

European Alliance Against Coronavirus

Friday 24th July 2020 at 8:30

Waste management and recovery of metals from electronic devices

Working format is based on “Gilles Rules”:

1. conceptual framework
2. needs and disruptions
3. solutions

Speakers:

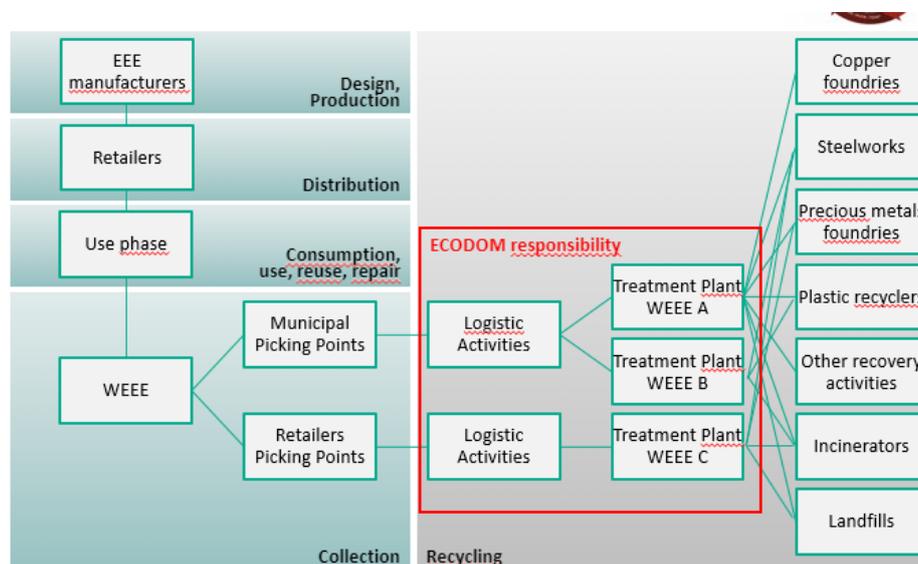
- Luca Campadello, Ecodom
- Paolo Rosa, Politecnico di Milano

[Link to session's recording](#)

1. CONCEPTUAL FRAMEWORK

Luca Campadello opened this session with the presentation of *ECODOM-Consortio Italiano Recupero e Riciclaggio Elettrodomestici*. ECODOM is a not-for-profit private consortium established as a Compliance Scheme by the leading producers of large household appliances, extractor hoods and water-heaters operating on the Italian market to manage Waste of Electrical and Electronic Equipment (WEEE). ECODOM handles 36,1% by weight of all WEEE collected in Italy with an high level of service.

Luca explained the ECODOM supply chain which is divided into two phases: collection and recycling. During the first one, ECODOM answers to the pick-up requests which come from the municipal or retailers picking points. Before starting the recycling activity, ECODOM handles the logistics activities. Overall, this consortium has a key role. The recycling activity allows to reduce the CO2 emission, saving energy and generating economic value, and it is very important find an efficient way to facilitate recycling activities. In fact, the world generated 53.6 million metric tons of WEEE in 2019 and only 17,4% of this was officially documented as properly collected and recycling.

