

MULTIPICK

MIEUX TRIER
POUR MIEUX RECYCLER

Gregory LEWIS, Comet Traitements
Robert BAUDINET, ULiège/Matvision



SALEMA Final Event

AutoWorld Car Museum, March 21st 2024



LE FONDS EUROPÉEN DE DÉVELOPPEMENT RÉGIONAL
ET LA WALLONIE INVESTISSENT DANS VOTRE AVENIR

GROUPE COMET

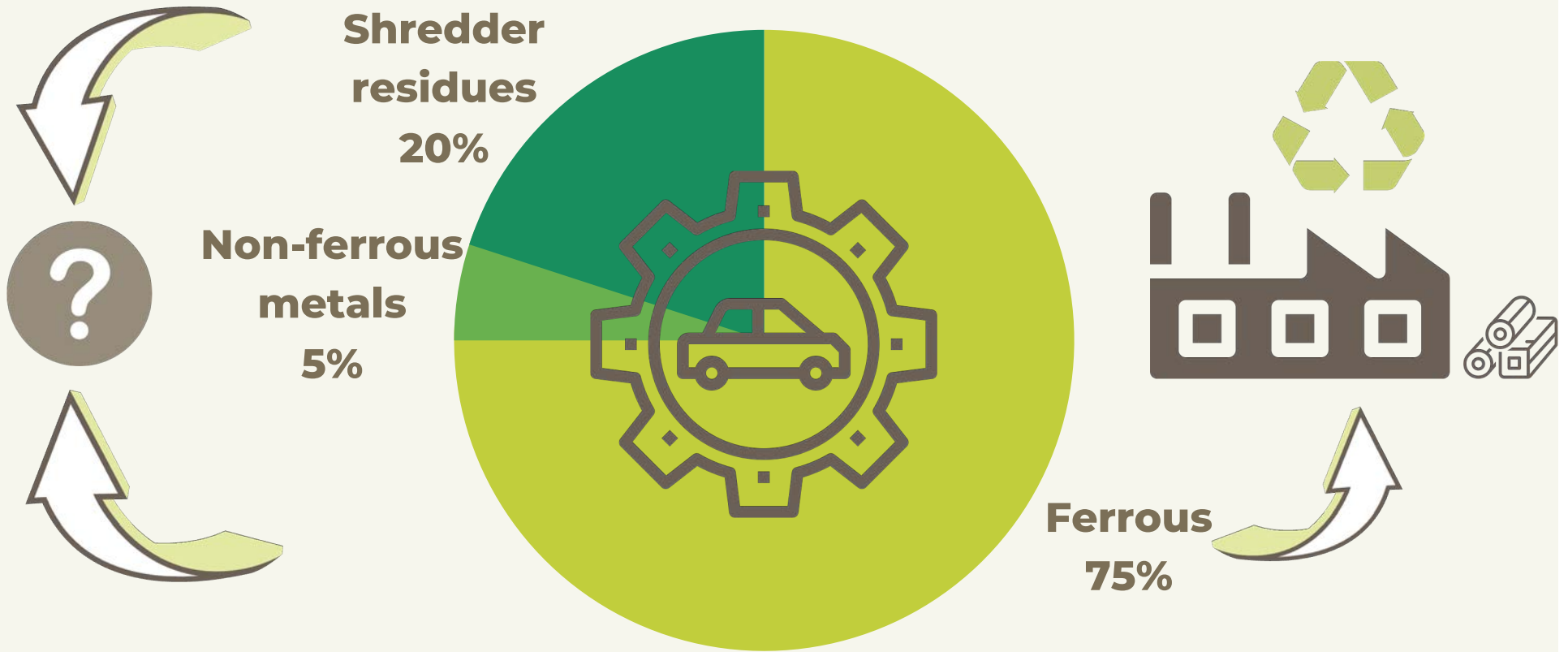


98,4%



The project has received funding from the European Union's Horizon research and innovation programme under grant agreement No 101003785.

1,200,000 tonnes processed per year



SORTING OF THE SHREDDER RESIDUES

Air

Water

**Eddy
current**

...





Shredder residues



Glass



Plastics



Organics...



