

Life Cycle Assessment

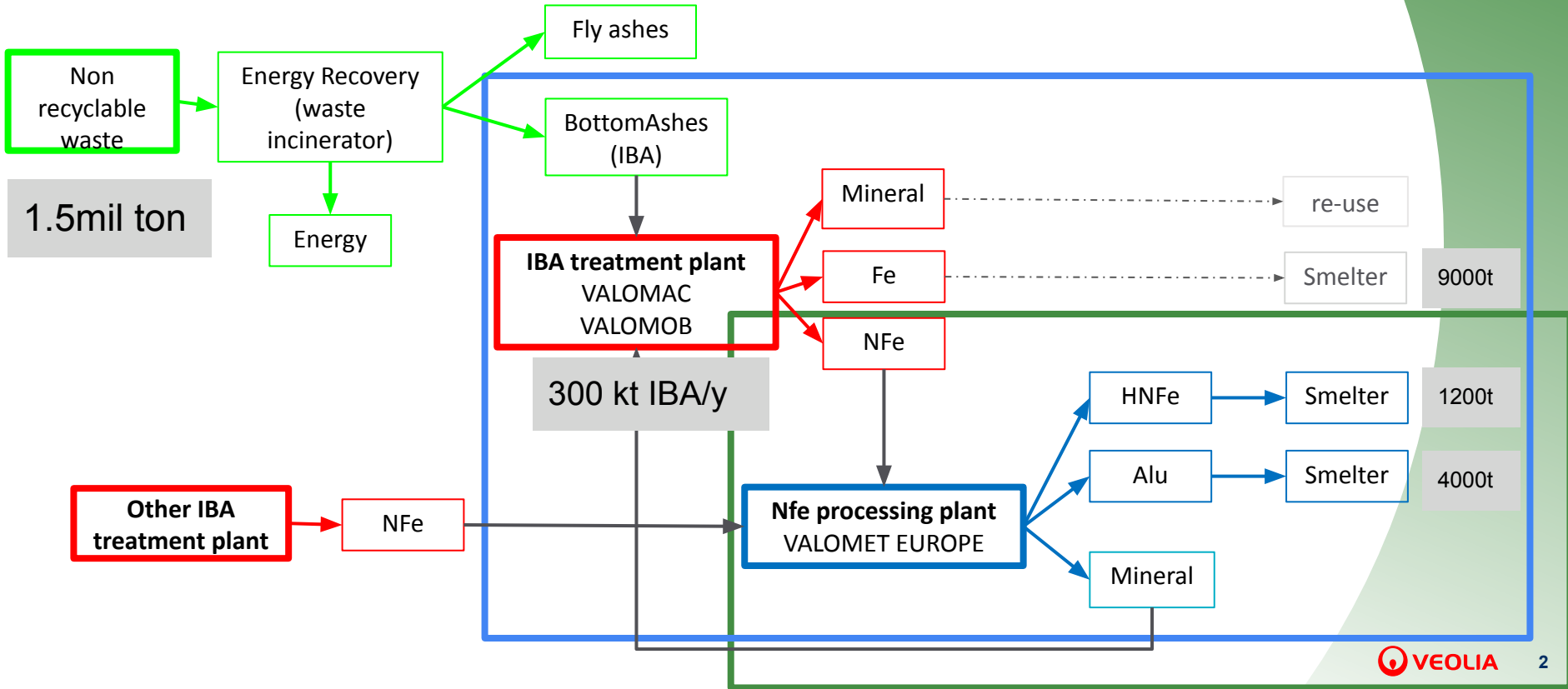
@ Veolia Treatment
& Recycling

A user experience



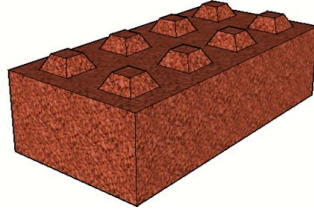
Refuse > Reduce > Reuse > Repair > Recycle >

Recover & Re-introduce



Recover the unrecoverable?

- Certified **Aggregates**
- Recovered **Ferrous**
- Recovered **Non-ferrous**



But does it make sense?



Life Cycle Assessment

Why?

