Dr. Michael Weltzin
Scientific Assistant
in the Parliamentary
Group

Waste Policy of Alliance 90/The Greens in the German Parliament

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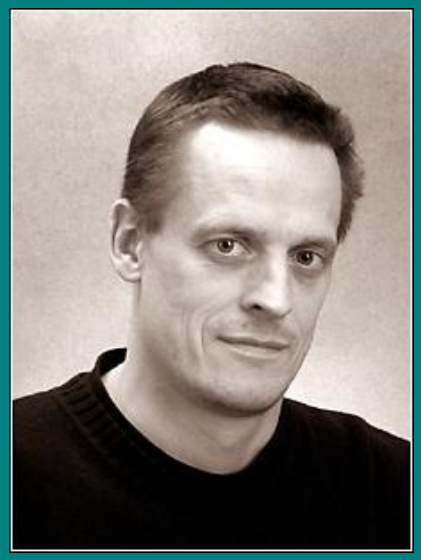

- **Senior advisor for climate policy to the Greens**
- **Working fields: Climate policy, waste, chemistry policy and renewable resources**
- **Doctorate in groundwater remediation technology**
- **Diploma in biology at the Technical University Aachen, Germany**
- **Practical experience in biological waste treatment**

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Who the Greens are

- **Self-esteem of Alliance 90/The Greens: party of peace, social fairness, protection of the environment and a sustainable development.**
- **They are a constituent part of the German Parliament for 25 years now. National election results up to 10.7 %.**
- **From 1998 – 2005 Alliance 90 / the Greens were part of the government and Mr. Jürgen Trittin was the first "green" Federal Minister for environment.**
- **Green accomplishments were: phasing out of nuclear power, passing the Renewable Energy Act and implementation of CO_2 emission trading.**

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Germanys waste policy today

- **today waste avoidance has became a central policy target,**
- **high readiness in the society for separating and collecting of waste,**
- **high quotas on recycling,**
- **multi way packaging is promoted,**
- **strong legal emission-limits for waste incineration,**
- **no more untreated waste in landfill sites since June 2005 (directive under green government).**

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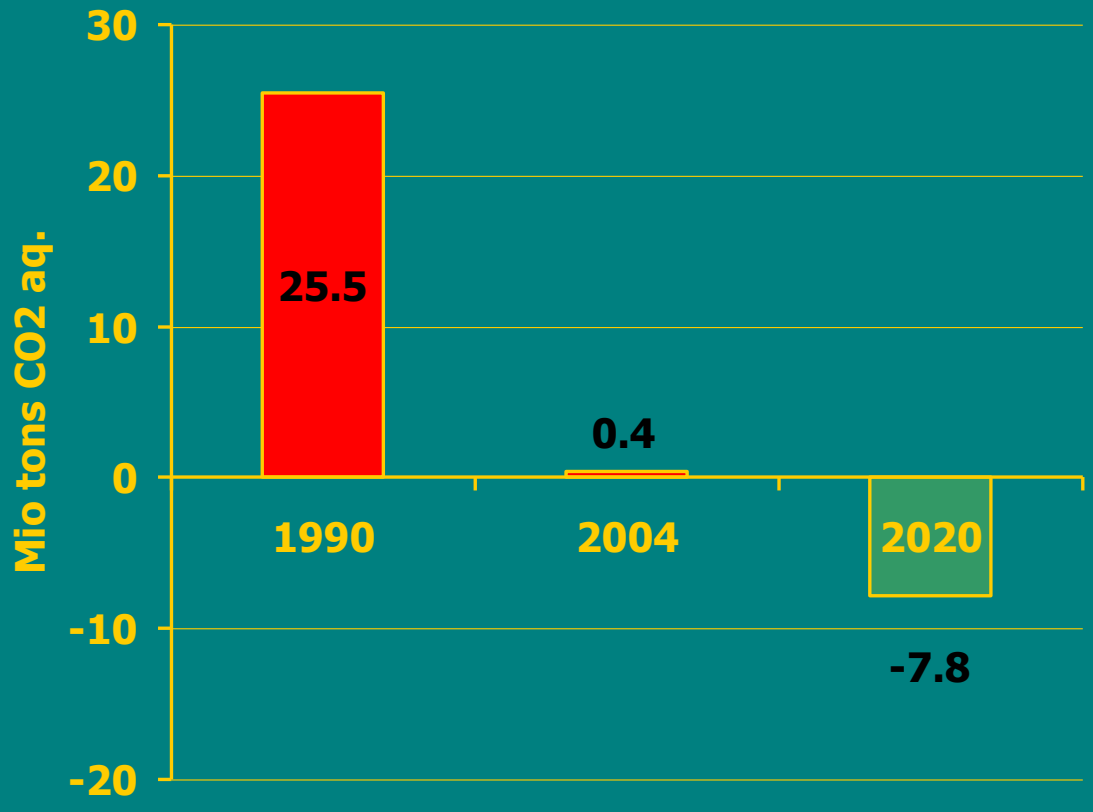
Climate effects of all waste actions for Germany



