

## Municipal Solid Waste - Incinerator Bottom Ash

Mineral & Metal Recovery - Aggregate application area's



**Greendeal workshop**

**Stockholm, 18 September 2018**

- Introduction Inashco
- Effect of Greendeal on market transition

*Rogier van de Weijer*

*International Business Development Manager*

# EfW in Circular Economy = Add on to Waste Hierarchy



# EfW: Opportunity to recover value from non-recyclable waste





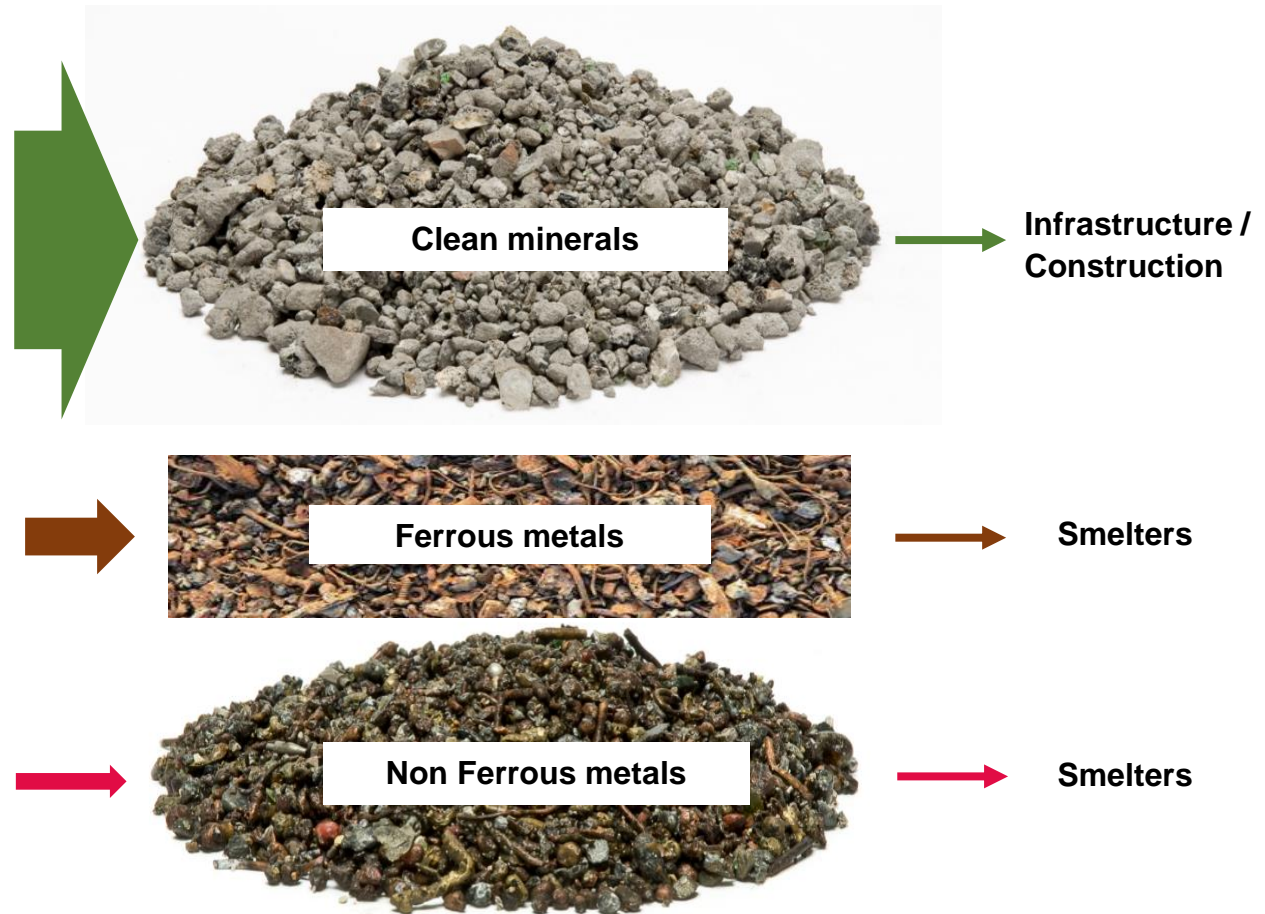
# EfW: Opportunity to recover value from non-recyclable waste