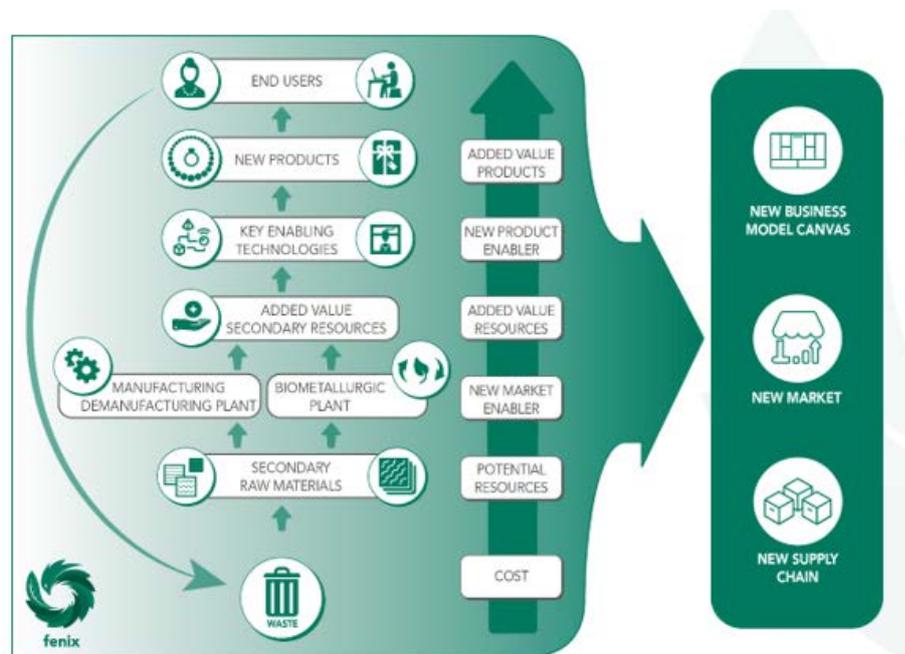


To find new business models for the efficient recovery of natural and industrial secondary resources, Paolo Rosa from Politecnico di Milano presented a project under the Horizon 2020 program called FENIX.

The main aim of Fenix is to develop new business models and industrial strategies for three novel supply chains in order to enable value-added product-services:

- a modular, multi-material and reconfigurable pilot plant producing **3D printing metal powders**
- a modular, multi-material and reconfigurable pilot plant producing **customized jewels**
- a modular, multi-material and reconfigurable pilot plant producing **3D printing advanced filaments**

The following image demonstrates the general idea. The project integrates Key Enabling Technologies (KETs) for the efficient recovery of secondary resources like advanced manufacturing systems (e.g. Industry 4.0), industrial biotechnologies (e.g. biometallurgy) and nanotechnologies (e.g. nano-structurization of materials).



2. IDENTIFICATION OF DISRUPTIONS

First disruption: temporary Covid-19 related reduction of Waste of Electrical and Electronic Equipment (WEEE)

Evidence: The collection of electronics waste involves several sectors, both public and private and are related to design, production, distribution, consumption, use and repair. Among the consequences of the pandemic, it is highlighted that the ordinary monthly flow of WEEE managed on a national scale was reduced by 80% during the months of sanitary emergency, which is linked to the drop in sales for appliances and electronic devices. This drop was temporary during the lockdown measures.

Geographical impact: Reported for Italy

Stage of value chain: End of product life, input management

Character of the disruption: Drop in amount of gathered WEEE

Time frame: short term

Recommendation: implement safety measures for the collection of WEEE

Second disruption: Instability of WEEE collection

Evidence: The WEEE collection trend showed different curves during the pandemic and manifested an unstable trend: during the months of March, April and May, there have been an overall decrease in sales of electronics, and consequently there was a reduction in waste collected. However, in the period of June and July, the sales of electric and electronic appliances skyrocketed. The sharp increase led to difficulties in collecting the materials and to the inability in responding efficiently to the growing demand for collection.

Geographical impact: Reported for Italy and Spain

Stage of value chain: All

Character of the disruption: Instability of WEEE flow

Time frame: short term

Recommendation:

- Establish longer intervention times to favour suppliers (from 5 to 10 days)
- Selection of the necessary pick-up requests: evaluation of the actual emergency in the pick-up requests and interruption of ordinary pick-up requests at smaller picking points
- Increase of the formal storage limits to avoid WEEE and secondary raw materials stock saturation
- Large scale experiences of preparation for reuse of WEEE are missing, need of support from manufacturers and legislation

3. NEEDS

- **Ongoing analysis of investment and environmental impacts.** When is the recycling of WEEE profitable? The business model needs to be sustainable and profitable to make it on the market.
- **Strengthen the refurbishing and re-use of products, not only recycling by design in production.** Despite the attention given to circular economy, it is essential to work on the lifetime of products and to make them be used longer. It is necessary to improve and look for other processes to separate and recycle electronics products, and to promote and force mediated companies to repair and refurbishment for the products to return to the market and greatly reduce waste.
- **Reaching critical mass in waste collection to exploit scale economies.** As reported in the first disruption, it is important and necessary to reach critical mass in waste collection to contain costs as the volumes gathered grow. This allows to exploit scale economies in waste management, with a substantial economic advantage

- **Recycling of plastics.** Currently, there are too many polymers in the output of mixed plastic from the recyclers, leading to difficulties in performing a quality recycling of plastics. There is a need to work on more elaborated processes to be able to recycle all types of plastics.
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4. SOLUTIONS

- Re-adaptation of projects to make recycling more flexible to meet the changing environment of the last months in terms of demand, production, and purchase