

The role of slags and other by-products within circular economy in the steel industry

- Slags in Poland
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*ESTEP Focus
Group Circular
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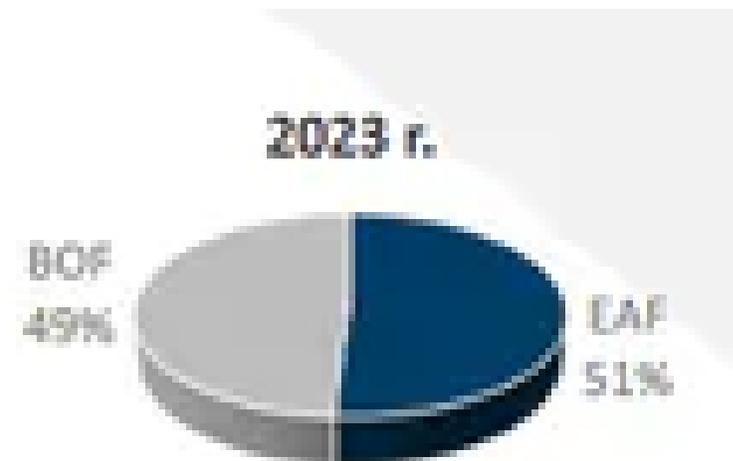
Polish Steelmaking 2023-2024

- Poland:
- 25th worldwide based on crude LST
- 7.1mT of LST pa
- 10.1% y-to-y increase
- Drop over years
 - used to be over 10m LST pa

Rank	Country	2024	2023	%2024/2023
1	China	1 005.1	1 022.5	-1.7
2	India	149.6	140.8	6.3
3	Japan	84.0	87.0	-3.4
4	United States	79.5	81.4	-2.4
5	Russia (e)	70.7	76.0	-7.0
6	South Korea	63.5	66.7	-4.7
7	Germany	37.2	35.4	5.2
8	Türkiye	36.9	33.7	9.4
9	Brazil	33.7	32.0	5.3
10	Iran	31.0	30.7	0.8
11	Viet Nam (e)	22.1	19.2	14.9
12	Italy	20.0	21.1	-5.0
13	Taiwan, China (e)	19.1	19.1	-0.3
14	Indonesia (e)	17.0	16.8	0.9
15	Mexico (e)	13.7	16.4	-16.5
16	Canada (e)	12.2	12.2	0.1
17	Spain	11.8	11.4	3.3
18	France	10.8	10.0	7.6
19	Egypt	10.7	10.4	3.6
20	Saudi Arabia	9.6	9.9	-3.4
21	Malaysia (e)	8.8	7.5	16.9
22	Ukraine	7.6	6.2	21.6
23	Austria	7.1	7.1	0.0
24	Belgium (e)	7.1	5.9	21.1
25	Poland (e)	7.1	6.4	10.1
26	Netherlands	6.4	4.7	36.1

