

Ash is a useful chemical substance

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- It is registered in the European Chemical Register

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Ash – a REACH-registered substance

- Ash is within the scope of REACH
 - If not have a waste status
- Ash is a chemical substance when some chemical modification has taken place
 - a reaction with water in pelletizing
- Several ash types are registered in European Chemical Register
 - European Chemical Agency, ECHA

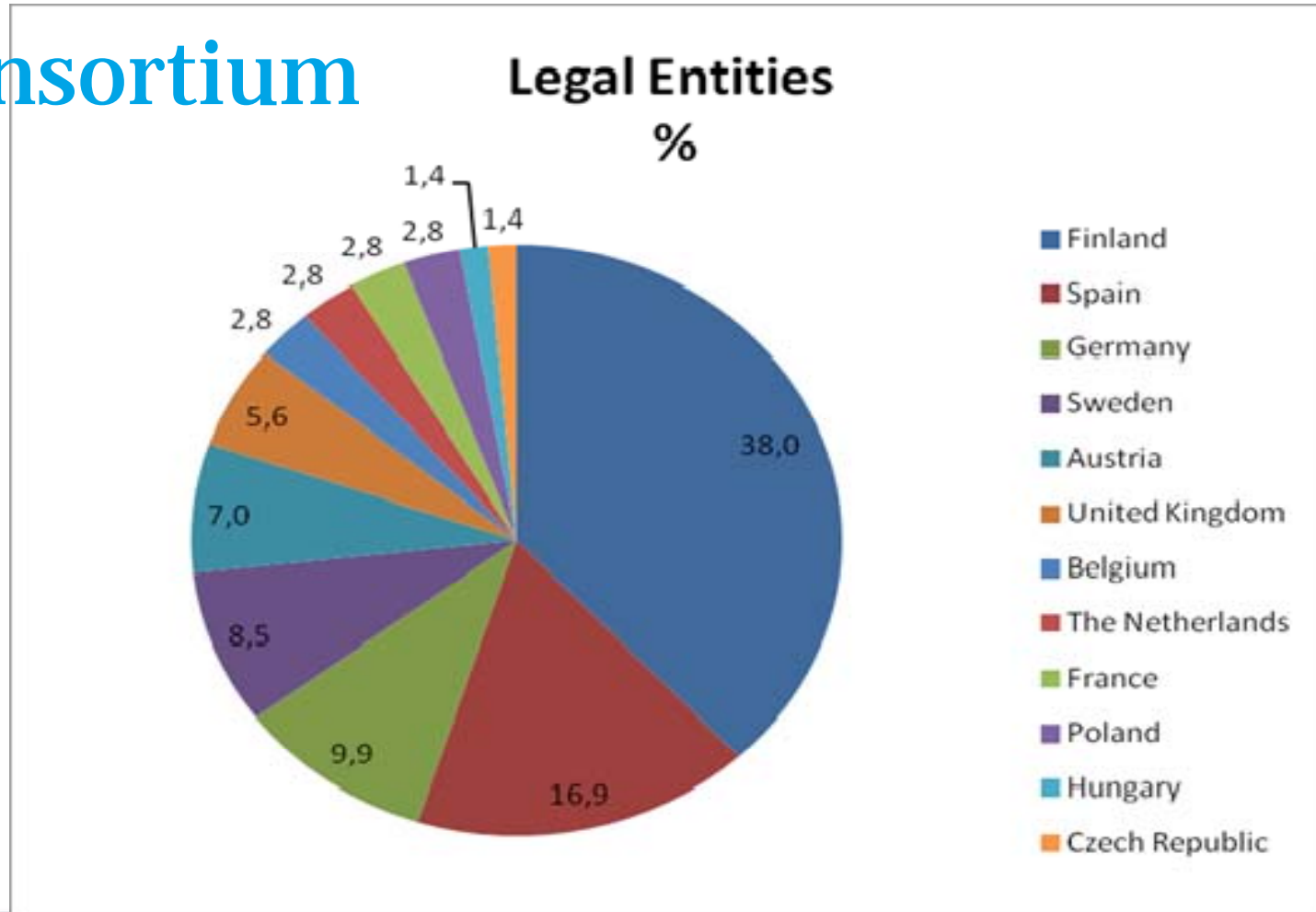


Mixed Ash Consortium

- **Founded in October 2010**
- **71 companies made a joint registration of ash**
- **Pohjolan Voima Oy from Finland operates as the Lead Company and the Lead Registrant**
- **The consortium is guided by a steering committee, in which 10 members are represented.**
- **The consortium is administrated by the consulting company Linnunmaa Oy.**



