

# Reuse and recycling of steel by-products in construction: State of art and future perspectives

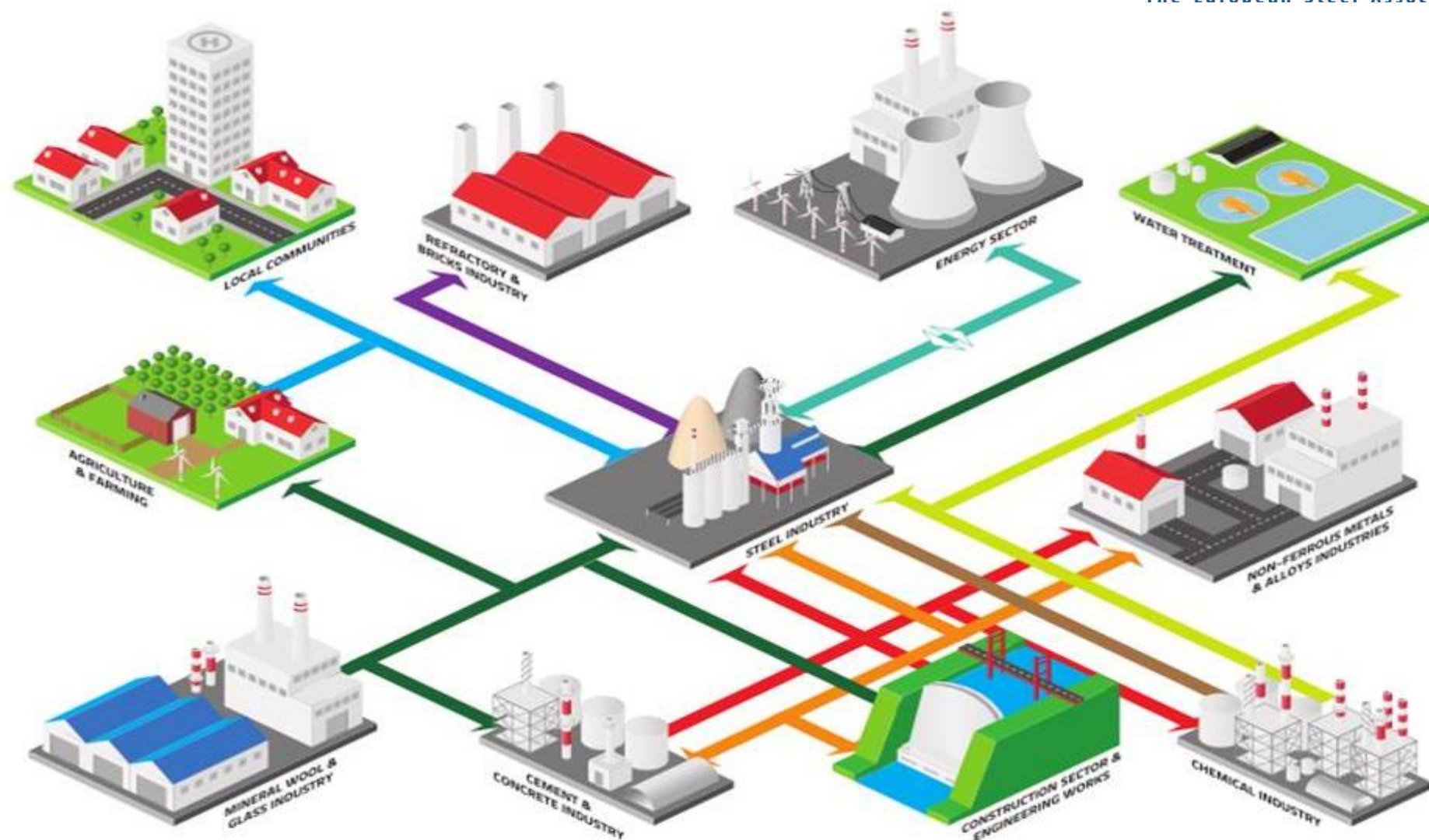
Aurelio Braconi

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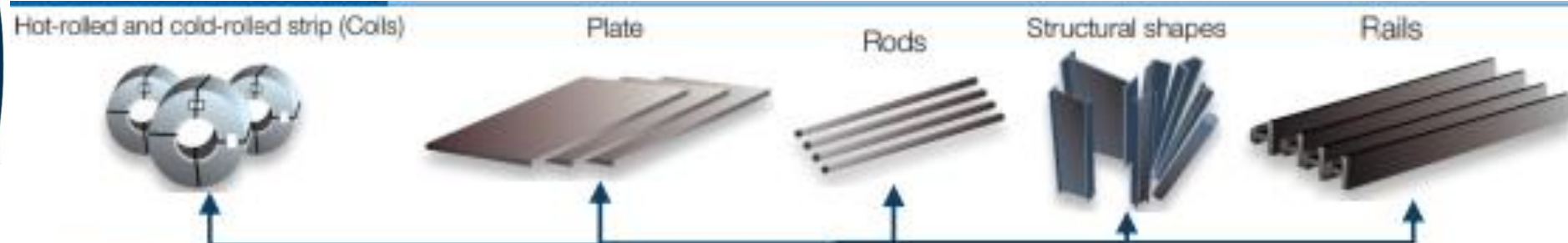
#EUCircularTalks



*The steel sector is  
part of an  
industrial eco-  
system*



- |                              |                     |
|------------------------------|---------------------|
| ■ Used bricks & refractories | ■ Chemical compound |
| ■ Mill scale & iron oxide    | ■ Dust              |
| ■ Process gases              | ■ Heat              |
| ■ Sludge                     | ■ Ferrous slag      |



