



Transformation of WtE ash residue into sustainable aggregates

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Ash: A sustainable source of raw materials

- ▶ **VISION:**
All raw materials should be brought back into the Circular Economy
- ▶ **MISSION:** To be partner of choice for the WtE Industry
 - Inashco has the knowledge and experience to serve the industry with the transformation of ash residue
 - Create fit for purpose aggregates for country specific market demand



Offering: Dé-risking the WtE Industry

- ▶ Historically Inashco's focus: fine non ferrous metals
- ▶ 2016: Inashco group one-stop-shop solution provider
 - Sustainable ash solution is **“license to operate”** for the industry
 - Dé-risking the Industry by long term guaranteed off take
 - Sustainable utilization of ash residue

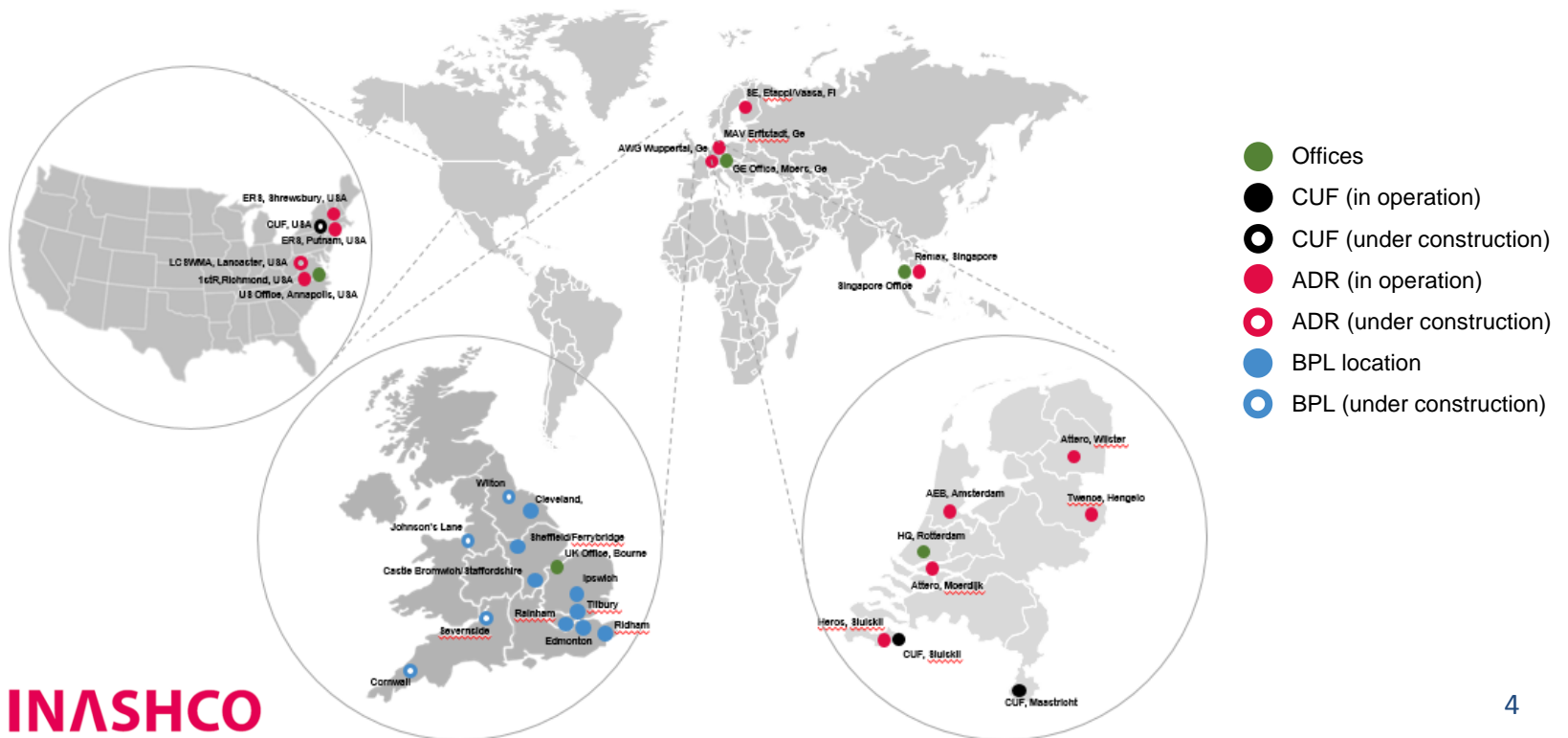


The Dutch approach sets the pace in the market.....