## 1000 ton of household Waste

- **Energy**
  - 660 MWh Electricity
  - 2000 MWh Heat energy
- **Construction materials**
  - 220 ton IBA Aggregate
    - Glas - Sand - stone etc..  
Replace virgin materials in construction industry
- **Metals**
  - 15 ton of steel (ferrous)
  - 1,25 ton Aluminium
  - 0,5 ton Copper
  - 0,3 ton Brass
  - 0,1 ton – Tin, Zinc, Lead, Nickel etc



# The 20-25% IBA Residue mix should not be landfilled





# Long term safe use of IBA aggregates in the environment





- Sustainable Waste to Energy ash reuse
  - Between EfW industry (12 EfW facilities in NL) and Dutch Government
  - Signed in 2012 - target date Phase 1, 2017, to be completed by 2020
  - Goal
    - Improvement of IBA quality to become freely applicable secondary raw materials
- North Sea Resources Roundabout – IBA case
  - Between North Sea countries & business'
  - Signed March 2016
  - Goal
    - Remove barriers for cross border transportation of waste derived products





**Green Deal**

## Incinerator Bottom Ash (2012 – 2020)

Problem: IBA was used in road construction under restrictions and high cost of future maintenance

- Inspect & Control by road constructing companies

### Greendeal Concept

- Voluntary action / investments by industry
- Reliable Government (regulations not to be changed)

### What happened

- Industry willing to set very ambitious goals
- Government support by accepting & assuring approval for use of the produced aggregates from IBA at the set environmental goals



# Lessons learned

- Industry representatives & Government created mutual accepted regulations & ambitions
  - Acceptance by market
  - Willingness to invest
- **Conclusion:** Greenddeal model works to change a (conservative) market
- Keys to success
  - Voluntary agreement without penalties
    - Easy acceptance by market to really change the way of working
  - Guarantee of government
    - Not change regulations
    - Guaranteed permit to use IBA Aggregates by market (construction) companies