Non-ferrous metals

Aluminium

Copper

Zinc

Brass



Stainless steel



ENERGY TRANSITION



1	IA																18	VIIIA																	
1	H																2	He																	
HYDROGENE																		HELIUM																	
3	IIA												13	IIIA		14	IVA		15	VA		16	VIA		17	VIIA		18	VIIIA						
2	Li		Be												5	B		6	C		7	N		8	O		9	F		10	Ne				
LITHIUM		BERYLLIUM												BORE		CARBONE		AZOTE		OXYGENE		FLUOR		NEON											
11	22.990		12		24.305												13	26.982		14	28.085		15	30.974		16	32.06		17	35.45		18	39.948		
Na		Mg												Al		Si		P		S		Cl		Ar											
SODIUM		MAGNESIUM												ALUMINIUM		SILICIUM		PHOSPHORE		SOUFRE		CHLORE		ARGON											
19	39.098		20	40.078		21	44.956		22	47.867		23	50.942		24	51.996		25	54.938		26	55.845		27	58.933		28	58.693		29	63.546		30	65.38	
K		Ca		Sc		Ti		V		Cr		Mn		Fe		Co		Ni		Cu		Zn		Ga		Ge		As		Se		Br		Kr	
POTASSIUM		CALCIUM		SCANDIUM		TITANE		VANADIUM		CHROME		MANGANESE		FER		COBALT		NICKEL		CUIVRE		ZINC		GALLIUM		GERMANIUM		ARSENIC		SELENIUM		BROME		KRYPTON	
37	85.468		38	87.62		39	88.906		40	91.224		41	92.906		42	95.95		43	(98)		44	101.07		45	102.91		46	106.42		47	107.87		48	112.41	
Rb		Sr		Y		Zr		Nb		Mo		Tc		Ru		Rh		Pd		Ag		Cd		In		Sn		Sb		Te		I		Xe	
RUBIDIUM		STRONTIUM		YTRIUM		ZIRCONIUM		NIOBIUM		MOLYBDENE		TECHNETIUM		RUTHENIUM		RHODIUM		PALLADIUM		ARGENT		CADMIUM		INDIUM		ETAIN		ANTIMONE		TELLEURE		IODE		XENON	
55	132.91		56	137.33		57-71	La-Lu		72	178.49		73	180.95		74	183.84		75	186.21		76	190.23		77	192.22		78	195.08		79	196.97		80	200.59	
Cs		Ba		Lanthanides		Hf		Ta		W		Re		Os		Ir		Pt		Au		Hg		Tl		Pb		Bi		Po		At		Rn	
CESIUM		BARIUM		Lanthanides		HAFNIUM		TANTALE		TUNGSTENE		RHENIUM		OSMIUM		IRIDIUM		PLATINE		OR		MERCURE		THALLIUM		PLOMB		BISMUTH		POLONIUM		ASTATE		RADON	
87	(223)		88	(226)		89-103	Ac-Lr		104	(267)		105	(268)		106	(271)		107	(272)		108	(277)		109	(276)		110	(281)		111	(280)		112	(285)	
Fr		Ra		Actinides		Rf		Db		Sg		Bh		Hs		Mt		Ds		Rg		Cn		Nh		Fl		Mc		Lv		Ts		Og	
FRANCIUM		RADIUM		Actinides		RUTHERFORDIUM		DUBNIUM		SEABORGIUM		BOHRNIUM		HASSIUM		MEITNERIUM		DARMSTADTIUM		ROENTGENIUM		COPERNICIUM		NIHONIUM		FLEROVIUM		MOSCOWIUM		LIVERMORIUM		TENNESSE		OGANESSON	

LANTHANIDES

57	138.91		58	140.12		59	140.91		60	144.24		61	(145)		62	150.36		63	151.96		64	157.25		65	158.93		66	162.50		67	164.93		68	167.26		69	168.93		70	173.05		71	174.97	
La		Ce		Pr		Nd		Pm		Sm		Eu		Gd		Tb		Dy		Ho		Er		Tm		Yb		Lu																
LANTHANE		CERIUM		PRASEODYME		NEODYME		PROMETHIUM		SAMARIUM		EUROPIUM		GADOLINIUM		TERBIUM		DYSPROSIUM		HOLMIUM		ERBIUM		THULIUM		YTTERIUM		LUTETIUM																