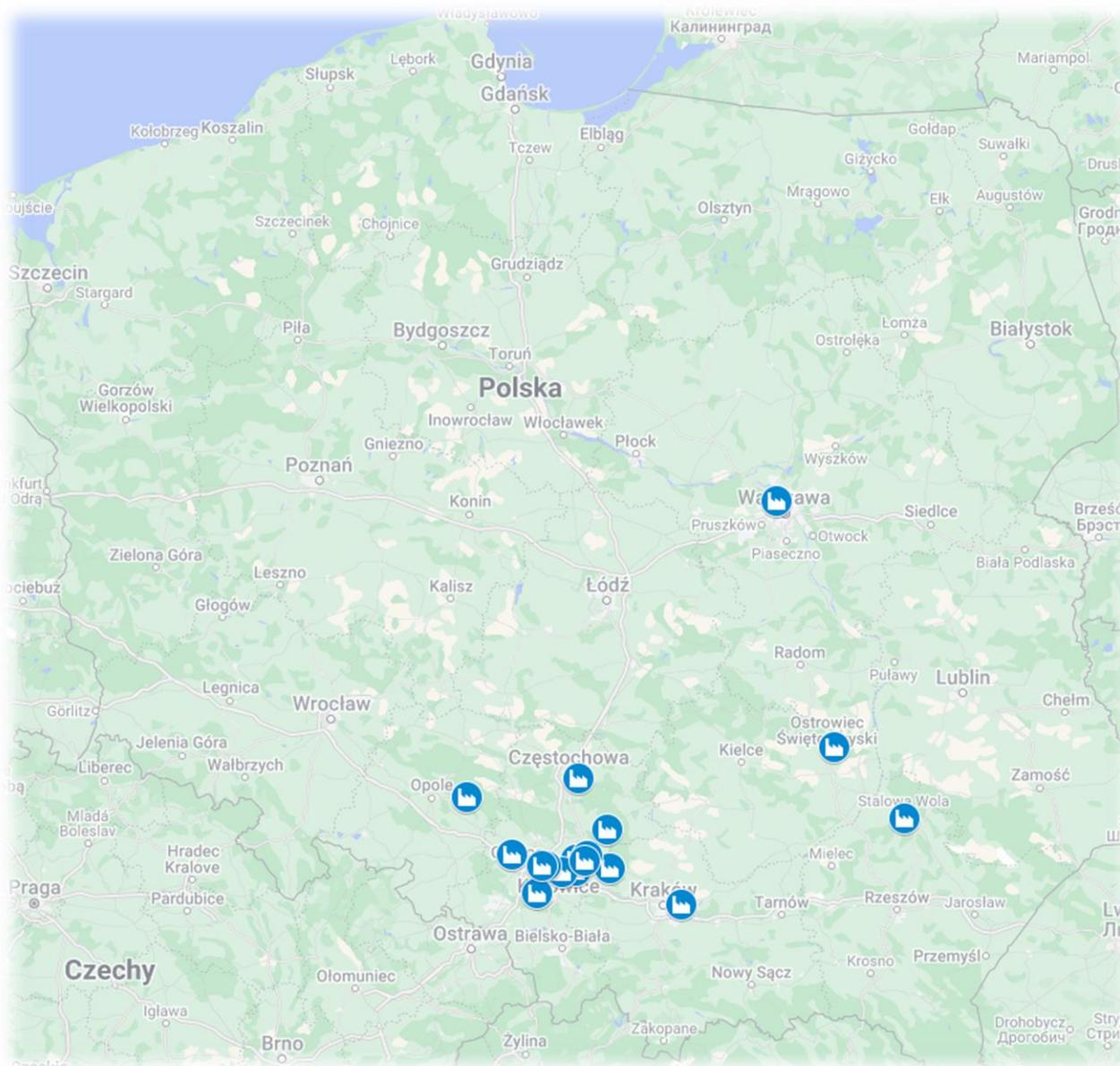
Crude steel making (mT)

- Over 13.000 suppliers and 6.000 customers
- 1 BOF steelshop
- 8 EAF steelshops
- 5 flat rolling mills
- 16 long producer issues Declaration and marks products with CE mark
- rolling mills
- 10 pipe and sections units



Poland is an importer of steel products. This increased after closure of AMK Krakow a few years ago

