

1° Sessione | Gestione e valorizzazione dei rifiuti in ambito di economia circolare

La digitalizzazione nella gestione,
selezione e riciclo dei materiali
strategici presenti nei rifiuti elettronici



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Futuredata Srl

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Camera di Commercio
Genova

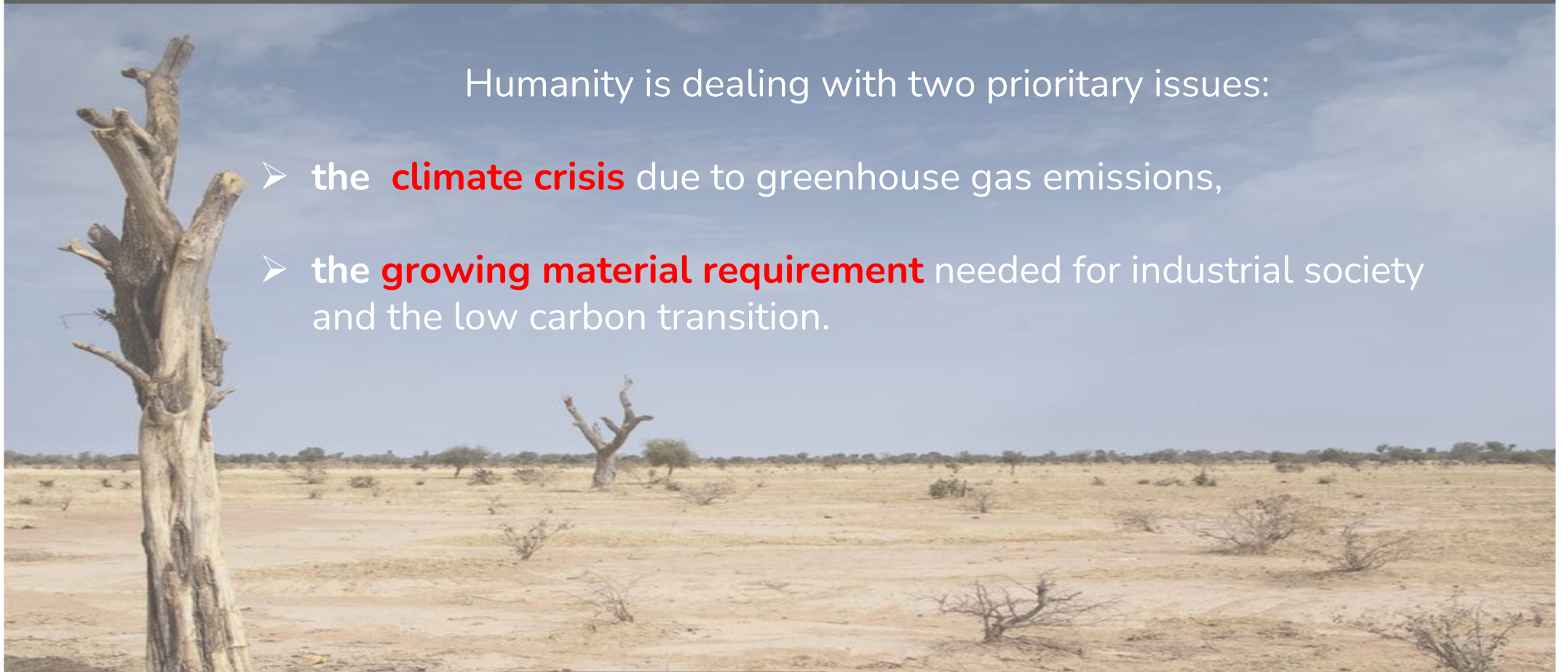


Sinergie locali per un'economia sostenibile

The problems

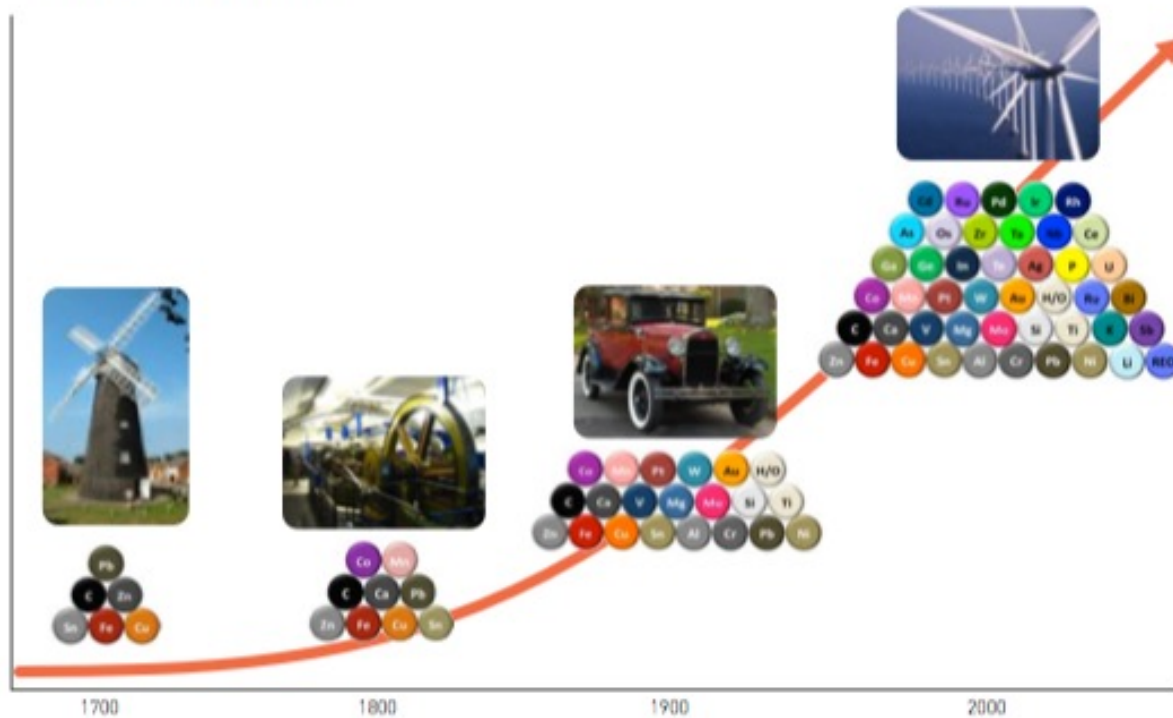
Humanity is dealing with two priority issues:

- the **climate crisis** due to greenhouse gas emissions,
- the **growing material requirement** needed for industrial society and the low carbon transition.



New materials new problems

Metal/Element Use Intensity in Products



In the Fourth industrial revolution, many new different materials have become in common use.

At-the-state-of-art recycling methods fail to provide cost-effective holistic recovery opportunities.

When any article is composed of a few materials, very different from each other, it is easy to separate and recover them...

... but when these materials are dozens, many of them present in small quantities, their separation requires a new approach to the problem.

The scale of the issue



The scale of the issue is massive

The United States generates about 46 pound (21 Kg) of e-waste per capita annually, according to the United Nations 2020 e-waste monitoring report.

Globally, 53.6 million metric tons of e-waste are produced every year worldwide, the analysis estimates.

Maybe unsurprisingly, but still alarmingly, only about 17 percent of this waste is properly collected, documented and recycled across the globe each year.

Much of the remaining 83 percent of e-waste sits idle in homes and businesses or is disposed of improperly.

Today materials recovery

In the treatment process where products or part of products are shredded for sorting, all the materials will be mixed with other materials, making it much more difficult to extract and recycle the materials.