ACTINIDES

89	(227)		90	232.04		91	231.04		92	238.03		93	(237)		94	(244)		95	(243)		96	(247)		97	(247)		98	(251)		99	(252)		100	(257)		101	(258)		102	(259)		103	(262)	
Ac		Th		Pa		U		Np		Pu		Am		Cm		Bk		Cf		Es		Fm		Md		No		Lr																
ACTINIUM		THORIUM		PROTACTINIUM		URANIUM		NEPTUNIUM		PLUTONIUM		AMERICIUM		CURIUM		BERKELIUM		CALIFORNIUM		EINSTEINIUM		FERMIUM		MENDELEVIUM		NOBELIUM		LAWRENCIUM																

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1700



1800



1900



2000



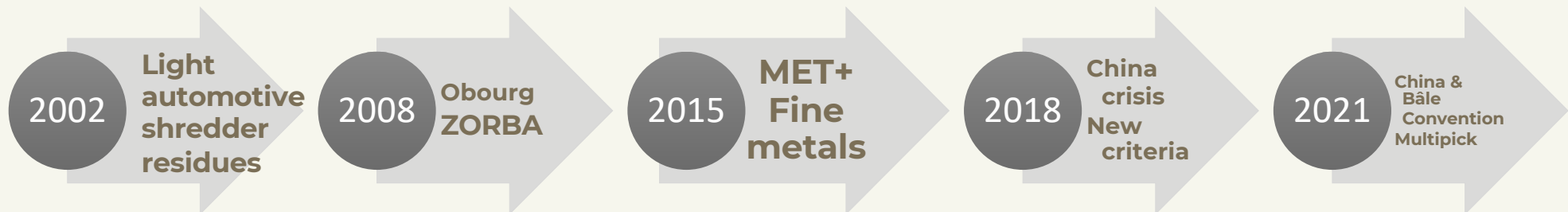
EU & US Zorba resources



