Symsites
EcoSites implementation for I-US through social and technological solutions

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HORIZON EUROPE CALL

HORIZON-CL4-2021-TWIN-TRANSITION-01-14: Deploying industrial-urban symbiosis solutions for the utilization of energy, water, industrial waste and by-products at regional scale (Processes4Planet Partnership) (RIA)

12, 404, 455.00€

New technologies
Stakeholders’ engagement methodologies
Industrial Urban Symbiosis
Four European regions
EcoSite concept
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**What’s an EcoSite?**

- **Actors**
  - Biowastes
  - Wastewater
  - Non recyclable wastes

- **Wastes streams**
  - Anaerobic MBR
  - NRW pyrolysis
  - Tertiary treatment (Adsorption column)

- **Technologies**
  - Fertilizers
  - Bioplastics
  - Green H2
  - CH4
  - H2S
  - Platform molecules
  - Non treated water
  - Char

- **High value new resources**

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**Treated water**
What’s an EcoSite?
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**Actors**

- Biowastes
- Wastewater
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**Wastes streams**

- Anaerobic MBR
- NRW pyrolysis

**Technologies**

- CH$_4$ from Biowastes and Wastewater
- NRW pyrolysis using CH$_4$ as an energy source.

**Energy** from CH$_4$ and H$_2$ via metabolic route

**Pyrolysis optimization** of NRW using CH$_4$ as an energy source.

**Antifouling treatment**
- Nano structured coatings
- Carbon dots coatings
- Magnetically induced membrane vibration

**Functionalized AC** with LigNPs and/or CDs to remove emerging pollutants.
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What's an EcoSite?

Wastes streams:
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Technologies:
- Anaerobic MBR
- NRW pyrolysis
- Tertiary treatment (Adsorption column)

High value new resources:
- Fertilizers
- Bioplastics
- Platform molecules
- Non treated water
- Char

Gases:
- Green H2
- CH4
- H2S
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Fertilizers

Bioplastics

Green H2

CH4

H2S

Platform molecules

Non treated water

Char

Nutrient recovery for fertilizer production

H₂ from CH₄ by protonic membrane technology

Water reuse

Nano-enabled antimicrobial composite (CHAR) for water absorbent columns

PHAs production from AnMBR sludge

Liquid-liquid extraction

High value new resources
What’s an EcoSite?
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**Layer 01: IIoT & Smart Data Gathering**
- Pilot Data Set (SQL/NoSQL)
- SQL/NoSQL Orchestration (I)
- Internal/External Sources
  - SCADA & IoT
  - Databases
  - Geospatial
  - Others
- Variables
  - Figures, GIS, Text, Relations, Media

**Layer 02: Calculation ENGINE**
- Cloud/Edge Computing
- Orchestration (II)
- Artificial Intelligence
- Agent Based Modelling
- Federated Artificial Intelligence
- Analytics

**Layer 03: Social Decision Support System**
- Smart Monitoring, Control & Optimization
- Smart Operation
- Smart Matching
- Smart Business
- UI - Potential Regional Map
- Policy Making based on Social Factors
- Smart Social Decision Making

**Layer 04: Cyber Security & Multi-Users Management**
- Users' Management: Multi Role & Users + Multi Stakholder Approach
- Cyber-Security Cross-Component

**How to distribute the resources?**
What's an EcoSite?
Where to find the EcoSites?
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Expected Impact and KPIs

- Near-zero GHG emissions
- Near-zero water discharge
- 90% energy valorisation
- 50% ↓ industrial waste
- Employment: Direct: 100 p Indirect: 400p (in 5 years)
- Symbiosis knowledge to the whole region
Activities and progress so far

Starting date June 1st, 2022

- Now preparing KOM @Alicante, Spain
Coordinator:

CSIC
Bar-Ilan University
Universidade Tecnolóxica de Galicia
Universitat Politècnica de Catalunya
KU Leuven
Facsa

FOVASA
BCU
University of Natural Resources and Life Sciences, Vienna
National Technical University of Athens

ICLEI
AGRA
GERMAINE CAPUCCINI
JOVER
Mein Schinken

SDM-DAN

Project HUB-360

BÖFA

Bornholms Energi & Forsyning
GÅRDEJER FINN
HARILD

Svaneké
Davo
GAV Südöstliches Tullnerfeld

KLINIK
Δήμος Δυτικής Αχαΐας

SIRMET

Engineering & Management

SPEEHPKZ ENEKZEP EKYTKE PAPRKZ
Thanks for your attention

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