The WaysTUP! project

Transforming urban waste into valuable products

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consulting services

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 818308.

WaysTUP!
VALUE CHAINS FOR DISRUPTIVE TRANSFORMATION OF URBAN BIOWASTE INTO BIOBASED PRODUCTS IN THE CITY CONTEXT

ETAM SA – Consulting Services

- **Type:** SME
- **YEAR OF ESTABLISHMENT:** 1993
- **LOCATION:** Greece, Heraklion Crete
- **MAIN AREAS OF EXPERTISE:** Developmental Planning, Communication & Marketing Strategies, Business & Marketing Plans, Environmental Studies
- **EXPERIENCE:** Partnerships and consultation in numerous EU projects
- **Role in the project:** WP8 Communication and Dissemination

visit us at www.etam.gr/en/

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Project's INFO

- **Title**: Value chains for disruptive transformation of urban biowaste into biobased products in the city context
- **Funded under**: Horizon 2020
- **Budget**: €11,664,322.50
- **Implementation period**: 01.09.2019 - 31.08.2023
- **Partners**: 26
- **Participating countries:** Spain, Greece, Belgium, United Kingdom, Czech Republic, Italy, Turkey, Serbia, Austria (9)

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WaysTUP!

The overall objective of WaysTUP!
is to demonstrate the establishment
of new value chains for urban biowaste utilisation
for the production of higher value purpose products
(i.e. biobased products, including food and feed
ingredients), through a multi-stakeholder approach
in line with circular economy.

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FEEDSTOCK

Meat and fish by-products
Spent coffee grounds
Source separated biowaste from households
Used cooking oils
Cellolusic rejection material
Sewage sludge

