

# Innovation at the Valdemingómez Technology Park (PTV)

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Capital  
Digital

01.

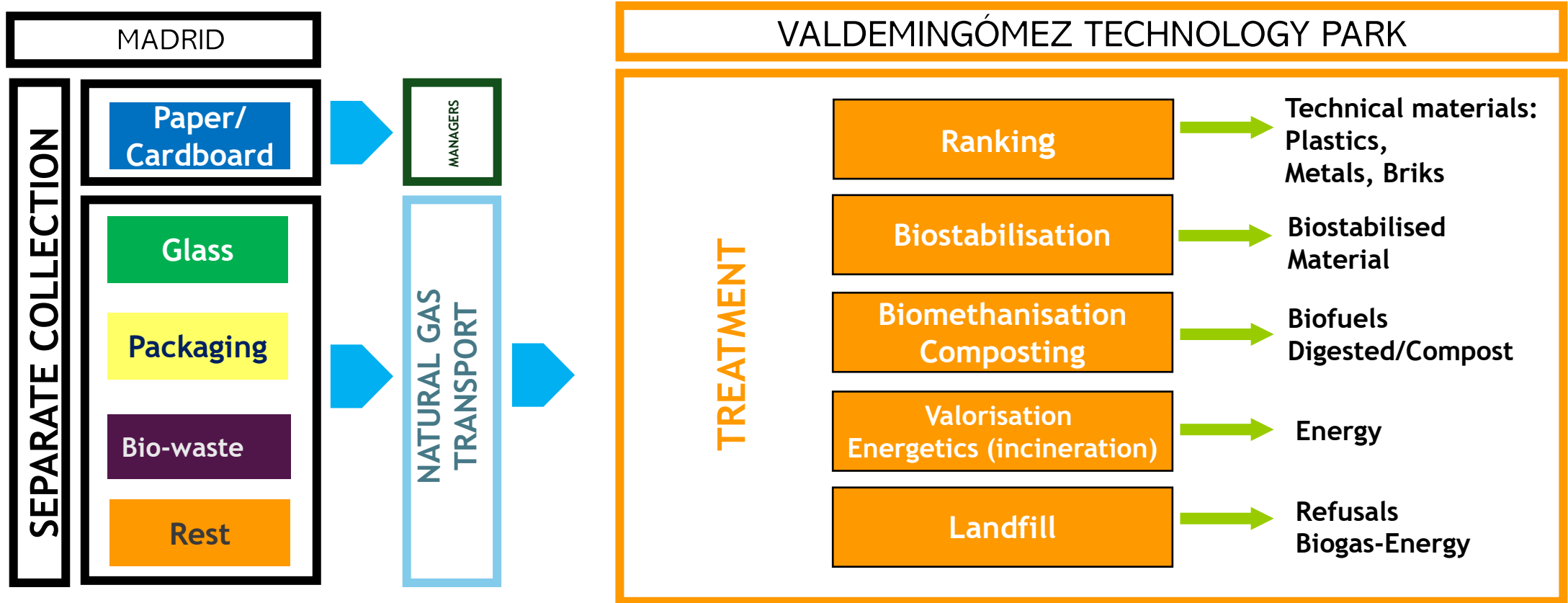
# MADRID WASTE MANAGEMENT MODEL

VALDEMINGÓMEZ TECHNOLOGY PARK



# Waste Management in Madrid

## Waste Management Model

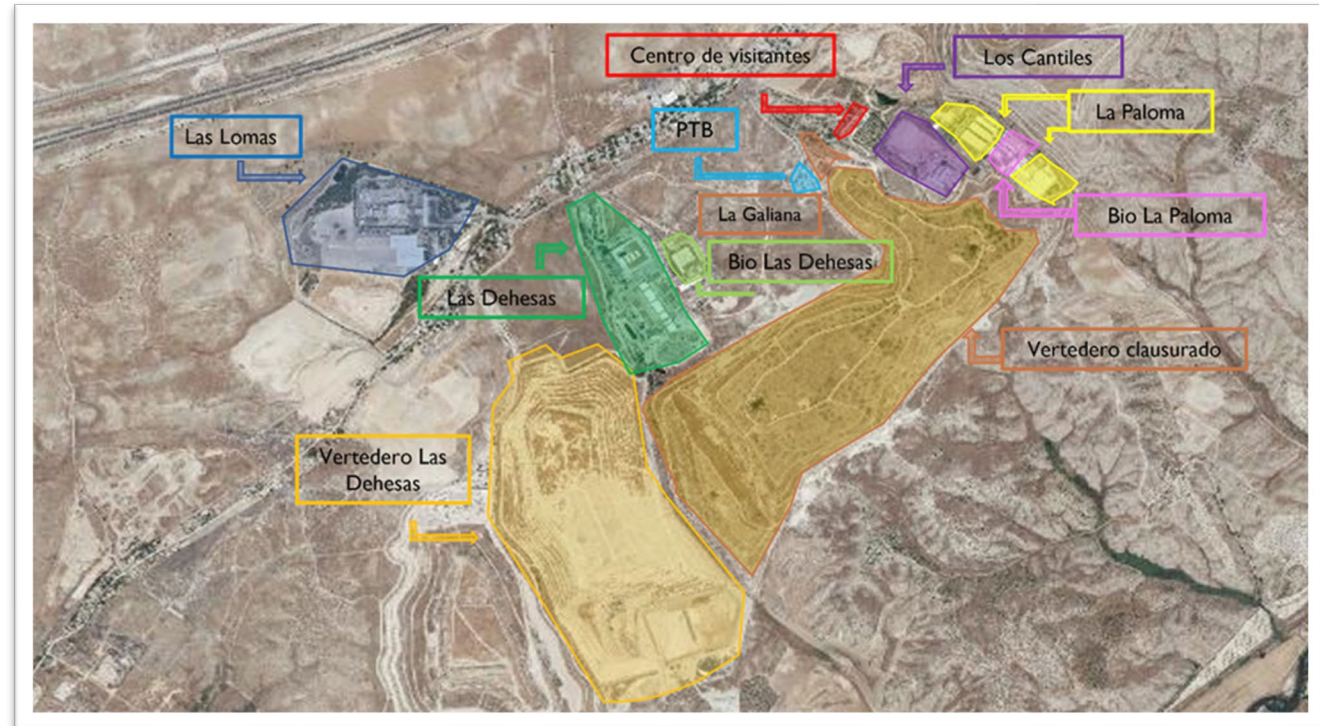


# Waste Management in Madrid

## The Technology Park (PTV) - Treatment Centres

The PTV consists of 7 treatment centres:

- 3 sorting plants
- 2 composting plants
- 1 Automated Composting Plant (...under construction)
- 2 biomethanisation plants
- 1 Energy Valorisation plant for treatment rejects
- 1 Co-generation plant converting landfill biogas into energy
- 1 biogas treatment plant
- 1 Landfill plant of 87 Ha





# Waste Management in Madrid

## The Technology Park (PTV) - Results

### Population



- **3.2 million inhabitants**
  - 8 million tourists per year
  - 500.000 commuters
- (\*) *pre-pandemic figures*

### Waste



- 1.2 million tonnes of waste
