

# ***Organic waste biogas to methane + CHP + DHS***

**ACEA Pinerolese Industriale**



# AMBIENTE

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**SHREC - Energy policies and innovative projects in Piemonte**

**21st of January 2021 - online workshop**

# ACEA: MULTIUTILITY COMPANY

ACEA is a public **multi-utility company**, which carries out the following services:

**WATER SECTOR:** for the management of the integrated water system

**ENERGY SECTOR:** for natural gas distribution and heat management

**ENVIRONMENT SECTOR:** for the integrated waste collection, treatment, valorization and disposal process



# AREA AMBIENTE: LOCATION AND ACTIVITY



The **ENVIRONMENTAL SECTOR** operates in the Pinerolo area -south west of the Province of Turin- for **47 Municipalities** and 150'000 inhabitants, carrying out the following activities:

- ❖ urban solid waste collection
- ❖ separate waste collection
- ❖ street sweeping
- ❖ waste treatment and disposal

# Reference point for the treatment of organic waste

The ACEA Waste Treatment Plant was established **in 2003** to initially serve only the Pinerolo area (150 ' 000 inhabitants).

Currently, the organic waste treatment line is a reference **at a regional level**, with a potential capacity of **60 ' 000 t / year** (to be enlarged to 90 ' 000 t / year), serving roughly **1 ' 000 ' 000 inhabitants**.



