Early-Stage Lithium Recovery (ESLR) for Enhancing Efficiency in Battery Recycling

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Motivation

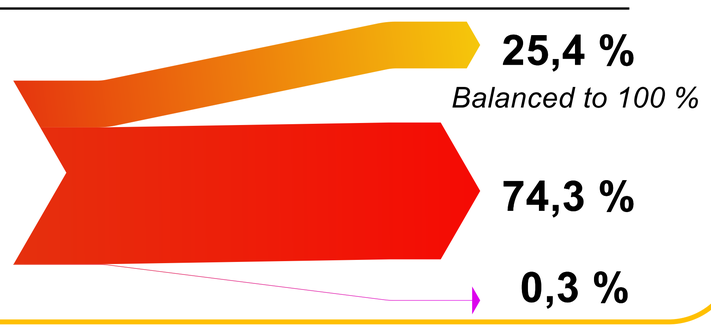
- Robust and flexible battery recycling processes
- Still unsolved challenges in Li-recovery e.g. Li-losses in slags and cross-contaminations in different pyro- and hydrometallurgical extraction paths
- Indispensability for battery technology and rising prices make lithium recovery important
- Maintaining of flexibility for hydro-, and pyrometallurgical processing

Research Targets

1. **Low energy requirement**
2. **No chemicals needed**
3. **No Co/Ni losses**
4. **Easy and safe process**
   (simple plant construction, minimized offgas treatment)
5. **Lithium Recovery η_{Li} > 90%**
6. **H_2O circulation / near zero waste**

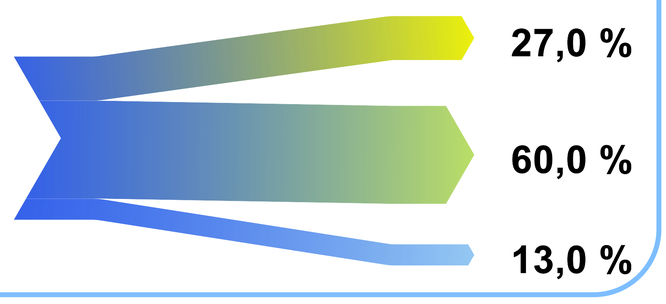
Lithium Distribution in Conventional Extraction Paths

Smeltig Example

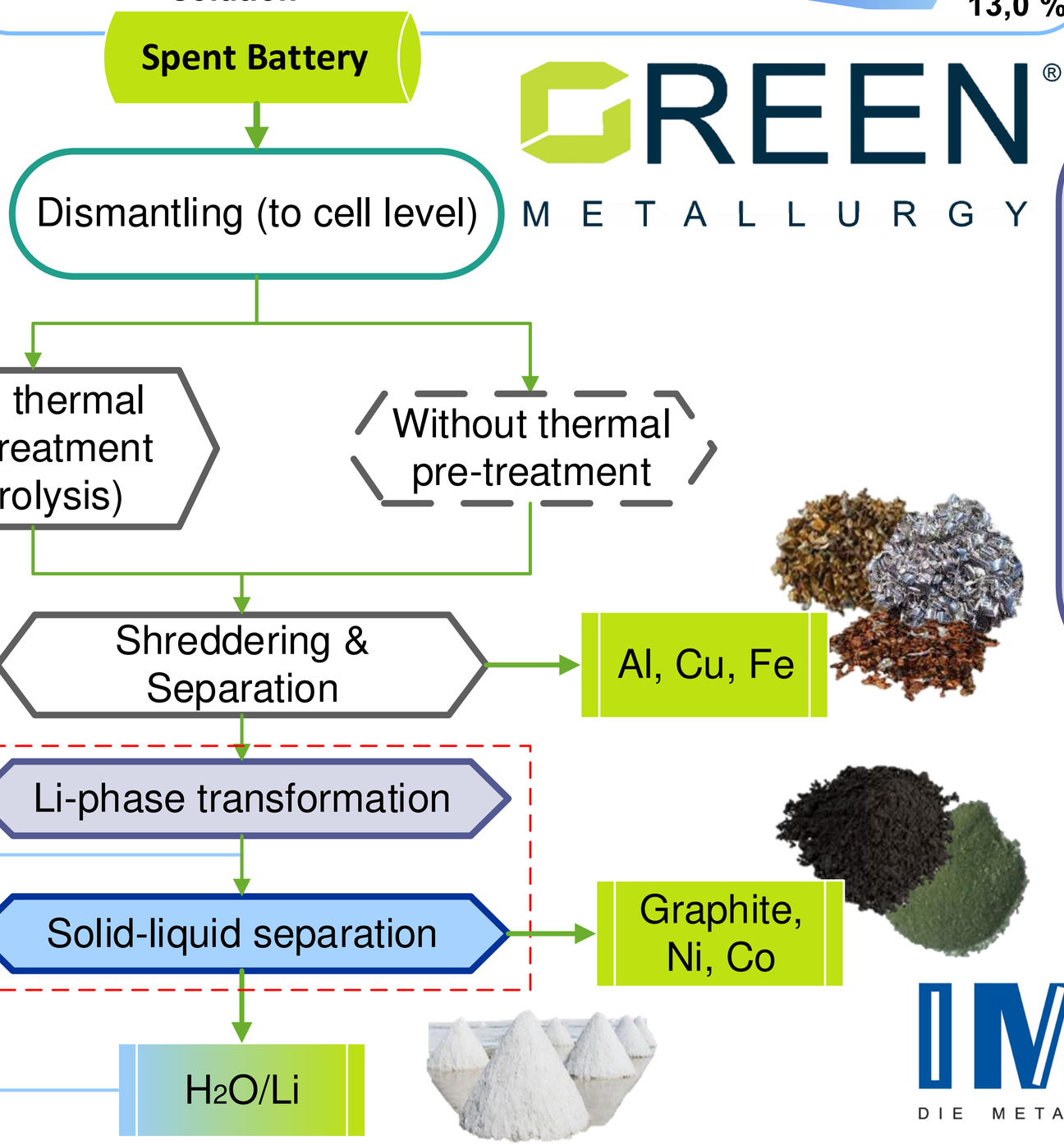


Unavoidable occurrence of Lithium in slag and flue dust, due to ignoble and volatile behavior

Leaching Example



Unacceptable Lithium losses in different filter cakes due to physical adsorption



Solution:
Li-Phase **transformation into water soluble** compounds by methods such as:

- Supercritical CO_2-treatment
- Thermal carbonation

→ **Early-Stage Li-Recovery**

For more information please follow this QR code. In case of questions please contact

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