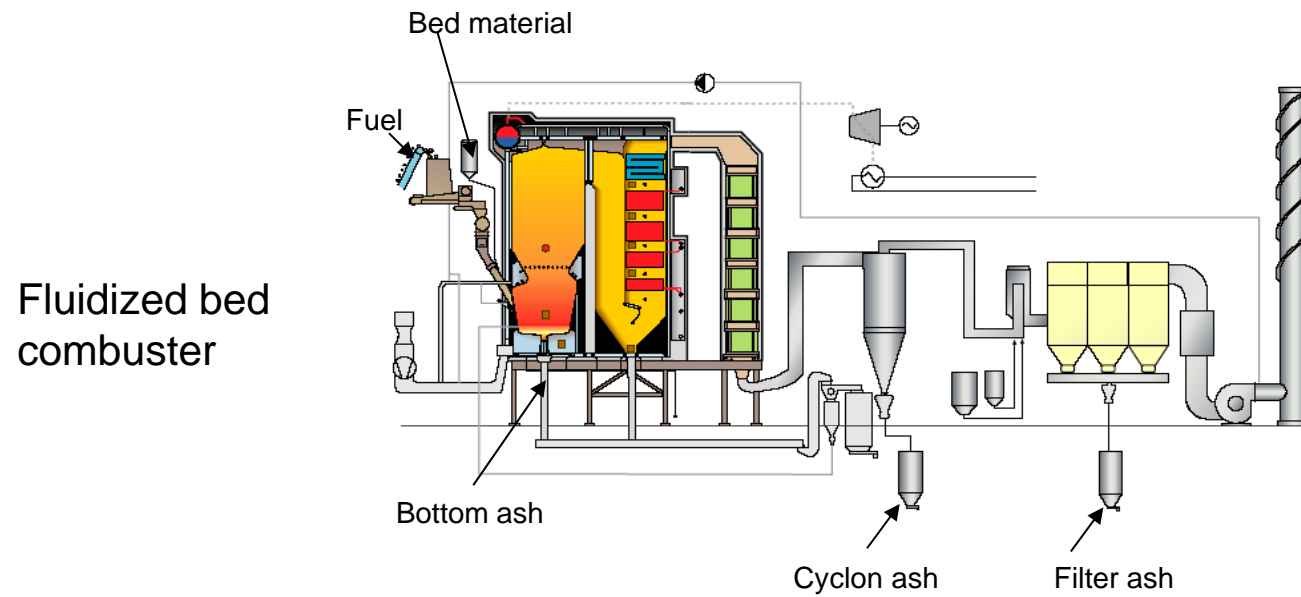
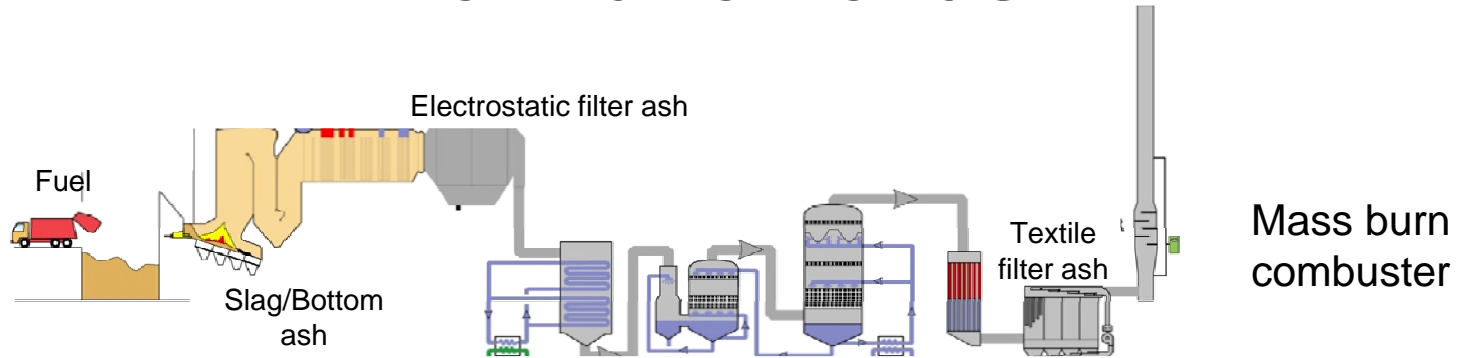


Metals in MSWI ash- problems or opportunities?