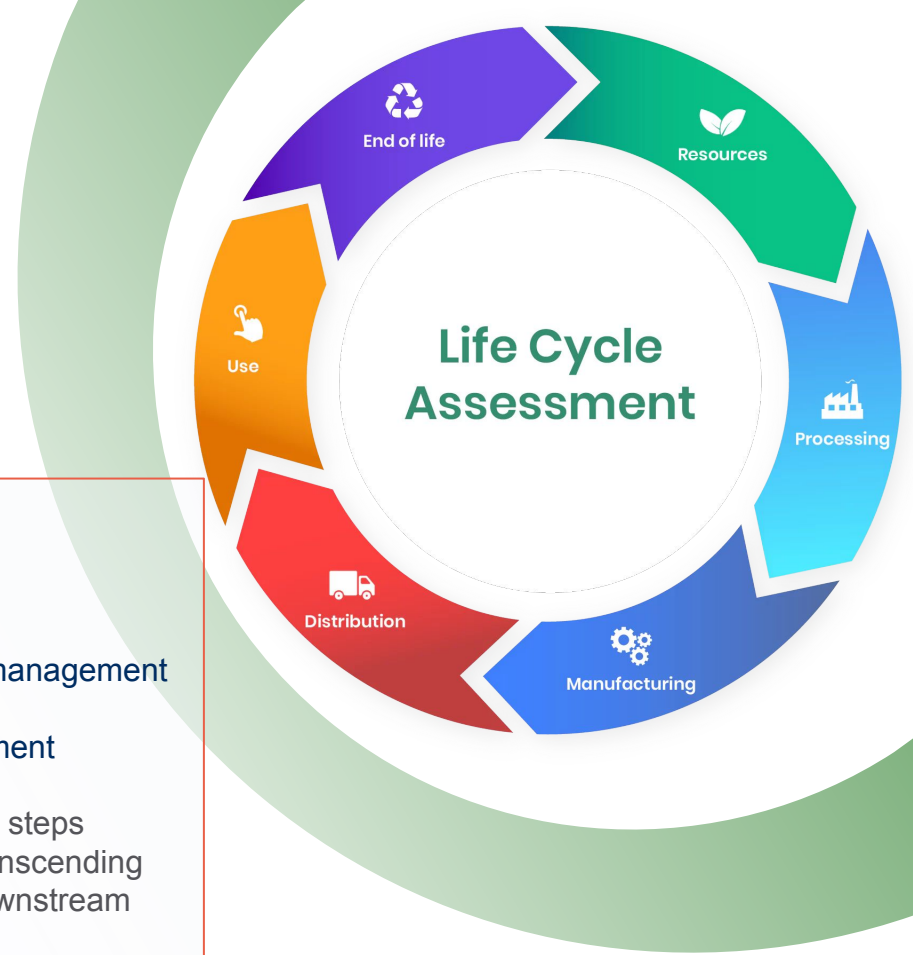
- Identify **own emissions**
- Recovery impact: **avoided emissions**
- **Living Tool** to communicate to client and customer specific
- **Verifiable** and **auditable**

Challenges?

- Traceability
- Data & inventory management
- Variation management

between process steps
sector/activity transcending
interlinked up/downstream

Overcome the data gap!



Our approach

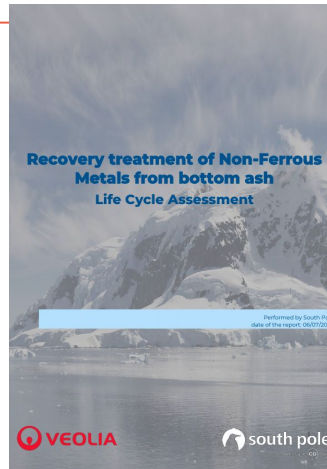
Evaluation of the **environmental impact** of the recovery and recycling of Non-ferrous metals coming from incinerated bottom ashes by **life cycle assessment** realized by the expert company “**CO2 logic - South Pole group**” using **ISO 14040** and **ISO 14044** standards.

2 deliverables

1. A report of the LCA
2. A tool to calculate the environmental impact of each non-ferrous metal batch processed at Veolia Valomet

Deliverables **audited and verified** by the independent party “**Vinçotte**”:

- Voluntary initiative
- Living tool: yearly update and verification



The image is a screenshot of an Excel spreadsheet titled "230823_Tool LCA Valomet_CO2logic_verified". The spreadsheet contains data for a Life Cycle Assessment (LCA) performed by CO2logic for Veolia. The data is organized into several sections: "Outliers non-ferrous treatment", "Product information", "Treatment unit inputs", and "Treatment unit outputs".

