

Sucess stories: Anaerobic Digestion of biowaste in Europe

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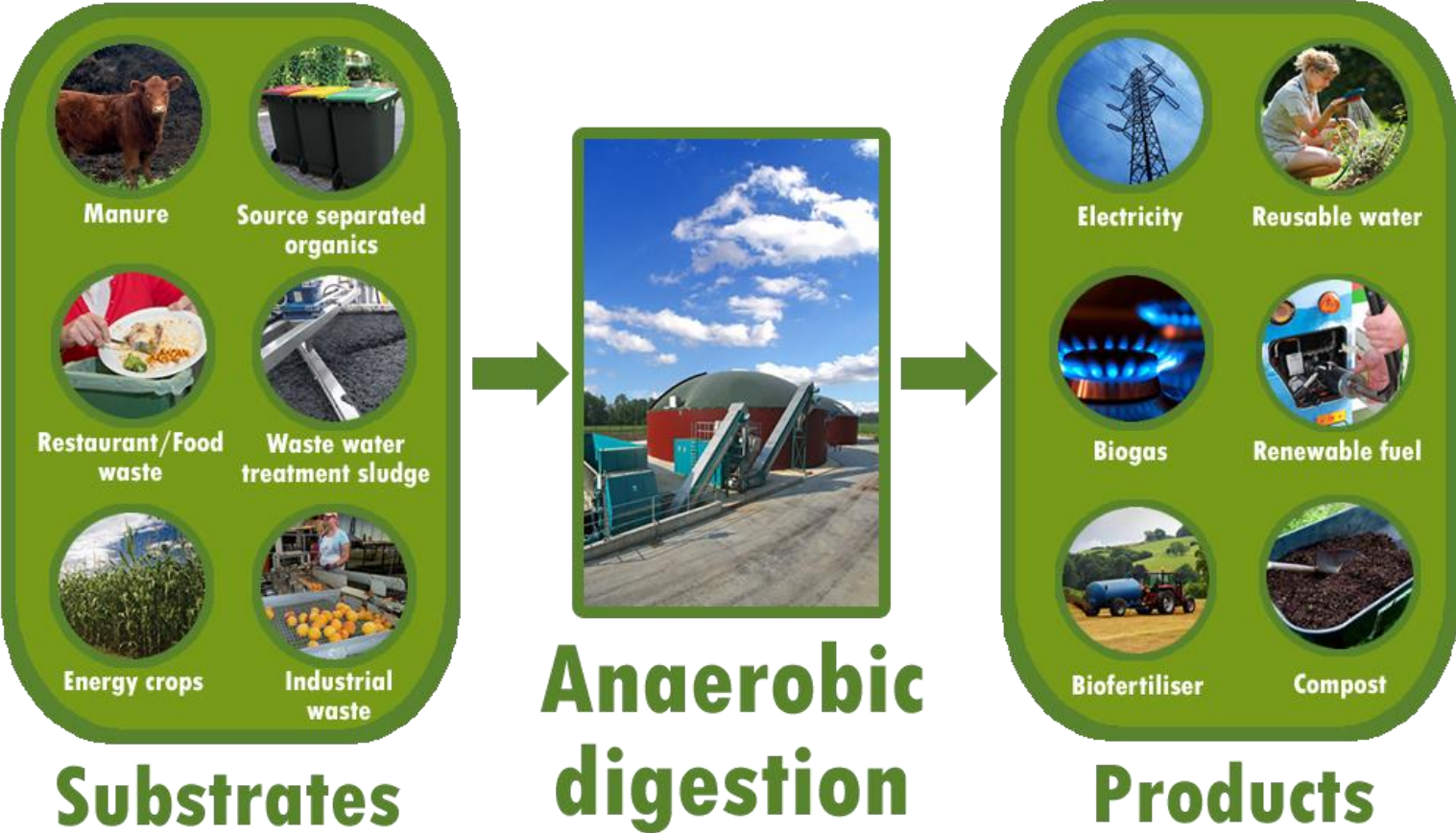
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EBA