Karin Karlfeldt Fedje
Renova AB

Formation of ash

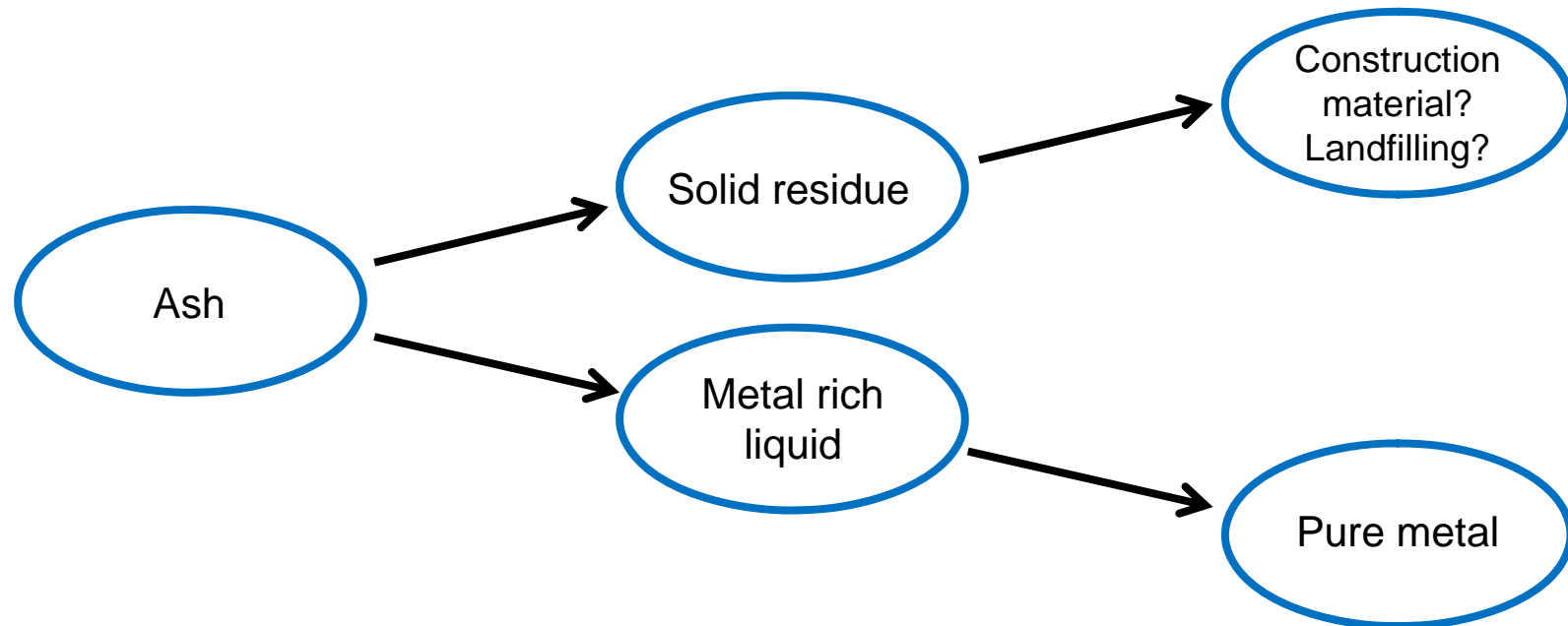


BACKGROUND

Karin Karlfeldt Fedje



The Principle

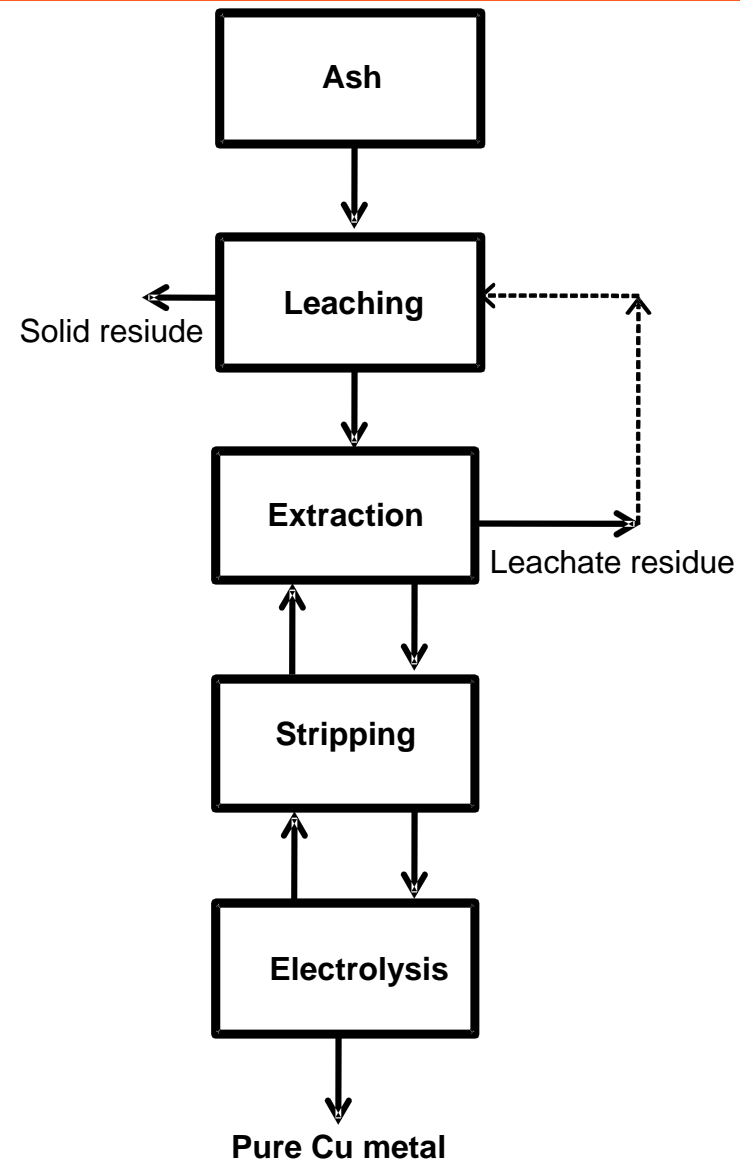


