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# **Landfill Neu Wulmstorf**

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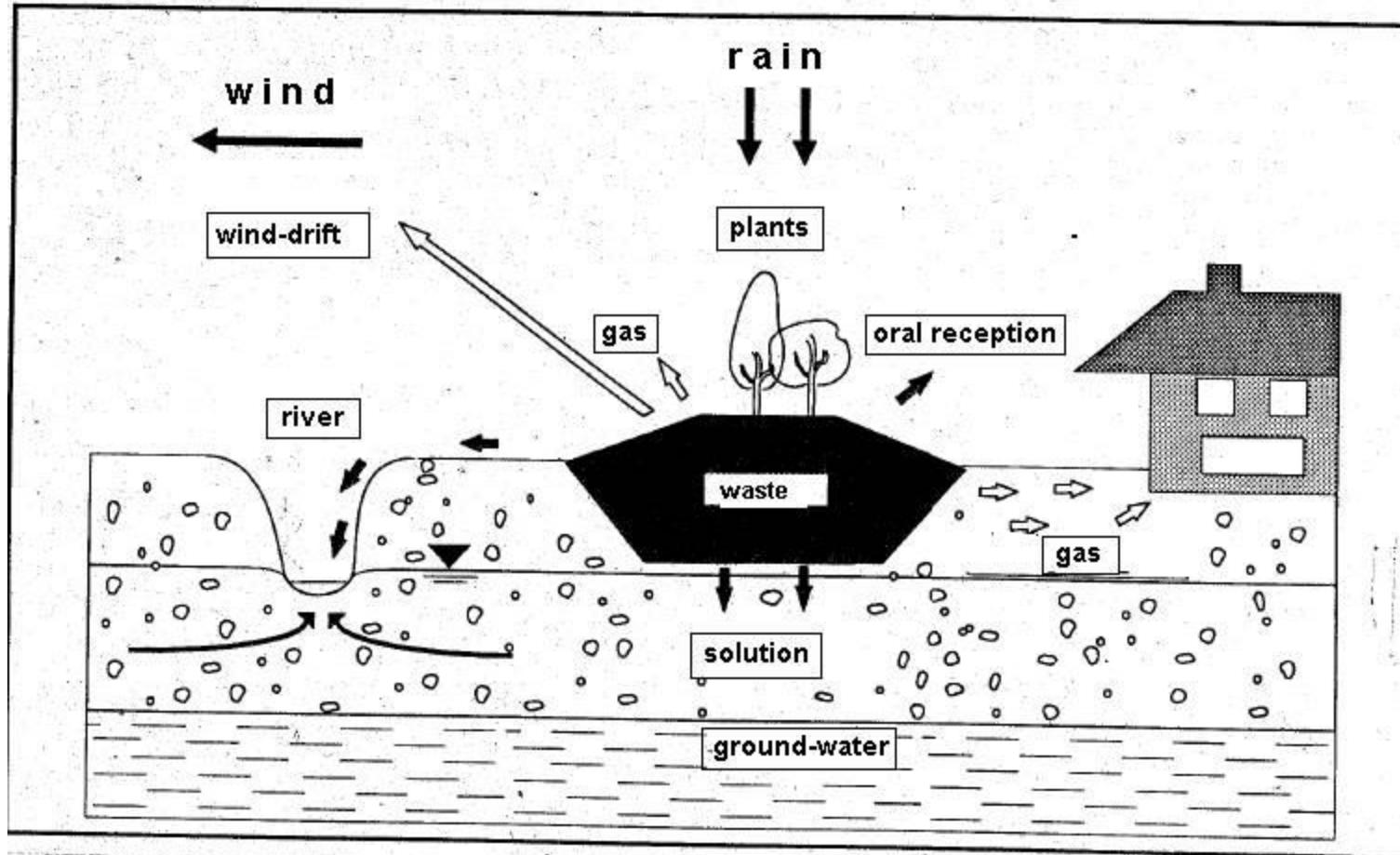


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# Landfill Neu Wulmstorf

- History
- Recultivation
- After – care
- Ecological power-plants

# Ecoligical hazards caused by landfills





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# **Landfill Neu Wulmstorf / History (1)**

Exploitation of gravel: ca. 1955 – 1970

Landfill-Operation:

1. segment (south) 1972 - 1982

2. segment (north) 1982 - 1986 with base liner

Volume: 3,4 Mio m<sup>3</sup> municipal waste

Area: 320.000 m<sup>2</sup>



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## Landfill Neu Wulmstorf / History (2)