▶ Inashco group

- 28 production sites; Europe, North America, Singapore
- Processing 5 Million ton WtE ash annually



International markets - Tailor made solutions

Application of aggregate product dictates technology choice driven by country specific geological conditions

- ▶ Netherlands: Green Deal compliance as of 1st Jan 2017
 - Single soil condition & ground water nature; Soil Quality Degree
 - Need for extensive ash processing to create sustainable aggregates
- ▶ United Kingdom: IBAA utilization common practice
 - **Ballast Phoenix** : Hydro Geologic Condition Assessment
- ▶ Europe
 - Landfill / salt mine stabilization / road construction / noise barriers
- ▶ United States
 - Landfill / mono fill

International markets - Tailor made solutions (2)

▶ Nature of the Ash

- Bottom ash only / Bottom ash + Boiler ash / Bottom ash + Boiler ash + fly ash
- Moisture content (wet deslagging / semi dry deslagging)
- Amount of unburned material
- Pollutants like Chlorides, Sulphates and Antimony

▶ Requirements for IBAA utilization

- Landfill quality standards
- Partial re-use in concrete products (non reinforced)
- Full re-use in controlled ground conditions
- Full re-use under Dutch “Green Deal” parameters

eQuiAsh – Semi Dry Method



- ▶ Urbanite ® - Developed with AEB Amsterdam
 - Based on patented technologies TAUW

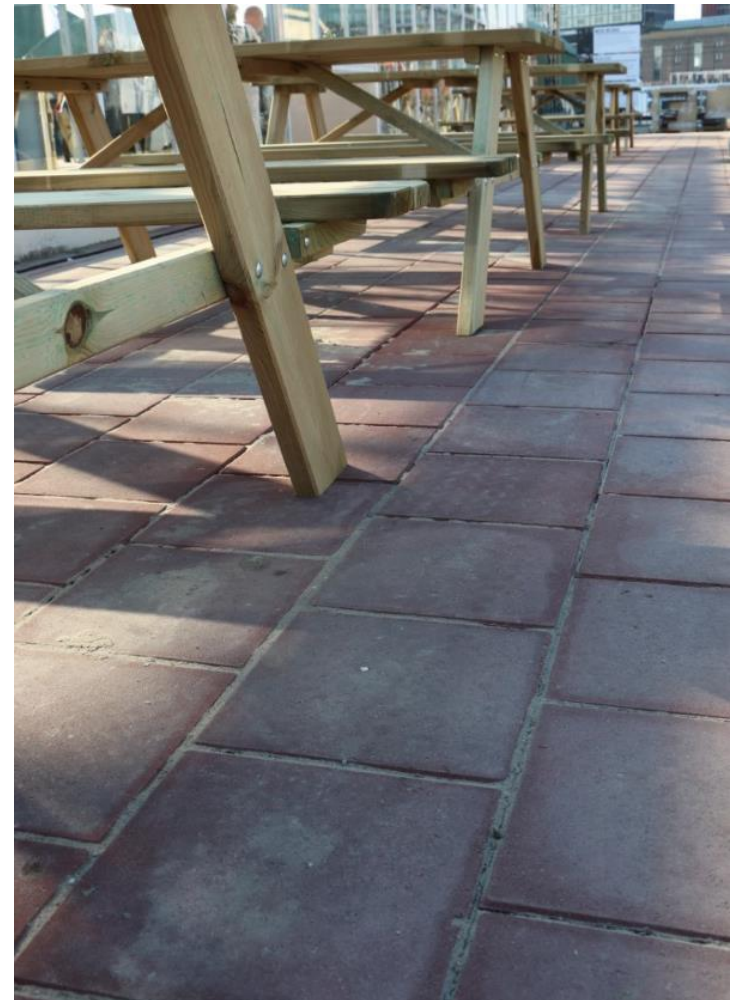
Solution	eQui Ash - Semi Dry Method	
Aggregate recovery	Goal	Means
Copper	Decrease organic content	Carbonatation with Co2
Antimony	Binding	Mineralisation
Sulphates	Removal	Wash out So4
Chlorides / Bromides	Removal	Wash - Water disposal / cleaning
Metal recovery	Goal	Means
>12 mm	Recovery NFc + Fe	Dry classification, magnets + ECS
1 - 12 mm	Recovery NFc	ADR, magnets + ECS
40mu - 1mm		n.a.

Full Wet Solution

- ▶ Full wet solution - Developed with Boskalis
 - Based on patented technology Boskalis

Solution	Full Wet Solution	
Aggregate recovery	Goal	Means
Copper	Structural removal of organic	Fluf removal by density searation
Antimony	Structural removal	Scrub off Ettringite
Sulphates	Structural removal of Gypsum	Log washers
Chlorides / Bromides	Precipitation of Salts	Salts removed w Sludge
Metal recovery	Goal	Means
>12 mm	Recovery NfC + Fe	Wet classification, magnets + ECS
1 - 12 mm	Recovery HNF + LNF product	Wet classification, magnets + ECS
40mu - 1mm	Recovery HNF product	Wet classification only

Aggregate applications



Inashco – Contact information



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