- 5 fractions
- **3,347 t/d**
- 370 Kg/inhab. year

### Treatment



- **Technology Park**
- Industrial complex with **7 treatment centres**
- + 1 under construction

### Results



- More than **67,000t of recovered materials** and 12,800t of compost and biostabilised material.
- **273,521 MWh of electricity**
- 139,651 MWh injected into the Enagas grid as biomethane
- Balance of emissions: -200,000 tCO2e/year

### Cost



- Management costs: EUR 75 million (**66.66 EUR/tonne**)
- Future investment costs: EUR 46 million
- Revenues: 45% of costs



# 02.

## MADRID AND INNOVATION IN WASTE MANAGEMENT

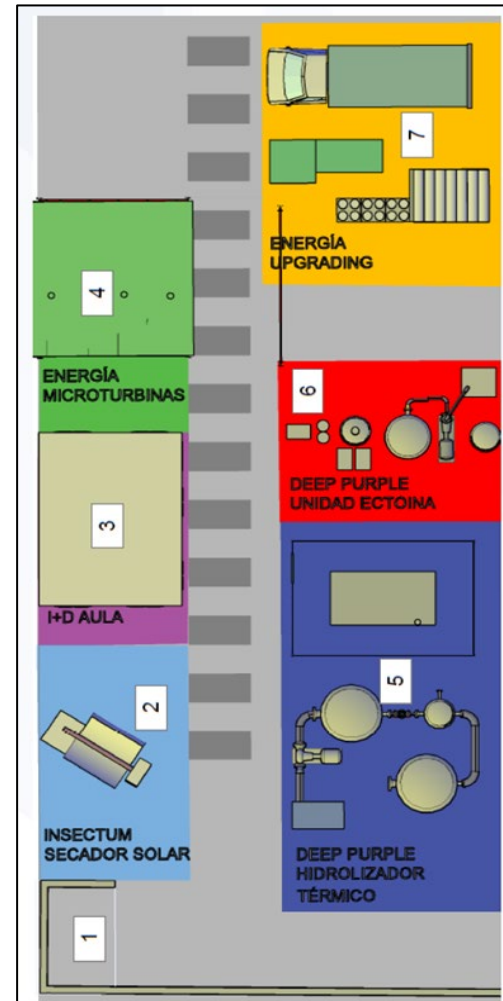
VALDEMINGÓMEZ TECHNOLOGY PARK

## Advanced Data Acquisition (Advanced Data Acquisition aka ADA\_)

- 5 automations > no\_paper
- Dashboards and management > self-billing
- **Communications:** Industrial 5G network
- AI: Plant workload **prediction**
- **Machine vision** for stock control
- **Intelligent predictive maintenance** > equipment