METHOD

Karin Karlfeldt Fedje



Theoretical flow chart for Cu recovery from MSWI ash



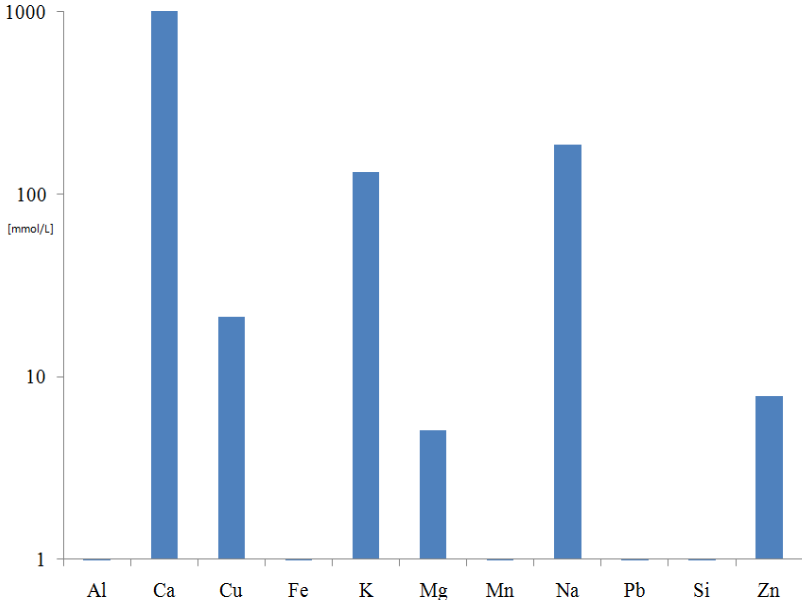
METHOD

Karin Karlfeldt Fedje

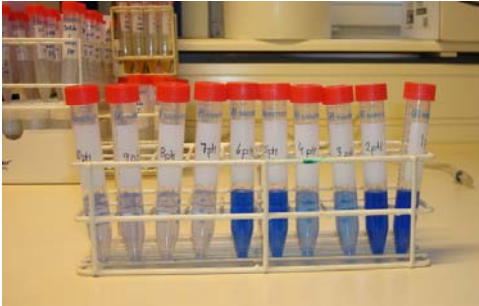