# North Sea Resources Roundabout

## Case: Incinerator Bottom Ash



United Kingdom  
Netherlands  
Flanders  
France



# North Sea Resources Roundabout

## The Problem

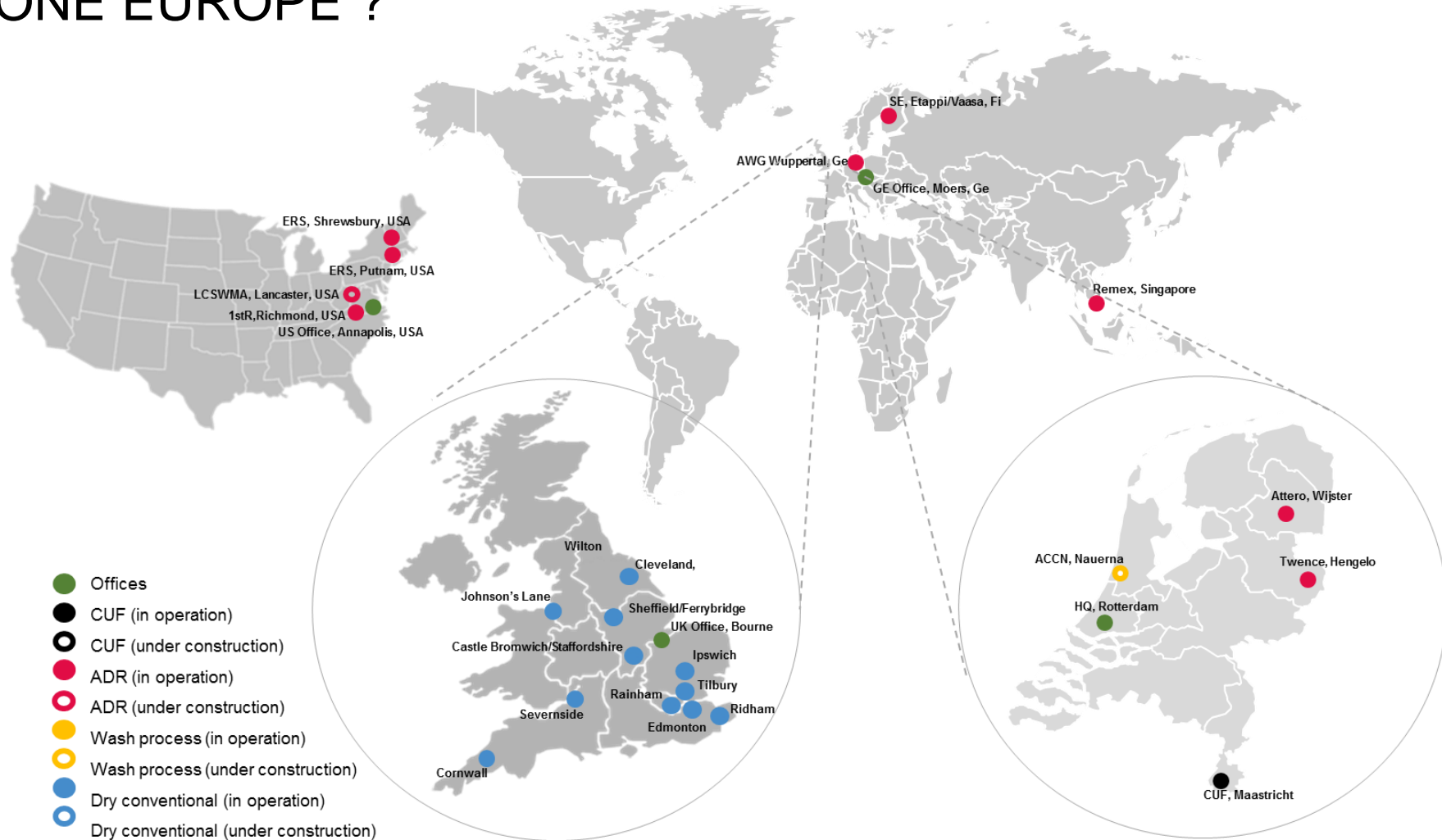
- Level playing field
- Unclear time frame
- Consistency
- Efficiency
- Changing transport routes (carriers)
- Financial guarantees
- Samples for commercial screening



United Kingdom  
Netherlands  
Flanders  
France



# ONE EUROPE ?



Goal: Remove legal barriers for cross border transportation of waste derived products

# Transportation Barriers

## Operational sites

- Inflexibilities
  - Carriers decide to take new route  
i.e: UK – NL via France, Belgium.
- Level playing field
  - Countries differentiate
    - EVOA Enforcement
    - Material application regulations
    - Enforcement of regulations
- Adding costs
  - Administration & financial guarantees
- Influencing international use of best available technologies
  - Inability to compete

## New Business Development

- Samples for business potential analysis
  - 25 kg allowed but need for 25 tons for representative materials
- 3<sup>rd</sup> Parties; metal concentrates
  - Inflexibility to bid on public offerings
  - Cannot compete due to time needed to get materials processed

# Lessons learned

- Four countries & industry representatives working together
  - Slow start, needed persistent action of case manager (Inashco & Dutch gov)
  - Brexit (UK government other priorities)
- Success
  - Accelerated Assessment procedure
  - Inashco metals facility
    - preconcentrated installation
    - Dutch Government audit
  - Guarantee Dutch government
    - procedure will be finalized within short timeframe