Burden

Benefit

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Benefit for the economy and the environment

Waste treatment

- **is climate protection, in Germany 4.5 % reduction of greenhouse gas emissions since 1990,**
- **is active protection of groundwater and soil,**
- **is a job generator, in Germany 250.000 employees in waste economy in 2006,**
- **business with a turnover of 50 Bill. €uro a year in Germany,**
- **is a lead market for environmental technologies and technology transfer.**

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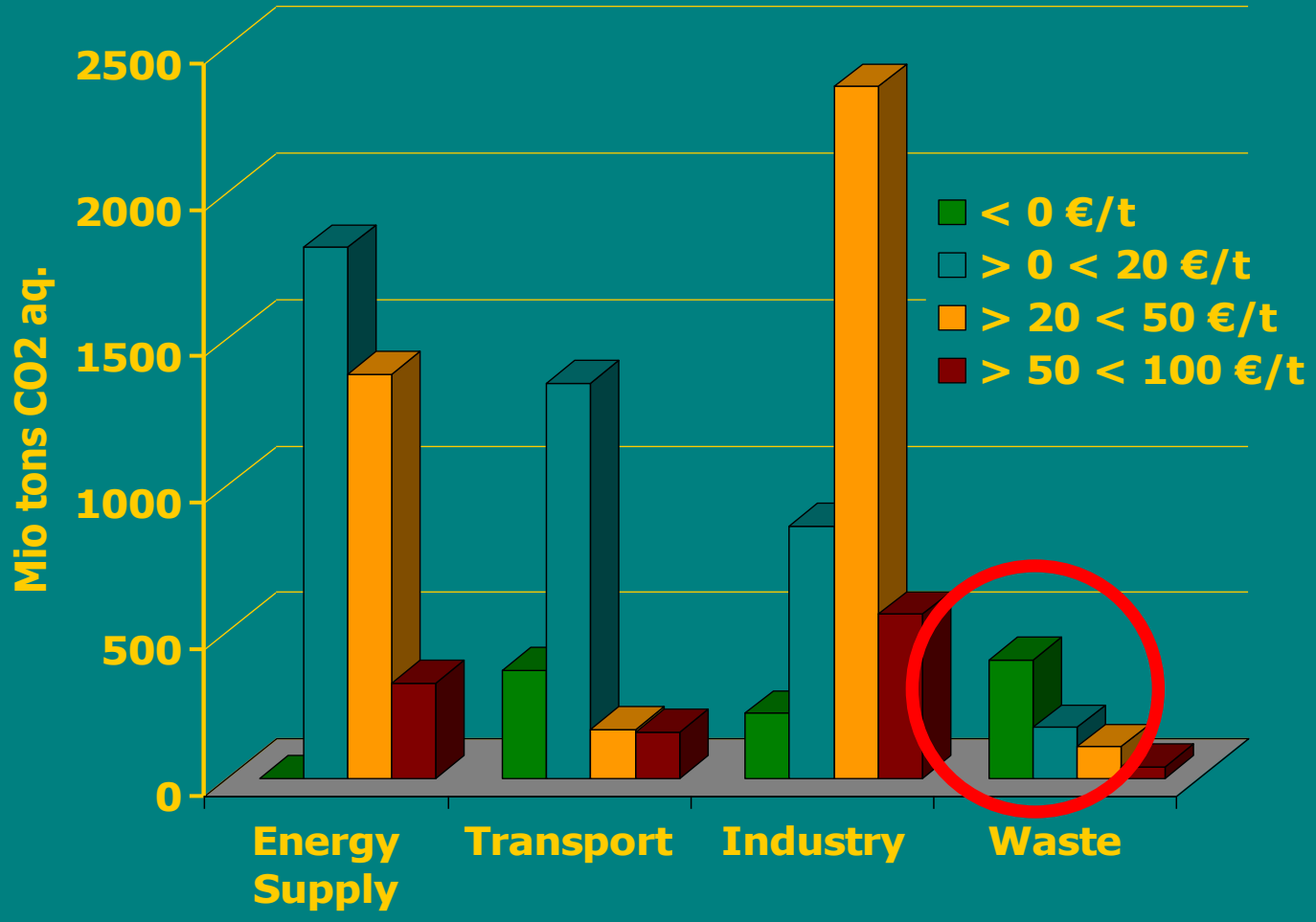
Waste treatment: low costs for climate protection