### Recultivation 1995 – 1998:

- sealing of surface-area 320.000 m<sup>2</sup>
- 1 Mio m<sup>3</sup> movement of sand / soil / waste
- 23 km pipes (gas / surface-water / leachate-water)
- pumpstation for leachate-water
- compressor-station for landfill-gas
- torch and gas-motor
- service-building
- total invest: 33 Mio €



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**movement of > 1 Mio m<sup>3</sup> soil + waste**





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# Recultivation 1995 - 1998

Drain-mat, plastic-sealing, clay-mat („Bentonit“)





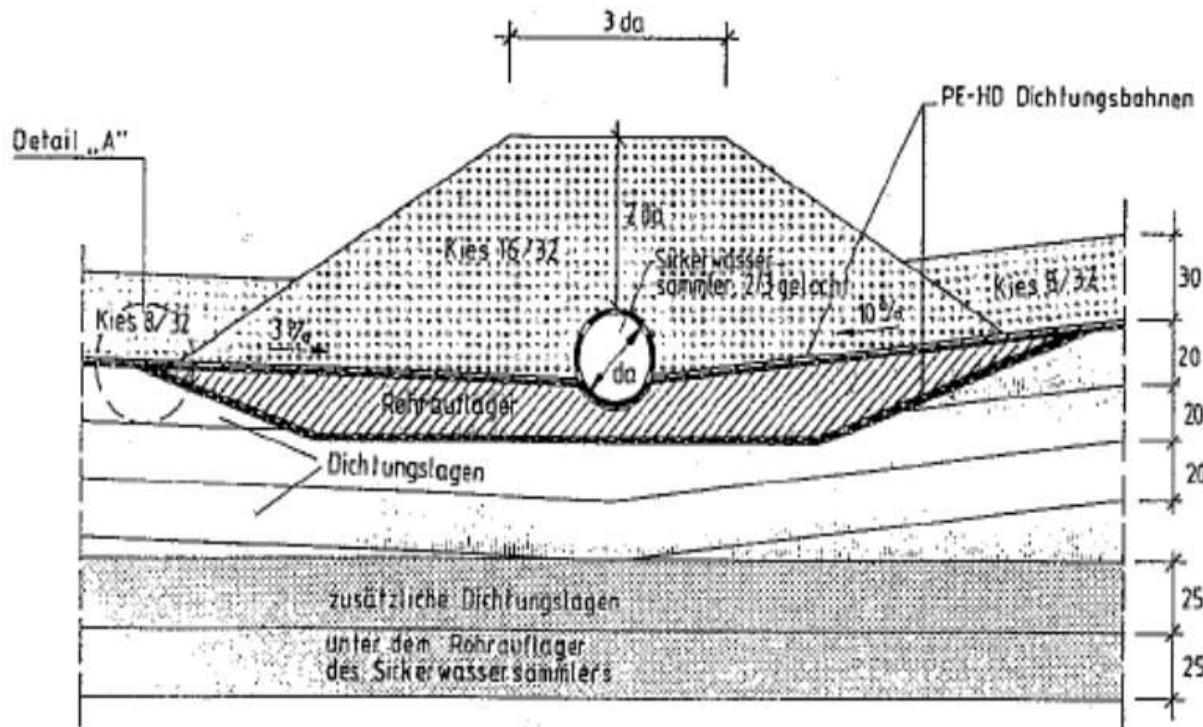
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# **drainage piping: 4 km ditches, 6 km pipes**