VALORISATION TECHNOLOGIES

Insect breeding
Fermentation
Extraction
Bioprocessing

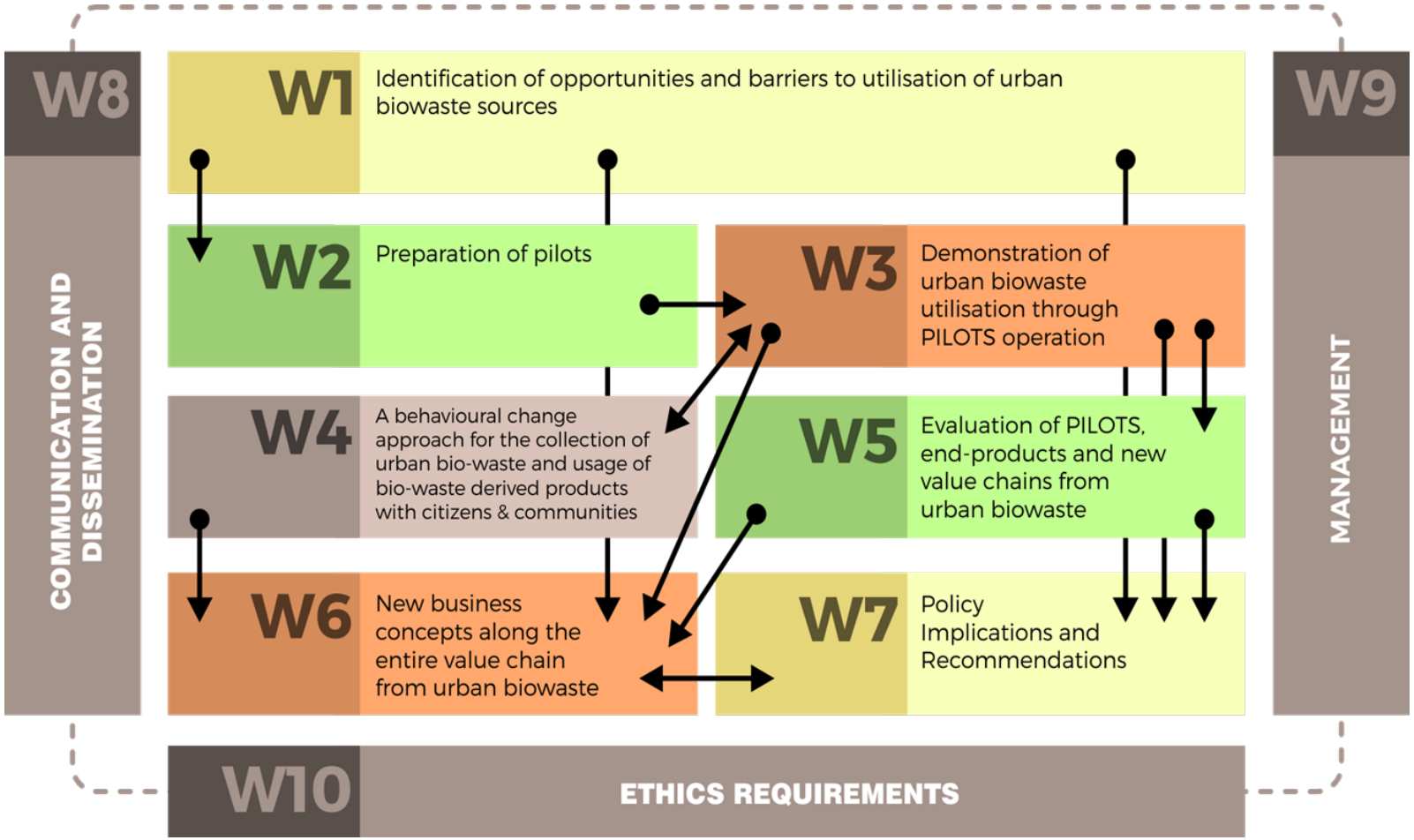
END PRODUCTS

Active peptides
Enzyme for tendering
Gelatin - Flavors - Polyphenols
Proteins - Bio-solvents
Coffee oils - Bioplastics
Biochar - PHAs
Ethyl lactate
Long chain dicarboxylic acid

CHANGE OF MINDSET

New business models
Change citizens behaviour
Policy Recommendations

The Workplan



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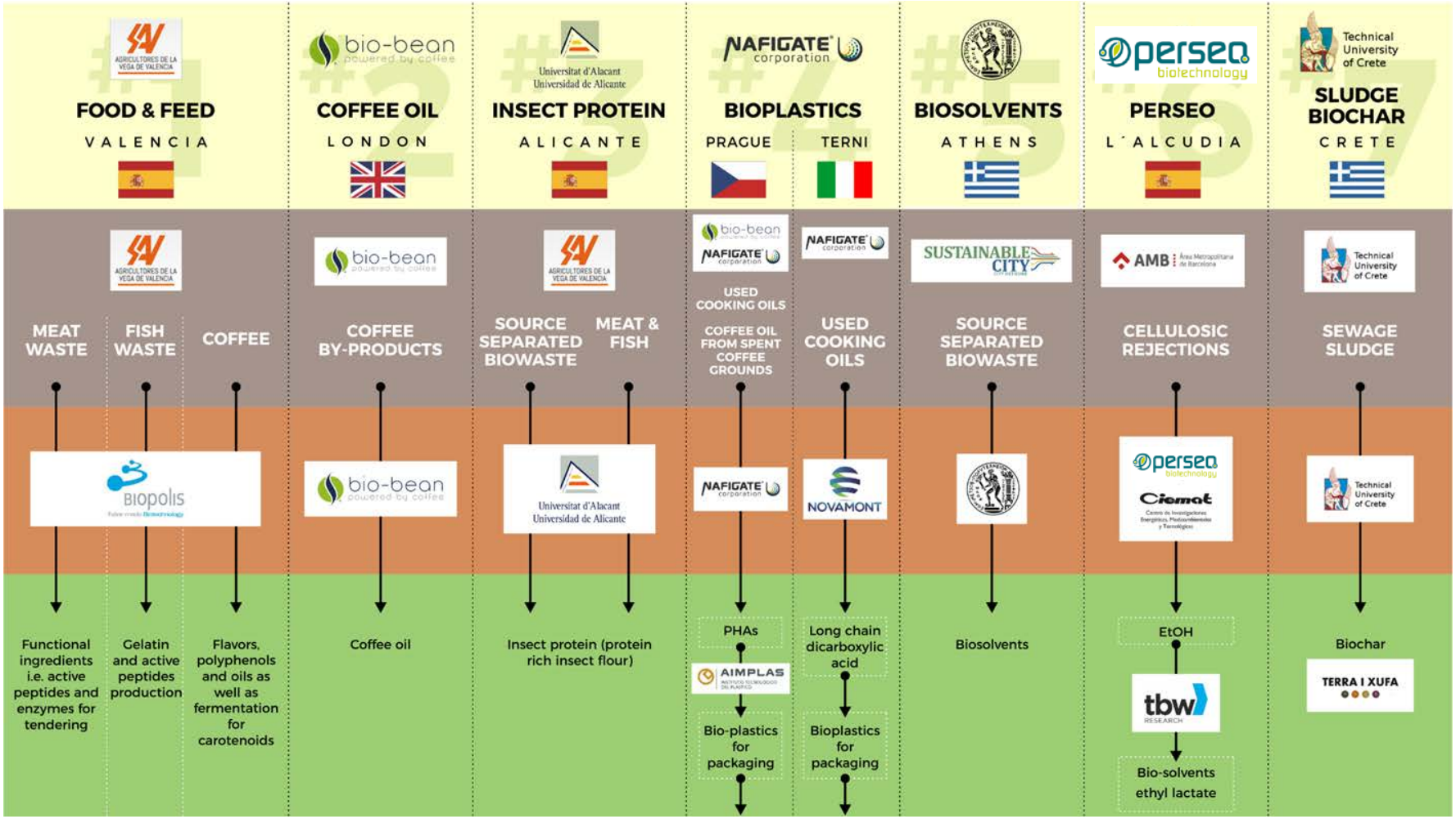
Pilots' overview