# FROM WASTE TO RESOURCE



**BIOGAS**



**COMPOST**



# Raw materials



## *FOOD WASTE*

- *Household*
- *Restaurants*
- *Canteens*
- *Local markets*

*Anaerobic digestion*

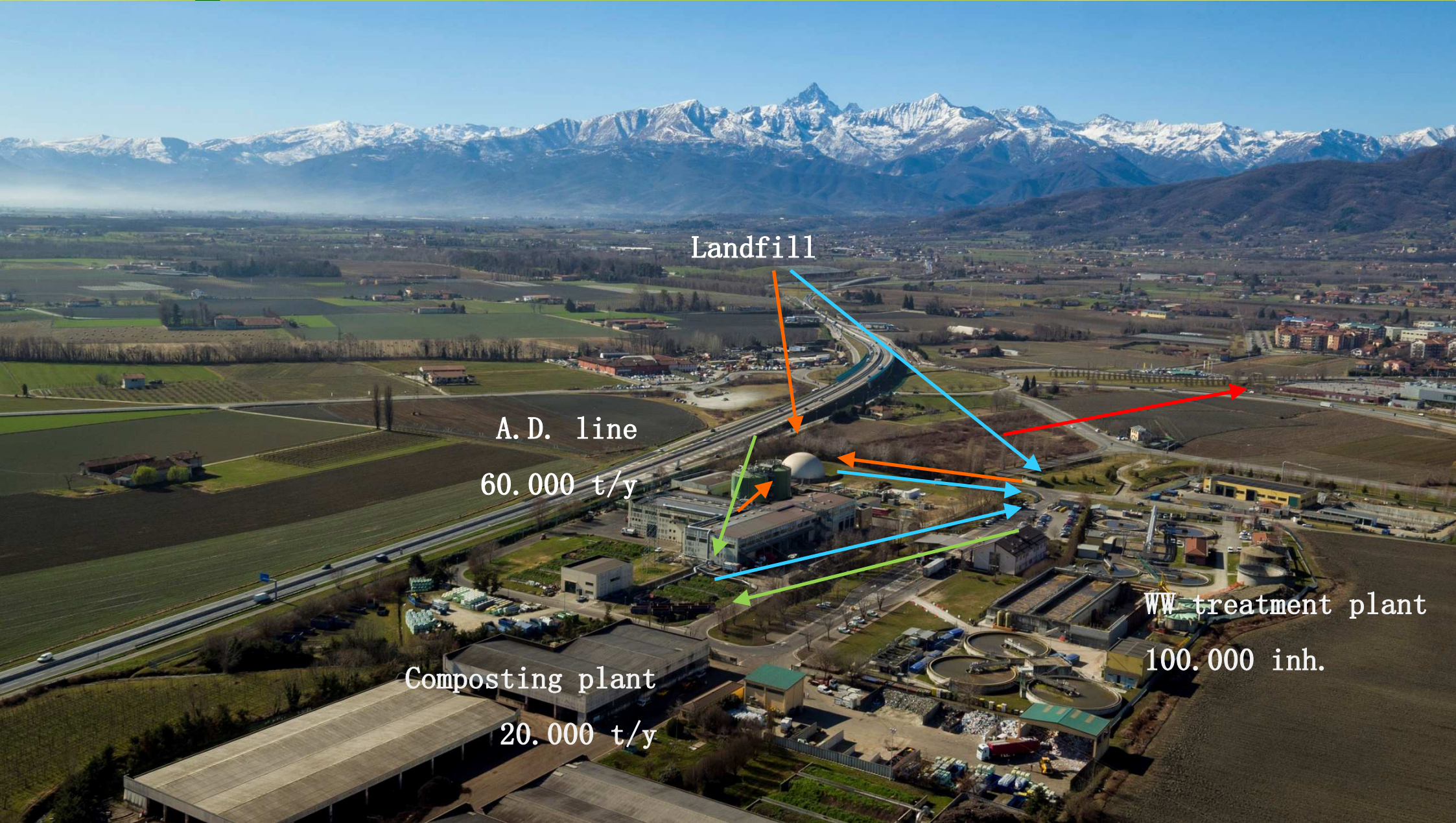


## *GREEN WASTE*

- *pruning of domestic origin*
- *Urban green waste*

*Composting plant*