## Las Dehesas Biomethanisation Plant R&D&I Area

- R&D&I centre for the development of **innovative pilot projects** aligned with the circular economy, which seek to obtain high added value products from innovative waste management processes and services. The City Council participates by providing support or as a partner.
- Concept of **URBAN BIOREFINERY**. Transformation of materials (biogas, leachates or bio-waste) through **CHEMICAL AND/OR BIOLOGICAL RECYCLING**, to obtain products of great value in different sectors (cosmetics, plastics, construction and fertilisers...).
- **Projects to improve the plant's energy balance:** self-supply of energy, production of biofuels for the plant's vehicles.



## OTHER PROJECTS:

- Sustainable Mobility Project with EMT: **Buses / Bicimad**
- GHG emission monitoring: **ESA** collaboration
- Remote Stations Project: odorant gas monitoring
- Domotisation (IoT) projects in the Park: **UPM** collaboration

## ROBOTISED Inspections: Las DEHESAS Landfill Site

Use of landfill robots for the **qualification/quantification of fugitive biogas emissions**. Sensorised with **OGI cameras to locate leaks**.

Information platform:

- **Digital twin**
- **Machine Learning** Techniques
- Transforming **Data into Knowledge**

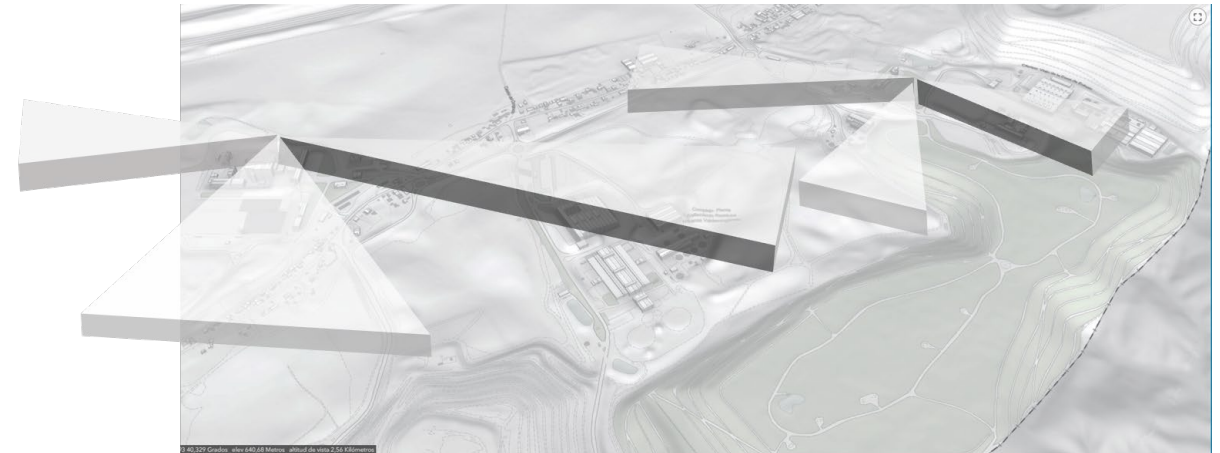
## Plant: Los Cantiles 4.0

- **Information platform: towards Industry 4.0**
- Fully sensorised and automated plant
- **5G Corridor**
- Intelligent street lighting
- Waste treatment control through the use of IoT sensors (pit filling sensors, odour control, etc.)

## SMART URBAN SPACE

### USE CASES:

- **Pit Fill Level Monitoring** (radar/ultrasonic/image analysis)
- **Real-time waste characterisation:** Application of AI and computer vision.
- **Integration with PTV information system:** Advance Data Acquisition (ADA\_)
- **Intelligent preventive maintenance:** Integration with Plant SCADA
- **Autonomous driving of reject trucks between plants**
- **Environmental monitoring:** sensors for concentration of SH<sub>2</sub>, CH<sub>4</sub>, NH<sub>3</sub>, ...







THANK YOU

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