

# Odours management at biogas and composting plants



# **Odour management – Experiences from Swedish biological waste treatment plants**

Co-operation project between  
The Swedish Waste Management Association  
and  
**SWECO**

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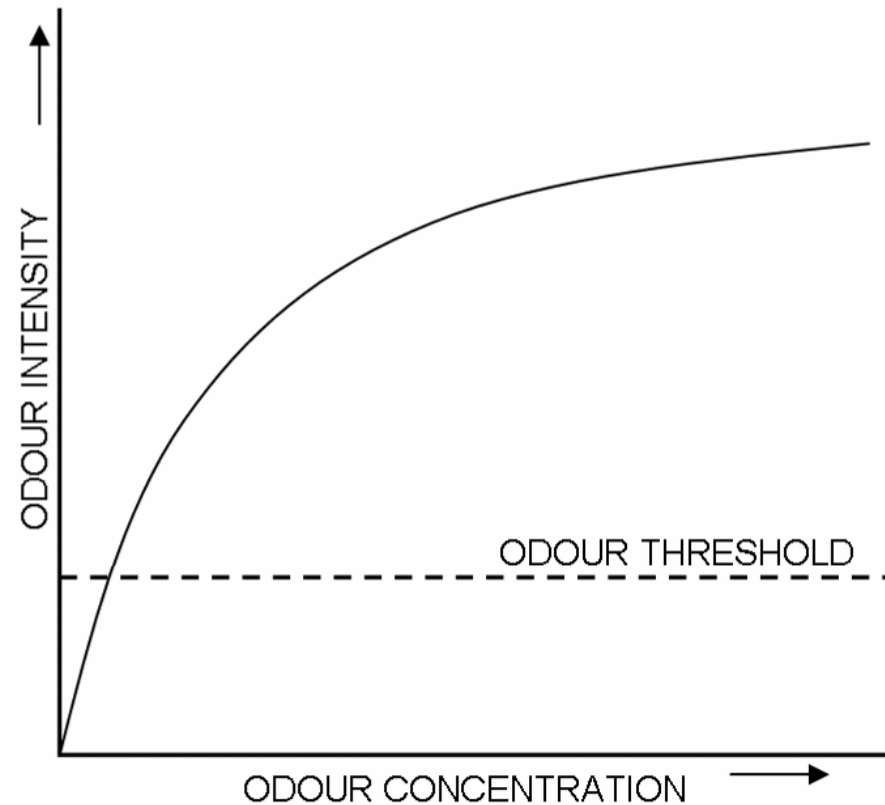
Katarina Jonerholm & Eric Rönnols

# The project



- Problems with odours must be prioritized
- Inventory of odour treatment techniques
- Survey – 36 biogas and composting plants
- Contact with authorities and suppliers

# Odour – what is it?



**Example:**

<b>Ammonia</b>	<b>17 ppm</b>	<b>Unpleasantly sharp</b>
<b>Dimethylamine</b>	<b>0,34 ppm</b>	<b>Rotten fish</b>
<b>Hydrogen sulfide</b>	<b>0,0005 ppm</b>	<b>Rotten eggs</b>

