Deliverable 8.4 – SAMEX communication kit (KUL)

08 September 2020

Project: Selective Ammoniacal Extraction Process for Valorizing Zn-rich BOF Sludges (SAMEX). Project nr. 19205

Version No. 1

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

SAMEX communication kit

This report constitutes the deliverable *D8.4 SAMEX communication kit*. SAMEX includes a dedicated work package on Communication, Dissemination and Education. A core objective is to pro-actively engage the relevant stakeholders, to obtain more buy-in from the general public with respect to the steelmaking sector and to tailor communication and dissemination activities of the project results. In parallel, SAMEX targets key education programmes aimed at the SAMEX partners, the EIT RawMaterials Members, policy makers and the wider S/T community.

The SAMEX communication kit consist of a general, corporate presentation (ppt) as well as a poster. These will be used by SAMEX partners to present the project at relevant workshops, meetings etc. The corporate presentation is attached as Annex 1 to this deliverable. The corporate poster as Annex 2. They are also available on the SAMEX website (https://eit-samex.eu/)

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Annex 1: SAMEX corporate presentation

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SAMEX

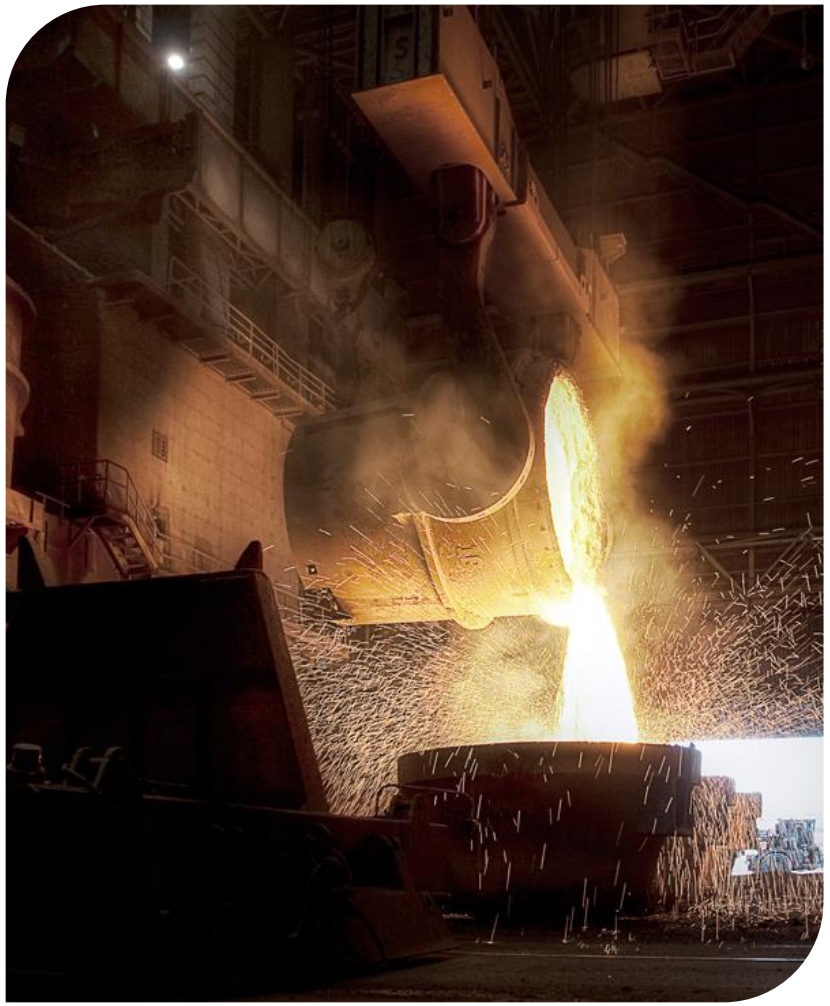
tecnalia Inspiring Business

ArcelorMittal

KU LEUVEN

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**

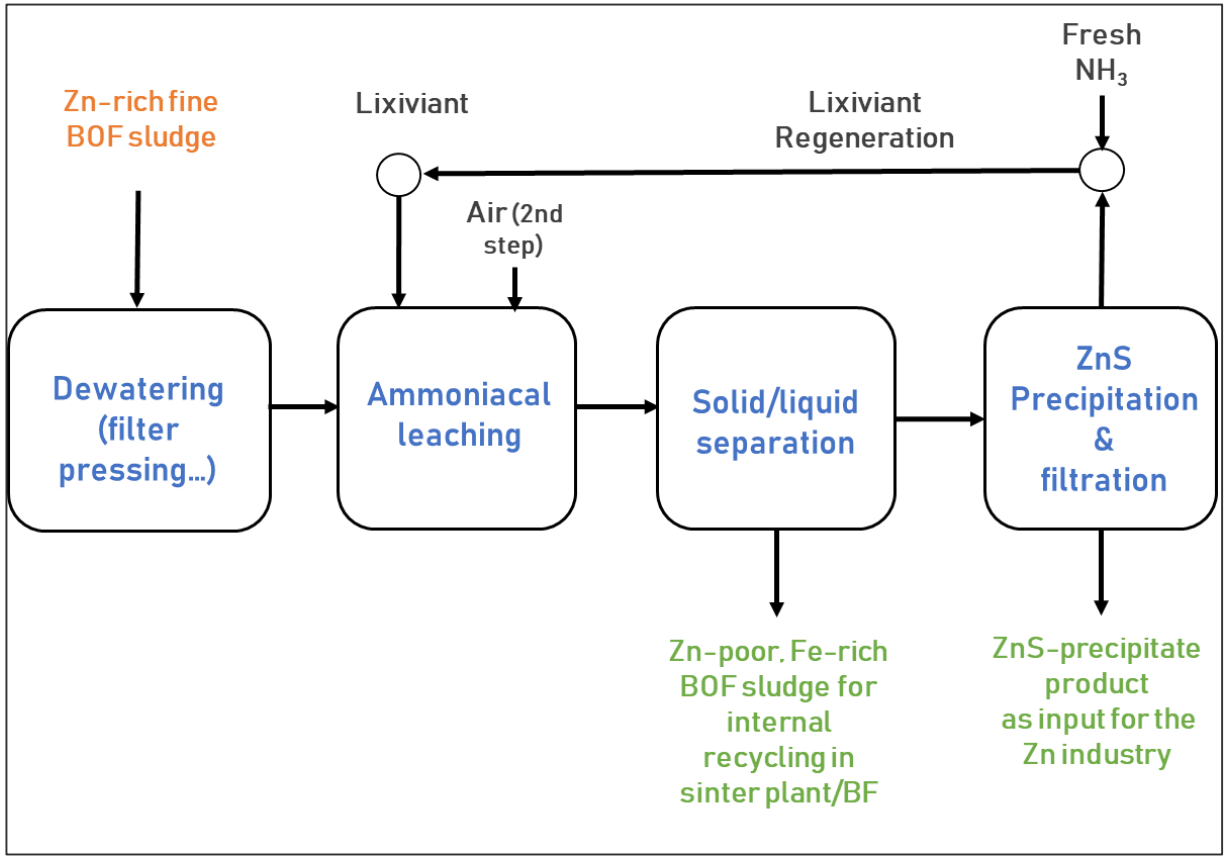


Picture: BOF furnace. Source: AM

SAMEX process allows valorisation of fine BOF sludge

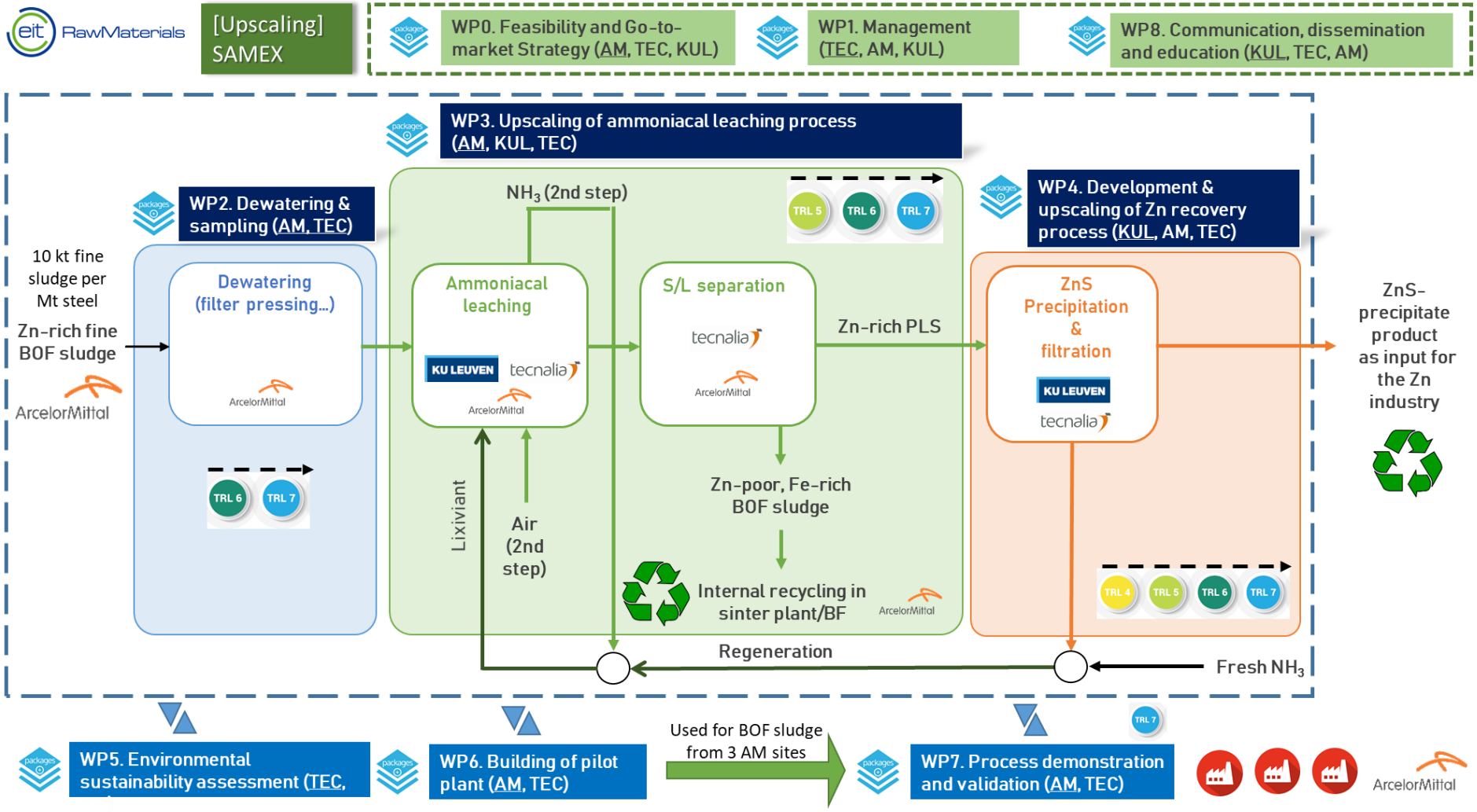
Previous to SAMEX, ArcelorMittal developed, in collaboration with KU Leuven, an **ammoniacal leaching process:**

- ✓ 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



EIT SAMEX project: an industrial pilot for BOF sludge valorisation

- ✓ 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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SAMEX

Supported by:

eit RawMaterials

Connecting matters

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Annex 2: SAMEX poster

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

supported by: eit RawMaterials Connecting matters

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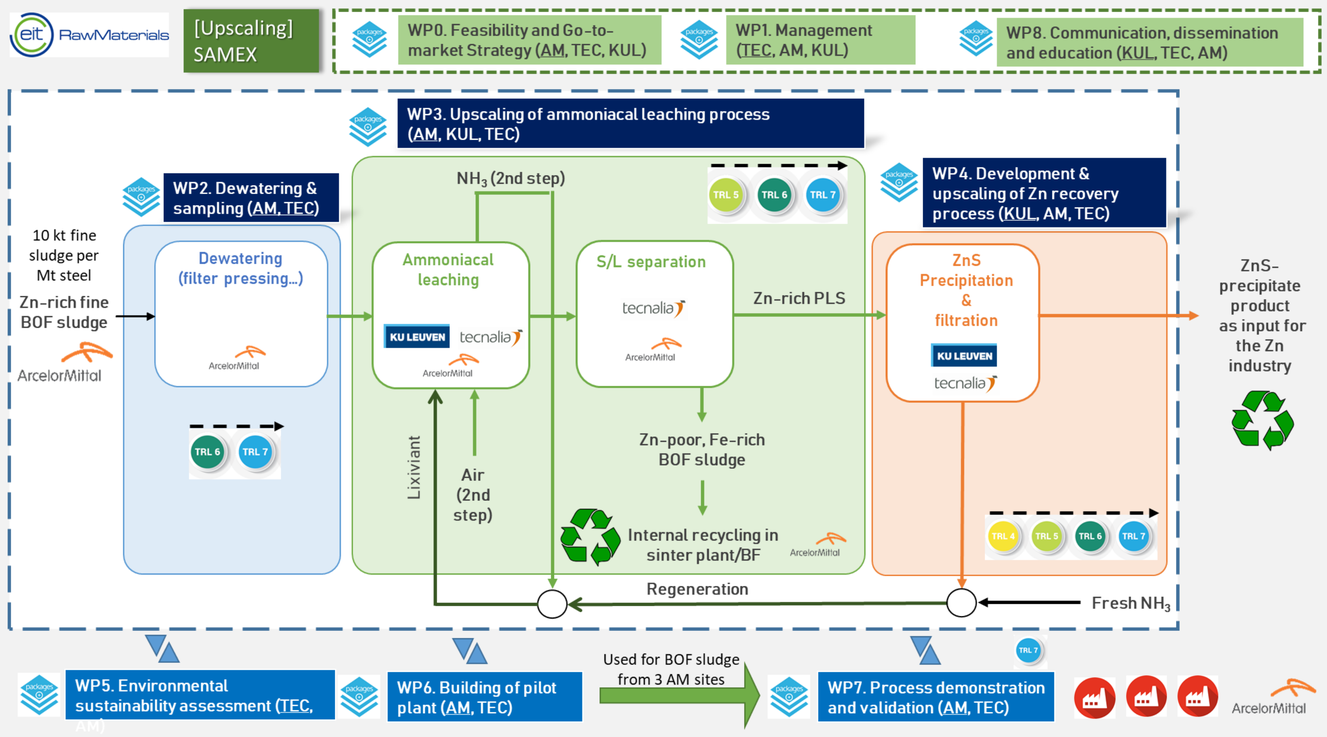
Photo: ArcelorMittal – Bremen

- For **each million tonne of steel** ArcelorMittal (AM) produces, it also generates on average **10,000 tonne** of zinc-rich **fine Basic Oxygen Furnace** (BOF) sludge.
- In contrast with coarse BOF sludge, which is already internally recycled by ArcelorMittal (via sinter plant to 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.
- As a result, ArcelorMittal either **internally stores these sludges or is forced to landfill them**.

- ArcelorMittal developed, in collaboration with KU Leuven, an **ammoniacal leaching process**. The process selectively extracts zinc from the sludge while leaving behind most iron.
- If the zinc content is low enough, the **cleaned, iron-rich residue can be fed to the BF**, representing major iron cost savings.
- Concurrently, the leached zinc is precipitated as **zinc sulphide** which serves as a feed for the zinc industry.
- In EIT Raw Materials SAMEX, Tecnalia (Spain), ArcelorMittal (Spain) and KU Leuven (Belgium) will **upscale the ammoniacal leaching process and the zinc recovery process to TRL7**, aiming to engineer and build a pilot plant.



Pictures: KU Leuven 1 L and 5 L reactors (left), Tecnalia 100 L reactor (centre) and Tecnalia filter press (right) used for intermediate upscaling steps

- 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.
- 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).
- Furthermore, **other sludge producers and steelmaking companies** will be able to **benefit** from the results generated in the project.

Partners in SAMEX consortium

tecnalia Inspiring Business
ArcelorMittal
KU LEUVEN

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