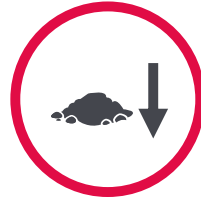




# Thank you



*Resource recovery*



*Reduce waste to landfill*



*CO<sub>2</sub> reduction*



*Operational excellence*



*Preserve the earth*



*Protect the environment*

## Contact information

### **Inashco BV**

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ISO / OHSAS



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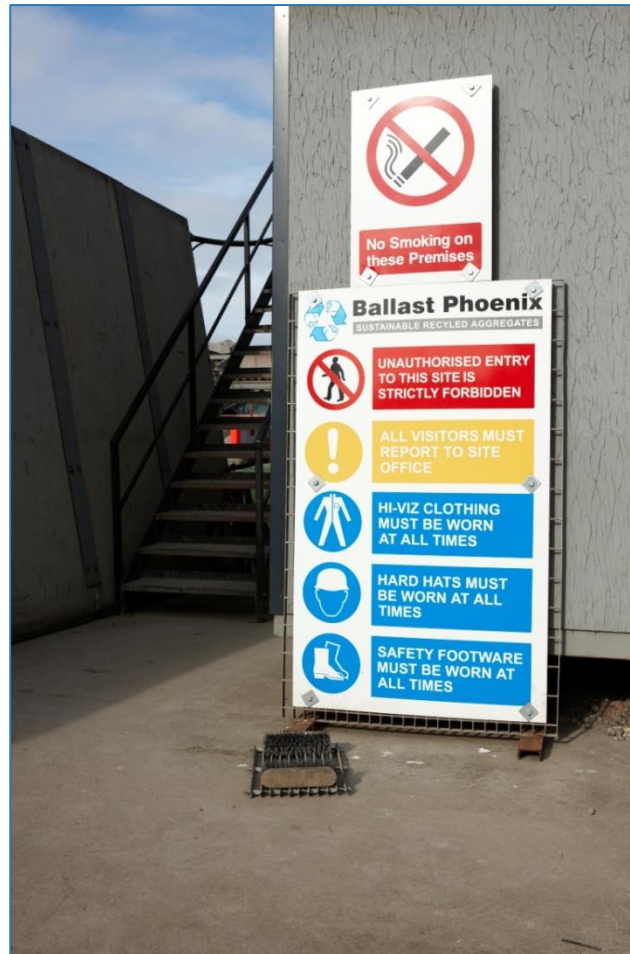
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# The process - but Safety first!