Outliers non-ferrous treatment									
Product information									
Supplier									
Product									
End of treatment									
End of treatment									
Total emissions GHG (t)									
GHG avoided dry matter (t)									
Treatment unit inputs									
Product	Ratio (%)	Mass (t)	Price (€/t)	Total (€)	(%)	(€/t)			
Aluminium	35.87%	0.35	2 350.00 €	822.50 €	74.35%	5.83			
Heavy metals	15.27%	0.15	4 500.00 €	675.00 €	74.35%	4.57			
Waste	48.86%	0.49	303.84 €	148.20 €	11.30%	4.58			
Total	100.00%	0.99	5383.4 €	1482.0 €	89.32%	4.58			
Treatment unit outputs									
Treatment		0.00	1482.0 €	1482.0 €					
Total				1482.0 €					
Results									
Price per ton:				1 482.00 €					
INFORMATIONS CONTACTS									
VEOLIA Treatment & Recycling NV/SA									
Head Office									
Head Office Belgium (HQ/ops)									
Tel: +32 (0) 2 719 18 11									
Tel: 00 3439 713 000									

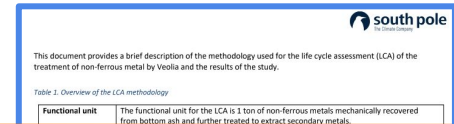
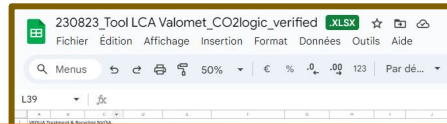
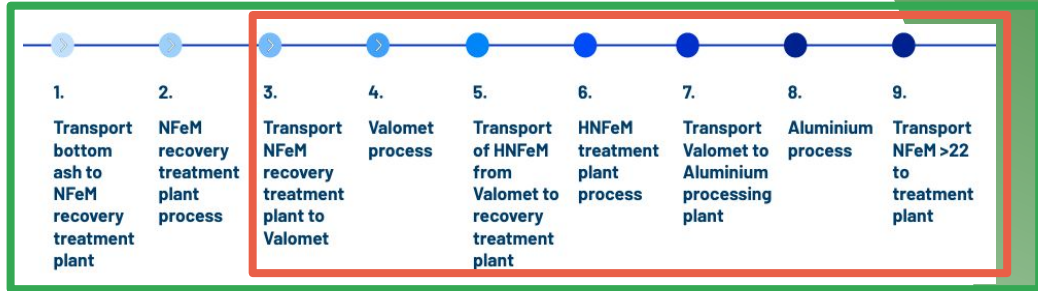
Veolia IBA value chain & scope?

LCA scope including IBA processing : communication with Valomac's clients (IBA producers)

LCA scope excluding IBA processing: communication with Valomet's clients (NFe producers)

LCA certificate based on process data: communication to Valomet's customers (purchase & reuse)

Quick use Tool, verified and audited: impact quantifiable per client, per batch.



Data quality & traceability!

Treatment unit data				Assumed input by client (provided by)	
Product	8400.762	90.00	7941.076	79	300000
Aluminium	38.00%	0.25	1.180.000	420.00	4.22
Other metals	22.00%	0.22	4.400.000	670.00	1.27
Residuals	44.44%	0.40	30.00	11.00	
Total	138.00%	0.87			4.49
Residuals		0.00	100.00		
Total			100.00		
Residuals per ton			1.000.79		

Complete any missing datasets needed for the modeling.

