

Selective Ammoniacal Extraction Process for Valorizing Zn-rich BOF Sludges (SAMEX)

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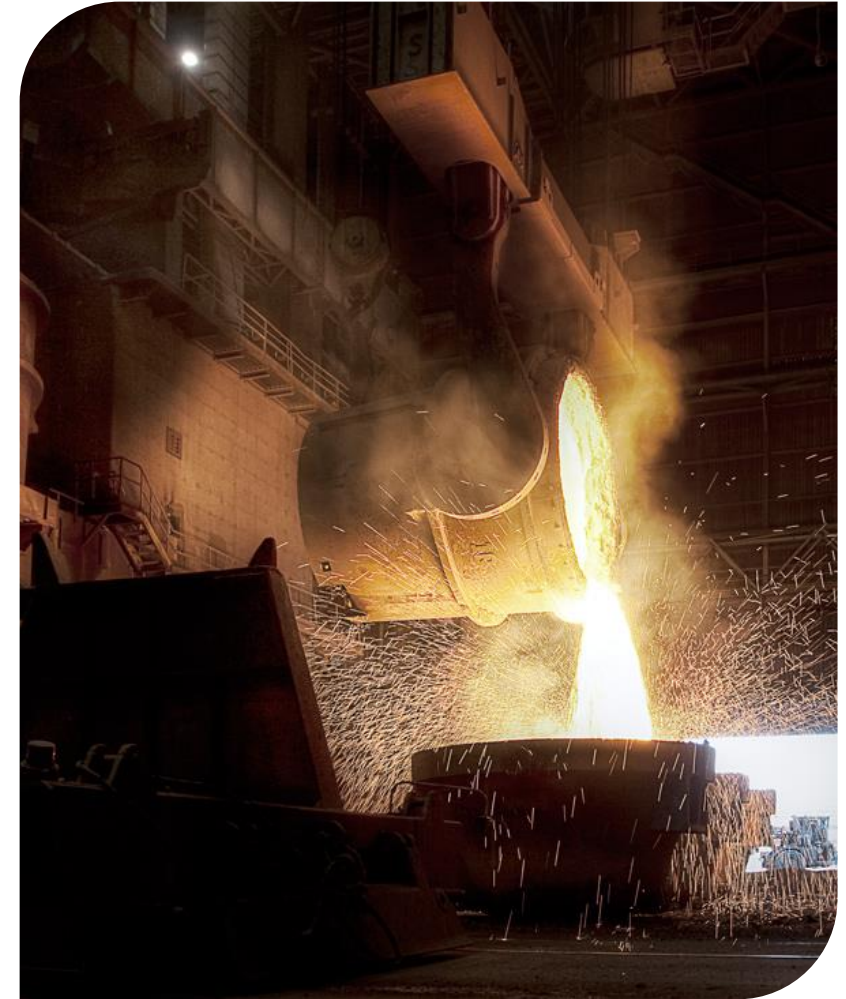


This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

Photo: ArcelorMittal – Bremen

Fine Basic Oxygen Furnace sludge is currently stockpiled/landfilled

- ✓ For **each million tonne of steel** ArcelorMittal (AM) produces, **~10,000 tonne** of zinc-rich, **fine Basic Oxygen Furnace (BOF)** steelmaking sludge is generated
- ✓ In contrast with coarse BOF sludge, which is already internally recycled (via the sinter plant to the Blast Furnace), fine BOF sludge cannot be fed to the Blast Furnace (BF), as the zinc content would lead to prohibitive refractory failure and disturbances in the BF process
- ✓ ArcelorMittal either **internally stores these sludges** or is **forced to landfill them**

