

**The AIChE Netherlands / Belgium Section is pleased to invite you
to attend the Lecture Dinner Meeting:**

**Low-NOx Ammonia Combustion and Cracking:
Industrial Applications for Refineries and Hydrogen Production**

Ir. Jebin James, Process Development Lead – Duiker Clean Technologies

18th November, 2025 – Golden Tulip, Zoetermeer

Program

17:30 – 18:00	Registration
18:00 – 19:00	Lecture
19:00	Dinner

Summary

Northwest Europe is emerging as a key hydrogen region, accounting for about 60 % of Europe's use, mainly in refining and chemicals. Ports such as Rotterdam, Antwerp, Hamburg, and Wilhelmshaven are developing into import and production hubs. Rotterdam is leading through projects like the Maasvlakte Electrolyzers Park and a planned regional hydrogen backbone. Yet, high costs, slow pipeline rollout (beyond 2030) and looming green hydrogen mandates pose challenges. This drives interest in hydrogen carriers as practical options for import of hydrogen.

This presentation explores Duiker Clean Technologies' approach to unlocking hydrogen via ammonia, combining refinery-proven combustion expertise with an advanced cracking reactor system. Ammonia offers clear logistical advantages as a hydrogen carrier, but its deployment depends on safe and efficient conversion.

At the core is Duiker's Stoichiometric Controlled Oxidation (SCO) process, which enables stable combustion of up to 100 % ammonia while controlling emissions to low ppm levels. The heat generated in the SCO is directly applied to the dedicated cracking reactor. This is equipped with optimized catalyst systems that achieve near-complete NH₃ conversion to H₂ and N₂ at high pressures. Downstream, a pressure swing adsorption (PSA) unit purifies the cracked gas, delivering pipeline-ready hydrogen with high purity and without recompression. Using essentially three main unit operations: SCO, cracking reactor and PSA the process achieves ammonia conversion with no water or waste by-products.

Attendees will gain technical insights into how the elements mentioned before lead to a compact, inherently low-emission system, capable of operating fossil-free, with zero direct CO₂ emissions.

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Professional Background of the Speaker

Ir. Jebin James, Process Development Lead – Duiker Clean Technologies

Jebin James is a seasoned Process Development Lead specializing in process development and technology scale-up. He is a Chemical Engineer by background with a Master in Chemical Engineering from the University of Manchester and an Engineering Doctorate in Process & Equipment Design (EngD) from TU Delft.

As part of his Engineering Doctorate, he worked at TNO (a department that was formally ECN), collaborating with a consortium of companies on a techno-economic study for green ammonia synthesis in the Netherlands (Eemshaven and Middelharnis) and the subsequent conversion to hydrogen. He then joined full-time TNO (then ECN), where he advanced process development of Sorption Enhanced Water Gas Shift Technology. Leading model development, piloting, and testing. Over time, he transitioned into a technology consultant role, focusing on CCUS, before being appointed Program Manager for Industrial Heat Systems. In this position, he oversaw TNO's activities in areas such as industrial heat pumps, heat electrification, and advanced combustion systems.

Three years ago, he joined Duiker Clean Technologies. At Duiker he is the Process Development lead, responsible for all process development activities. He leads a team responsible for developing and commercializing the ammonia cracking technology. His work focuses on bridging engineering fundamentals with practical, scalable solutions.

Jebin brings a wealth of experience in process design, technology scale-up and cross-functional collaboration. He is a passionate advocate for the role of chemical engineers in shaping a low-carbon future.

He is also Chairman of the Institute of Chemical Engineers (IChemE) in the Netherlands and sits on the board of directors for Ammonia Energy Association.

Registration Form

Yes, I would like to attend the Lecture Dinner Meeting with the subject 'Low-NOx Ammonia Combustion and Cracking: Industrial Applications for Refineries and Hydrogen Production' on Tuesday, November 18, 2025.

Company:

Name:

Job Title:

Email:

Diet:

Please send the invoice to:

Company:

Attn.:

Address:

City:

Reference:

Fees

Participant: 95 Euro

Sponsor: 60 Euro

Registration by mail: aiche@kborganisatietalent.nl

A week before the start of the Lecture Dinner Meeting you will receive a confirmation with practical information and your invoice. Free cancellation is possible, when in writing, 48 hours prior to the event.

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