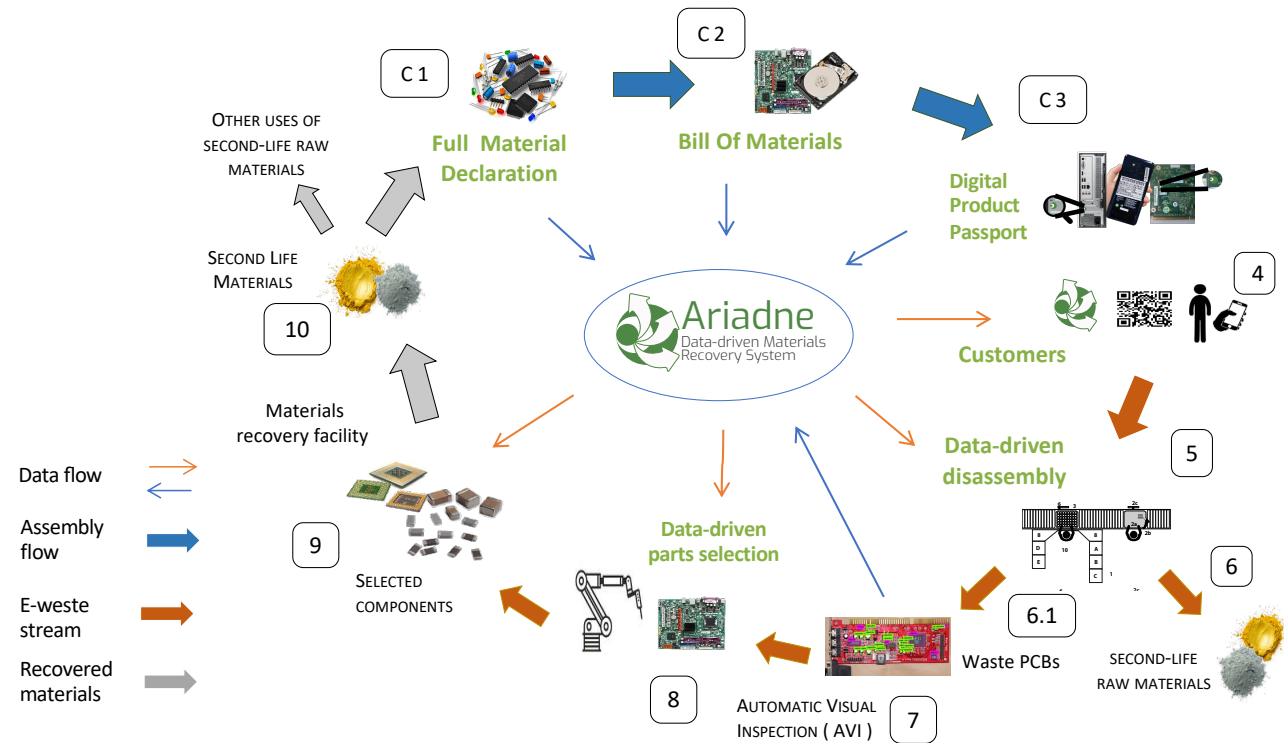
Metals	Assay	
Cu	28,13	%
Au	22,5	g/t
Ag	445	g/t
Pd	4,1	g/t
other fees		

At the end of selection remains a heterogeneous mixture that contains many materials at very low concentration. The components present in small quantities are consequently further diluted, making their recovery and refining technically very difficult and economically unsustainable.

OUR SOLUTION

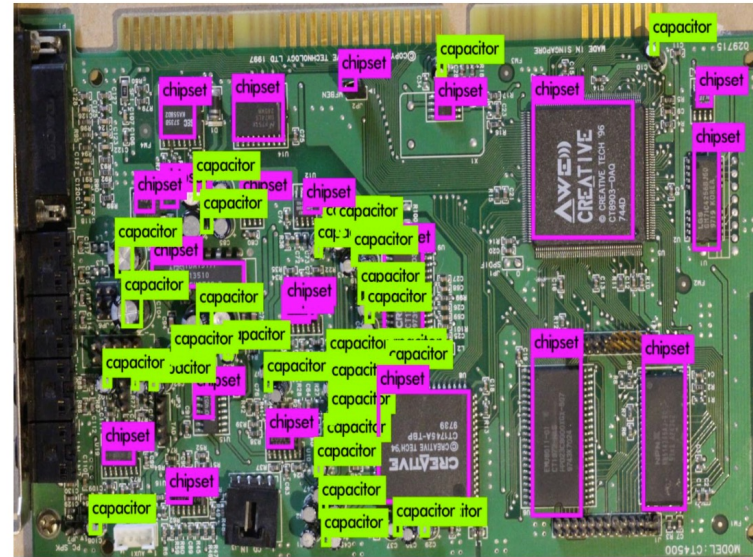
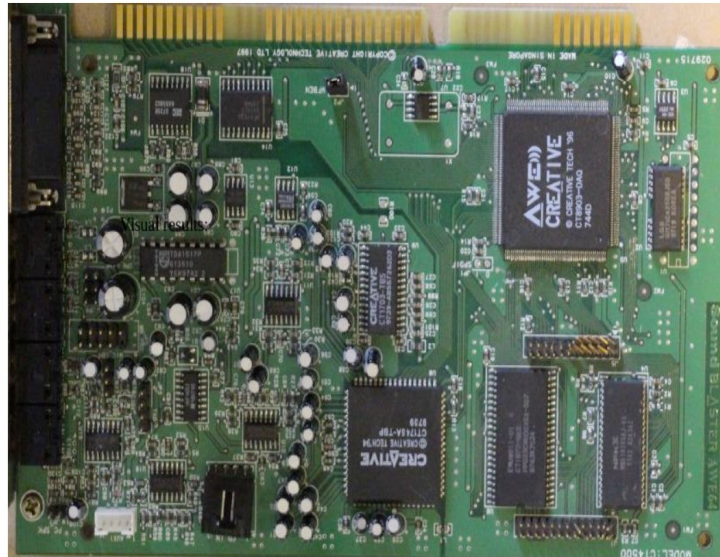
Extensive digitization and Industrial symbiosis allows us to remove, select and recover materials from e-waste in the best possible way today.