Members of the Mixed Ash Consortium



Registration costs

- The joint costs in Consortium have been about 700 thousand Euros.
- If a new company registers its own ash
 - It takes a few months' time
 - Costs 20 – 25 thousand Euros/LE
 - Need some chemical analysis of the ash
 - Need production and use information
 - Need a letter of access (LoA) for the joint registration dossier



Substance Identity

- The ash is named according to REACH rules as **“the product from the burning of a combination of carbonaceous materials”**.
- An EC number is not available for this ash at the moment, but a listing number is given by ECHA.
- Includes as oxides: aluminum, calcium, iron, magnesium, potassium, and silicon.



Substance Identity (2)

- **UVCB substance**
 - is identified by its fuel composition and combustion technology
- **Fuels:**
 - biomass, biofuels, peat and sludge
 - with coal, solid recovered fuel (SRF) and supplementary fuels as needed
- **Covers ash originating from gasification and combustion**

Composition

- The composition and properties of ash vary depending on the type of fuel and the combustion and ash separation technologies used.
- The registration was based on laboratory analyses of several different ash samples, and variations were taken into consideration in the risk assessment.



Typical composition of ash

Constituent		EC number	Typical concentration * mg/kg	Min mg/kg	Max mg/kg
Aluminium	Al	231-072-3	68900	4500	100000
Calcium	Ca	231-179-5	240000	20000	420000
Iron	Fe	231-096-4	21900	2500	180000
Magnesium	Mg	231-104-6	18400	3000	150000
Phosphorus	P	231-768-7	4190	400	30000
Potassium	K	231-119-8	13500	500	100000
Sodium	Na	231-132-9	5690	500	25000
Silicon	Si	231-130-8	148000	28000	450000

* A mixed sample as a combination of several ash samples was created and analyzed.



Registration dossier

- Includes information on the registrant, chemical composition, physicochemical information, toxicological data, ecotoxicological data, exposure data, risk assessment and guidance on safe use
- Several laboratory tests were conducted
- The main and common part of the dossier is covered by the joint dossier submitted by the Lead Registrant.

- +...  0 Related Information
- +...  1 General Information
- +...  2 Classification and Labelling
- +...  3 Manufacture, use and exposure
- +...  4 Physical and chemical properties
- +...  5 Environmental fate and pathways
- +...  6 Ecotoxicological Information
- +...  7 Toxicological information
- +...  8 Analytical methods
- +...  11 Guidance on safe use
- +...  12 Literature search
- +...  13 Assessment Reports

Risk Assessment

- Based on testing the mixed sample of several ash
- Phys Chem testing like water solubility
- Toxicological testing like
Rat oral tox (28d): not toxic
- Ecotoxicological testing like
Algae (72h): EC50 = 21.3 mg/L
- Test results, variation on composition and exposure estimation
 - Toxicological and ecotoxicological risk
 - Risk Management Measures

Useful multi-purpose product

- High content of various useful minerals for different uses
- The end uses of ash covered in the REACH registration are:
 - Production
 - Distribution
 - Formulation and repacking
 - Construction materials and castings
 - Hot aggregates
 - Fertilizer
 - Soil construction
 - Stabilization, disinfection and animal bedding
 - Flue gas treatment
 - Paper production
 - Secondary steel process



eSDS in Ash Life cycle



Classification

GHS05 Danger

Skin Irrit. 2, H315: Causes skin irritation

Eye Irrit. 1, H318: Causes serious eye damage

STOT SE3 H335: May cause respiratory irritation.



- ✓ Ash is classified as corrosive mainly due to the high content of calcium oxide.
- ✓ During the aging process, the calcium oxide content of ash decreases, which decreases the corrosivity
- ✓ Mixed ash is not classified as hazardous to the environment according to rules of the chemical regulation REACH.
- ✓ Ash is not classified as dangerous goods for transportation.



Safe use of ash

- Alkalinity and dustiness are the main hazards of the ash for workers.
- Use is safe when the appropriate risk management measures are applied.
 - to use the recommended personal protective equipment to avoid hazards
 - If the ash is dusty, inhaling dust should be avoided and respiratory protection is needed.