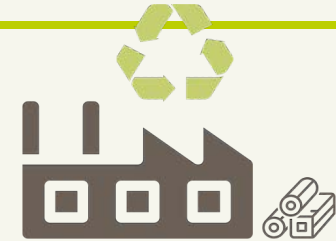
1,5 million tons



Bring metal sorting back in EU



Supply of EU smelters



MULTIPICK

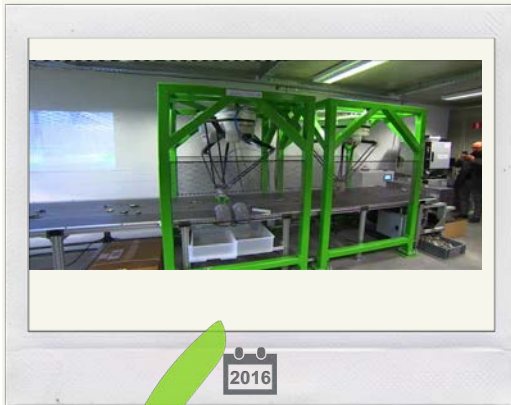
Value creation



Technology showcase

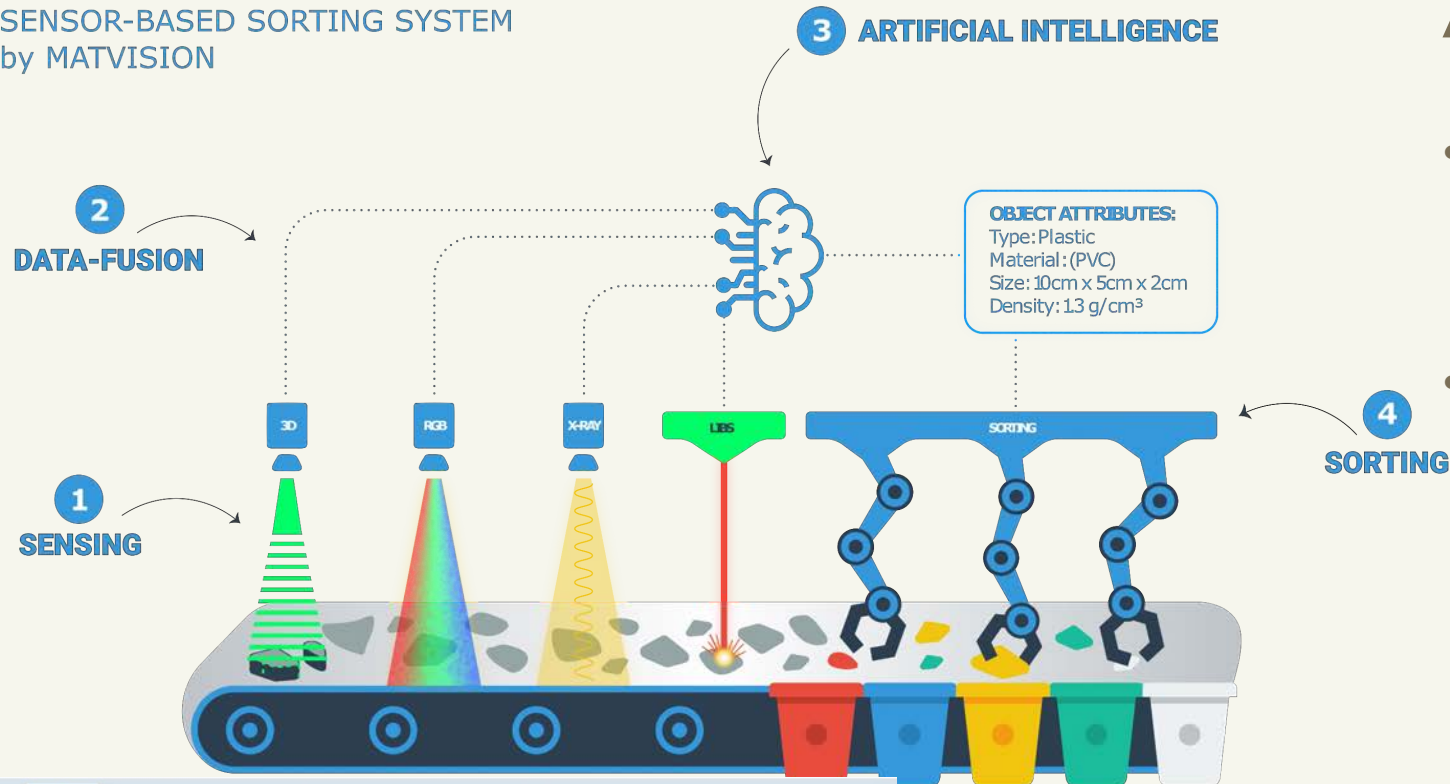


From PICK-IT (2015-2020) to MULTIPICK (2023)



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SENSOR-BASED SORTING SYSTEM by MATVISION



Advantages:

- Allows to assess which subset of sensors suit best a **specific case-study**
- Multi-output sorting with delta-robots => **Number of sorted classes is flexible**