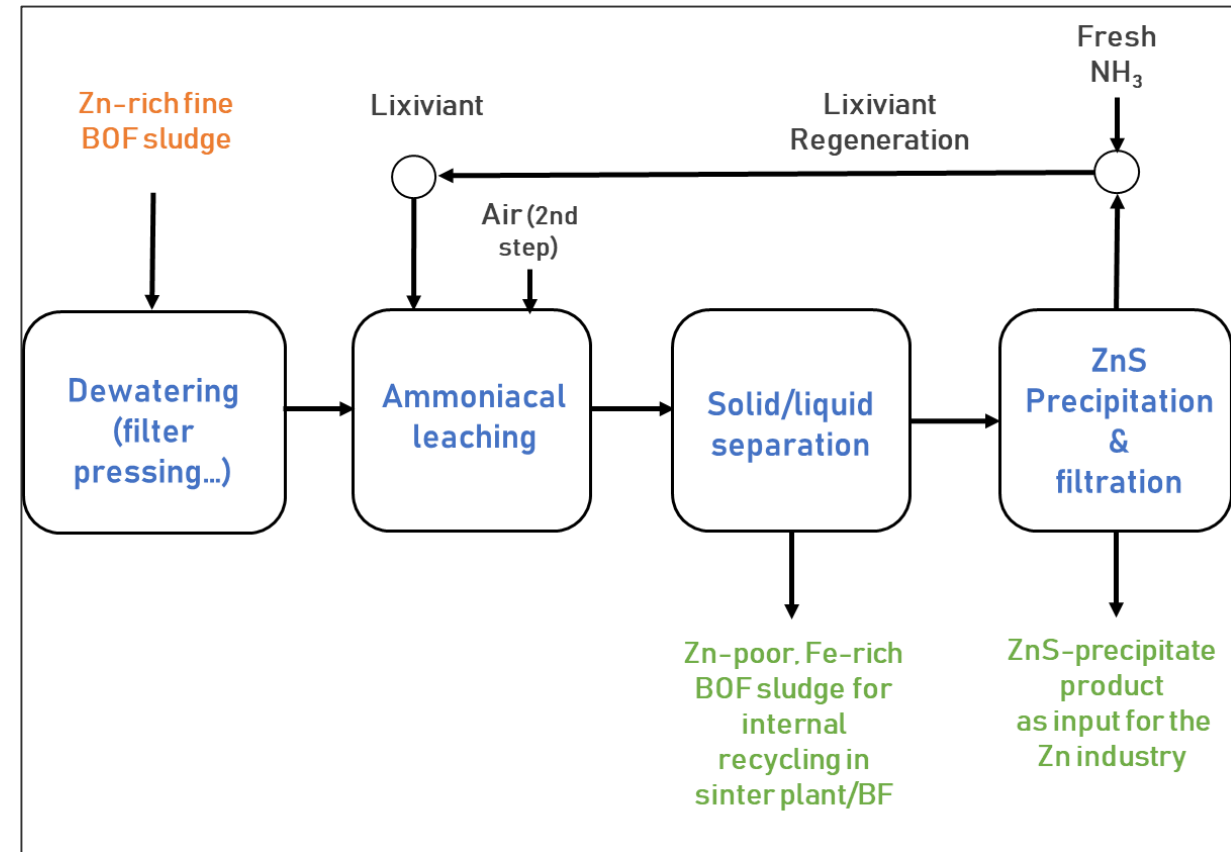


Picture: BOF furnace. Source: AM

SAMEX process allows valorisation of fine BOF sludge

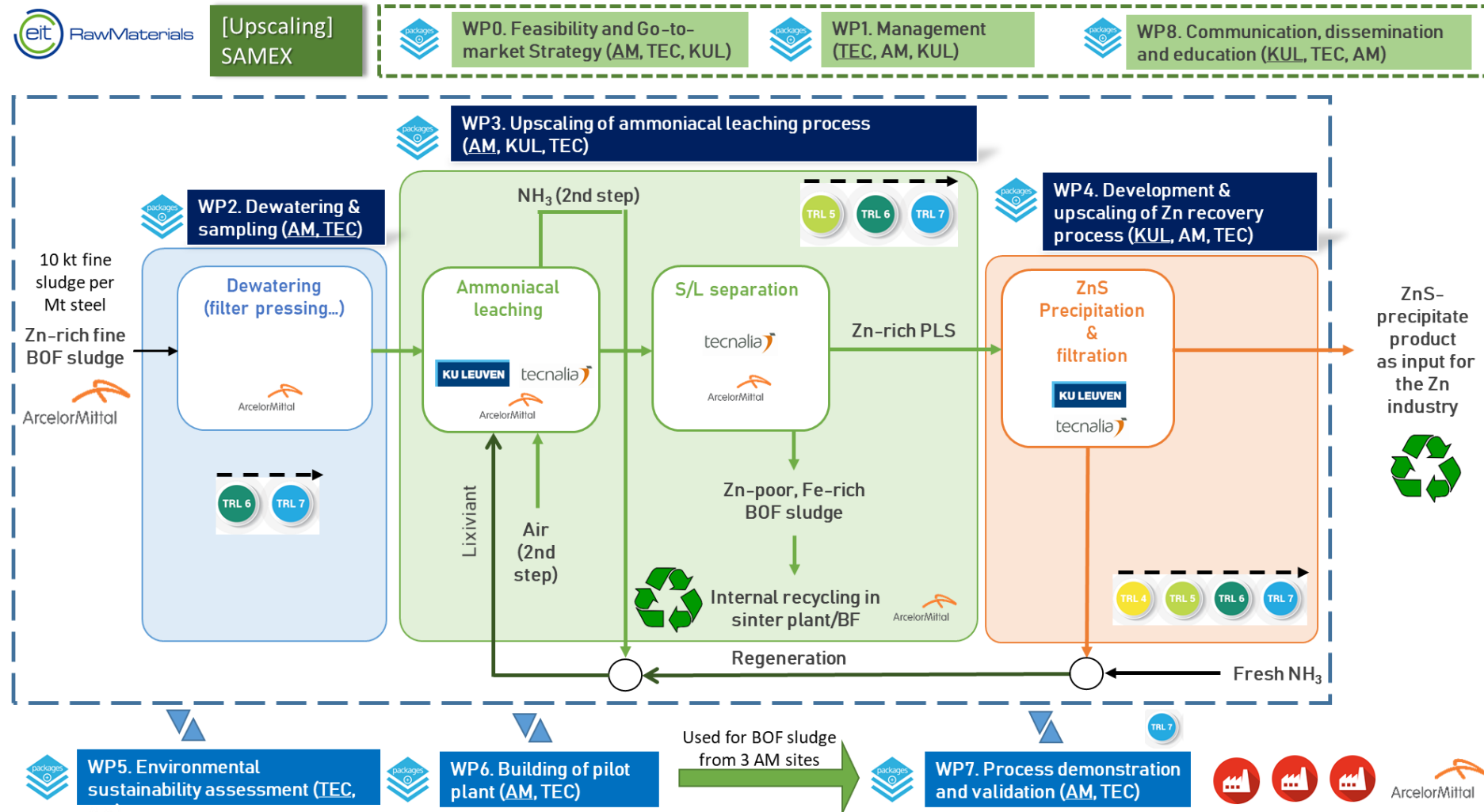
Previous to SAMEX, ArcelorMittal developed, in collaboration with KU Leuven, an **ammoniacal leaching process**:

- ✓ The process extracts zinc from the sludge while leaving behind most iron
- ✓ If the residual zinc content is low enough, the **cleaned, iron-rich residue can be fed to the BF**, via the sinter plant, representing major iron cost savings
- ✓ Concurrently, the leached zinc is precipitated as **zinc sulphide** which serves as a feed for the zinc industry



Picture: Schematic flow chart SAMEX process

EIT SAMEX project: an industrial pilot for BOF sludge valorisation



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- ✓ In SAMEX Tecnalia (Spain), ArcelorMittal (Spain) and KU Leuven (Belgium) will **upscale the ammoniacal leaching process to TRL7**, aiming to engineer and build a pilot plant.
- ✓ After basic engineering and a preliminary CAPEX/OPEX performed by Tecnalia, ArcelorMittal will lead the pilot plant construction in order to demonstrate and validate the flowsheet, using distinct BOF sludges from different ArcelorMittal plants in Europe.
- ✓ In parallel, the environmental sustainability assessment will be produced by Tecnalia.



Pictures: pilot facilities used in SAMEX

- ❑ Upper left: 1 and 5 L leaching reactors at KU Leuven
- ❑ Upper right: Tecnalia's 100 L leaching reactor
- ❑ Bottom: Tecnalia's filter press installation

EIT SAMEX project: an industrial pilot for BOF sludge valorisation

- ✓ If successful, ArcelorMittal foresees to **implement the process in at least one third of its EU-plants** by 2025 (i.e. treatment of 120,000 tonne/year BOF fine sludge)
- ✓ **Other sludge producers and steelmaking companies** will be able to **benefit** from the results generated in the project



Picture source: Arcelormittal

Website

- ✓ Homepage: <https://eit-samex.eu/>
- ✓ Public deliverables:
<https://eit-samex.eu/public-deliverables/>
- ✓ LinkedIn:
<https://www.linkedin.com/company/37549689/>

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