Ariadne **reduces** environmental pollution, plastic waste and CO2 emissions, and **fight**s climate change and it makes EEA more sustainable



Ariadne Circular model

AUTOMATIC VISUAL INSPECTION (AVI)



Here an example of coffee machine at the first step of dismantling.

For a better recycling, every part has a material equivalent color code.

MATERIALE	COLORE
AISI 430 1.4016	GIALLO
AISI 304 1.4301	BLU
PLASTICA MORBIDA:	
PE Marlex® HXM 50100 Chevron Phillips	VIOLA
COMPONENTI ELETTROMECCANICHE	ROSSO
MISTO	VERDE
RAME	ARANCIONE
OTTONE	GRIGIO
PLASTICA: PC Makrolon® 2456 550115 Covestro	CELESTE
PLASTICA: ABS+PA Terblend® N NG-04 + N NM-12	NERO
PLASTICHE E GOMME	BIANCO
MAGNETI	ROSA

LINEA MINI

ISTRUZIONI DI SMONTAGGIO:

ID BOM	Nome	CODICE SAP	DESCRIZIONE	MATERIALE DB	Peso (config)
1	LM00002125	I.1.099	VITE M4X10 TPB A TAGLIO INOX	AISI 304 1.4301	1.5
2	LM00002055	I.1.006	VITE M4X8 TPB A CROCE INOX A2	AISI 304 1.4301	1.6
3	LM0000247	A.7.003.R	SERBATOIO ACQUA LINEA MINI	PE Marlex® HXM 50100 Chevron Phillips	92.1
4	LM0000079	C.1.189.**	PANNELLO	AISI 430 1.4016	-
5	LM0018152	C.1.204.01	STAFFA SCHEDA ELETTRONICA	AISI 430 1.4016	168.7
6	LM0001719	F.1.017	COPERCHIO PER SERBATOIO GS3	PC Makrolon® 2456 550115 Covestro	24.0
7	LM0000248	A.7.003.R	SERBATOIO ACQUA LINEA MINI	PC Makrolon® 2456 550115 Covestro	330.8

PROCEDIMENTO:

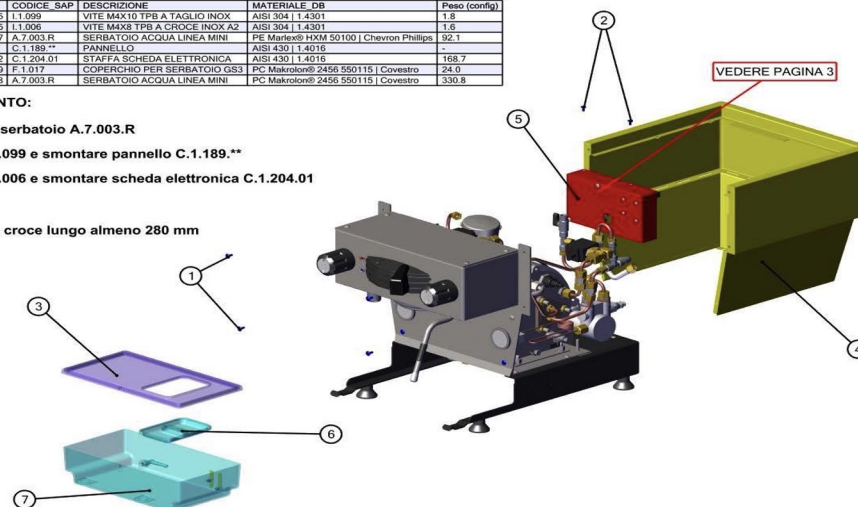
40) Smontare serbatoio A.7.003.R

50) Svitare I.1.099 e smontare pannello C.1.189.**

60) Svitare I.1.006 e smontare scheda elettronica C.1.204.01

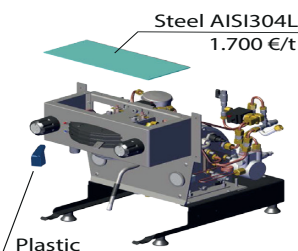
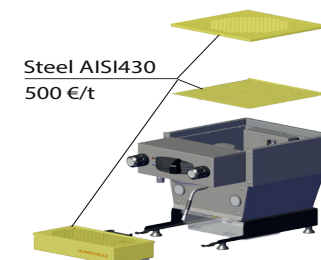
UTENSILI:

-Cacciavite a croce lungo almeno 280 mm



la marzocco
handmade in Florence

2/17 →



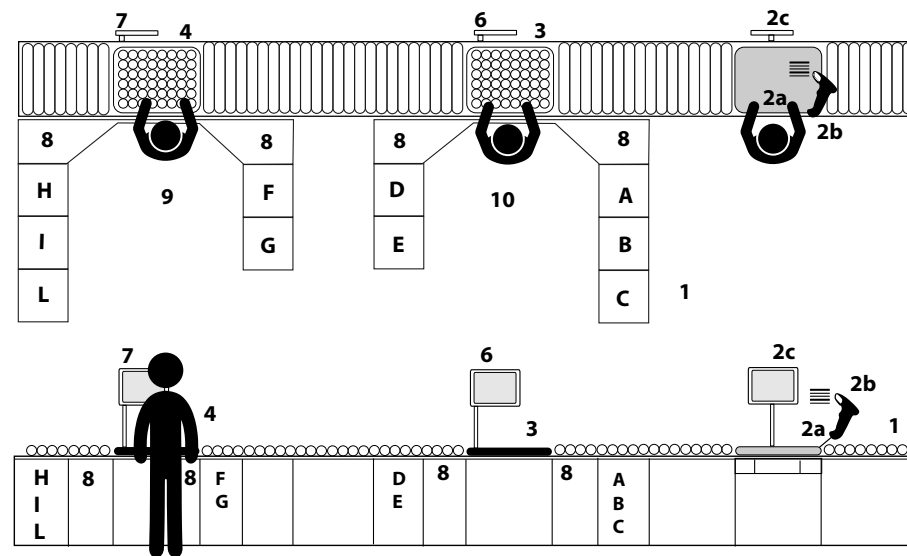
Linea Mini

la marzocco
handmade in Florence

DATA-DRIVEN DISMANTLING AND SELECTION

Disassembly and manual selection are made in a specially prepared structure and linked to the WEB platform for the acquisition of the information that the operator receives on the screen in front of him.

- A-L Containers for the selected materials (on demand with balance)
- 1 Roller conveyor
- 2 Workstation for identifying the e-waste to be disassembled
- 2.a table top with balance
- 2.b bar code scanner
- 2.c data entry panel
- 3 - 4 Rotating dismantling workstation
- 6 - 7 Guide panel for disassembly and material selection
- 8 Support table for manual dismantling
- 9 - 10 - 11 Space for operators



Circular and Holistic approach

Adriane is the unique solution that approaches e-waste management in a holistic and circular way.

Consistent with SDG



Responsible
Consumption and
Production



Industry, Innovation
and Infrastructure



Climate Action



Retain Critical Raw Materials in
Europe



Close the material loop in the Electric and Electronic
industry



From 1% to 10% of critical materials recovered
From 10-15 to 20-25 types of materials recovered



Reduce environmental and plastic pollution, through
better e-waste recycling.



Create direct and indirect jobs



Thank you

Mine the E-waste not the Earth



Camera di Commercio
Genova



Comune di Genova



Sinergie locali per un'economia sostenibile