

UNIVERSITY OF OSLO

Your Master Project Topics

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Hi, I'm Matylda!

And it is very likely we have met already. Together with Kaja, I welcomed you at ITS at the beginning of this semester, when you started your MSc journey.

But if I have not had a chance to meet or talk to you yet, let me briefly introduce myself.



- I tend to say that I'm 3-in-1: materials scientist, chemist and crystallographer. But I am also a teacher.
- I specialize in investigation of functional chemical compounds that are used in various green technologies. While the technical part of my work focuses on application of sustainable materials for renewable energy generation, conversion & storage, my research interest goes beyond a single-discipline perspective.

Thus, I am also interested in:

- I. how green technologies interplay with climate, economy and societies in general,
and
- II. how we can combine and use knowledge produced by various academic disciplines to help you (i.e., students) and young researchers get equipped with skillset necessary to drive the meaningful sustainable change



Since I do believe that most fascinating discoveries happen at crossroads of various research fields, my scientific explorations are highly multidisciplinary; they are blends of technical notions and abstract concepts, as reflected by MSc topics I have prepared for you.

TOPIC I: Hydrogen from the Sun

Photoelectrochemical hydrogen production & storage – a single technology for two processes

- **YOUR** work will be a part of the project focused on the design & performance of a prototype device that can produce & store hydrogen based on solar energy
- **YOU** will focus on synthesis and optimization of hydrogen storage materials that will be utilized as electrodes in this device
- **The work will involve lots of experimental activities in our new renewable energy storage laboratory!**

Finding new applications for waste batteries from eclectic vehicles, scooters, and bikes



- **YOUR** activity will be a part of the **EMPOWER** project
- Sustainable Batteries in Mobility - (Em)powering a Net-zero Energy Transition*
- **YOU** will join **our super-multidisciplinary EMPOWER team** (Marianne is also there) with whom you will have a chance to explore & invent various ways of extending life of Li-ion batteries that can no longer be used in their original applications
 - Your project can be either experimental or theoretical, or can combine both aspects
 - You can also work with our education-oriented team and help us to develop tools that will be used to teach your younger colleagues to better understand the sustainable future with batteries
 - **YOU** will work in a close collaboration with various project stakeholders from industry and academia

TOPIC III: Energy for Future

How the future energy system should look like from a perspective of young Norwegians?

- **YOUR** activity will be a part of the **Energy for Future (EFF)** project

Envisioning swift and inclusive energy transitions with young people across Norway

- **YOU** will join **our multidisciplinary EFF team** (and Marianne is also here 😊), and together we will try to understand which sustainable energy solutions are important for youths in Norway and if their views differ depending on where they live
- You will be involved in design, preparation and conduction of workshops with young people in Norway
- **YOUR** work, which will be done in collaboration with project partners, will be linked to the design of a virtual reality (VR) game that will serve as a visualization tool for comparison of various renewable energy technologies

If you find any of these activities interesting or you would like to know more about them - **let's talk!**

I. You can find me in my office at ITS: **room no. 208 / 2nd floor**

II. You can also send me an email: **matylda.guzik@its.uio.no**