



# HED-LiS

## High Energy Density Lithium Sulfur Batteries for Stationary Applications

” HED-LiS has been established for the realization of the high performance and stable Li-S batteries.

Integration of energy storage systems to renewable energy parts would make wind and solar energy investment more profitable promoting their acceptance. Local, affordable energy storage system would also reduce need for back-up energy system based on diesel engine or aggregates based on them. Consequently, threshold for wider use of renewables is promoted. Li-S battery technology would provide low cost battery solutions for local grids and off-the-grid application as well allow easily transported mobile units in remote areas with permanent or reliable grid access.

Successful execution of this project creates technology platform for material solutions and processing of Li-S batteries with improved cyclability. Li-S batteries would offer great potential especially for stationary energy storage systems and flying vehicles. Furthermore, it could be feasible solutions also for certain electric mobility solutions like e-buses and small trucks as well as marine applications.

ERA-Net Smart Energy Systems



This project has received funding in the framework of the joint programming initiative ERA-Net Smart Energy Systems. The initiative has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039 and no. 755970.

### Project Duration

01.10.2020 - 01.10.2023

### Project Budget

Total Budget: € 981,400

Funding: € 595,700

### Project Coordinator

Assist. Prof. Dr. Mahmud Tokur  
Sakarya University (Turkey)

### Project Partners

- Sakarya University (Turkey)
- Morrow Batteries AS (Norway)
- Pulsedion OY LTD (Finland)

### Project Website

hedlis.sakarya.edu.tr

### Contact

Assist. Prof. Dr. Mahmud TOKUR  
Sakarya University,  
Metallurgical & Materials Engineering,  
Serdivan/Sakarya, 54050  
mtokur@sakarya.edu.tr  
+90 539 967 62 65

### ERA-Net Smart Energy Systems Joint Call 2019 (MICall19)

This project has been awarded funding within the ERA-Net SES Joint Call 2019 for transnational research, development and demonstration projects. EUR 16.5 Mio of funding have been granted to 14 projects active in 15 regions and countries.

## Main Objectives

A multidisciplinary project consortium has been established for the realization of the high performance and stable Li-S batteries. Each partner has been nominated with different tasks to accomplish the main idea of the project which targeted to reach the outcomes given in the EC Set Plan 7. Therefore, each partner aimed to realize specific goals according to the project main target. So, the target of this project is to develop Li-S base Li-ion batteries with tailored functional layers in separators and anode side for reaching acceptable battery cyclability for stationary energy applications and other applications like flying vehicles (drones, airplanes, satellites).

## Expected Key Results

After optimized the electrodes and electrolytes, large-scale Li-S batteries in the form of pouch cell will be fabricated with 3A-5A-10A capacity and ~400 Wh/kg energy density.

## Technology

- Clean Energy
- Electrochemical Energy Storage
- Battery Technology
- Lithium Sulfur Batteries
- Layer Deposition

## Market

- Electric Mobility (personal cars, buses, working machines)
- Airborne Vehicles (drone, possibly small passenger airplanes)
- Energy storage integrated to renewable energy production (wind, solar, waves) with unpredictable and uneven energy production
- Working tools and Marine applications



**Joint Programming for Flourishing Innovation –  
from Local and Regional Trials  
towards a Transnational Knowledge  
Community**

**[www.eranet-smartenergysystems.eu](http://www.eranet-smartenergysystems.eu)**

## *Project Partners*



**MORYOW**

**PULSEDEON**