Air Cooled Slag

Granulated Slag

Basic Oxygen Slag

Secondary Steel Slag

Electric Arc Furnace Slag

*The ferrous slag is the main stream co-generated with steel*

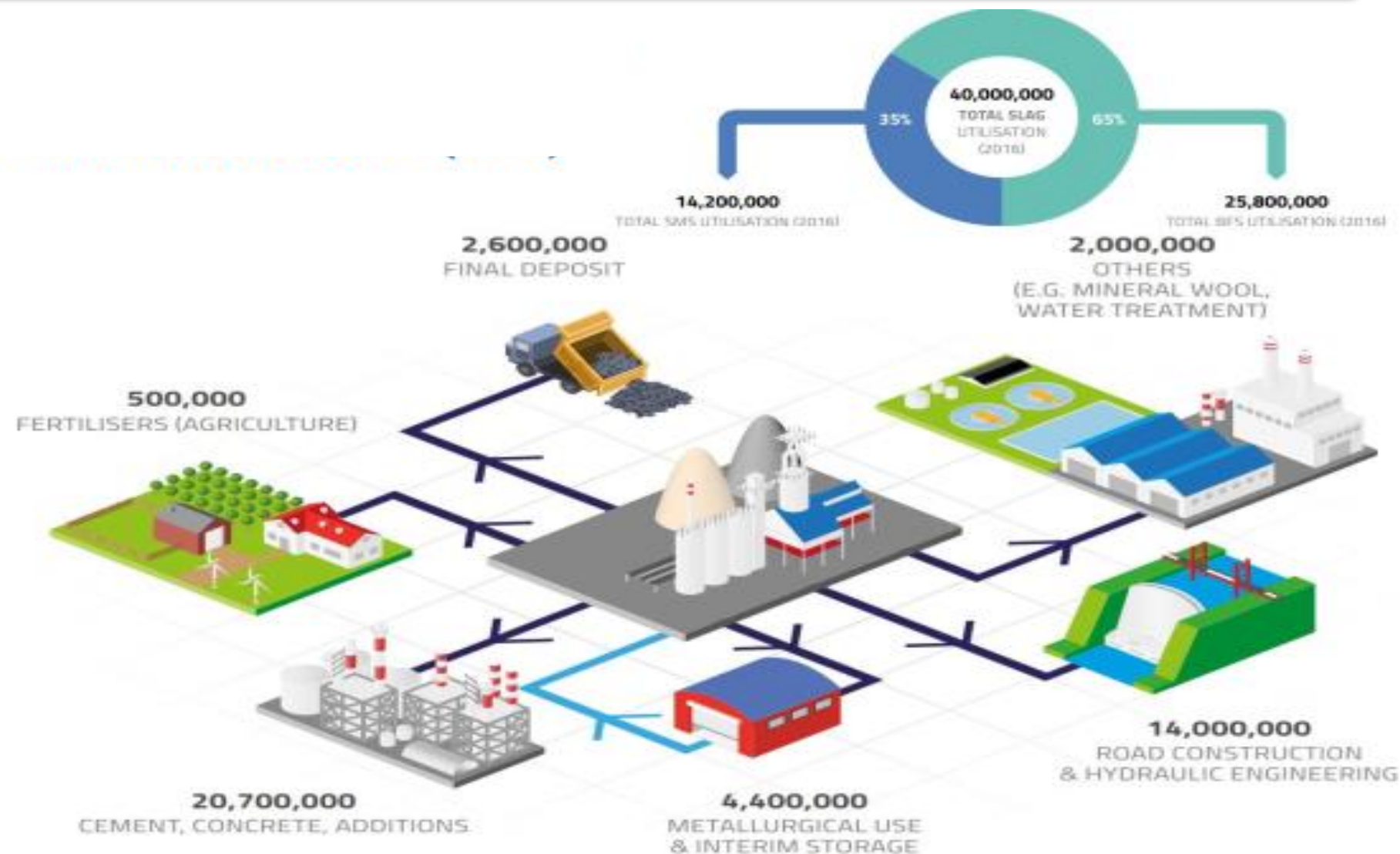


■ Production in 2016

Steel: 158,800,000 t;

**Ferrous Slag: 48,100,000 t**

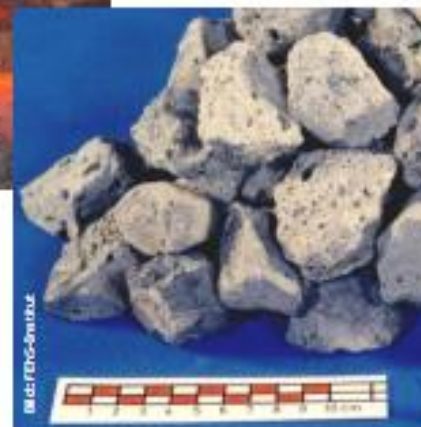
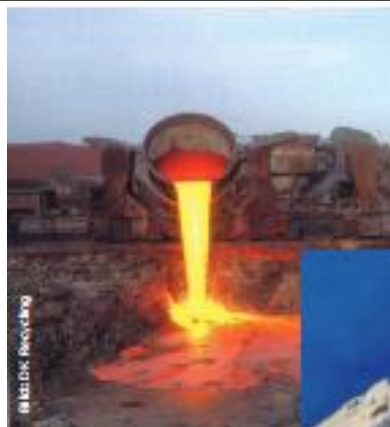
## *The ferrous slag within the Circular Economy*



Properties of ferrous slag controlled and designed during the production as for a product

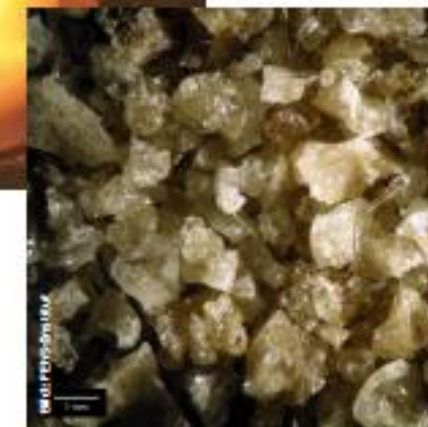


		No treatment	Alumina treatment	Alumina + Lime treatment	Optimal treatment
Adding	Alumina		↑	↑	↗
	Lime			↑	↗
Leaching	Chromium	↑	↓	↓	↓
	Vanadium		↑	↓	↓
	el. conductivity			↑	↓



