

## Toward sustainable batteries based on silicon, sulfur and bio-mass derived carbon

The **sustainable production of batteries** requires securing the availability of raw materials, and the use of effective strategies for their recycling. Given the intrinsic limitations of current lithium-ion batteries, a **new sustainable battery technology** is needed.

**2BoSS will develop sustainable batteries compatible with the circular economy by:**

1. **validating a silicon-sulfur battery technology** designed to minimize the use of CRMs, provide optimized performance, and enable the circular use of material resources;
2. **validating effective recycling strategies** for the separation and reuse of raw materials;
3. **assessing the cost, life cycle, and environmental, health and safety impact;**
4. **designing high-performance products** and their scaled-up manufacturing

Besides improving performance and minimizing the use of CRMs, a key advantage of the battery technology here proposed is **the easier recycling of its raw materials.**

2BoSS batteries are designed to use no metal collector and to incorporate no metal additive, which will allow a more effective and economical separation of the two key raw materials.

**2BoSS will design, validate and define the up-scaling of effective lixiviation strategies to separate and regenerate the battery key elements.** Additionally, life cycle assessment and social life cycle assessment will be carried out to better understand environmental and social impacts of the developed technology along the life cycle and to provide valuable feedback to optimize their contribution to a more circular economy.



ERA-MIN 3



2BoSS was approved as part of the ERA-MIN Joint Call 2021 on Raw materials for sustainable development and the circular economy.

ERA-MIN 3 received funding from the European Union's Horizon 2020 Research and Innovation Programme.

Project ID: PCI2022-132985

### PROJECT DURATION

36 months

(from 24/04/2022 to 23/04/2025)



### PARTNERS

- Institut De Recerca De l'Energia De Catalunya (IREC) (Coordinator – SP)
- Politecnico di Torino – DIATI (IT)
- Commissariat à l'énergie atomique et aux énergies alternatives (CEA) (FR)
- Cleopa GmbH (CLEO) (DE)

### FUNDING INSTRUMENT

ERA-NET Cofund (H2020)

### BUDGET

Total costs for DIATI: **170.100 €**

Funding: **120.100 €**

### POLITO and DIATI's role:

Politecnico di Torino – DIATI is partner of the Consortium.

Scientific manager for DIATI:

Prof. **Gian Andrea Blengini**