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# Anaerobic Digestion of organic waste in the Province of Bolzano

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# Anaerobic Digestion of organic waste in the Province of Bolzano

## Description

- Rural area with high tourist load
- Small surface area of uncultivated land
- Objective: anaerobic digestion plant with energy recovery for organic waste

## Implementation

- Timescale: 2 steps construction
- Resources: about 20 M €
- 53 municipalities involved

## Evidence of success

- Need to expand the plant
- Very high biogas production

## Lessons learnt

- Positive: Limited quantities of screening, use of paper bags
- Negatives: in-situ composting
- Challenge: biogas upgrading implementation, digestate management



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# Description

- Province of Bolzano is a **rural area with high tourist load**
  - 7,9 million arrivals with an average 4-5 days stay in 2022
  - continuous increase in tourist numbers
  - province population: 520.000 inhabitants
  - significant load waste fluctuations ( )
- **Small surface area** of free or uncultivated land
  - Province surface area: 7.400 Km<sup>2</sup>
  - mountainous territory, only 14% lies below 1,000 m altitude
  - agriculture employs 8% of the workforce and limits surface availability
- **Objective:** anaerobic digestion plant with energy recovery
  - little surface needed
  - no smell issues
  - Production of valuable biogas and digestate for composting
  - possibility to feed self-generated energy surplus into the electrical grid



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# Implementation

## ■ Timescale:

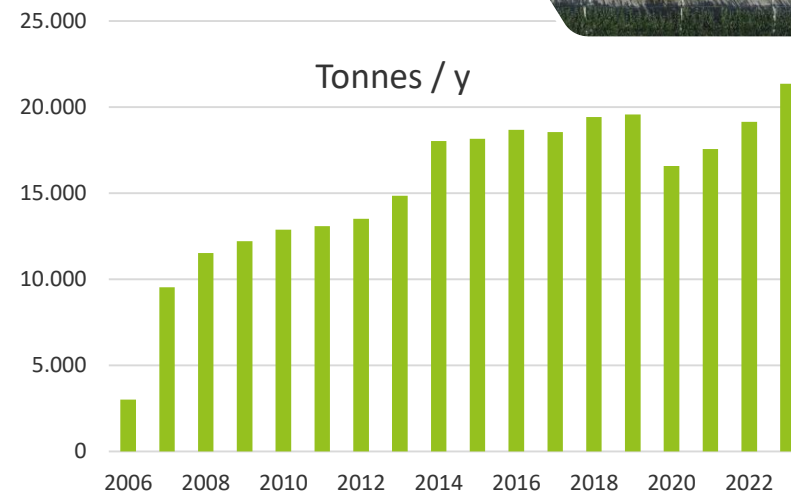
- First plant building 2006 (6,000 – 8,000 tonnes/y)
- Plant extension 2020 (up to 30,000 tonnes/y)
- Currently treating about 20,000 tonnes/y
- Upgrading from biogas to biomethane foreseen for 2026

## ■ Resources needed

- 11 plant operators
- about 20 M € considering the plant extension

## ■ Actors involved

- 53 municipalities





# Implementation

## ■ Technology and process

- pretreatment: 2 hammer mills (Wackerbauer©)
- 3 mesophilic anaerobic reactors working at 39 °C: 4.200 m<sup>3</sup>
- wet digestors with bottom scrapers
- Centrifuge for sludge dewatering
- digested sludge: 2,000 tonnes/y (25% dry material) to composting facility
- cogenerators: total 1732 KWe producing heat and electricity