Leaching

Complexing agent



Acid

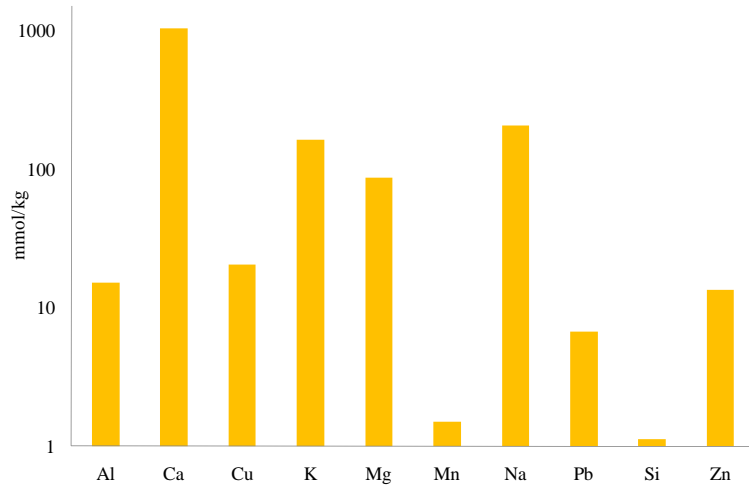


RESULTS

Karin Karlfeldt Fedje



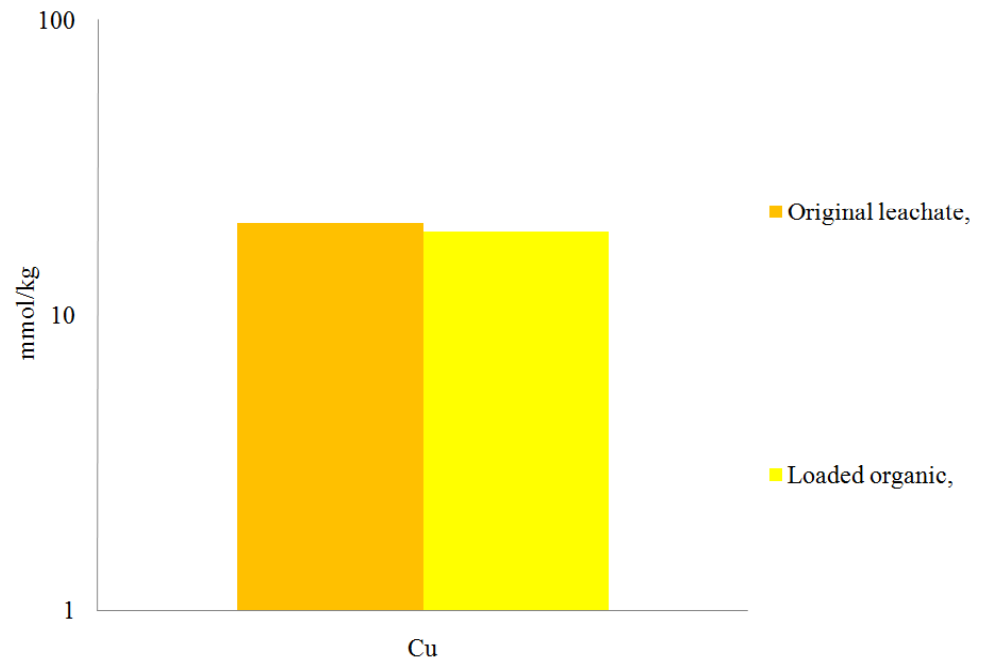
Extraction of Cu



Stripping;