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Future concept for 2020

- **Greens are campaigning to end the disposal of waste from human settlements on landfill sites by 2020 completely. That means:**

1.) much more waste avoidance (e.g. by duties on products, taxes on raw materials)

2.) more production of reusable and recyclable products (e.g. by producer responsibility, integrated product design, …)

3.) automatically sorting of the residual waste

4.) recover all valuable substances

5.) residues that are left over should be used to generate energy

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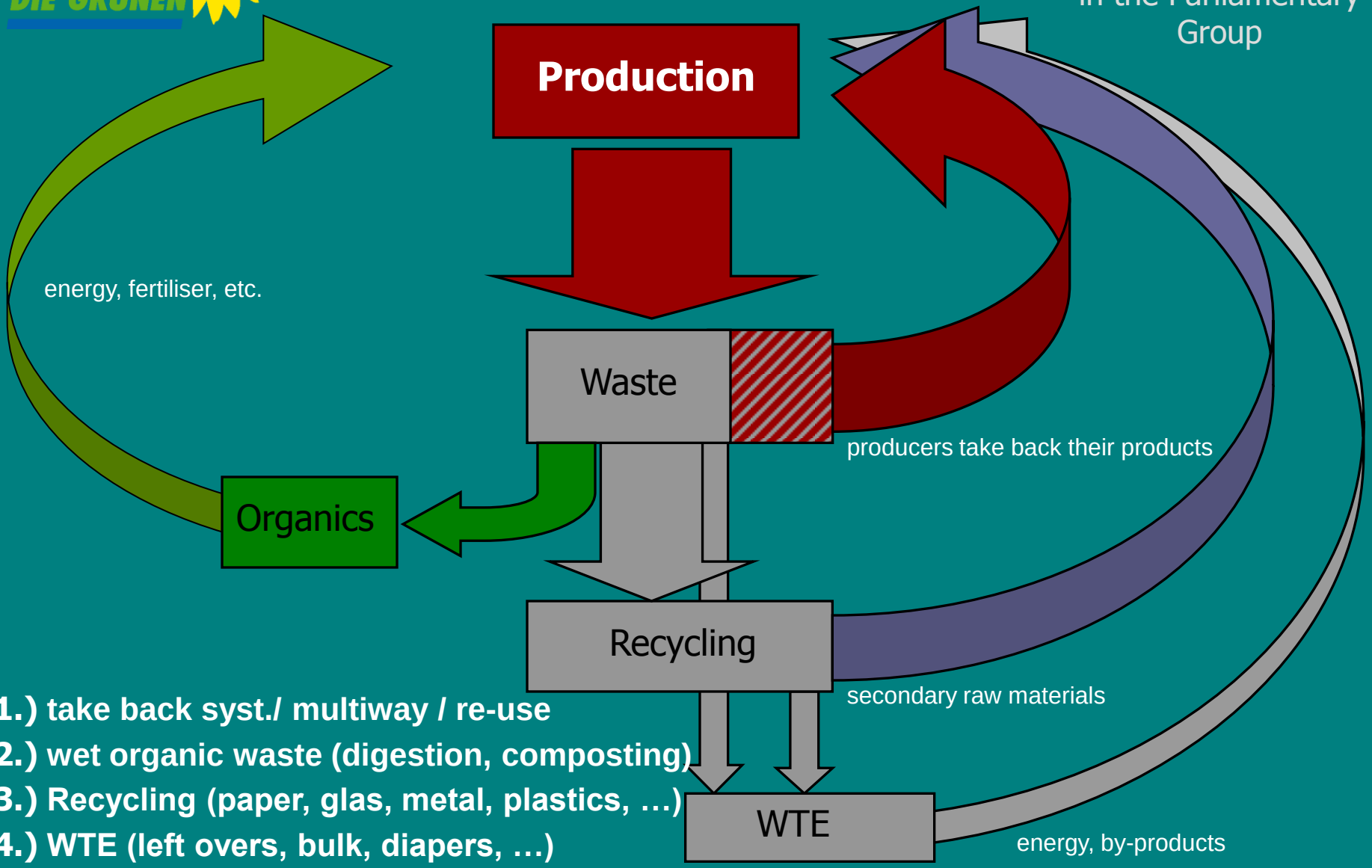