# Odour sampling and measurements

**Sampling**



**Olfactometry**

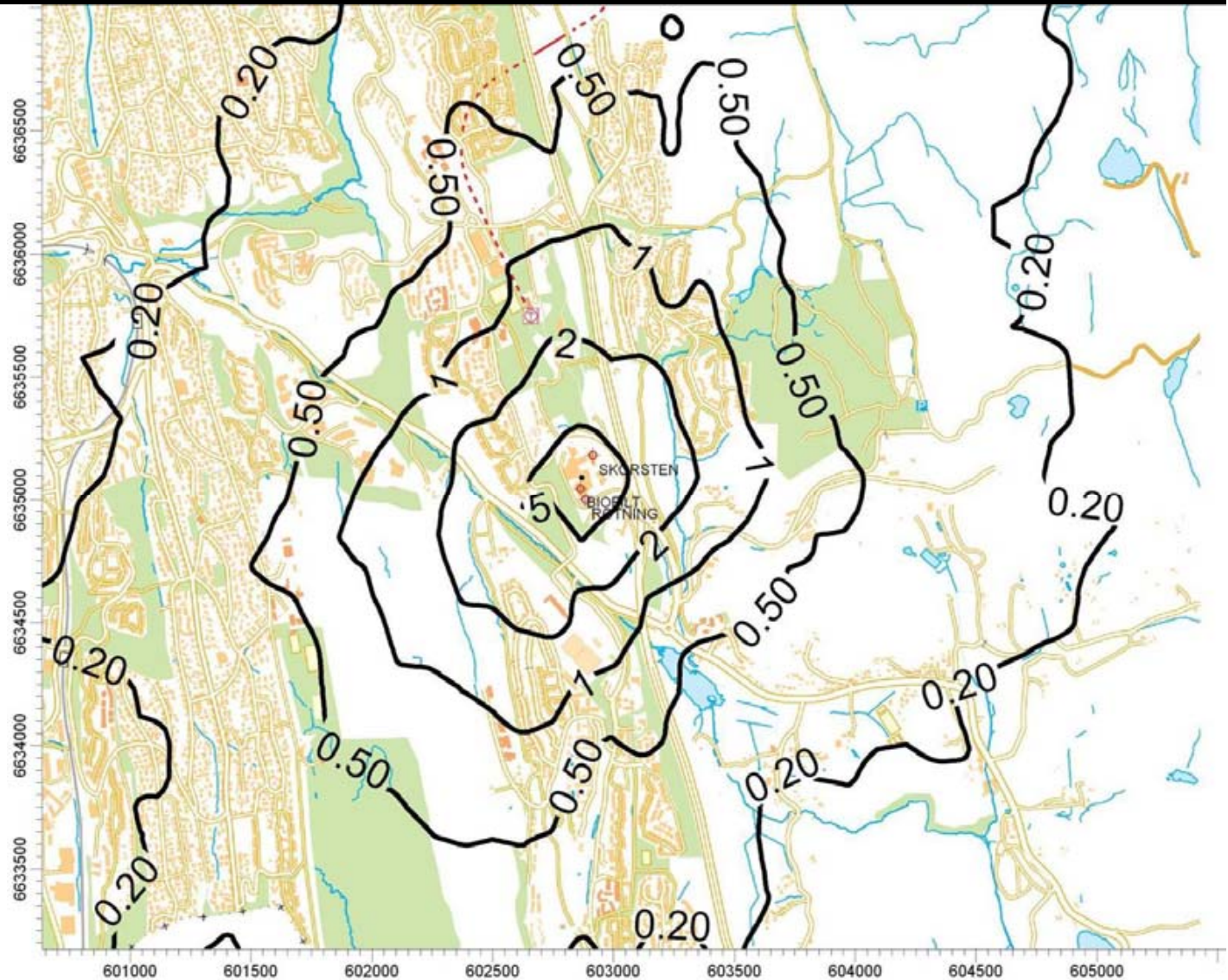
**Spectrophotometry**



# Dispersion modeling

## Future biogas plant in Oslo as example

- No measures taken
- Emissions from roof level



# Dispersion modeling

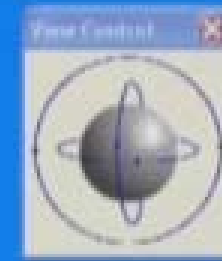
## Future biogas plant in Oslo as example

- Odour treatment with emitted substance concentration max  $500 \text{ ou}_E/\text{m}^3$
- Emissions from chimney (40 m)