90% of the Cu is transferred to the water phase

Traces of Pb och Zn



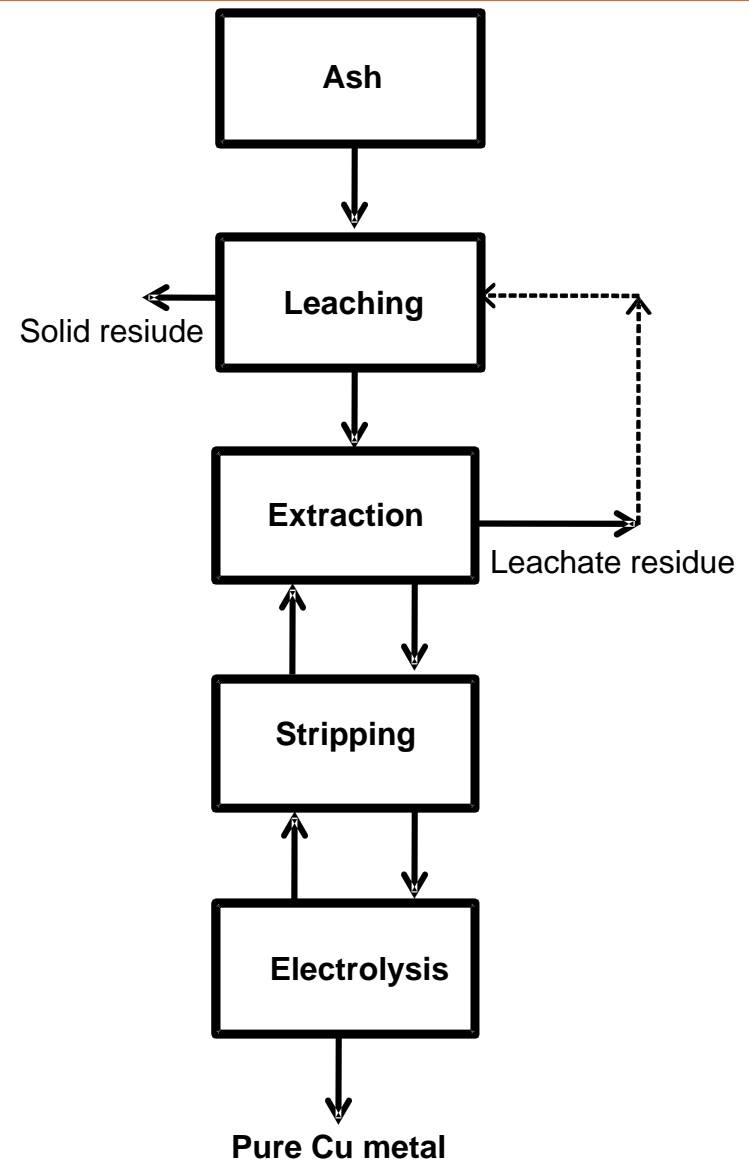
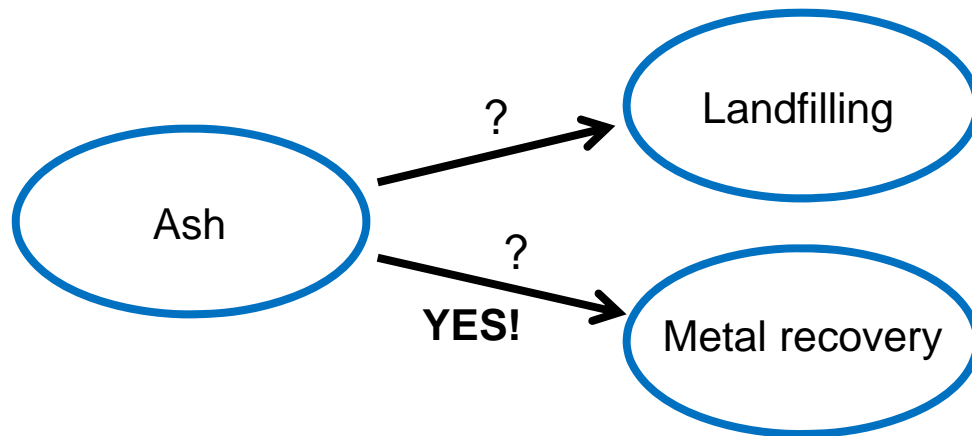
RESULTS