# leachate water pipes

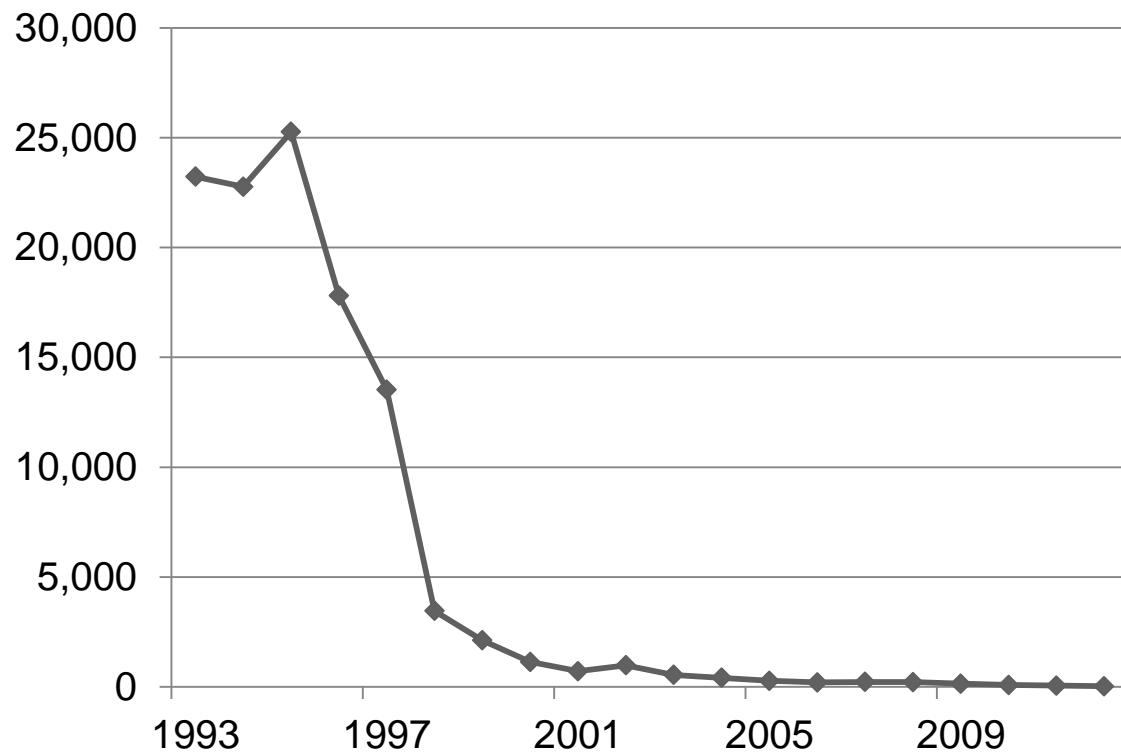




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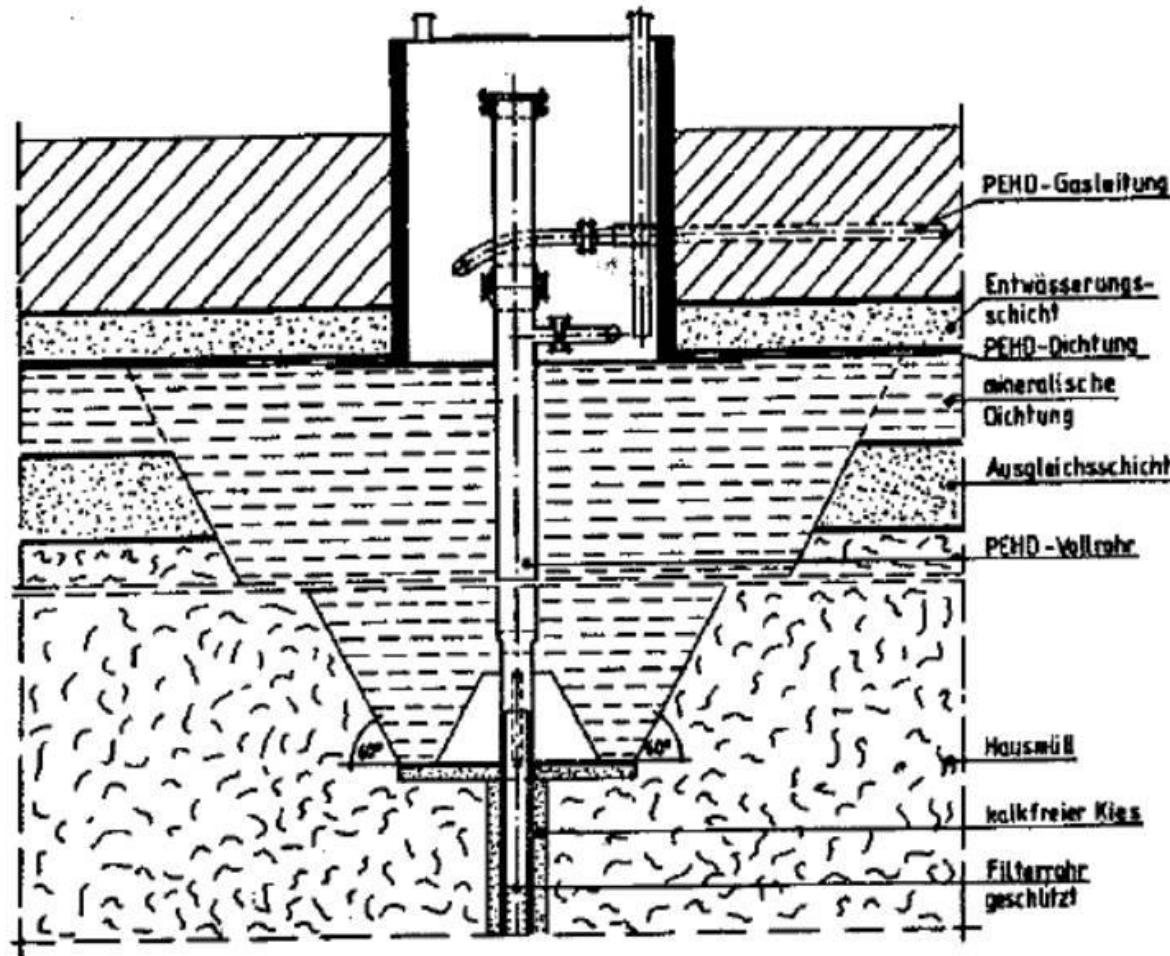
# Landfill Neu Wulmstorf