1.) take back syst./ multiway / re-use
2.) wet organic waste (digestion, composting)
3.) Recycling (paper, glas, metal, plastics, …)
4.) WTE (left overs, bulk, diapers, …)

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How to deal with the leftovers? Alternatives

- **Landfilling / landfilling with methane recovery?**
- **Pyrolysis, gasification and others?**
- **Mechanical Biological Treatment?**
- **Incineration?**

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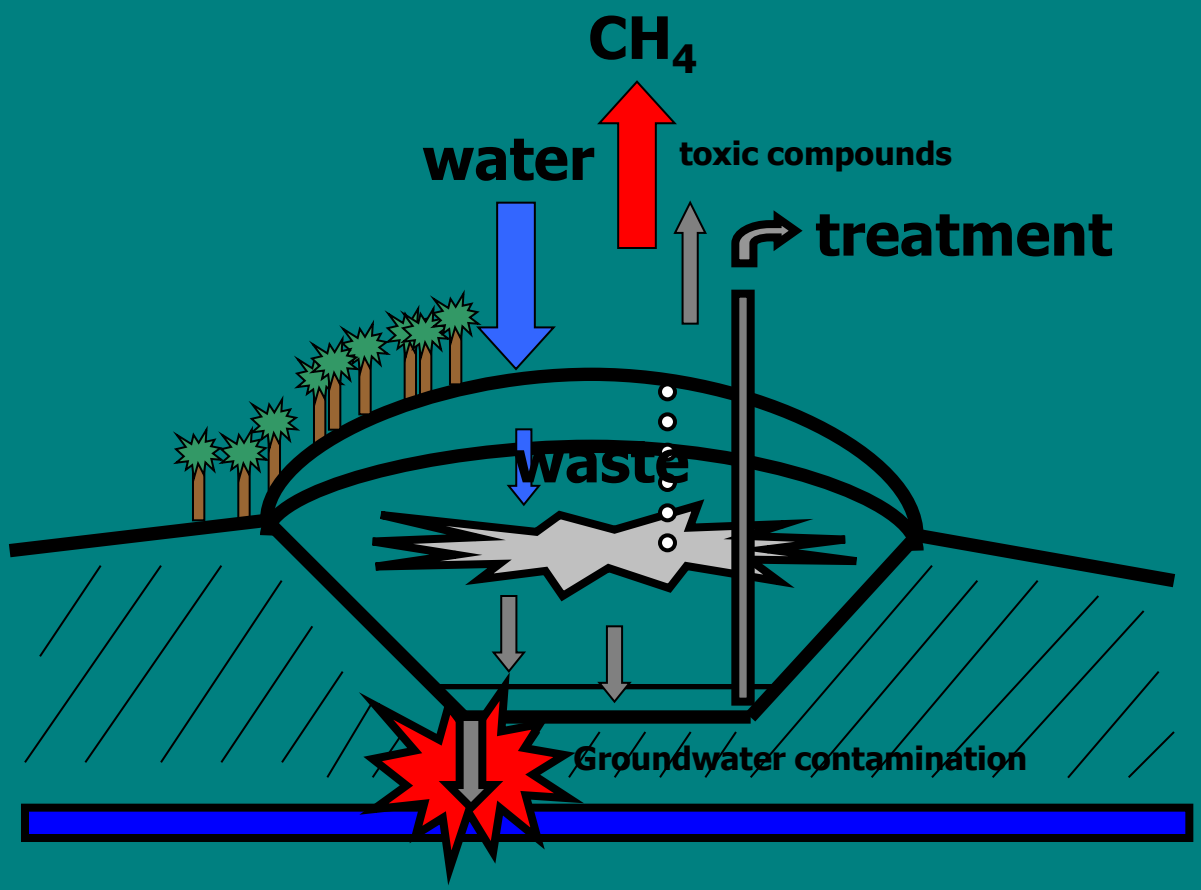
Landfilling as a shift of problems



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Compounds of landfill gas

Methane	CH_4	up to 65 Vol.%
Carbon Dioxide	CO_2	up to 65 Vol.%
Carbon Monoxide	CO	up to 2,8 Vol.%
Ammonia	NH_3	up to 0,35 ppm
Hydrogen Sulphide	H_2S	up to 700 ppm
Acetaldehyde	CH_3CHO	up to 150 ppm
Benzene	C_6H_6	up to 800 ppm
Vinyl Chloride (VC)	C_2H_3Cl	up to 72 mg/m^3
Dichlormethane	CH_2Cl_2	up to 2400 mg/m^3
Chloroforme	$CHCl_3$	up to 11 mg/m^3
Trichloroethylene	C_2HCl_3	up to 251 mg/m^3
Tetrachloretylene	C_2Cl_4	up to 182 mg/m^3
...		