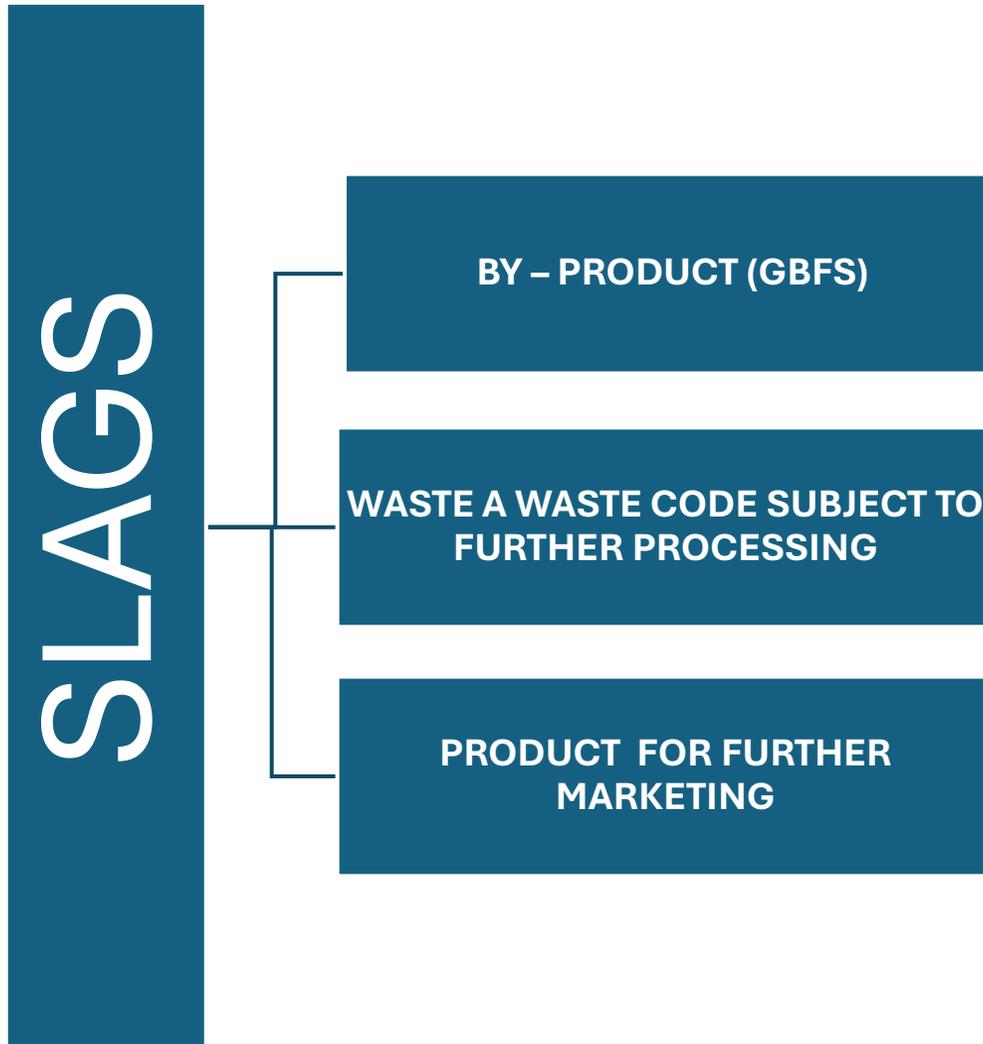
Steel mills mainly located in southern Poland



- Large steel making companies present on Polish steel market:
 - ArcelorMittal
 - CMC
 - Celsa

plus several local companies

Slags classification



Legally, “slag” is classified as waste, which means it is subject to waste regulations.