Karin Karlfeldt Fedje





Effectivity and profitability



RESULTS

Karin Karlfeldt Fedje



Potential values in MSWI fly ash

Sweden

~200 000 tonnes fly ash/year

Cu 0,4%, 6.6 Euro/kg Cu → **6 million Euros/year**

Zn 2,5%, 1.5 Euro/kg Zn → **8 million Euros/year**

V 0,005%, 280 Euro/kg V → **3 million Euros/year**

EU27

~2 000 000 tonnes fly ash/year

Cu 0,4%, 6.6 Euro/kg Cu → **60 million Euros/year**

Zn 2,5%, 1.5 Euro/kg Zn → **80 million Euros/year**

V 0,005%, 280 Euro/kg V → **30 million Euros/year**



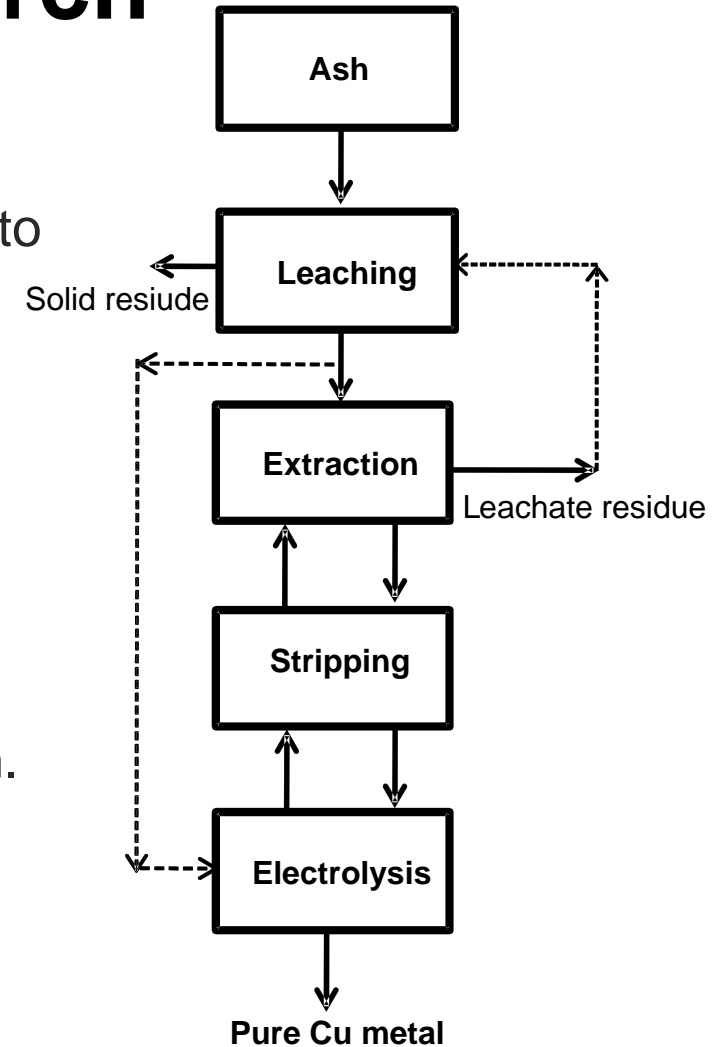
Present research

Electrolysis

- Microbial bioelectrochemical systems (BES) to reduce energy consumption.
- BES on simulated unpurified ash leachates. Cu and Zn metal could be recovered.

P recovery from ash

- A low grade P fertilizer is recovered from ash.
- Further purification needed and in progress.
- Research on fly and bottom ash.



CONCLUSIONS

- Metal contents in MSWI ash are relatively high.
 - A Cu recovery method based on leaching, extraction and electrolysis.
 - This treatment could be profitable compared to land filling.
 - 90% of all Cu in the leachates could be selectively recovered.
 - Leaching is a most important step in this Cu recovery process.
-
- Potential metal value in European MSWI ash is hundreds of million Euros, annually.
 - Reduced energy consumption during electrolysis using BES.
 - P recovery
 - Can we afford not using the ash?**

THANKS for your attention!