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Pilot 1: FOOD & FEED

Bio-processing of meat by-products

- Meat by-products are costly to be treated and disposed of ecologically.
- They contain good amounts of nutrients (i.e. essential amino acids, minerals, and vitamins).

The objective

- To demonstrate the production of functional ingredients from animal by-products (active peptides, enzymes for tendering) in a city context.
- To emphasize in the sociological aspect of the recycling process, fighting to de-stigmatize the concept of waste not being valuable.

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Pilot 1: FOOD & FEED

AGRICULTORES DE LA VEGA DE VALENCIA

Biopolis
Tailor-made Biotechnology

VALUE CHAIN 1.	Feedstock type	Technology solution/PILOT	End-products
	Meat waste	Fermentation/ PILOT 1	Functional ingredients i.e. active peptides & enzymes for tendering
	Feedstock providers	Technology solution providers	End-user/Industry
	SAV	BIOPOLIS	Consumers, NS, ADMW

VALUE CHAIN 2.	Feedstock type	Technology solution/PILOT	End-products
	Fish waste	Fermentation/ PILOT 1	Gelatine and active peptides production
	Feedstock providers	Technology solution providers	End-user/Industry
	SAV	BIOPOLIS	Consumers, NS, ADMW

VALUE CHAIN 3.	Feedstock type	Technology solution/PILOT	End-products
	Spent coffee grounds	Fermentation/ PILOT 1	Flavours, polyphenols, oils, carotenoids
	Feedstock providers	Technology solution providers	End-user/Industry
	SAV	BIOPOLIS	Consumers, NS, ADMW

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Pilot 2: COFFEE OIL

- **Coffee-oils from Spent coffee grounds** Spent coffee grounds (SCG) are currently quite unexplored.
- SCG into liquid bio-chemicals .

The objective

- Sustainable production of coffee oil from spent coffee grounds.
- Revalorization of coffee oil for the production of PHAs.