collected leachate water (m<sup>3</sup> / a)





# gas well





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**degassing: 122 gas wells**





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**degassing: 16 km gas pipes  
10 gas collecting stations**



**landfill gas motor:**

- 1997 = 2x 307 kW**
- 2001 = 1x 307 kW**
- 2011 = 1x 124 kW**



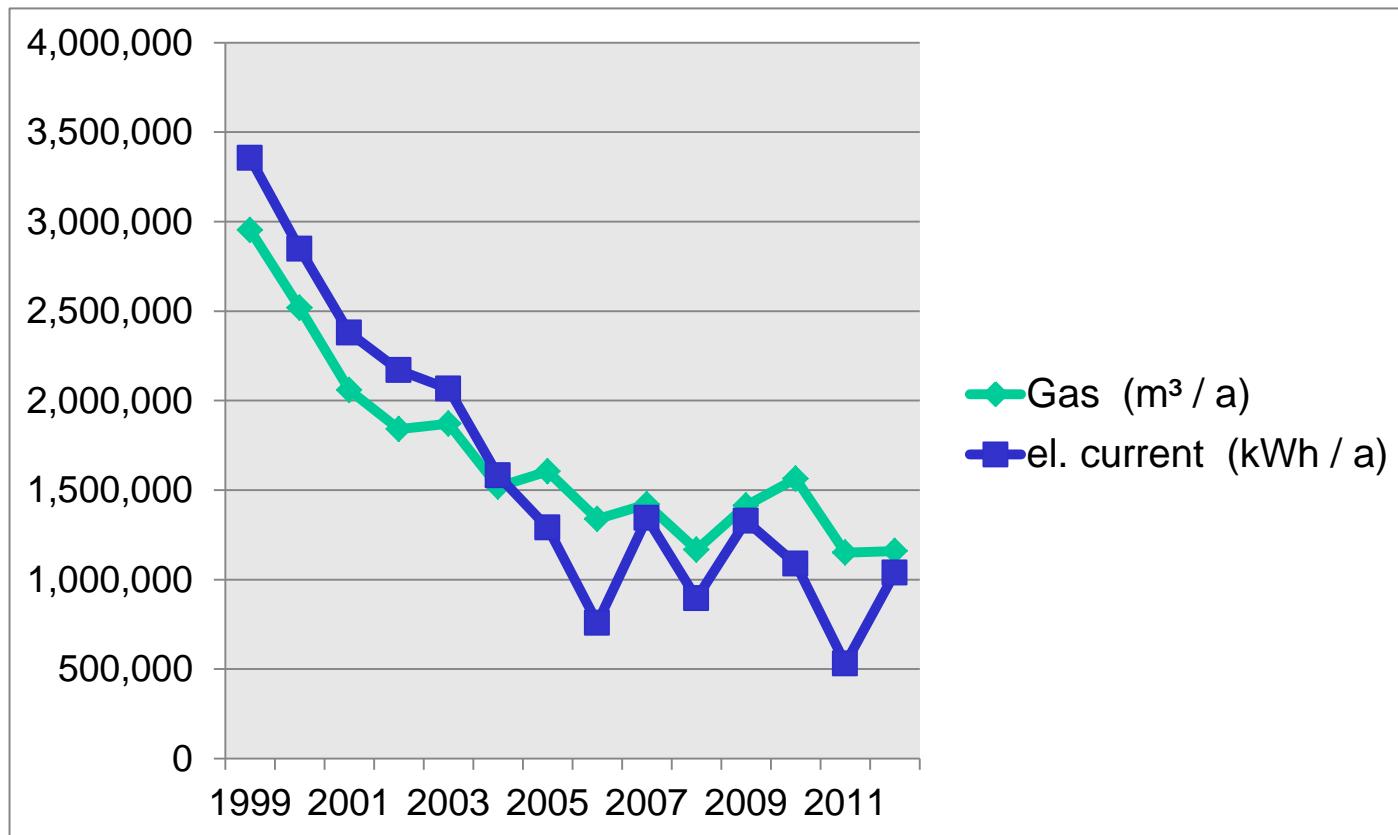
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# Deponie Neu Wulmstorf

