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2<sup>nd</sup>

# Zero Waste Technologies Seminar



**ZERO WASTE  
TECHNOLOGIES**

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## Recycling of lithium-ion batteries toward energy conversion systems – batteries in the circular economy

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**Abstract:** Nowadays, lithium-ion batteries (LiBs) are an integral part of our daily life. Smartphones, laptops, tablets, or other portable devices that are used every day are powered by LiBs. Their global application continuously increases causing the dynamic growth of LiBs production. It leads to the generation of harmful waste that needs to be properly collected and recycled [1, 2] but current solutions in battery waste management are far from the high effectiveness. Therefore, recycling procedures must be improved to protect the environment, and save energy. As the spent battery waste may lead to severe health issues the recovery of the harmful ingredients is highly desired especially when it comes to health protection. To do that, the reuse of spent battery waste as a source of various metals, including lithium, cobalt, nickel, and carbon materials, e.g. graphite [3, 4] is one of the routes that can solve the secondary battery waste pollution. To meet global efforts on battery waste management we proposed to utilize the recovered materials from spent LiBs as electrocatalysts in renewable energy conversion systems. Our research [5] showed that spent Li-ion battery waste exhibited excellent (electro)catalytic properties towards 2-electron oxygen reduction and increased the efficiency of H<sub>2</sub>O<sub>2</sub> generation in a biphasic system at the liquid-liquid interface more than 20-times!

### References

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