LIFE DRONE

Direct pROduction of New Electrode materials from battery recycling

LIFE19 ENV/IT/000520

Newsletter N° 1 – LIFE DRONE PROJECT PRESENTATION

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1. Project presentation

The European co-financed project LIFE DRONE began in September 2020 and it's expected to end in December 2023. This project aims at demonstrating the environmental and economic feasibility of an innovative process for the recycling of different types of lithium-ion batteries and the realization of new NMC batteries without the need to separate metals individually. Project's partners are the following:

Technosind **(coordinating beneficiary):** founded in 1990 in order to coordinate R&D activities mainly in the field of recovery of raw materials from waste and in the field of renewable energy. Its main core is the development of innovative processes from the laboratory scale up to the industrial one.

The skills of Technosind are documented by a wide and qualified international experience, in a context of strategic projects funded by the EU.

The company constantly collaborates with "La Sapienza" University of Rome, in the field of energy storage, nanotechnologies and the treatment/reuse of urban and industrial wastewater.

ECO RECYCLING: born as a spin-off of "Sapienza" University of Rome, the company operates mainly in the field of sustainable innovative processes aimed at the WEEE recovery and recycling. The company's activities are mainly related to the following subjects: the development of innovative processes for the recovery of metals from primary and secondary raw materials; process and plant engineering; support for start-up, management and staff training; chemical analyzes for environmental monitoring and process optimization.

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SEVal: Società Elettrica Valtellinese, is a company active since 1987. Born in the field of electrical construction, now includes four specific sectors:

- Research: energetic and environmental studies and analyses;
- Engineering: ecologic plant design for the treatment of WEEE (waste electrical and electronic equipment);
- Production: power lines construction and maintenance;
- Ecology: recovery of refrigerators, electrical and electronic materials (WEEE), batteries and portable accumulators.

The SEVal ecological division was born in 1999 through a new transport and recovery activity for the bulky waste (as refrigerators, TV, end of life domestic appliances) and the opening of a treatment center in Sondrio (Italy). The main goal of this division is to operate in disposal, treatment and waste recovery sector.

FAAM Research Center: the R&D company of Seri Industrial S.p.A. dealing with the development of lead-acid and lithium-ion technologies. Seri Industrial is a listed company on the MTA, with about 765 employees and 200 M€ of revenues.

Its mission is to accelerate the energetic transition to sustainability and decarbonisation, controlling the supply chain of electric accumulators and plastic materials, thanks to the expertise present in its two business units: FIB (owner of the historical brand FAAM) and Seri Plast, for accumulators and plastics respectively.

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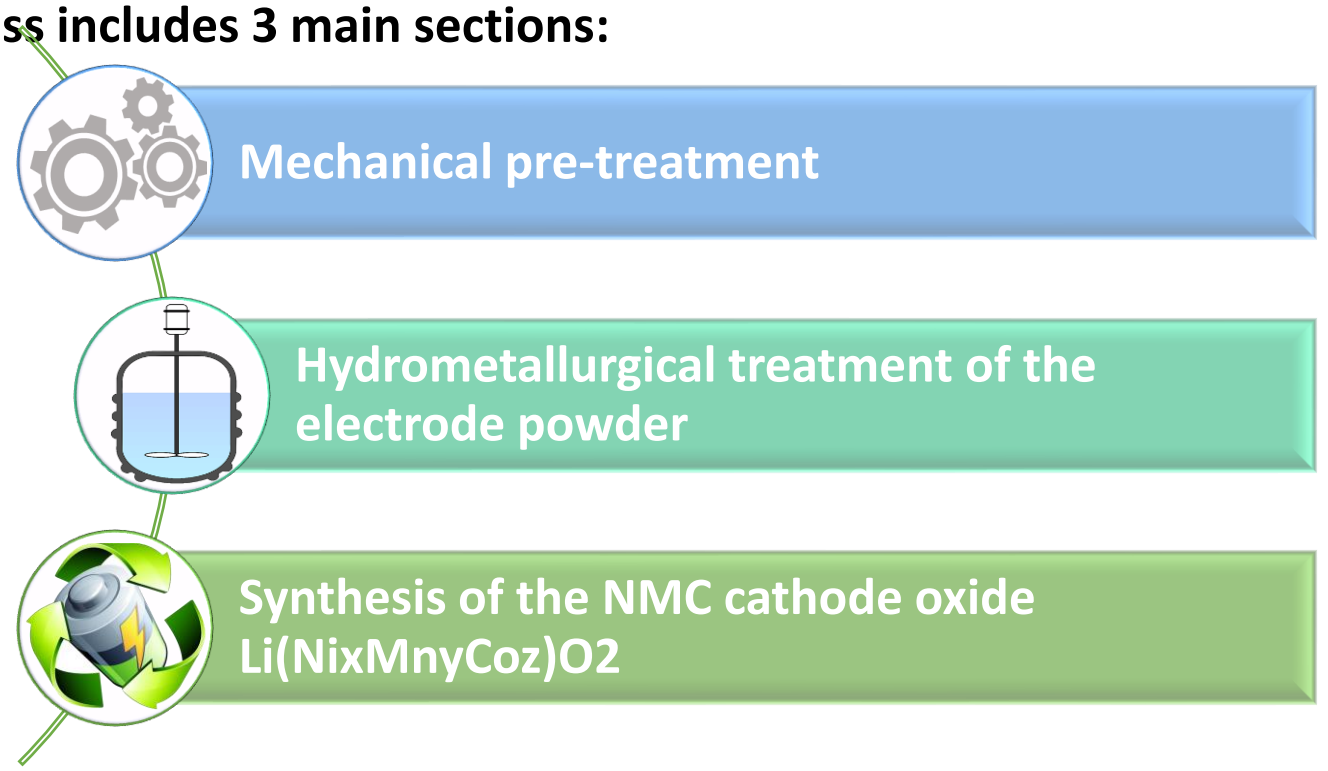
UNIROMA - Sapienza University Dep. of Chemistry: the group of "Theory of the Development of Chemical Processes" is involved in the development of innovative hydrometallurgical processes for high tech waste exploitation. During the last years the research group, also collaborating with the interuniversity center HTR (High Tech Recycling), performed R&D activities concerning the treatment of alkaline batteries. These activities led to the completion of a series of European projects aimed at the recovery of metals with high added value, starting from electronic and electrical waste.

2. Recovery process

The main idea of the DRONE process is that the separation of the different electrode metals (Co, Ni and Mn) into high-purity streams, which is performed by state-of-the-art hydrometallurgical processes, is unnecessary if the extracted metals can be directly employed to produce new batteries. Accordingly with this idea, an innovative recycling process will be demonstrated in DRONE to recover graphite and directly synthesize a high-quality cathodic material for new NMC batteries, without separating the different metals (Ni Co and Mn). NMC batteries are one of the most successful Li-ion systems that can be tailored to serve Energy Cells or Power Cells.

The process includes 3 main sections:



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3. Management and Dissemination

The first activities carried out within the project concerned management and dissemination. As regards the management, the partnership agreements were signed, the steering commission was defined, the project kick of meeting was made, both the official one and the internal one with the involvement of all partners. As regards the Dissemination a dedicated website (https://www.lifedrone.eu) has been create where the information about the project progress will be reported periodically. Some social media (LinkedIn, YouTube) has been selected to disseminate the project to a wide range of public both scientific and non-scientific, the notice board was prepared, printed, and installed in the partner offices, the dissemination and communication plan was updated.