# Fresh IBA



# Fresh IBA is quarantined prior to processing, pending confirmation of non-haz classification





# Loading the feed hopper



## Processing – Most UK installations run Indoors

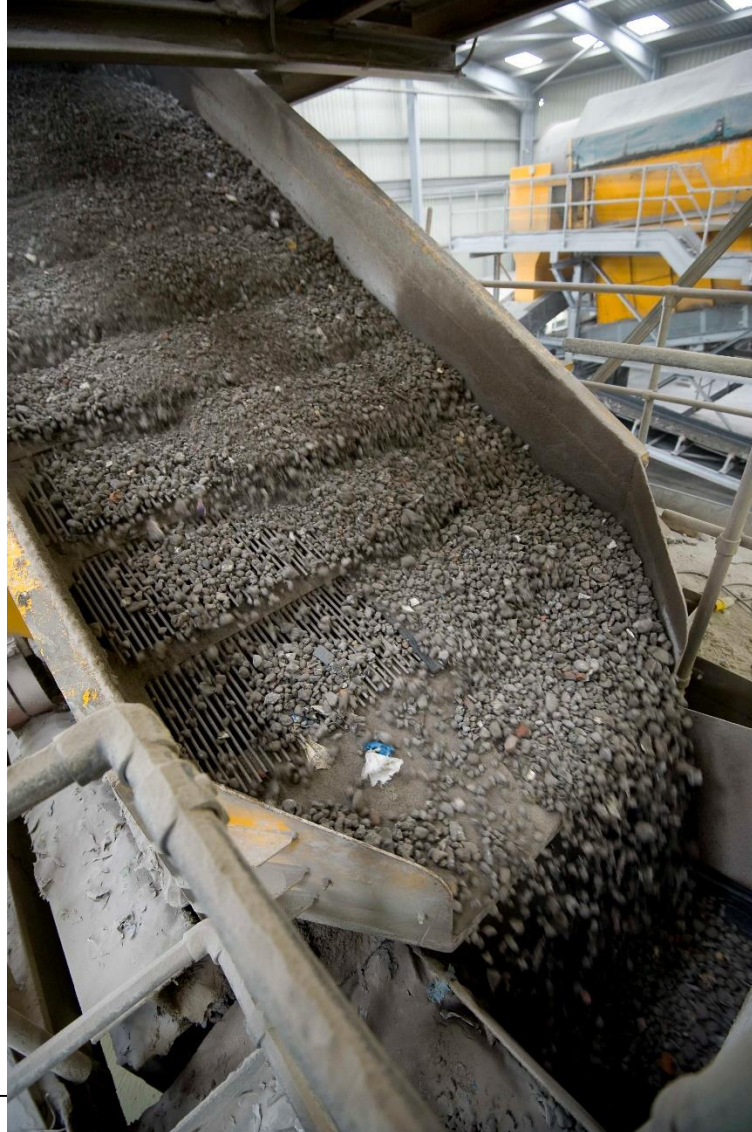




# Elevated control room



# Aggregate sizing





# Cleaning aggregate from polluting metals (recovery of NF metals)



# 0-10mm Aggregate





# 10-40mm Aggregate



# Recovered metals





# Dust Suppression



# IBA and IBA Aggregate





## Attenuation tank to store site drainage





What can IBAA be used for?