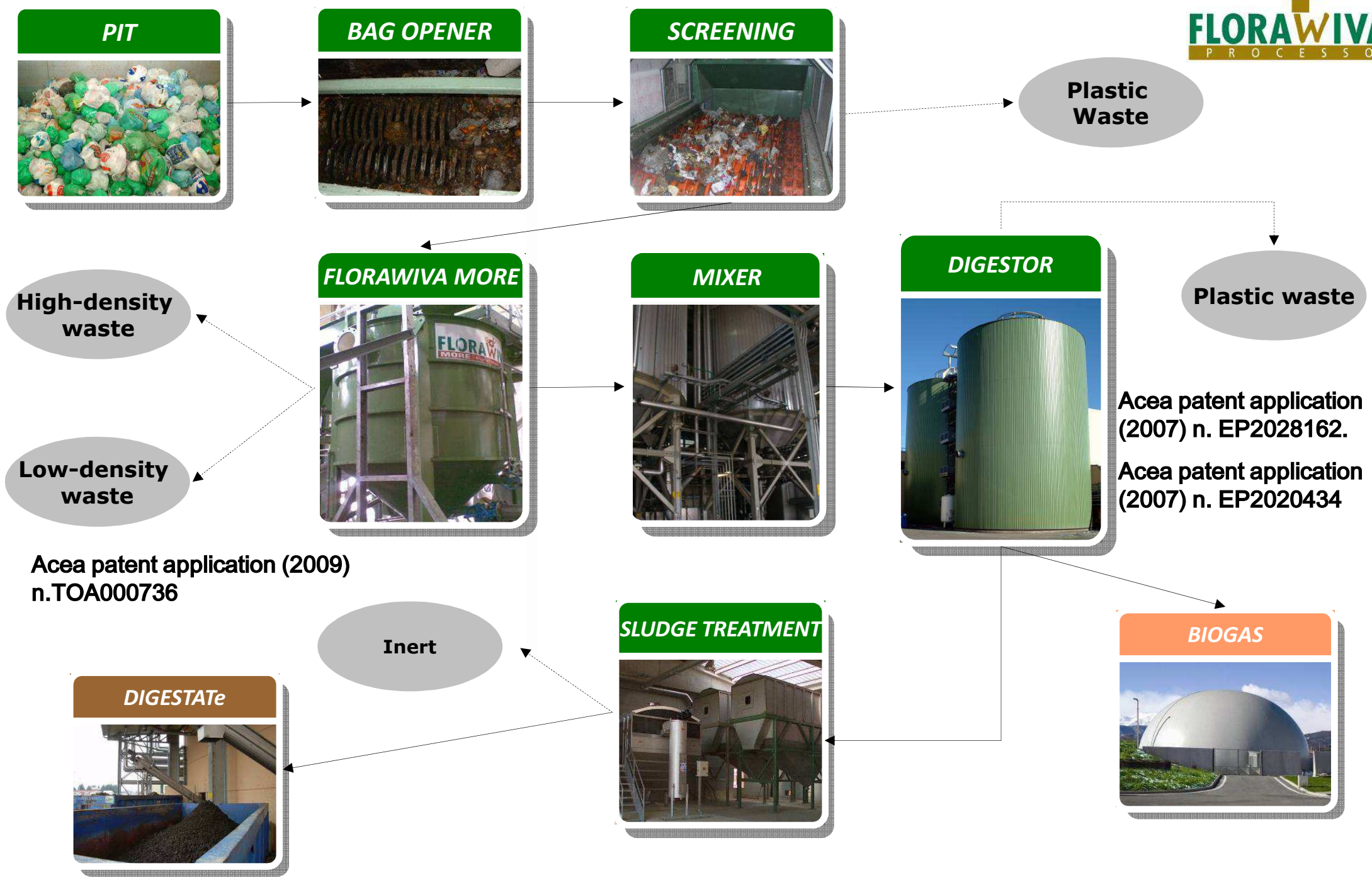
# Integrated Environmental district



→ Biogas  
→ Wastewaters

→ Sludge/digestate  
→ DHS, biomethane

# BIOWASTE- Anaerobic digestion





# Biowaste- Composting process



# CHP

LANDFILL



ANAEROBIC DIGESTION



WW TREATMENT



GASHOLDER



FLAME



Untill Sep. 2020!