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Pilot 2: COFFEE OIL

bio-bean

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 4.	Coffee waste	Extraction/ PILOT 2	Coffee oil
	Feedstock providers	Technology solution providers	End-user/Industry
	BIOBEAN	BIOBEAN	Chemical industry, plastic industry

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Pilot 3:
INSECT PROTEIN

Insect protein from biowaste

- Insects are efficient converters of organic waste.
- Insect meals are a high-quality protein source in animal feeds.

The objective

- Achieve a reduction of waste as well as retaining and upgrading valuable nutrients.
- Create protein-rich insect flour from source-separated bio-waste and meat and fish by-products.

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Pilot 3: INSECT PROTEIN

AGRICULTORES DE LA VEGA DE VALENCIA

Universitat d'Alacant
Universidad de Alicante

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 5.	Source separated biowaste	Insect breeding/ PILOT 3	Protein-rich flour for feed
	Feedstock providers	Technology solution providers	End-user/Industry
	SAV	UA	Feed industry

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Pilot 4: BIOPLASTICS

Bioplastics from used oils

- Long-chain dicarboxylic acids (lcDCA), have a wide range of applications as raw materials for the synthesis of polymers (polyesters).
- Optimize the process of lcDCA production through fermentation.

The Objectives

- Test and evaluate possibilities of feedstock from used cooking oils as well as coffee oil.
- Formulate bio-based and biodegradable polyesters based on long-chain dicarboxylic acids with enhanced properties.

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Pilot 4: BIOPLASTICS

AIMPLAS
PLASTICS TECHNOLOGY CENTRE

NOVAMONT

NAFIGATE corporation

AMB Àrea Metropolitana de Barcelona

bio-bean

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 6.	Used cooking oils	Fermentation/ PILOT 4	PHAs, long chain dicarboxylic acid, bioplastics
	Feedstock providers	Technology solution providers	End-user/Industry
	AMB	AIMPLAS, NFG, NVMT	Consumers, plastic industry

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 7.	From waste coffee grounds	Fermentation/ PILOT 4	PHAs, long chain dicarboxylic acid, bioplastics
	Feedstock providers	Technology solution providers	End-user/Industry
	BIOBEAN	AIMPLAS, NFG, NVMT	Consumers, plastic industry

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Pilot 5: BIOSOLVENTS

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 8.	Source separated biowaste	Fermentation/ PILOT 5	Biosolvents
	Feedstock providers	Technology solution providers	End-user/Industry
	SUST	NTUA	Chemical industry

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Pilot 6:
PERSEO BIOETHANOL®

The idea!

Ethanol from cellulosic rejections streams of MWTP and WWTP

- PERSEO & CIEMAT, have developed a bio-technological patented technology to produce second-generation bioethanol from the organic fraction of MSW (PERSEO Bioethanol®).

Objectives

- Succeed in circular bioethanol production.
- Ethanol will be further processed to produce ethyl lactate via a reactive distillation.

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Pilot 6: PERSEO BIOETHANOL®

VALUE CHAIN 9.	Feedstock type	Technology solution/PILOT	End-products
	Cellulosic rejections	Fermentation/ PILOT 6	Bioethanol, Biosolvents
	Feedstock providers	Technology solution providers	End-user/Industry
	AMB	IMECAL, CIEMAT, TBWR	Chemical industry

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Pilot 7: BIOCHAR

Biochar from Sewage Sludge

- Biochar is a carbon-rich, fine-grained, porous material, which can be applied to soil to offer both agricultural and environmental benefits.
- Treat gas emissions of the biochar production process to produce an off-gas concentrate (Pirolenheso) rich in nutrients and micro-nutrients.
- Both used in agriculture (fertiliser and plant nutrient).

Objectives

- Transform sewage sludge into biochar.
- Generate Pirolenheso to increase the value of the procedure and its circularity.

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Pilot 7: BIOCHAR

Technical University of Crete

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 10.	Sewage sludge	Slow pyrolysis/ PILOT 7	Biochar
	Feedstock providers	Technology solution providers	End-user/Industry
	TUC	TUC	TiX, farmers

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THANK YOU

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