- collected landfill gas (m<sup>3</sup>/a)
- produced electrical current (kWh/a)





## After - care

- maintenance-costs ca. 250.000,- €/a
- periodical report to licensing authorities  
(settlements, analysis of gas, groundwater, leachate-water ...)
- time-period of after-care is not determined.
- control of sealing-systems may last many decades !
- use of the area is restricted by settlements and gas-danger.

→ only expense, no receipt !





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# **Ecological power-plants**

„EEG“ (renewable energy-law)

Power-plants for electrical current by use of :

water / wind / solar radiation / heat of earth / organic material

Fixed price for produced current over 20 years

→ secure investment, positive image, ecological measure



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# wind power (2001)





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## 3 windmills (600 kW)

Invest: 2,4 Mio €

Income: 350.000,- €/a

Production: 3,6 Mio kWh/a

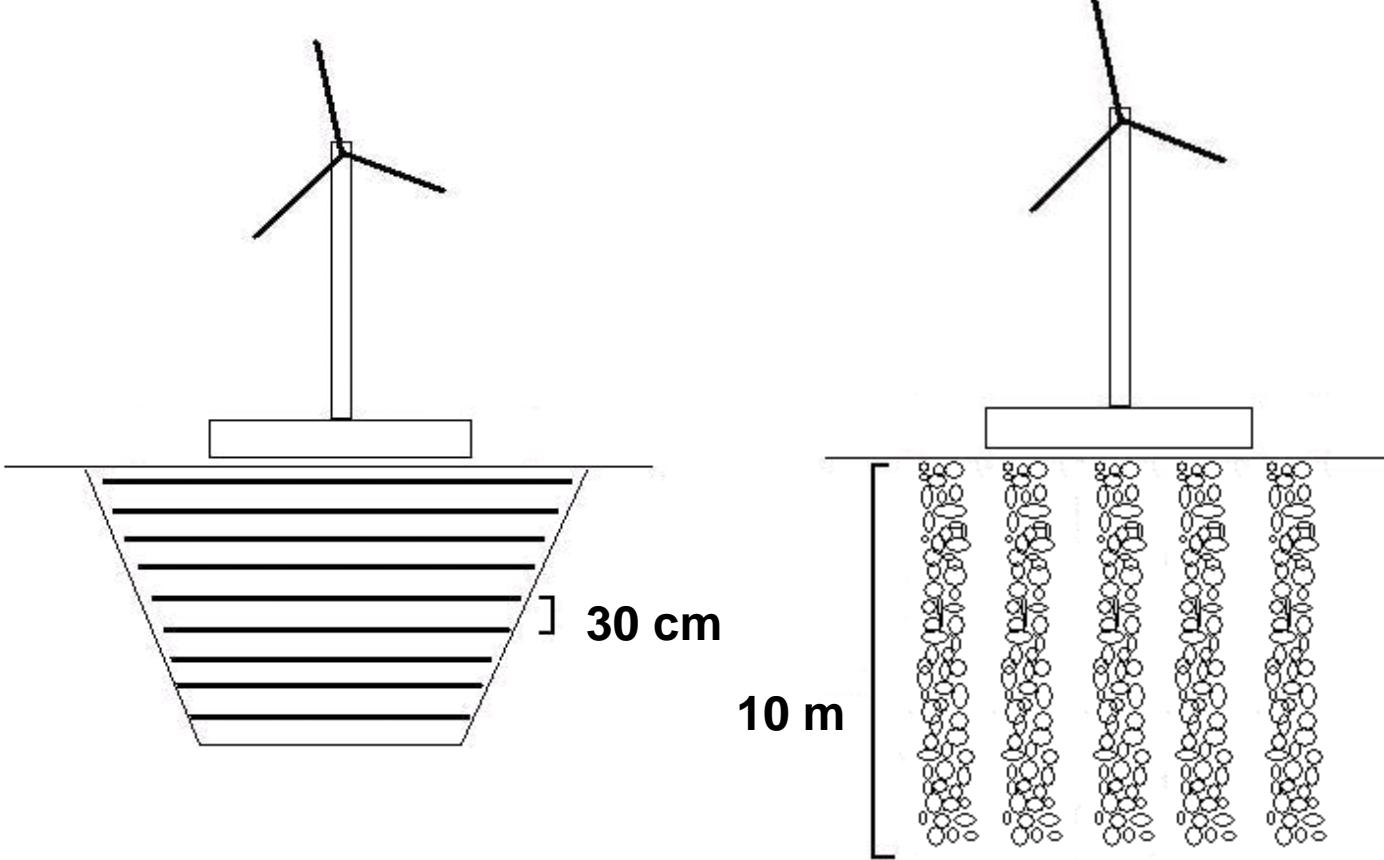
Maintenance: - 50.000,- €/a





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# Depth Compaction



compacting each layer

compaction by vibrating



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# windpower / depth compaction





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# windpower / foundation

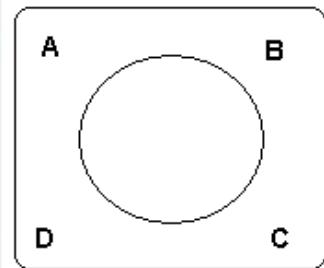
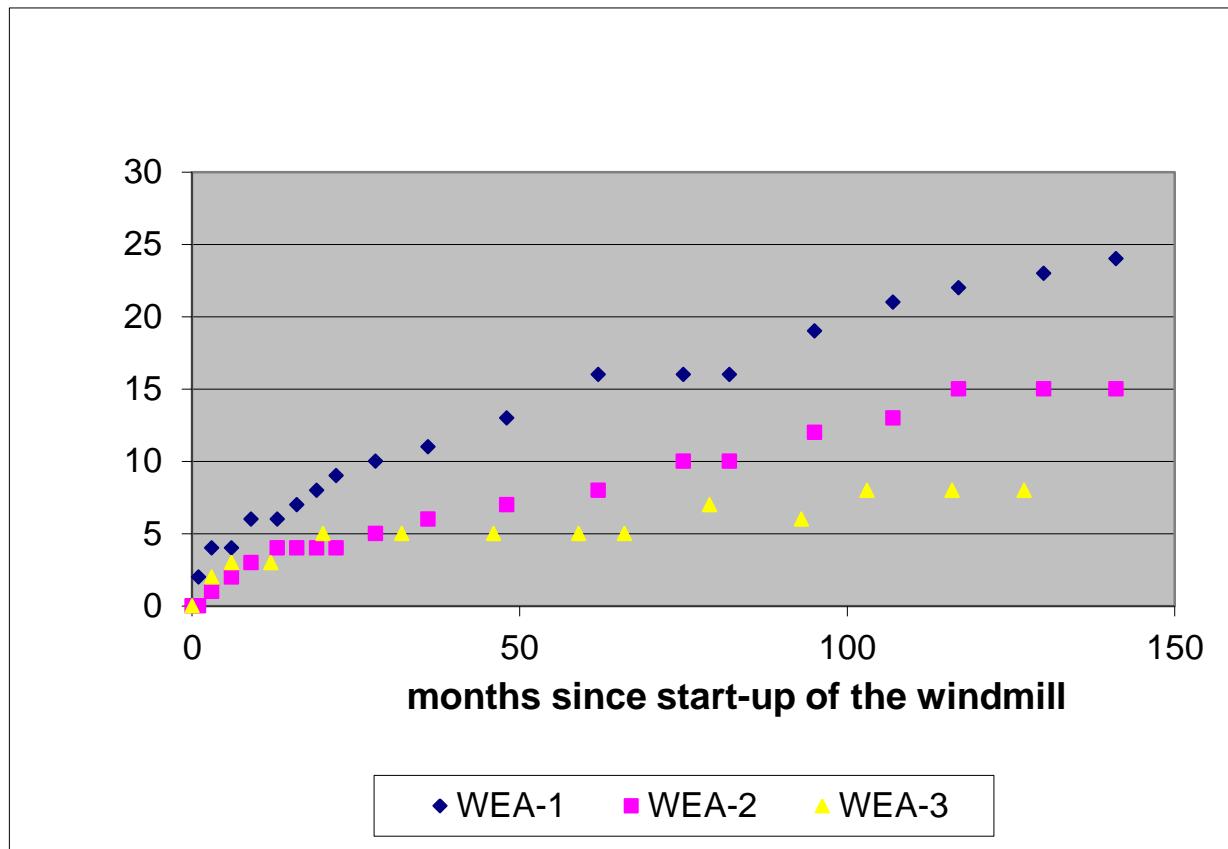