Many applications



# Capping layer for site development



## Sub base to an industrial floor

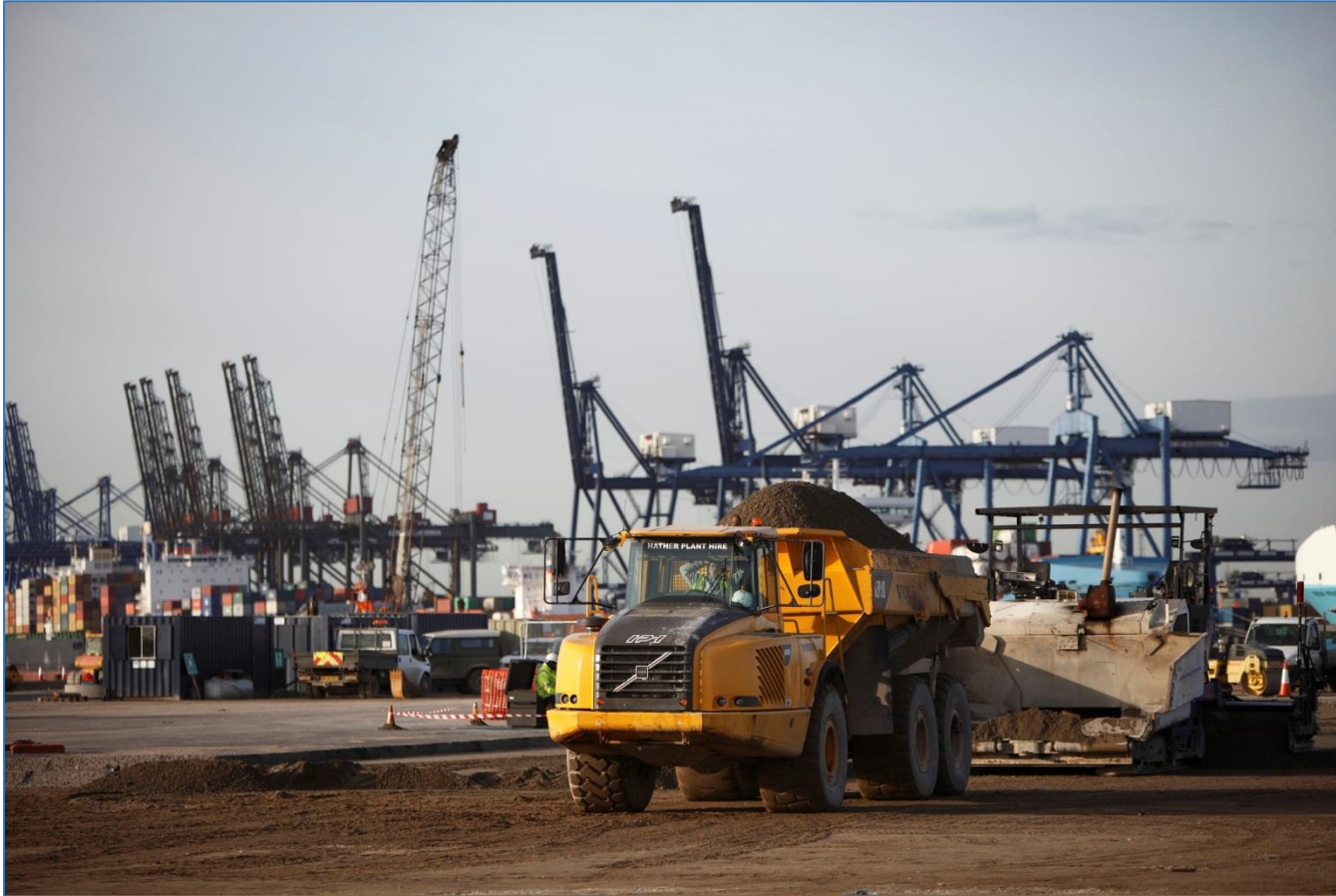




# Trench reinstatement

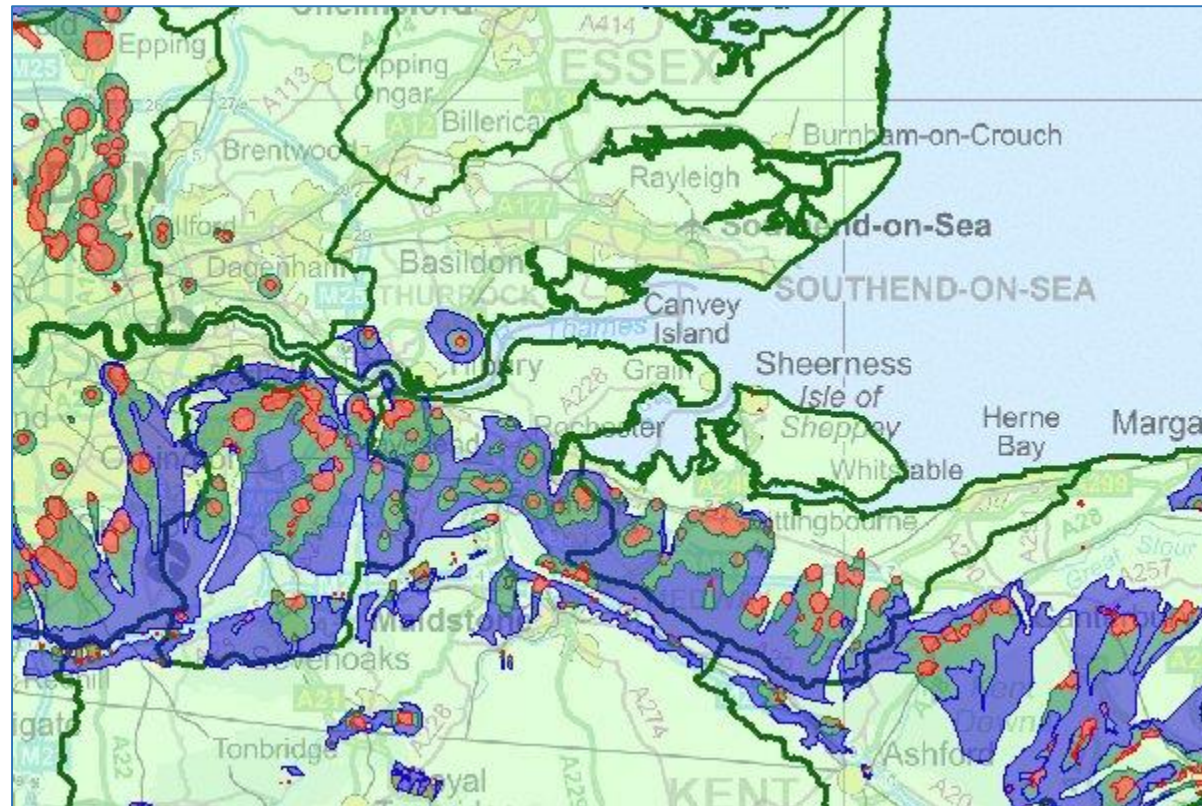


# Cement treated base for a port project





Risk assessment includes the hydrology and geology of the location of intended IBAA use



# **‘DUTY OF CARE’**

## **Environment Protection Act 1990**

- Applies to companies and individuals
- Primary and secondary aggregate producers should all comply
- MIBAAA members assess every site prior to supply
- The assessment routine becomes part of either BS EN 9001 or 14001 accredited Management System