**Air cooled BFS**

- 100% crystalline
- Inert



**Granulated BFS**

- Almost 100% glazed
- Latently hydraulic



**EAF Slag**

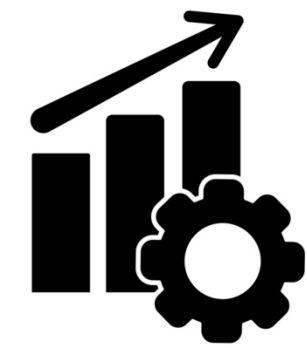
- Water granulation
- Highly glazed





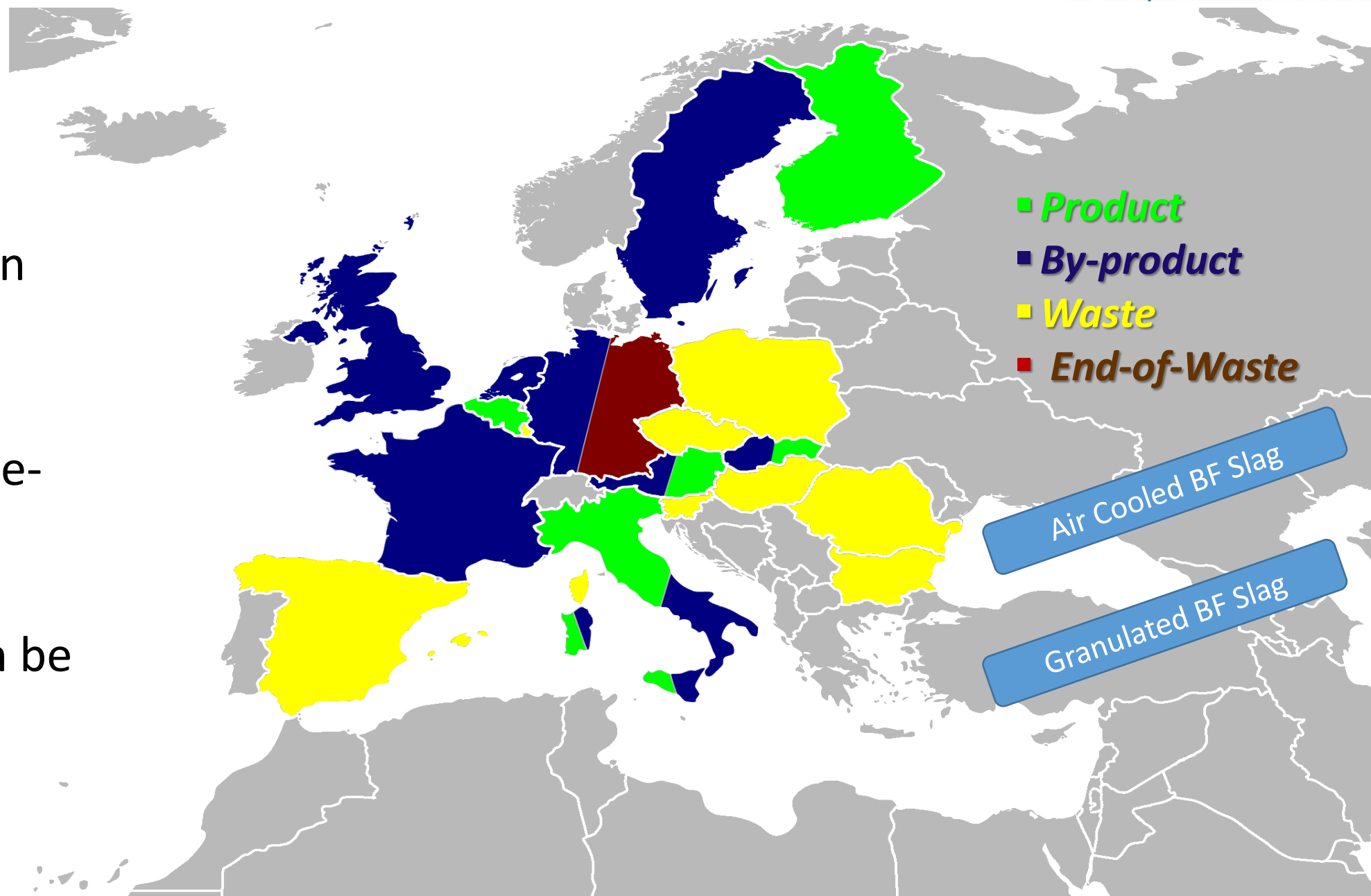
- Ferrous slag (GBS, ABS, EAFS) properties have a very good fit with most of construction and engineering works