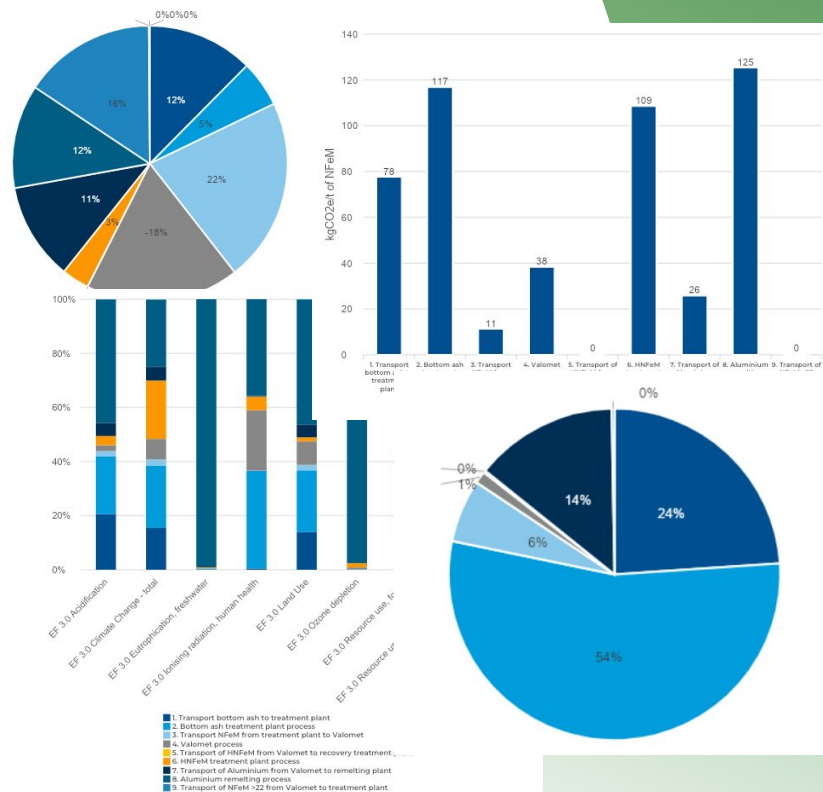
Allocation	The metal recovery treatment of bottom ash produces different co-products (one of them being the non-ferrous metals which is the flow of interest in this study). Impacts were allocated to the different co-products based on an economic allocation.
Impact characterization methodology	Environmental Footprint v3.0.
LCA software	Gabi v.10.7.0.183
LCA practitioner	Manon Willems: CO2logic, part of South Pole m.willems@southpole.com
Critical reviewer	Raimoes Stercks, Vinçotte

Table 2: LCA results

Environmental impact indicator	Unit	Total (per functional unit)
Acidification	Mole of H+ eq.	2.02E+00
Climate Change - total	kg CO2 eq.	5.23E+02
Eutrophication, freshwater	kg P eq.	1.72E-01
Ionising radiation, human health	kg U235 eq.	4.23E+01
Land Use	PE	2.26E+03
Ozone depletion	kg CFC-11 eq.	1.18E-05
Resource use, fossils	MJ	6.94E+03
Resource use, mineral and metals	kg Sb eq.	4.52E-02
Water use	m³ world equiv.	1.94E+02

Avoided Co2? Or is there more to it?

- LCA makes **all environmental contributions** apparent and transparent
- Allows to **identify** high impact actions and improvements!
- Set **clear targets**: examples
 Decrease own emissions?
 e.g Transport
 Environmental impact?
 e.g Water
 Increase impact avoided emissions?
 e.g recovery rate < 125µm
- **Traceability** throughout the value chain
- **Annual Update**: impact -8% decreased emissions



LCA + Tool: Veolia business case example

VEOLIA Treatment & Recycling NV/SA
 Boulevard Poincaré 78-79
 1060 Saint - Gilles
 Tel. : +32 2 370 66 11
 Fax : +32 2 334 36 17
 TVA : BE 0459 711 605



Send your invoice directly to :
 be.ves.invoice@veolia.com
 kevin.ancia@veolia.com

Batch number : [REDACTED]

Outturn non-ferrous treatment

Product information

Supplier : [REDACTED]
 Product : Non Ferro
 End of delivery : 6/5/2024
 End of treatment : 6/10/2024
 Total delivered qty (t) : 107,340
 Delivered dry material (t) : 100,107

Treatment and yields

Product	Ratio [%]	Mass [t]	Price [€/t]	Total [€]
Aluminium	30,45%	30,49	874,00 €	26.645,59 €
Heavy metals	10,31%	10,32	7.233,25 €	74.673,56 €
Residues	59,23%	59,30	-30,00 €	-1.778,90 €
Total	100,00%	100,11		
Treatment		107,34	-140,00 €	-15.027,60 €

Avoided impact on GWP compared to primary production of metals*		Emissions due to the process within the scope
[%]	[tCO2e]	[tCO2e]
-93,68%	-276,61	16,10
-76,12%	-93,84	17,36
		0,25
-88,27%	-369,46	33,72

CO₂logic and Vinçotte logos

LCA analysis and tool developed by CO₂Logic and approved by Vinçotte. *Avoided impact comparison including IBA processing step.

Total 84.512,64 €

Revenue

Revenue per ton : 844,22 €

- Between **2,5t - 4,5 tCO₂e emission avoided for 1t NFe processed on Valomet** due to less energy-consuming processes on recycled materials compare to processes on raw materials
- Corresponding to **0,15 - 0,27 tCO₂e emission avoided for 1t IBA processed on Valomac**.

THANK YOU

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