



Starting Date: February 2017

**Proposal for Master Thesis
“A Techno-Economic Perspective on Lithium-Ion Battery Recycling”**

Lithium-ion batteries are likely to play an important role for future energy and transportation systems. Due to strong projected demand from electric vehicles and energy grid applications (e.g., storage balancing power supply and demand) experts expect a dramatic uptake in the use of lithium-ion batteries. With increasing market presence of lithium-ion batteries, their disposal at the end of their lifetime can become both a regulatory requirement and an economic opportunity. While this topic has received more and more attention in both academia and industry, the economic opportunities for lithium-ion battery recycling have not been analyzed in detail.

Together with Bühler, a globally leading technology provider (<http://www.buhlergroup.com>), ETH Zurich's Group for Sustainability and Technology (SusTec, www.sustec.ethz.ch) offers a master thesis to further elaborate on this topic. While SusTec has undertaken extensive studies in the field of electric energy storage, Bühler provides globally leading industry expertise in lithium-ion battery production technology.

The master thesis should further explore this topic by investigating lithium-ion battery recycling with a techno-economic perspective. The aim of this thesis is to shed light on technological opportunities and potential markets for lithium-ion battery recycling. The student's main tasks may comprise (preliminary):

- Developing a thorough understanding of lithium-ion batteries, their value chains and possibilities for recycling.
- Identification of current and future lithium-ion batteries markets and analysis of future market sizes.
- Deriving implications for academia and practice.

We are looking for an excellent student who is highly motivated and is able to work independently. Strong communication and project management skills as well as a background in industrial or chemical engineering, business administration would be an advantage. The student will work together with both the SusTec team in Zurich and the Bühler team in Uzwil. Academically, the student will be embedded and supervised by the SusTec team at ETH Zurich. This master thesis will take place in the context of the D-MTEC's Corporate Master Thesis Program.

Are you interested? Please send your CV, a short letter of motivation (max. one page) and transcripts of previously obtained degrees (with grades) to Annegret Stephan (astephan@ethz.ch). Applications from non-ETH students are welcome.

We look forward to receiving your application!

Zurich, November 2016