COOLING



COMPRESSOR



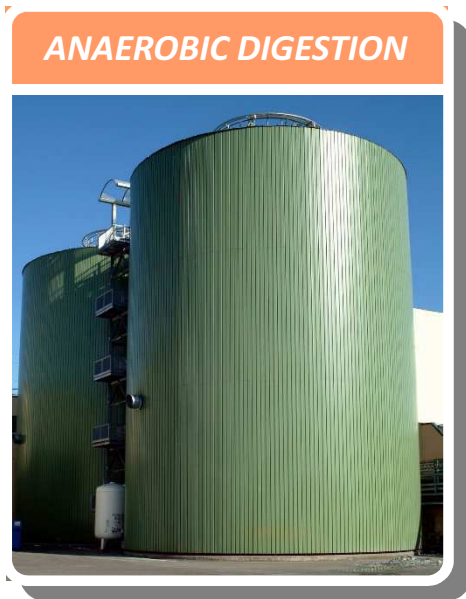
CHP



*Electric energy*

*Thermal energy*

# FROM BIOGAS TO BIOMETHANE



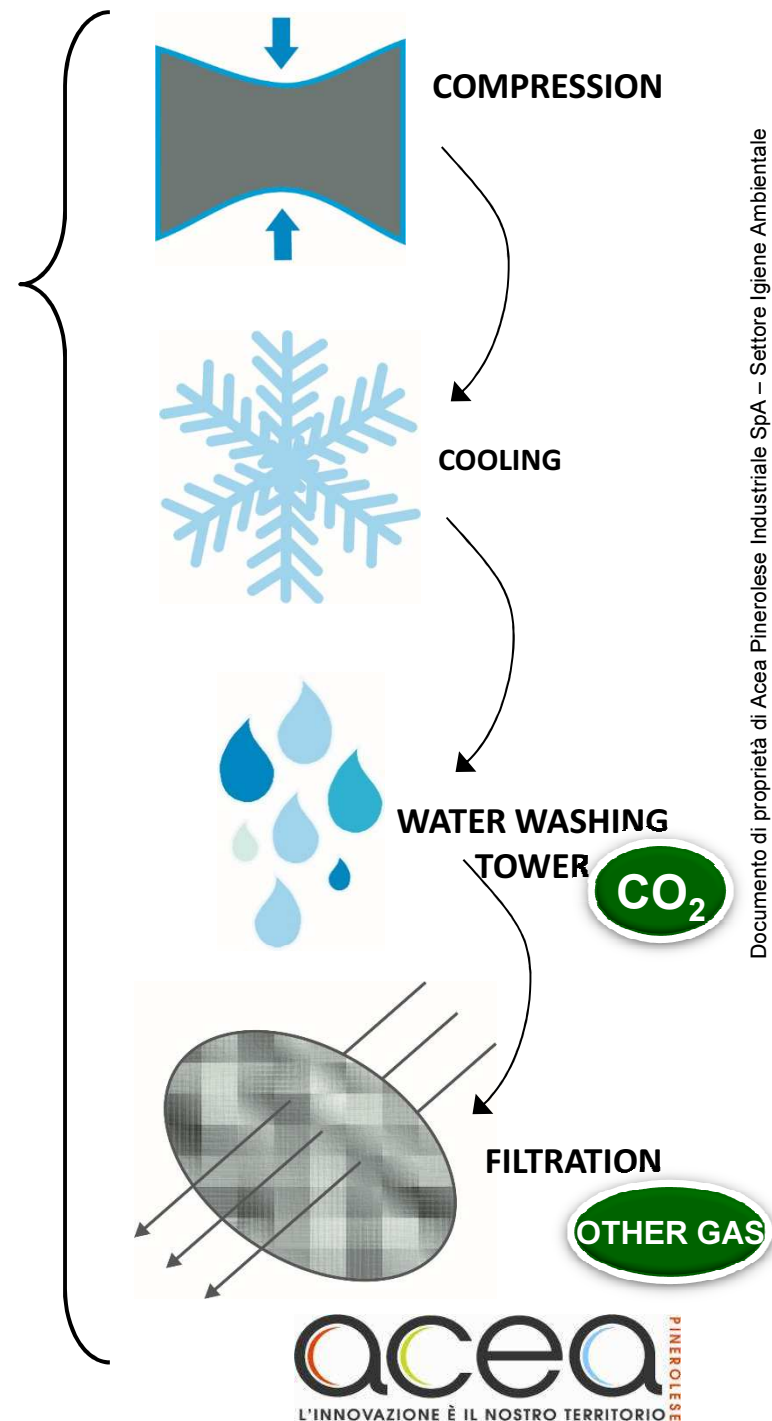
**Bio-methane**

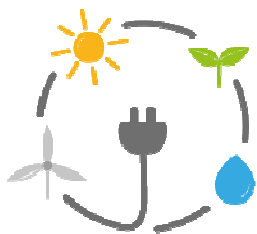
**Gas grid**

**Transport fuel**



From September 2020 on, ACEA started to inject biomethane into the natural gas grid!





## Clean energy



## Green chemistry



## Energy Community

# CLEAN ENERGY: BIOMETHANE

Progetti  
**GREEN NG  
BIOMETHAIR**

**HYSYECH**  
TORINO

**POLI-  
TECNICO**  
TORINO

**ACEA**  
PINEROLESE

**FCA**  
CRF

**BIOMETANO**

**September  
2015:**  
opening of the  
Panda prototype  
fuelled by  
**biomethane**  
and  
**biohydrogen**  
produced in  
ACEA



**October 2014:**  
inauguration of the **first  
experimental plant** for  
the production of  
**biomethane** using  
**OFMSW**

# CLEAN ENERGY: BIOMETHANE



...and new outcomes from



# CLEAN ENERGY

## **BioroburPlus** (EU Framework Program Horizon 2020)

Production of electricity from bio-hydrogen, derived from biogas produced by the anaerobic digestion of organic waste, TRL 6



Green hydrogen



## **Spotlight** (EU Framework Program Horizon 2020)

To develop and validate a photocatalytic device for the production of  $\text{CH}_4$  and green  $\text{H}_2$  in methane via the Sabatier process, and  $\text{CO}$  via the reaction *reverse water gas shift*



