Green Deal:

Utilization of Incinerator bottom ashes (IBA) in the Netherlands

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Dutch Waste Management Association

The Dutch Waste Management Association (DWMA) represents the national and international interests of waste companies active in the Netherlands.

The more than 50 members are active throughout the whole waste chain for around two third of the Dutch waste market:

- Waste collection
- Waste recycling and utilisation including composting and anaerobic digestion
- Energy from Waste and landfill
Netherlands Development in regulations for IBA

1981 - 1995
• **CROW**: Civil engineering guidelines for the utilisation of IBA in road construction
• **IPO-VROM**: Environmental regulatory framework based on leaching in column tests

1992 - 2014
• **RAW-Guidelines**: civil engineering standards for the utilisation of IBA in road construction
• **Certification standard (BRL 2307)**: environmental and civil engineering aspects

1995 - 2007
• **Dutch Building Materials Decree (Bouwstoffenbesluit)**: Environmental regulations (calculation of emissions from leaching test results and height of utilisation)
Netherlands Development in regulations for IBA

2008 - now
- Decree of soil quality (Besluit bodemkwaliteit): Environmental legislation (Emissions based on leaching test results): granular construction materials and "IBC"- construction materials

2012 - 2020
- Green Deal:
  Between DWMA and Ministry of Infrastructure and Environment:
  - 2012 Agreement on Green deal
  - 2017 >95% Utilisation of which ≤ 50 % EfW bottom ashes as IBC-construction material
  - 2020 >95% free Utilisation, no utilization as IBC-construction material
Certification is institutionalized ‘trust’ and refers to regulation: i.e. clarity for customer
Market for Incinerator Bottom Ashes

Utilization of IBA in the Netherlands
[Kilotonnes/year]
Increase in production of IBA

The present incineration capacity of the Dutch EfW installations amounts to more than 7.5 M Tonnes / year.

The “free” capacity at this moment is around 15 – 20 %; the free capacity is filled by imported RDF (primarily from UK).

The Dutch policy to increase recycling and separate collection of separate streams leads to an increase of:

- The “free” capacity and dependancy on waste imports
- The opposition to accept long term future utilization of “complex” and partly “English” IBA in road construction

**GREEN DEAL to mitigate the uncertainties due to reservations against the future utilization of IBA!**
Explanation of IBC

IBC is the Dutch acronym for "Isolate, control and monitor"
An IBC-Project typically is built up in the following way:
Explanation of IBC

Typical example of the construction of an IBC project:
The special "IBC"-Category for IBA has the following strong drawbacks:

- Continuous aftercare of isolation construction
- Risk that construction will sink below ground water level
- Complicated processing of IBA in the construction → risk for planning of construction phase

Conclusion: IBA quality needs to meet regular emission standards for construction materials (instead of IBC-category)

Furthermore: since last 20 years Dutch Ministry of Environment strongly insists on quality improvement of IBA.
Highlights of the ‘Green Deal’

Make the ‘IBC’ (Encapsulate, Protect, Control) category obsolete:
• By January 1st, 2017:
  50% of IBA has to find useful application, other than ‘IBC’
• By 2020:
  100% of the IBA finds other applications than ‘IBC’
• (Halfway: evaluation of the economical consequences)

Enhance the recycling of NF metals:
• By January 1st, 2017:
  75% recovery of non-ferrous metals fraction > 6 mm
• Before 2020:
  Set goals for the recovery of non-ferrous metals < 6 mm

⇒ Clear regulation leads to technical choices and progress: the market evolves
Approach to reach the goals of the Green Deal

Reduce the utilization as an IBC construction material:
In the Decree of soil quality the environmental demands for bottom ashes or for products from bottom ashes are defined. This leads to two possibilities to reduce the utilization as IBC construction materials:

• **As granular material (0-20 / 0-40 mm) after a cleaning step**
  Washing / fractionation based on wet soil cleaning technology
  Drawback: the sludge fraction (< 63 µm) (± 15 %) has to be landfilled

• **As an aggregate in “solid” end products**
  Aggregate / gravel fraction (> 4 mm) can be utilized in concrete paving materials
  Drawback: solution for < 50 % of IBA (due to market size)
Non-ferro metals and the Green Deal

Improvement of reclamation of non-ferro metals (75 % of NF > 6 mm):

Extension of NF-separation equipment lines
Enhanced Dry Recovery (InAshco)-installation as an extension to classical dry metal separation from IBA.
Sand and gravel fraction can be utilized in concrete in that case

Improveement of ballistic properties of NF-particles
Purify NF-particles through washing / fractionation based on wet soil cleaning technology
Washes IBA fractions can be utilized in that case as “normal” construction materials.
Progress of the Green Deal

11. June 2013: Opening of ADR at AEB, Amsterdam
Progress of the Green Deal

2013-2014: Demonstration (100.000 Tonnes)
IBA-washing, HVC, Alkmaar
Progress of the Green Deal

Wet fractionation & Washing

Feed material IBA: conventional (dry) Pre-treatment: 7% Fe and 1.8% NF recycled

100% HMV-Schlacken

- 0.7% NE-Metals
- 48% Granulate (3 mm – 20 mm)
- 39.5% Sand (63 µm – 3 mm)
- 12.5% Sludge (< 63 µm)

- 0.5% Scrap
- 40% extra
Example of Fractions of washed IBA

Granulate, 3 - 20 mm

Sand, 63 μm - 3 mm
Concluding remarks

A change in IBA treatment and upgrading is to be implemented in the immediate future, forced by:

- Political and legislative pressure to upgrade the environmental quality of IBA
- The intrinsic value of residual metals within the IBA.

Successful technologies lead to improvements in both fields

Metal reclamation can (partly) compensate the costs for environmental quality improvement
Thank you for your attention

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