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Al cast



Al wrought



Zinc

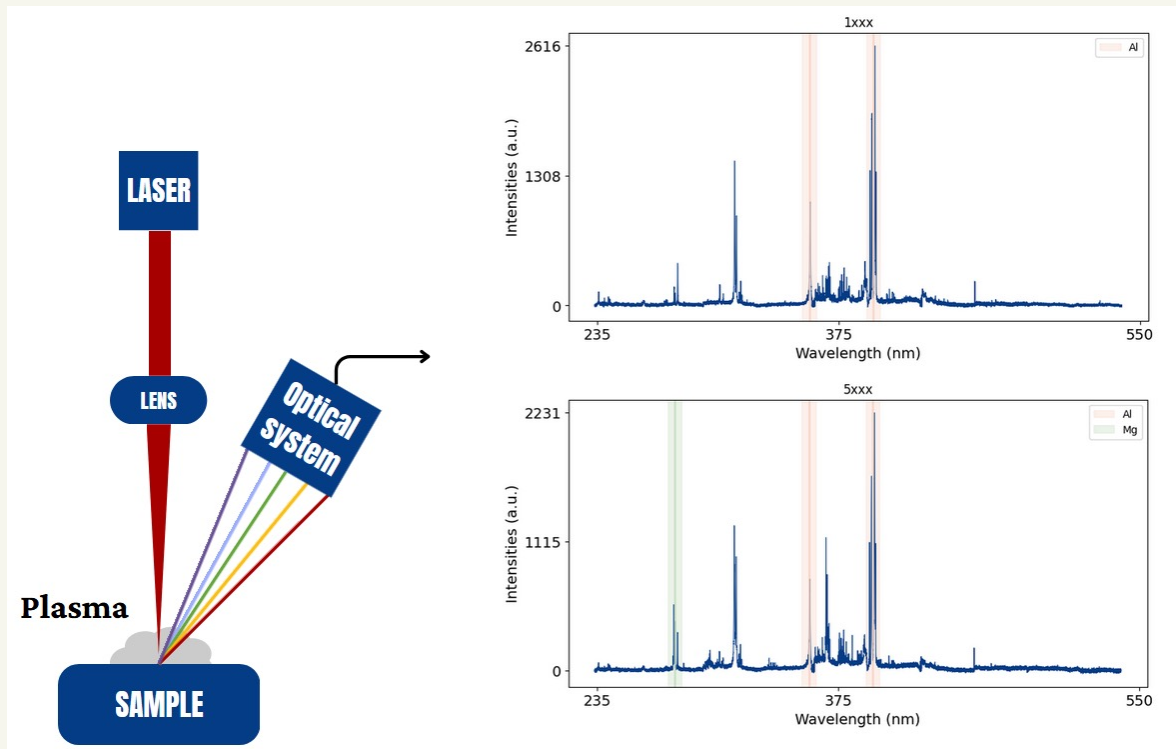