# Concept model – AERMOD

- Meteorological data
- Topographical data



# Preventative odour management



**Location, location, location**

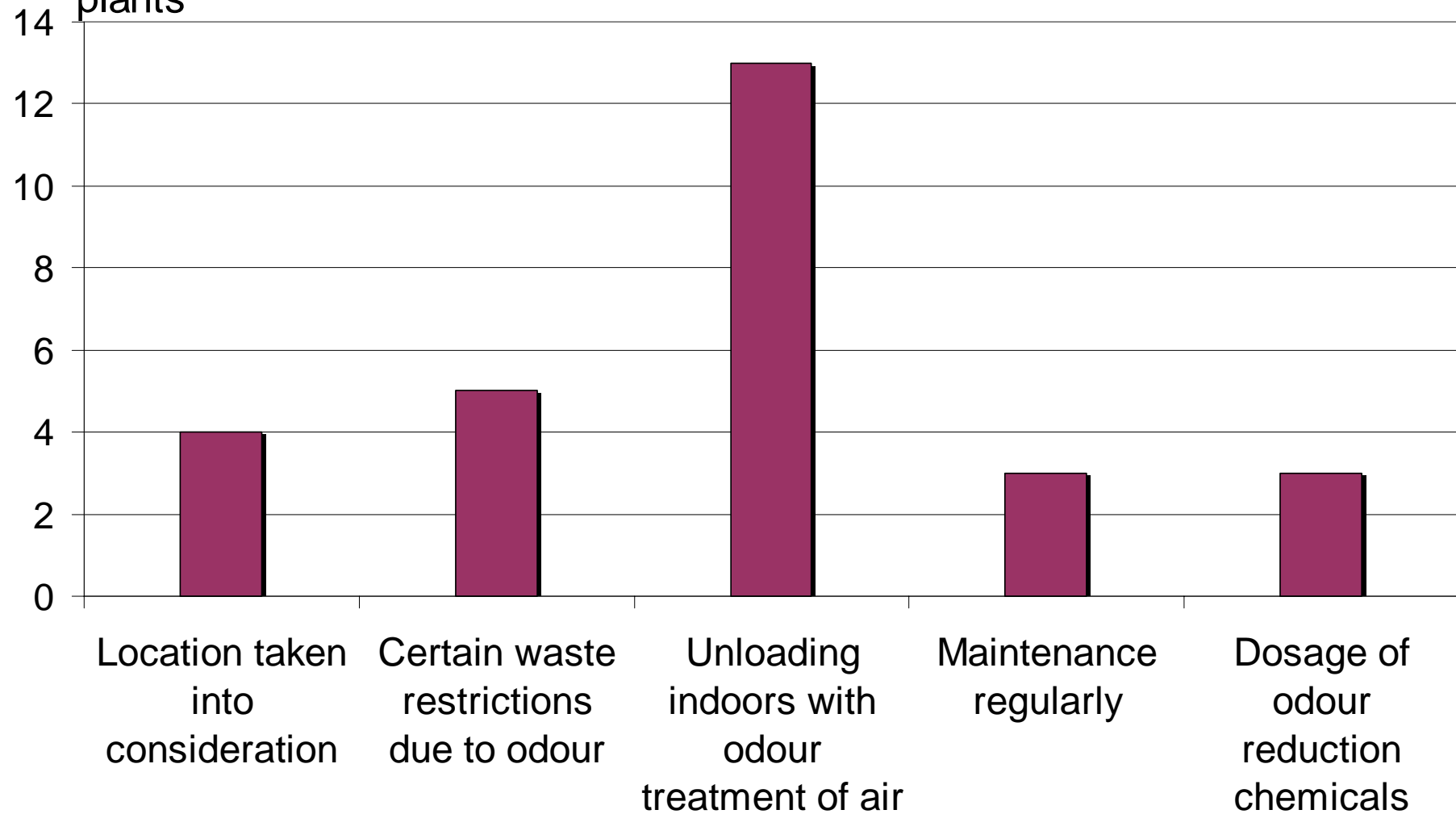
**Build-in**

**Process control**

**Maintenance**

# Preventative odour management

No. of biogas  
plants



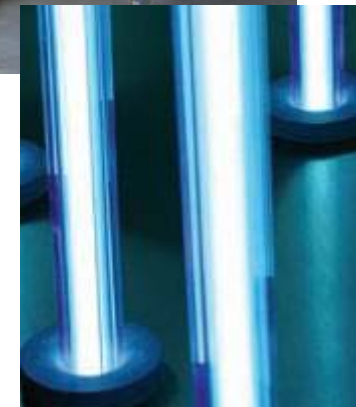
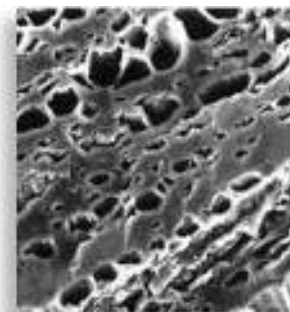
# Odour treatment techniques