European Biogas Association

Anaerobic Digestion: A Versatile Technology





Uppsala: Open market for digestate from anaerobic digestion

- ❖ Operator: Uppsala Vatten in charge of waste management, water and sanitation
- ❖ Objective: to bring nutrients back to the soil
- ❖ Feedstock: municipal organic waste, slaughter and other type of biowaste
- ❖ Raw biogas is upgraded to biomethane and used as a vehicle fuel (city buses)
- ❖ Swedish digestate market
 - ❖ "Certified Recycling" quality assurance scheme
 - ❖ 99% of digestate sold as organic fertiliser
- ❖ Plant exists since 1996 and was extended several times

Kunsangens farm biogas plant

Digesters:
2 x 2,400 m³

Capacity
40,000 t/y

Raw biogas:
4,700,000 Nm³/y

Biomethane:
3,000,000 Nm³/y

Digestate:
43,000 t/y

Employees:
9





Lille: Biomethane injection into the national grid

Organic recovery centre

Digesters:
3 x 1,900 m³

Capacity
108,000 t/y

Raw biogas:
7,400,000 m³/y

Biomethane:
4,111,000 m³/y

Digestate:
34,000 t/y

Employees:
39

- ❖ The Metropolitan area of Lille owns the waste management facilities and infrastructure and makes public-private partnerships with private companies
- ❖ Selective collection of biowaste implemented in 1994, Organic Recovery Centre since 2007 (objective: nutrients recovery)
- ❖ Produced biogas is upgraded to biomethane through 2 scrubbing towers
- ❖ Biomethane injection
 - ❖ In 2010, Lille won the licence to operate the pipeline from the Organic Recovery Centre to a nearby bus terminus filling station
 - ❖ In 2011 biomethane injection commenced
 - ❖ In 2012 feed-in tariff was obtained; the price of biomethane in France in 2012 was 125 €/MWh

Vienna: household waste out, energy in



Wiener Kommunal- Umweltschutzprojektg esellschaft gmbH (WKU)

Digesters:
27,000 m³

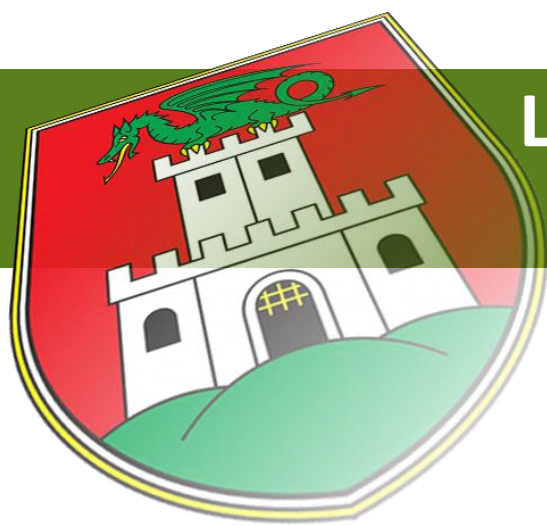
Capacity
34,000 t/y

Raw biogas:
1,700,000 Nm³/y

Biomethane:
1,000,000 Nm³/y

Employees:
5

- ❖ Separate collection exist since early '80s, around 35% of total waste is separately collected
- ❖ Biowaste separate collection from 1991
- ❖ The Viennese public company MA 48 owns a biogas plant
- ❖ Raw biogas is upgraded to biomethane through a membrane separation process (high gas quality)
- ❖ Biogas plant opened in 2007, biomethane injected into gas grid since May 2015
- ❖ Energy for the city
 - ❖ Biomethane is compressed up to 70 bar and sent to the Wien Energie network
 - ❖ Wien Energie customers can easily use green energy



Ljubljana: Algal treatment of digestate for more substrate

KOTO biogas plant

Digesters:

3 x 500 m³

Capacity

15,000 t/y

Raw biogas:

1,800,000 m³/y

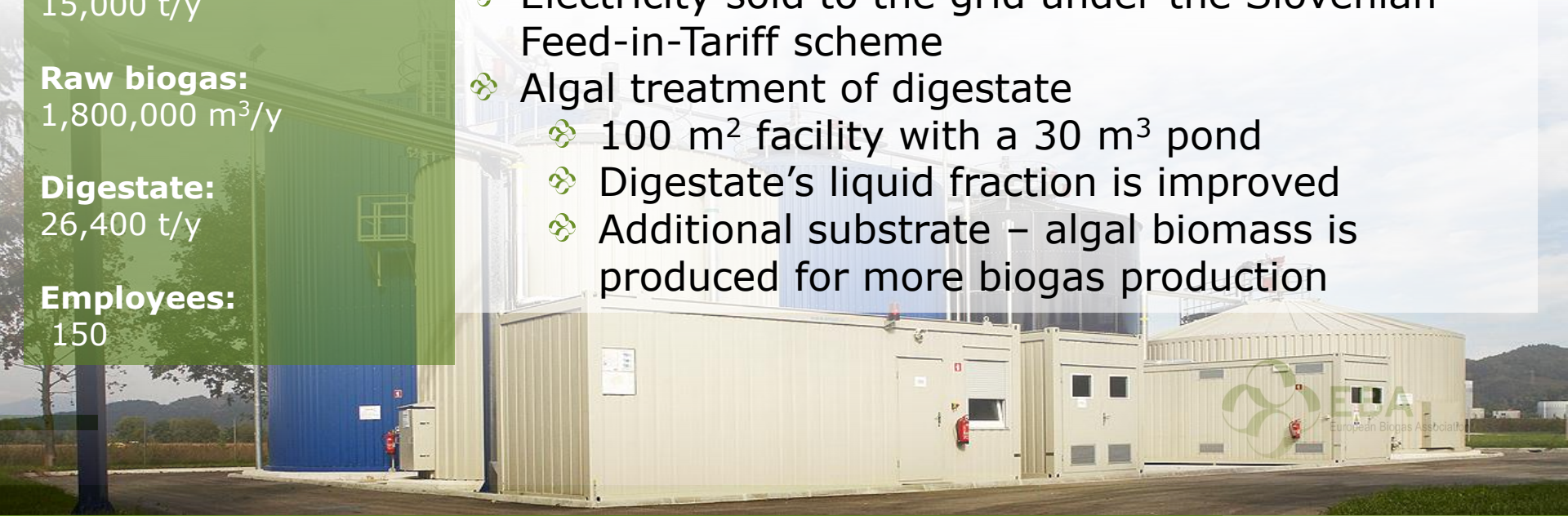
Digestate:

26,400 t/y

Employees:

150

- ❖ Good infrastructure for separate collection of biowaste (underground containers)
- ❖ A public company in charge of collection and treatment
- ❖ Feedstock: municipal organic waste, canteens, sludge, slaughterhouses, etc.
- ❖ Generates electricity and heat for sale and for own needs
- ❖ Electricity sold to the grid under the Slovenian Feed-in-Tariff scheme
- ❖ Algal treatment of digestate
 - ❖ 100 m² facility with a 30 m³ pond
 - ❖ Digestate's liquid fraction is improved
 - ❖ Additional substrate – algal biomass is produced for more biogas production



Conclusions

- Good collection system of organic waste is absolutely needed
- AD plants are run by private-public partnerships and subsidiaries
- Pathogens are killed by high temperature treatment
- Benefits:
 - Electricity and heat production for own needs and for sale to the grid
 - Clean fuel for city buses and cars
 - Organic fertilizer
 - Improved air quality, prevention of contamination



**Check EBA website for more
Anaerobic Digestion stories**

Thank you!

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