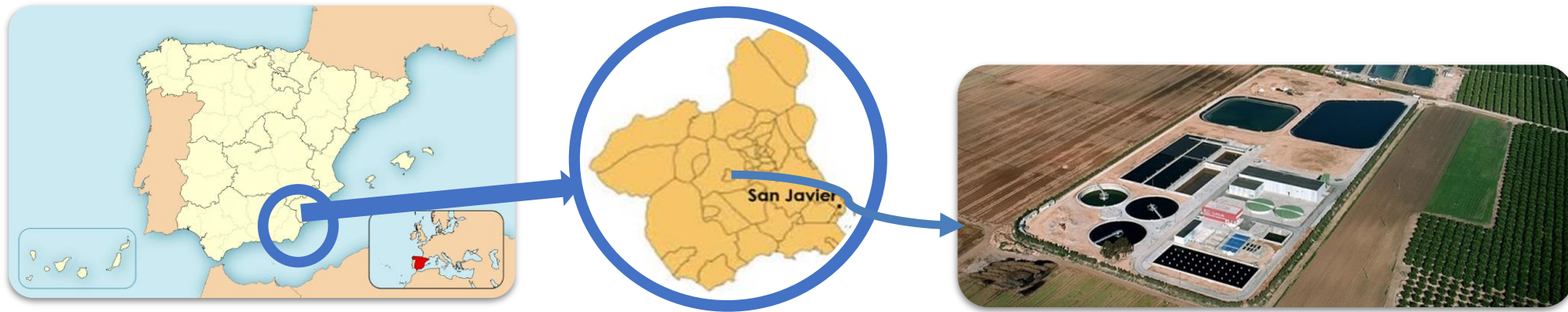


Crop
improvement





Demonstration prototype in San Javier (Murcia)'s WWTP.
Treatment **ALL** sludge produced.





Biorural DRY4GAS solution



Budget: 2,962.427 €
(UE Financing: 56,65%)





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3. Benefits





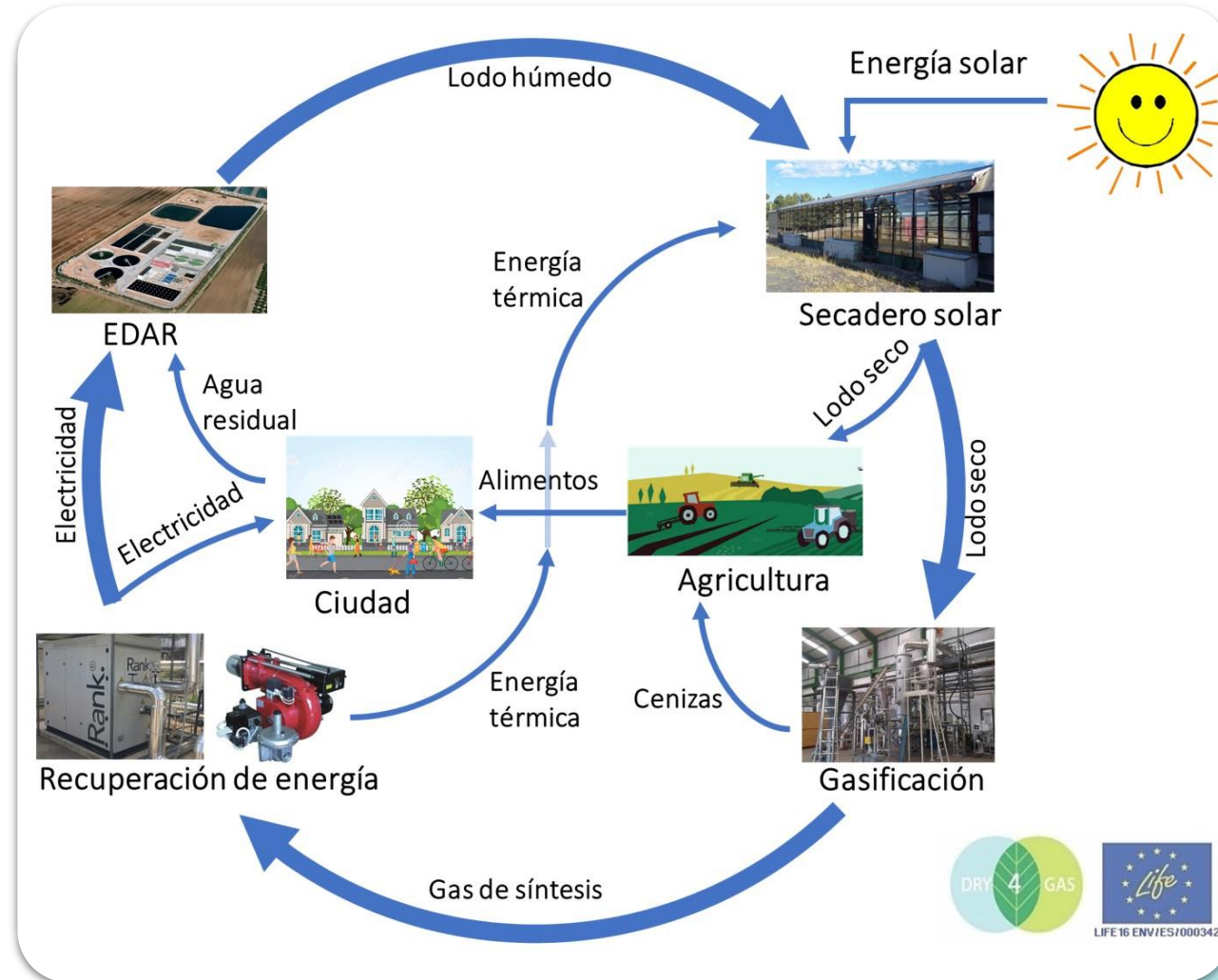
- ✓ **Contribution to Circular Economy**
- ✓ **Renewable Energy Production**
- ✓ **Emissions Reduction : CO₂, odor, noise...**