## Legislation – Properties – Expected performance



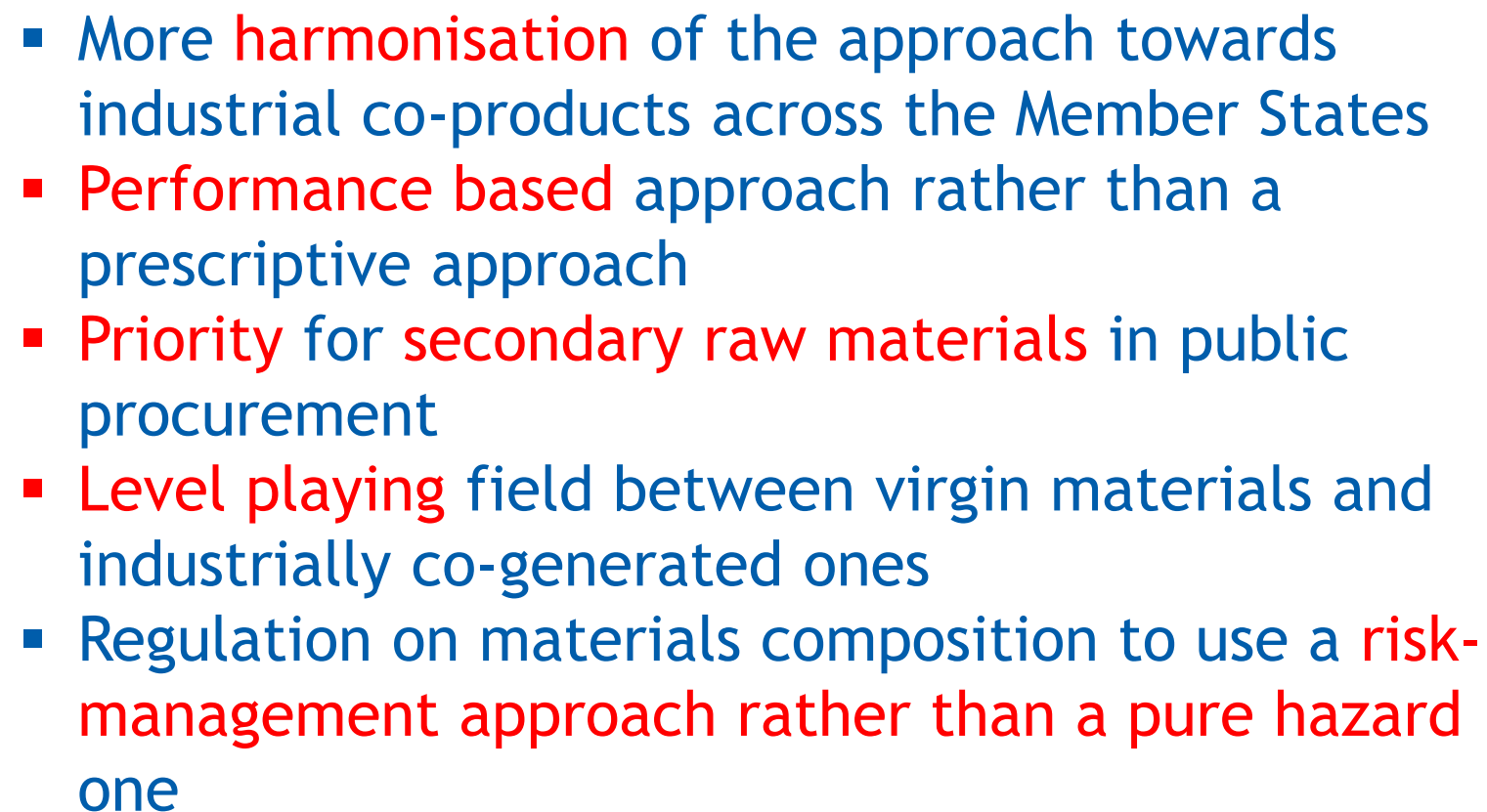
- The ferrous slag in practice is a by-product (i.e. a product)
- EU and national procurement instruments (no level playing field)
- Pure precautionary principle on classifying materials
- The properties of the ferrous slag can be properly designed
- The material is REACH registered (not-hazardous substances)
- Scientific evidences show that there is no real risk
- The cooperation between producers and users is essential
- Technical guidance to ensure the match: material ↔ utilisation
- Methodological (use) guidance for contractors


- No harmonisation
- Different legal interpretation
- Actual legal framework not fit for circularity
- The situation can be substantially improved





## What is necessary to be done?





**NEUVES MAISONS**

Chemin du Hail du Clos

32 020 Neuves-Maisons

**Fiche de suivi**

**Environnemental**

N° de dossier :

(page 2 sur 2)

**Acceptabilité Environnementale**

<b>Claque</b> Groupe 0 1 2 3 4	Labors Indépendants Guide d'application Octobre 2013 SETRA - référence : 1205																								Usage Type 3/2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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