## Biological techniques



# Odour treatment techniques

## Chemical techniques



# Odour treatment techniques

## Physical techniques



# Odour treatment techniques

**A combination of techniques  
reduce odours more efficiently**

**Example:**

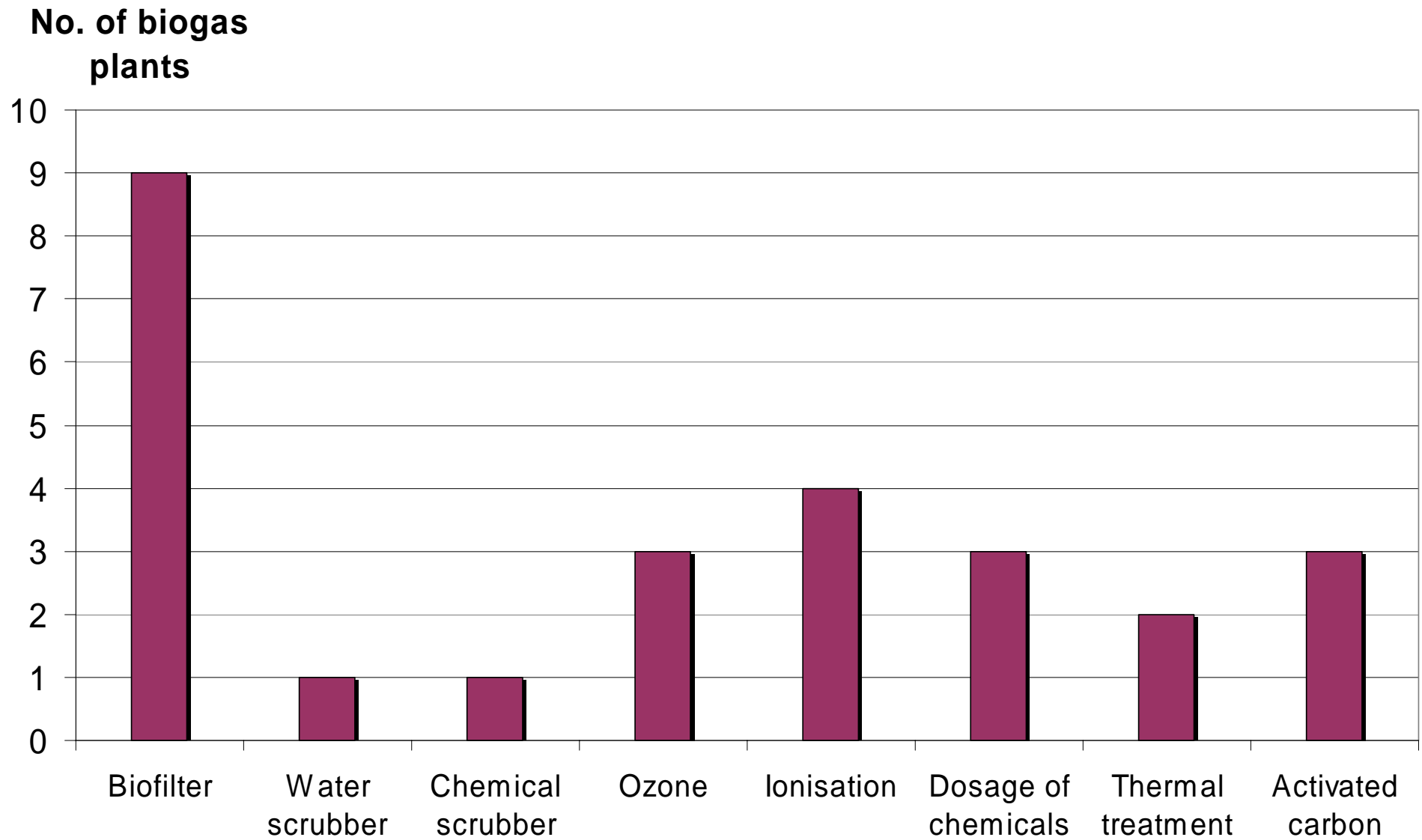
## **Water scrubber and biofilter**

- Air moisturizer
- Reduced load
- Reduce toxic compounds

## **Ozone and activated carbon**

- Higher efficiency
- Ozone regenerate active carbon

# Odour treatment techniques



# Odour treatment techniques

## What do users say?

No perfect solution

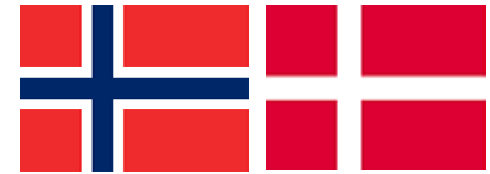
- Different kinds of odours require different kinds of treatment

Important factors to consider:

- Adjusting to the specific odour
- Space
- Economy

# Odour regulation

- Sweden –
  - No specific guidelines today
- Norway, Denmark –
  - Maximum 5-10  $\text{ou}_E/\text{m}^3$  Danish guidelines
- Germany –
  - Emitted odorous substance concentration, maximum 500  $\text{ou}_E/\text{m}^3$
- Netherlands –
  - Residential area odour concentration, maximum 1,5-3  $\text{ou}_E/\text{m}^3$  as 98th percentile



The Swedish Waste Association – New guidelines

# Conclusions

- Odour management – growing field
- More biological treatment of waste
- Minimization and prevention
- Combination of odour treatment techniques

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