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Toxic compounds of leaching water

Lead	Pb	up to 1.0 mg/l
Arsenic	As	up to 1.0 mg/l
Cadmium	Cd	up to 0.1 mg/l
Mercury	Hg	up to 0.05 mg/l
…		
AOX		up to 3.5 mg/l

In samples of an MSW – Landfill site

AOX: Organic halogens subject to absorption. This is a measure of the amount of chlorine (and other halogens) combined with organic compounds.

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Landfilling as a shift of problems

- **Landfill sites are black boxes, with uncontrolled biological and chemical processes.**
- **They need intensive care for generations, leaching water has to be treated for years.**
- **Permanent danger of leaks and rents, with heavy consequences for groundwater and soil. Such problems are usually more or less not reparable.**
- **Methane emission from landfiling is responsible for a significant part of the global warming problem (up to 2.6 % in 1990 in Germany).**

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Landfilling with Methane recovery

- **Methane capture /recovery is only a practical way of dealing with existing old landfills. Reasons:**
  - **Capture of methane only up to a maximum of 50% possible**
  - **ever lasting costs for landfill security**
  - **problem of leaches and danger of groundwater contamination is not solved**
  - **no sustainable solution black box**
  - **probably later need for remediation**

This technology is not for the future!

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Pyrolysis, gasification and others

Bad experiences in the past in Germany.

- **High costs with poor results:**
  - **"Babcock- pyrolysis" capacity only 26.000 t/a in the 80's**
  - **"Schwel-Brenn-Verfahren" pilot plant never worked regular**
  - **"Thermoselect" only one facility end in 2004, loss of 400 Mill. €**
  - **"PKA –process" since 2007 off duty**
  - **"black pump" 2004 sold for one €uro, since 2007 using coal**
  - **…**

These technologies have not shown reliability so far!

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Mechanical Biological Treatment

Mechanical Biological Treatment:

- **separation of waste stream in a recycling chain (metal, wood), a solid fuel strain (paper, plastics) and the biological treatment of the almost organic rest with a following landfilling.**
  - **Campaigned by the Greens in the early days, but there are still technical problems, no market for solid fuel, landfilling is still necessary**

This technology is an intermediate!

Explosion in MBA in Göttingen 2006

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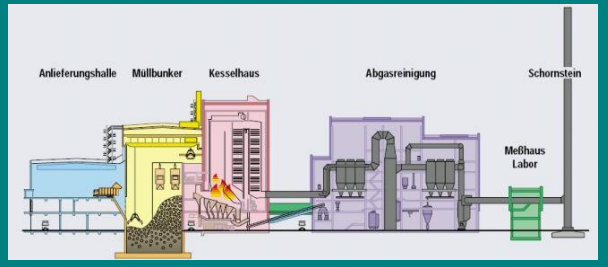
Incineration

- **Advantage: proven technology for many years**
- **When using a facility witch best available technology very low environmental impact (Example: MVR – Hamburg) :**
  - **high efficiency in recovering of heat and electricity,**
  - **very low emissions,**
  - **use of different by-products by producing acid and gypsum**
  - **use of ashes e.g. in the construction industry**
  - **no landfilling, only small amount of the input has to be left over to be deposited in the subsoil**



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Consequences of missing reliability

Definitely the worst case for our environment!

- **examples: Napoli, Italy and not working MBT Technology**

source: WDR, German Television, DUH 2007

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Lessons learned

- **Waste avoidance and recycling quotas are not the solution, they are just a part of it,**
- **Recycling has limits, e.g. plastics!**
- **Even recycling products become waste after use,**
- **Using best available technology for the incineration of residual waste means less impact to environment and to climate than landfilling.**
  - *although many members of the green party started their "career" in action groups against incineration plants, incineration with low emission levels, energy and material recovery is accepted today.*

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Summary

There are still challenges to meet!

A sustainable handling of waste is a central element of environmental and climate protection.

- **Closing the loop fore raw materials and increasing of Recycling**
- **Ending of landfilling as soon as possible.**
- **Therefore using the best available and reliable technology.**

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Thank you for your attention.