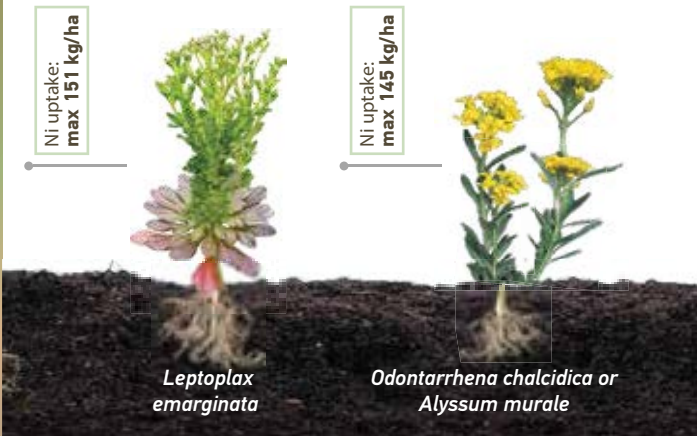
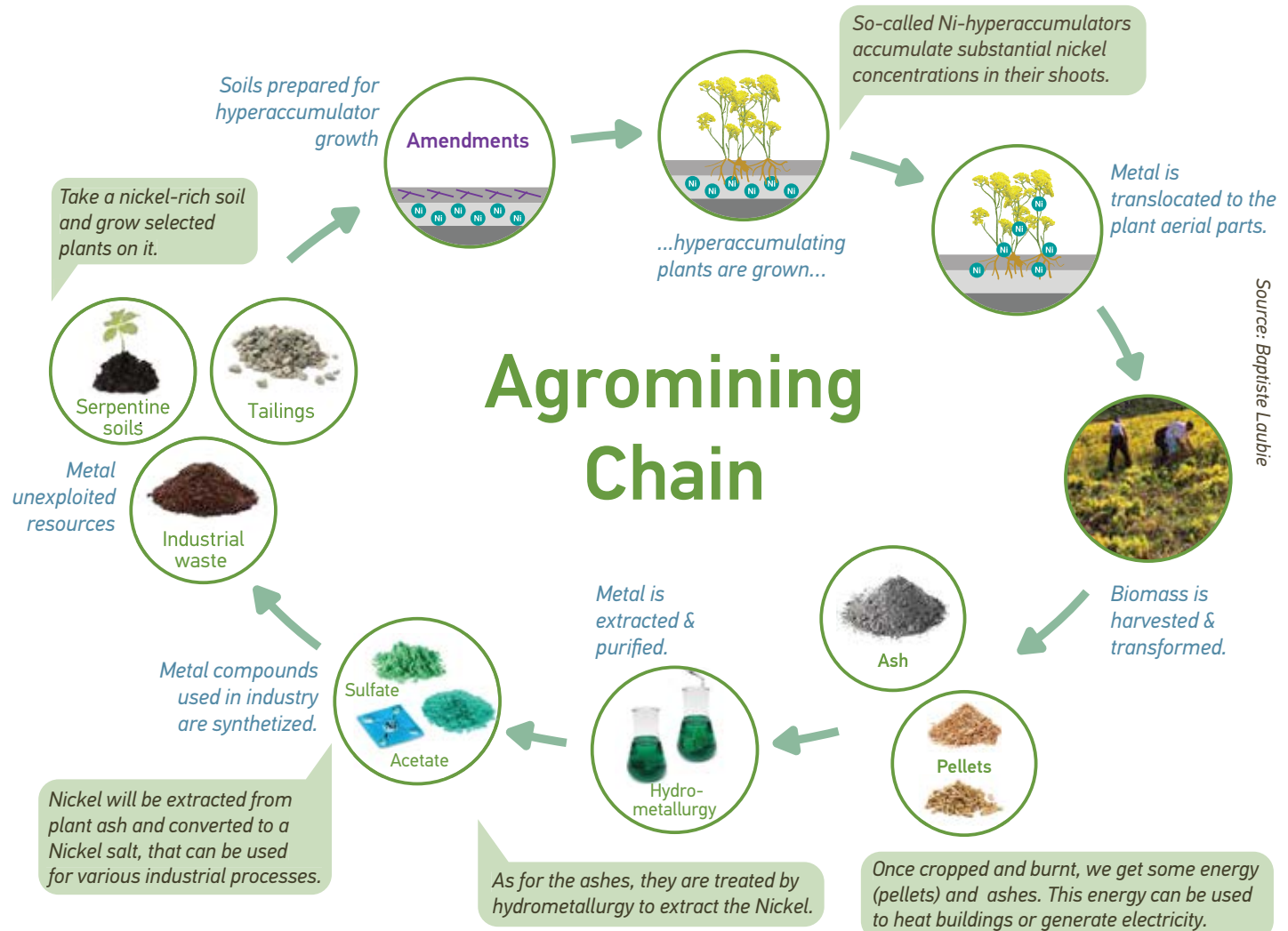