Converison from conventional sewage sludge management to LIFE-DRY4GAS management



DRY4GAS solution

Circular Economy





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- ✓ **Renewable Energy Production**
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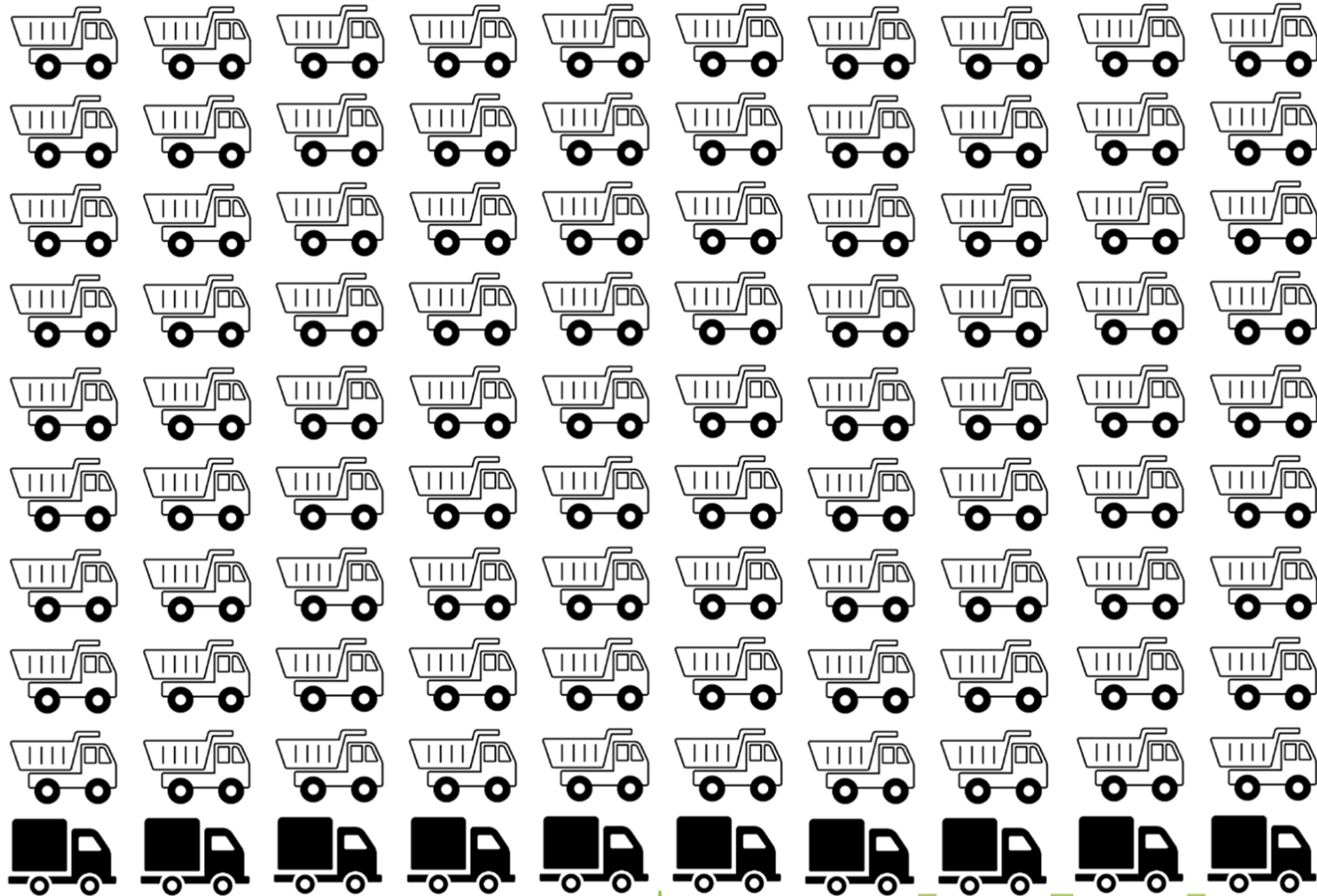


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Converison from conventional sewage sludge management to LIFE-DRY4GAS management



Conventional management



Water

Sewage
sludge



DRY4GAS management

Biorural DRY4GAS solution



Biochar Agriculture



Biochar Other uses





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