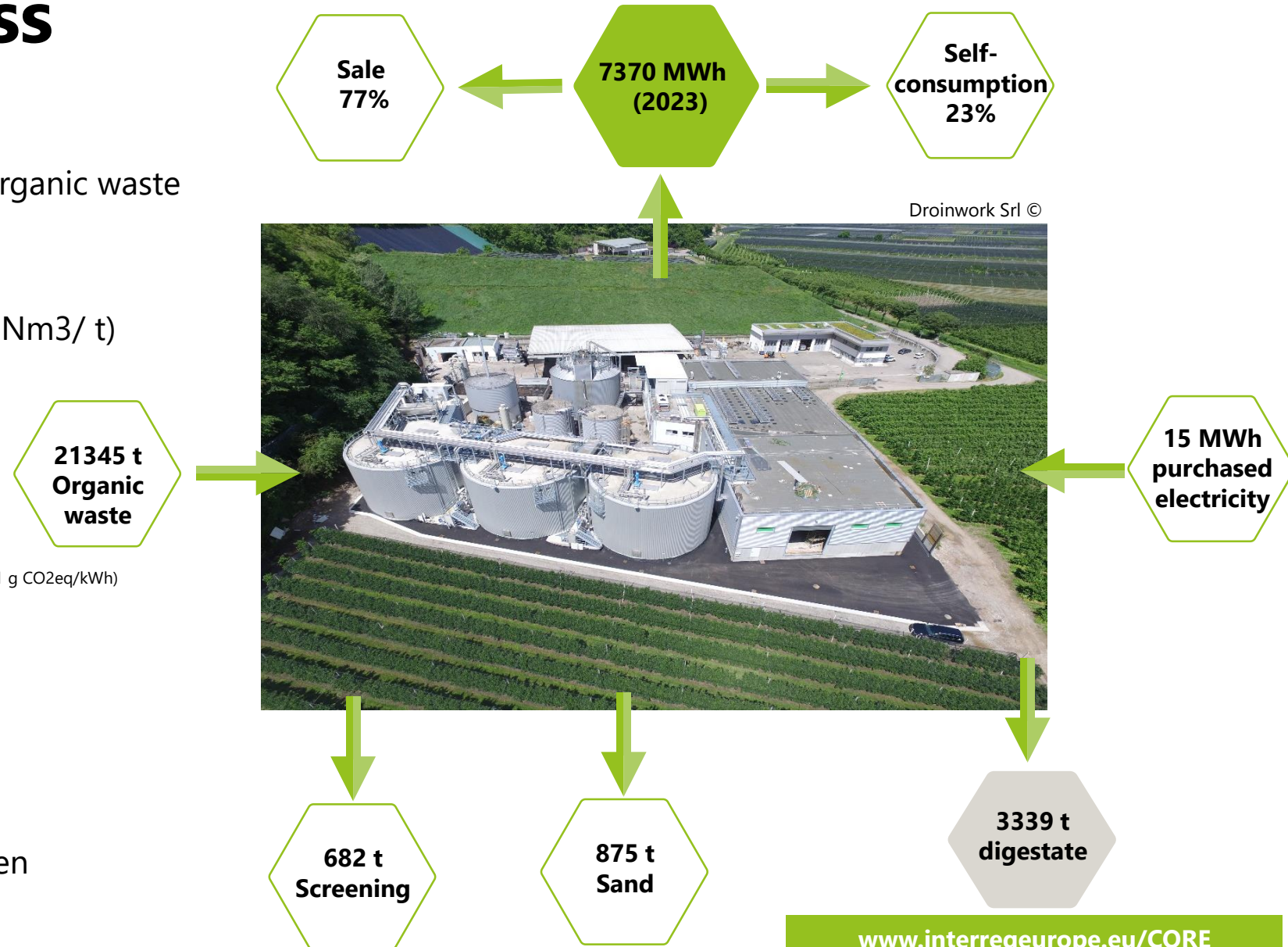
# Evidence of success

## Results achieved

- high success in the collection of organic waste in the main towns
- need to expand the plant
- very high biogas production (162 Nm<sup>3</sup>/ t)
- few sand and screening (3,2%)
- low price for waste disposal (79 €/t)
- Electricity for 2000 Italian families
- 1400 t of saved CO<sub>2</sub> emissions (251 g CO<sub>2</sub>eq/kWh)

## Users/ beneficiaries

- 2010: 34 municipalities
- 2020: 47 municipalities
- 2022: 53 municipalities
- 2025: 68 municipalities are foreseen





# Lessons learnt

## ■ Positive

- investing in **information campaigns for proper waste collection** brings to limited quantities of screening
- distribution of **free paper** bags
- right **pretreatments** to reduce screening
- **continuous** sand extraction system

## ■ Negative:

- in-situ composting
- too small plant area (10.000 m<sup>2</sup>)
- overcrowding of underground infrastructures

## ■ Challenge:

- **upgrading** implementation
  - ✓ investment: 2 M € by the end of 2025
  - ✓ methane to be fed into the local low pressure gas grid
- bringing organic waste full circle by **composting the digestate locally**



**Time for  
questions**





# Thank you!

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