Methanol

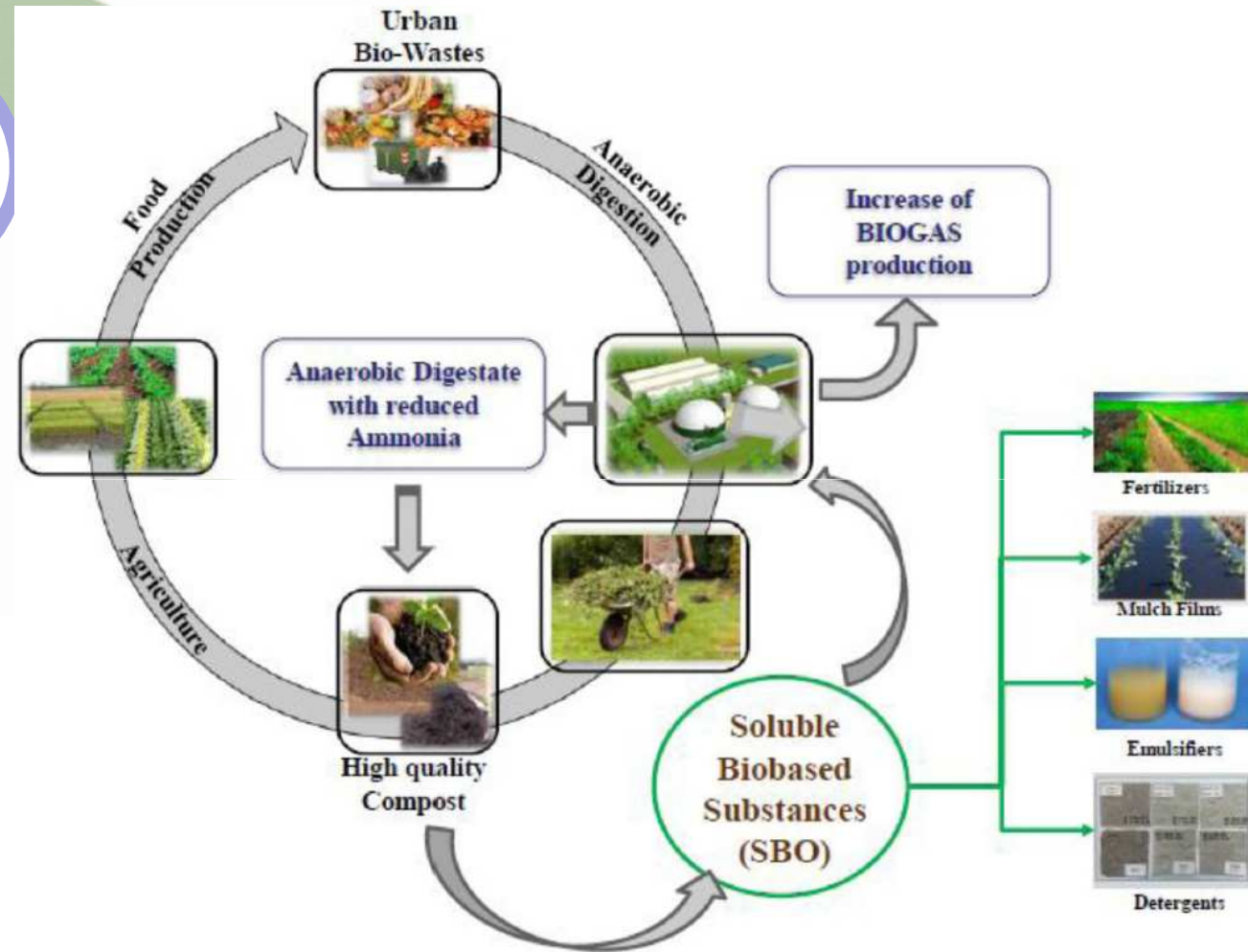
# GREEN CHEMISTRY: BIOPOLYMERS FROM COMPOST

Progetti  
**BiochemEnergy**  
**Saturno**  
**Lifecab**  
**LIFE EBP**

**Hysytech**

**ACEA**  
Pinerolese

**Università**  
di  
**Torino**





# GREEN CHEMISTRY: BIOPOLYMERS FROM COMPOST



**Engicoin** (EU Framework Program Horizon 2020)  
Production of bio-plastics from the waste matrices of the organic waste treatment process, both liquid and gaseous.



**ProGireg** (EU Framework Program Horizon 2020)  
Conversion of abandoned post-industrial areas into new eco-sustainable infrastructures, through experimentation with new green technologies.



**Saturno** (Piattaforma Regionale Bioeconomia)  
Conversion of organic waste into raw materials for use in various sectors (industrial chemistry, agriculture, etc ...) and recovery of carbon dioxide and its conversion into fuels and bio-fertilizers



## **E-crew** (EU Framework Program Horizon 2020)

Implementation of a business model and an operational tool for the creation of virtual communities for the management and development of renewable energy



## **ENER.COM** (Piattaforma regionale)

Feasibility study on the full implementation of the Energy community concept on the area of Pinerolo



*“Good decision-making about how we manage the waste we create is one of the most important contributions humanity can make to reducing its impact on the natural world.”*

ISWA Global Waste Management Outlook foreword



**Thank you for your attention**

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**aceapinerolese**  
L'INNOVAZIONE È IL NOSTRO TERRITORIO