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# Windfarm Neu Wulmstorf

difference of settlement (mm) on foundation



WEA-1:

0,1 °



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## Solar power (2005): 500 kW



3.132 solar panels



# **photovoltaic power-plant Neu Wulmstorf**

## **3.132 Solar Panels / 500 kW (2005)**



**Invest: 2,1 Mio €**

**Production: 470.000 kWh/a**

**Income: 200.000,- €/a**

**Operating costs: 20.000,- €/a**

**Return of investment: 17 years**

**Tariff: 43 Ct./kWh**

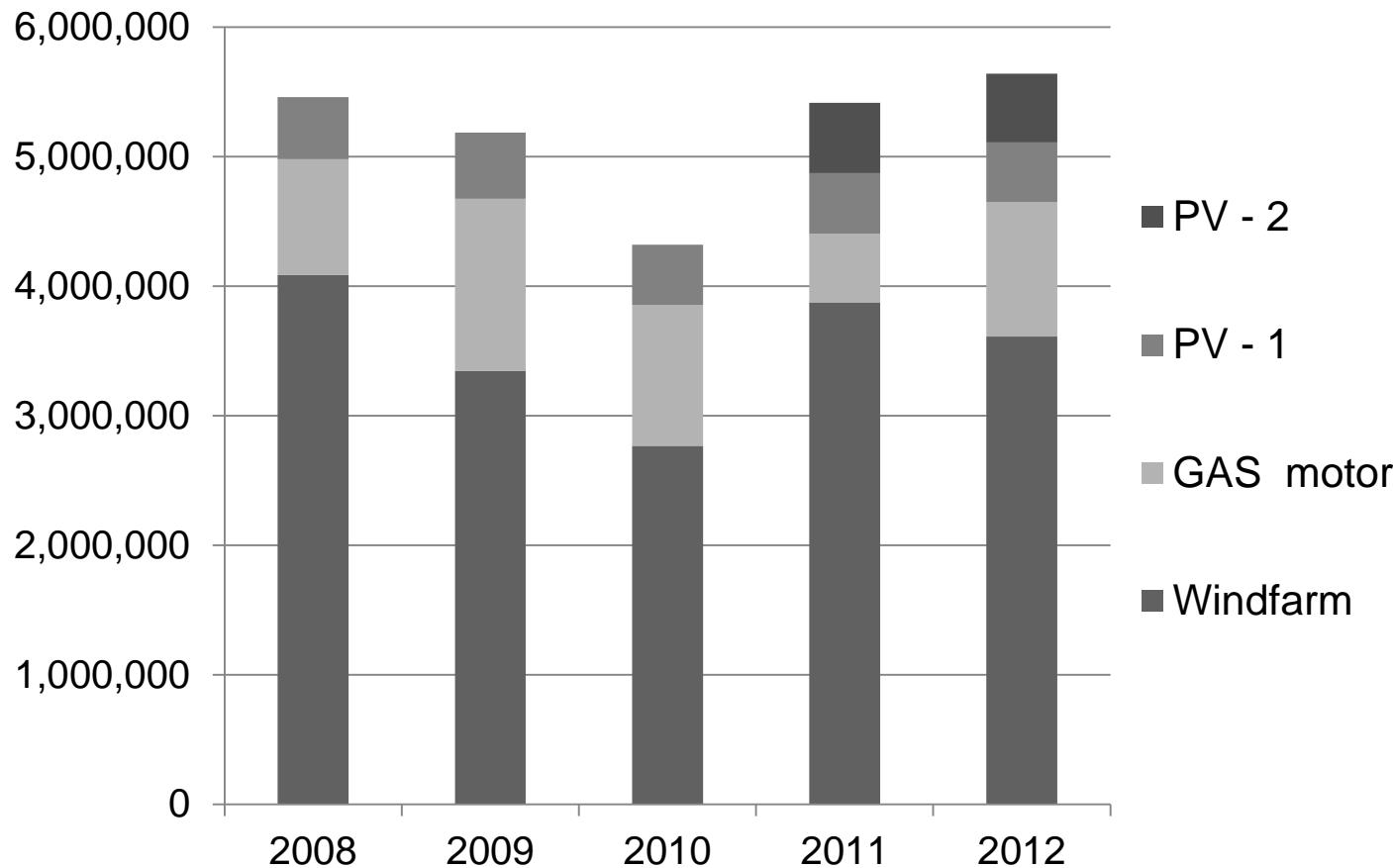




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# Landfill N.W.: energy production (kWh / a)

