

STORIES MENTORING PROGRAMME REPORT

Mentee (PhD Student) Details	
First Name:	Mayank
Last Name:	Joshi
Affiliation / Employer:	Politecnico di Torino
Country of Employer:	Italy
PhD Thesis Title:	Sustainable materials for sodium-based battery
Mentor (Supervisor) Details	
First Name:	Sai Gourang
Last Name:	Patnaik
Affiliation / Employer:	IMEC
Country of Employer:	Belgium
Online Meetings	
How often and since when do the mentee and mentor meet online?	
Once every month since October 2024	
In Person Meeting (if applicable)	
Where and when did the mentee and mentor meet in person?	
In Person meeting at IMEC, Leuven, Belgium from 27 th March to 30 th March 2025.	
Mentoring Programme Report	
<p><i>The doctoral thesis focuses on finding an alternative approach for producing efficient anode materials for sodium-ion batteries. Our objective is to synthesize hard carbon using a non-traditional method, which includes the process of mixing active material, binder, and conductive agent. Instead, the project aims to employ the electrospinning technique to create a carbon matrix structure with active material deposited on carbon nanofiber-like films, eliminating the need for a binder. The primary advantage of this approach lies in its</i></p>	

ability to generate a nanofiber-like structure that enhances electron mobility while increasing specific capacity by avoiding the use of binders.

Until now, in the StoRIES programme, we explored not only the theoretical aspects of the PhD work, but also its future possibilities. We discussed using an environmentally friendly polymer to develop a more durable material for sodium ion batteries, as well as resolving several processing concerns with electrospinning that prohibit us from attaining controlled morphology of the material.

We have one online meeting once every month as well as an offline meeting last month at IMEC to understand and gain experience with how large organizations like IMEC handle and solve many problems in the field of energy storage and in semiconductor field.

- **Confirmation**

This report has been confirmed by both parties (04/04/2025).

☒ Hereby, we authorize the publication of this report on the StoRIES website.

☒ Hereby, we consent to the processing of our personal data according to the StoRIES [privacy policy statement](#).