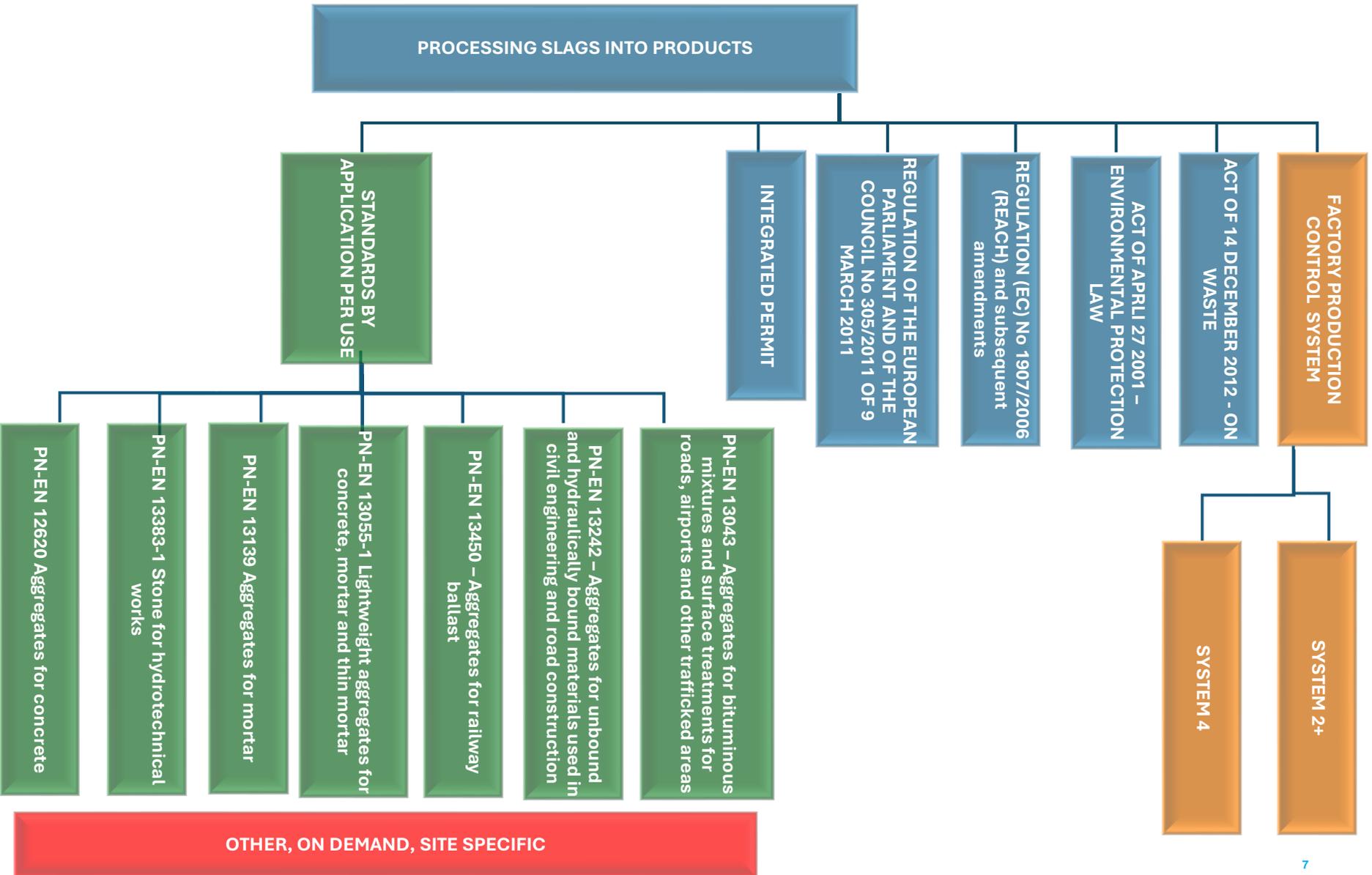
It depends on the Producer what they want to do with the waste they produce.

They include the concept in their waste management permit and manage the waste in this way.