# Inashco Group Characteristics

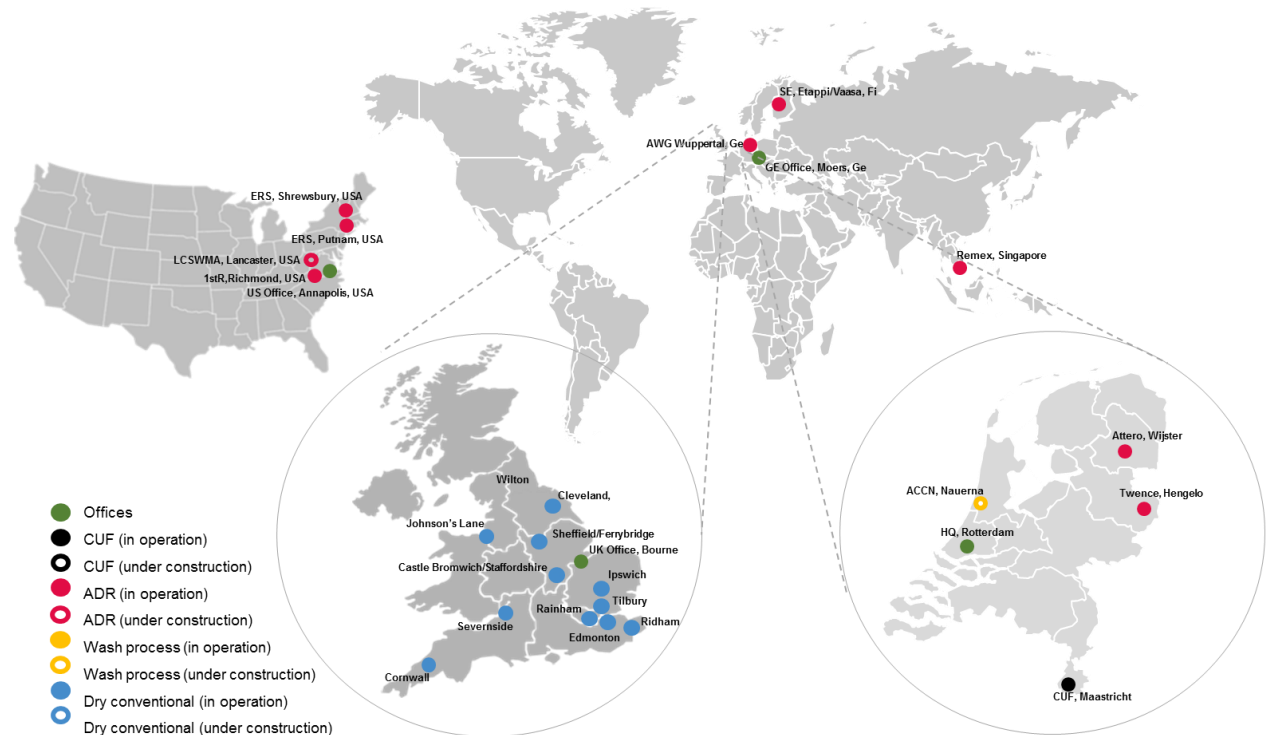
## Key figures:

- Group consists of
  - Ballast Phoenix Ltd
  - Inashco operations B.V.
- Bottom Ash processing: > 20 sites
- IBA processed per year: > 4 million tons
- Number of employees: > 200
- Annual Revenue: > € 100 million



## Key competences

- Operational Excellence
- Conversion of minerals into valuable construction materials
- (Fine) metals recovery
- Technology development





# Partner of Choice for the Industry

## Waste to Energy partners



Inashco JV partner  
Multiple sites USA



Multiple sites in  
United Kingdom



Multiple sites in  
United Kingdom



**eew**  
Energy from Waste

Netherlands



Plant under  
construction - USA



Multiple sites in  
UK & France

## Technology, Trading & Finance



Shareholder and  
fundamental R&D



Technology partner for  
Urbanite® Minerals



Mineral offtake & NL  
business partner

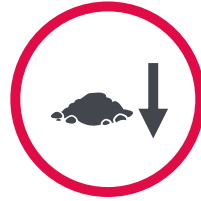


Shareholder – Finance  
Growth

# Inashco IBA Service Solutions: Closing the EfW Loop



*Resource recovery*



*Reduce waste to landfill*



*CO<sub>2</sub> reduction*



*Operational excellence*



*Preserve the earth*



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