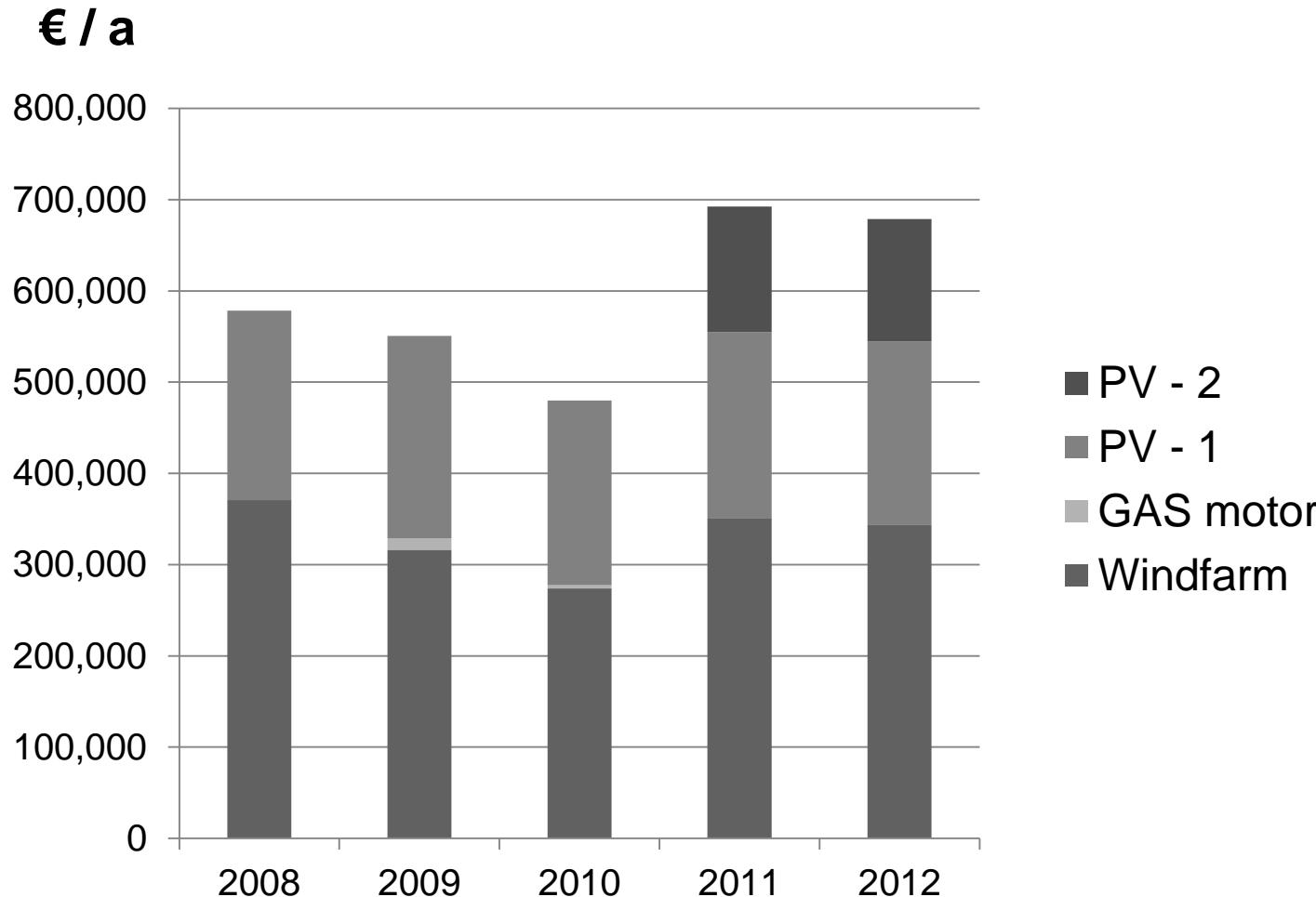
kWh / a





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# landfill Neu Wulmstorf: income (€ / a)





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# Landfill Neu Wulmstorf: 1996





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# Landfill Neu Wulmstorf: 2006





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# Landfill Neu Wulmstorf 2011:

## 2. PV power plant, 550 kW, 2323 panels

