Batteries and sustainability

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Li-ion battery types and their key constituents (based on figures by Olivetti et al. 2017).
BEBA

1. Building a world class battery company in Norway

2. Vast underlying and growing market driven by growth in renewables, energy storage and electrification of transport

3. Promising technology development of Li-S cells and Li-ion components – enabling cheaper, lighter and more energy dense batteries

4. Additionally positioned within charging stations, battery packs and ecotourism

5. Strong network within the industry through Bellona’s 30+ years of advocating electric vehicles and battery technology internationally

6. Experienced in applying for and obtaining soft funding from public institutions – highly favourable political climate for “green tech”
A Li-Sulphur battery will vastly outperform Li-Ion technology on performance and price while being more sustainable to handle and produce.

Input – cheaper and more efficient production

- **Cheaper** raw materials
- **More abundant** raw materials
- **More energy effective** production
- **Less harmful** production process
- **Less complex** production process

**Lithium Sulphur Battery**

- **500 Wh/kg**
  (double state of art Li-Ion)
- **< 100 USD/kWh**

Output – forward leap in battery technology

- **Lightweight** batteries with high energy density
- **Safe to use** – Non-explosive, low flammability
- **Low temperature** operation range
- **Competitive volumetric capacity**
- **Competitive cycle life**

The one who succeeds will be a major player in the battery industry where “the sky is the limit”
BEBA’s five pillars to build an international battery industry in Norway

Next generation battery technology
- Developing cell technology achieve performance levels Li-ion batteries cannot achieve

Battery components existing technology
- Improve key parts of today’s technology
- Create income and interest in Norway as a prime location

Battery Management System
- Improve performance and security through improved software for steering and integration

Prototyping, testing and certification:
- Common infrastructure for R&D and commercialisation of components or technologies

Production equipment
- New components and technologies require new production methods and equipment

Cooperation and constant feedback from (potential) clients and end-users:
System integrators and battery manufacturers in electric mobility, maritime applications, emissions free construction, green tourism and many more

Re-use, recycling and substitution of critical raw materials focus in all of BEBA’s activities