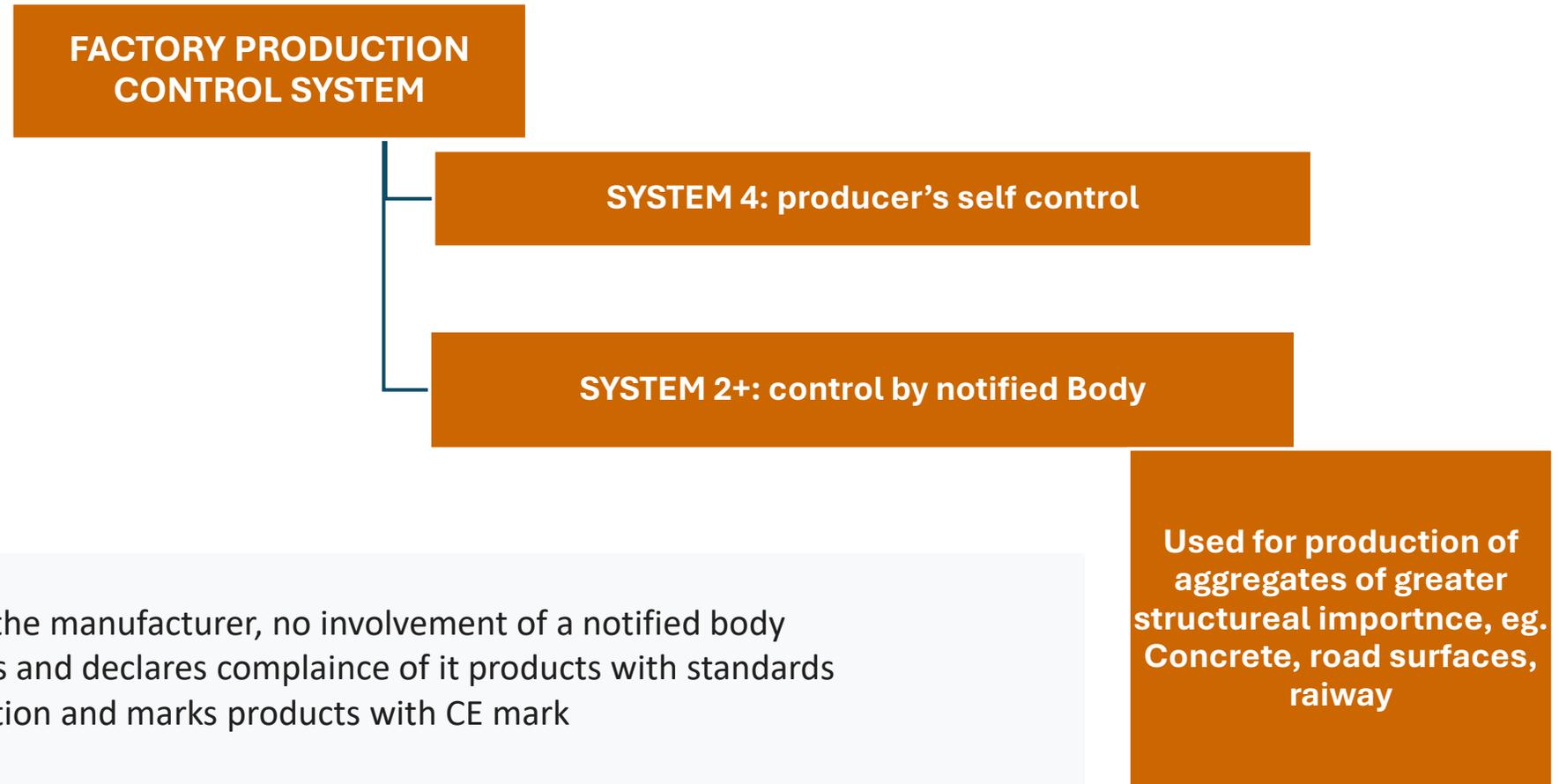
The goal is that slag processing process results in loss of waste status, and wastes are transformed into a product:

- Iron-bearing concentrates of various fractions - recycled to the steel smelting process,
- Metallurgical aggregates of various fractions - a commercial product with the possibility of use for various purposes.

Legal regulations for processing slags into products



Slag aggregates production system



Summary:

- **System 4** complete self-control of the manufacturer, no involvement of a notified body
 - * producer performs tests and declares compliance of its products with standards
 - * producer issues Declaration and marks products with CE mark
- **System 2+** requires supervision of a notified body and certification of the Factory Production Control.
 - * constant supervision by external Officials
 - * producer issues Declaration and marks products with CE mark based on valid certificate
 - * is more demanding and is used for aggregates of critical structural importance.

System 4 is commonly followed for slag aggregates