Copper



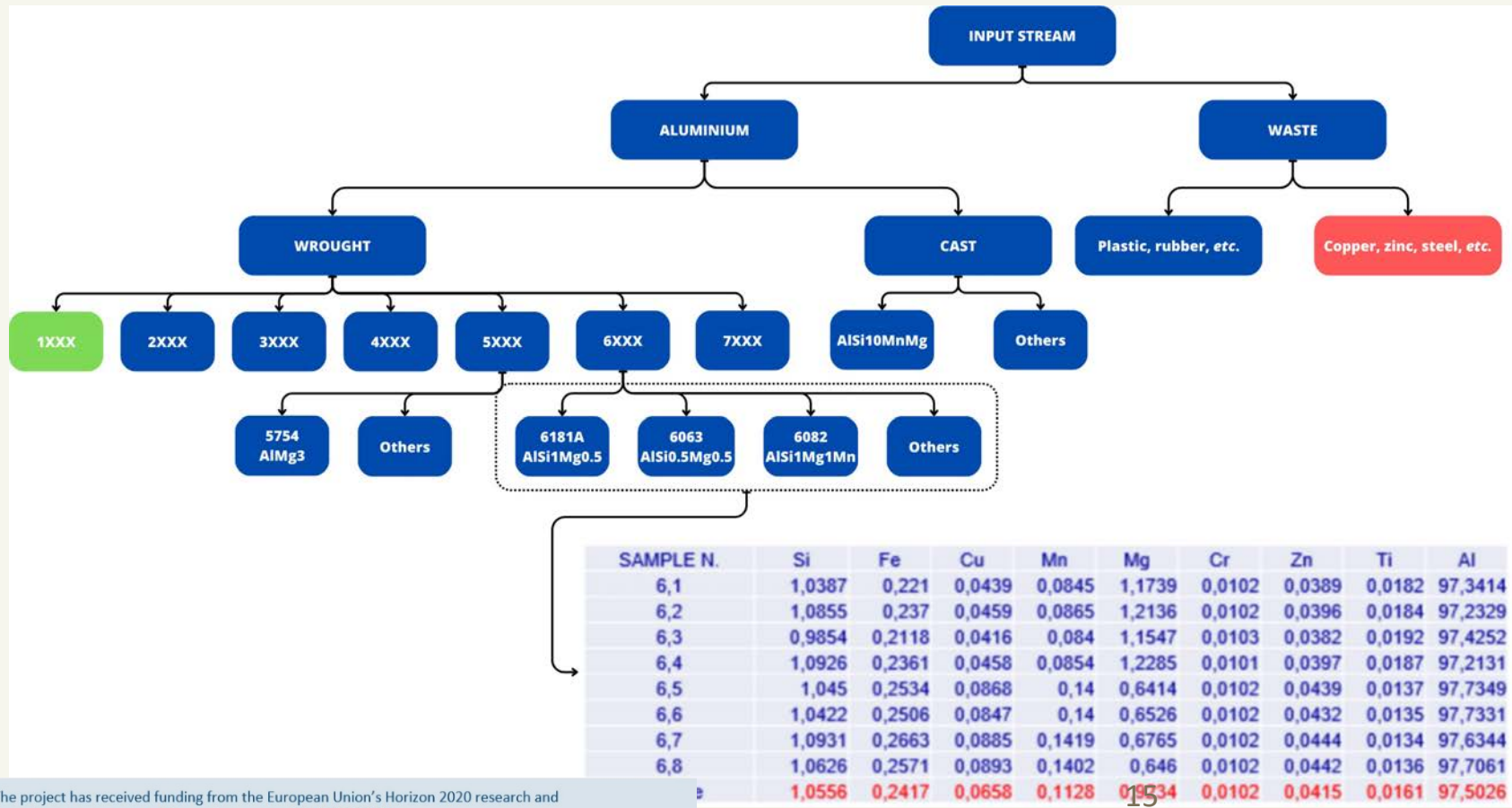
Brass



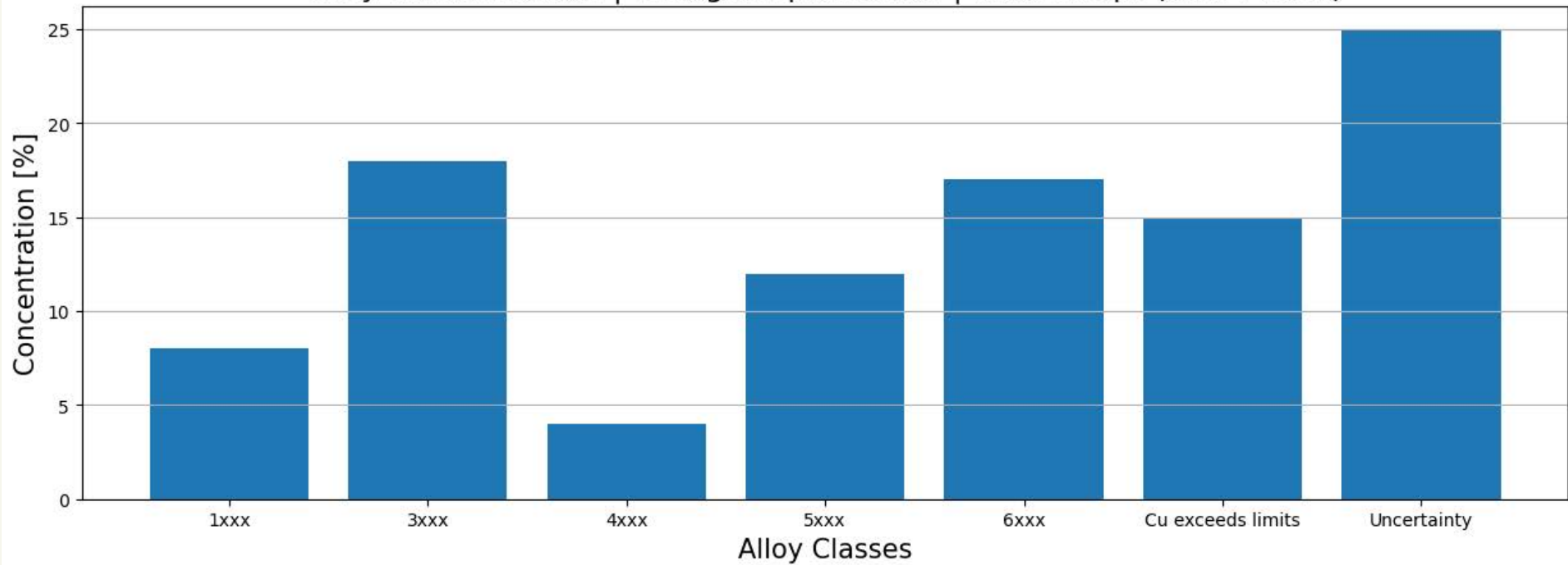


LIBS analysis:

- Sample surface is excited **by a laser**
- **Plasma** is created
- When cooling down, **the plasma emits light**
- This light contains **peaks characteristic of elements present**
- **Optics collect light** and transmit it to a spectrometer

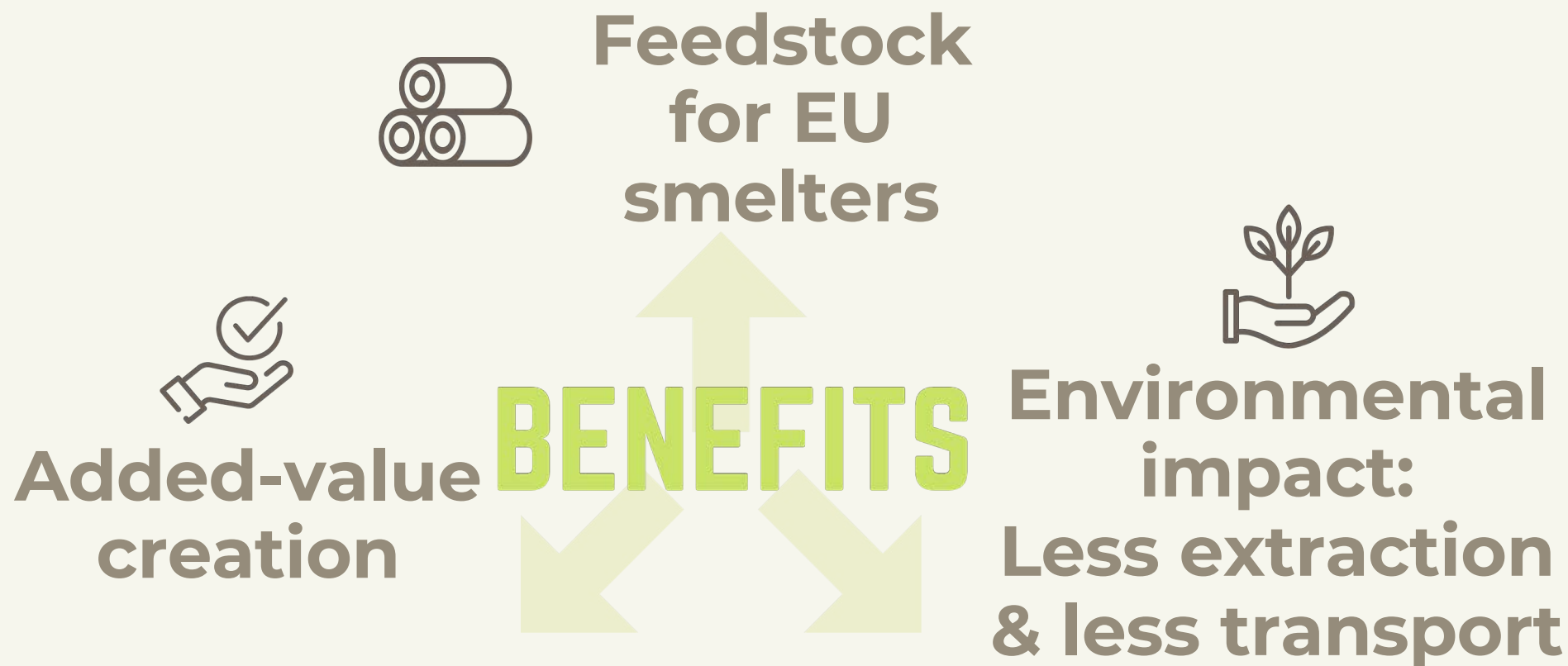


Alloy Concentrations | Wrought input stream | 4200 scraps (05-04-2023)



Challenges

- 1. Increase Labeled Data:** Consider efficient labeling strategies to maximize dataset quality.
- 2. Optimize Class Distributions:** Strive for a balanced and diverse set of classes. Reduce the model uncertainty on new classes.
- 3. Enhance Model Architecture:** Continuously explore and implement advanced model architectures.
- 4. Intensify Model Evaluation:** Conduct thorough evaluations of the model's performance, especially with real production outputs.



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THANK YOU

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