Farming for Metals:

Life AGROMINE aims to demonstrate a sustainable approach for the recovery of nickel (Ni) from sub-economic ores. The approach is based on the use of nickel-accumulating plants, which extract nickel from soil and store it in the above-ground biomass. After harvesting and incinerating the plants, nickel is recovered by a hydrometallurgical process from the ash. The project is in line with the circular economy concept and creates a new business aimed at recovering high-value metals such as nickel.



Metal hyperaccumulators, e.g. such as *Leptoplax emarginata* and *Alyssum murale*, show a very unusual behaviour: they are able to accumulate specific metals in their leaves and stems without showing toxicity effects. Metal concentrations in these plants are often 100 - 1000 times higher than in non-accumulators and up to 10 times higher than in the soil itself. The metals are taken up from the soil and actively transported to the shoot biomass.



Source: Baptiste Loubie

This process is called "Agromining" and can be applied to any Nickel-rich soil or substrate. Soil science, agronomy and chemical engineering contribute to the development of this technology.

The new data in the frame of Life-Agromine project reconfirm the potential of the Ni hyperaccumulators with maximum >150kg/ha to develop a better growing system for phytoextraction technology;

- **145 kg/ha, 106 kg/ha** *Alyssum murale* (Albania, Greece)
- **89 kg/ha** *Bornmuellera tymphaea* (Greece)
- **151 kg/ha** *Leptoplax emarginata* (Greece)

Why to grow our Metals?

The worldwide demand for nickel (Ni) is experiencing an unprecedented growth under current industrial and economic pressures.

The European Innovation Partnership classified Ni as a raw material with high economic importance. However, mine production mainly takes place outside of the European Union.

Nickel-rich soils, such as ultramafic or serpentine soils (unattractive for agriculture in terms of fertility and productivity) are abandoned by local farmers, but have a high potential for plant-based metal recovery with application in metallurgical processes.

Technologies are urgently required to exploit primary sources, such as ultramafic soils, in which Ni is present at significant levels (1500-4000 mg/kg), but where its extraction by conventional mining processes is not economically viable. Converting hyperaccumulator crops into nickel compounds, however, is a promising alternative for both farmers and Ni processing industry.

You've all had some nickel in your hands. Every coin of 1 and 2 euros are all made of nickel and some of its alloys.

When pure, nickel looks silver.

Nickel is widely used for industry. It is used in about 3000 alloys for 250000 applications e.g. in the automobile industry, rechargeable batteries and electronics, stainless steel production and uses, catalysers, luxury and art.

Nickel alloys are very resistant to shock, corrosion and temperature variations.

LIFE15 ENV/FR/000512



Implementation of pilot-scale agricultural plots- Albania, Austria, Greece, Spain



- Albania:** Aida Bani
+35 5692467488 / aida_alushi@hotmail.com
- Austria:** Markus Puschenreiter
+01 4765491162 / markus.puschenreiter@boku.ac.at
- Belgium:** Tom Kuppens
+32 11268755 / +32 473516873 / tom.kuppens@uhasselt.be
- France:** Guillaume Echevarria +33 372744125
Guillaume.Echevarria@univ-lorraine.fr
Claire Hazotte +33 354505240 / contact@econick.fr
- Greece:** Evgenia Tsianou
+30 6978600342 / office.greece@alchemia-nova.net
Maria Konstantinou
+30 2521060478, +30 6977899899 / mkonst@teiemt.gr
- Spain:** Petra Kidd
+34 981590958 / pkidd@iiag.csic.es

<http://life-agromine.com>

<https://www.facebook.com/LifeAgromine/>



Farming for Metals

Cropping hyperaccumulator plants on nickel-rich soils and wastes for the green synthesis of pure nickel compounds



Flowering nickel hyperaccumulators after successful implementation of Agromining

Abandoned mining sites are attractive for establishing Nickel Agromining