

## INVITATION

# Liberum Hydrogen 2020

Third annual hydrogen & fuel cells conference

**Date:** Wednesday 9 December

**Time:** 13:00-18:00 GMT (UK) / 08:00-13:00 EST (US)

**Host:** Adam Collins – Equity Research, Speciality Chemicals & New Energy

We have a very high calibre panel of experts presenting from across the hydrogen and fuel cells ecosystem. Each company webcast will last 40 minutes including 15 minutes Q&A.

Please contact [CIR@Liberum.com](mailto:CIR@Liberum.com) to register. For more information, please contact:



Adam Collins  
[+44 \(0\) 20 3100 2075](tel:+442031002075)  
[adam.collins@liberum.com](mailto:adam.collins@liberum.com)



Georgina Wood  
[+44 \(0\)20 3100 2046](tel:+442031002046)  
[georgina.wood@liberum.com](mailto:georgina.wood@liberum.com)



## Full Event Schedule (GMT)

13:00-13:40	<p>Air Liquide</p> <p>Pierre-Etienne Franc, VP Hydrogen Business Unit</p> <p>Hydrogen production/distribution (also secretary of Hydrogen Council)</p>
13:40-14:20	<p>Nel Hydrogen</p> <p>Jon André Løkke, CEO</p> <p>Renewable hydrogen production and fuelling</p>
14:20-15:00	<p>Johnson Matthey</p> <p>Maurits van Tol, CTO</p> <p>PEM fuel cell components and catalysts for efficient blue hydrogen production</p>
15:00-15:40	<p>Ceres Power</p> <p>Phil Caldwell, CEO</p> <p>Flexi-fuel solid oxide fuel cells for commercial scale heat and power and electric bus range extenders</p>
15:40-16:00	<b>20 minute intermission</b>
16:00-16:40	<p>Ballard Power</p> <p>Randy MacEwen, CEO</p> <p>Hydrogen fuel cell systems for buses, trucks, trains, cars</p>
16:40-17:20	<p>Nikola Corp</p> <p>Kim Brady, CFO</p> <p>Battery/Hydrogen trucks</p>
17:20-18:00	<p>ZeroAvia</p> <p>Val Miftakhov, CEO</p> <p>Hydrogen fuel cell Aviation powertrains</p>

# Companies



**Pierre-Etienne Franc**  
VP Hydrogen Business Unit

## Company

Industrial gases leader AL generates 10% of revenues from hydrogen today, primarily from natural gas, but is the IG player most invested in the clean hydrogen theme. It has commercial exposure to each of the three clean hydrogen production pathways – a 19% stake in electrolyser company Hydrogenics Cummins, c40 wholly-owned electrolysers in operation, a SMR+CCUS reference site at Port Jerome in Northern France and ownership of several biogas plants in Europe and the US. It is making sizeable investments in the immature North American hydrogen fuelling sector including a 20MW electrolyser supplied by Hydrogenics powered by hydropower in Quebec Canada costing around \$20m and a further \$150m investment in a 30tpd hydrogen liquifier plus SMR in Las Vegas fed by biogas. In addition, it has installed more than 120 hydrogen refuelling stations around the world to date of which around 60 are co-owned and operated by AL. In November 2019, it signed a MoU with Sinopec, China's largest petrochemical company, in the presence of the Chinese and French presidents relating to China hydrogen mobility. If the hydrogen economy grows significantly we expect AL to be an active player at the very least in hydrogen transportation and storage, blue and biogas hydrogen production and in hydrogen liquifaction as cryogenics is a core competence.

## Speaker

Pierre-Etienne Franc is a graduate from HEC Paris. He joined the Air Liquide Group in 1995 as strategic analyst for the Group general management and then held several positions in large Projects Business Development, Operations General Management, Strategy and Diversification activities. Since 2010 he has been supervising the portfolio of advanced businesses and technologies initiatives of the Group, in the fields of energy and environment, space, aeronautics, cryogenics. Since June 2017, he has been Vice President, Air Liquide, Hydrogen Energy World Business Line, in charge of developing the full potential of H2 activities for the Group worldwide.

He is the current Hydrogen Council Secretary. Between 2011 & June 2016, he was Chairman of Hydrogen Europe and of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU), the European Platform financing Hydrogen and Fuel Cell sector. He is author of three books (“Le Management du Client”, Eyrolles, 1994 ; “Hydrogen, the energy transition in the making”, Manifesto/Gallimard, 2015, “Entreprise et bien commun”, Palio 2018).



nel •

**Jon André Løkke**  
CEO

## Company

Nel can trace its origins back to the start of industrial hydrogen production in 1927, when its parent Norsk Hydro developed a large-scale alkaline electrolyzer plant using Norwegian hydropower for the production of ammonia based fertilizer. In 2014 it listed on the Oslo Exchange, in 2015 it acquired DK based H2 Logic adding fuelling station technology to the portfolio and in 2017 it acquired US based Proton Onsite broadening its capability to PEM electrolysis. The company has production facilities in Notodden, Norway, Herring, Denmark, and in Wallingford, Connecticut, USA and to date has delivered more than 3500 alkaline and PEM electrolyzers and more than 50 hydrogen fueling stations to customers.

In late 2018 Nel announced plans to expand the production capacity of its electrolyser manufacturing to 360MW/year, 10x current annual production, with the opportunity to go well beyond 1GW/year. The capacity increase will be aligned with customer demand. It is the nominated hydrogen fuelling station electrolysis partner to Nikola Motor and recently received its first orders for 5 truck fuelling stations, comprising 85MW electrolyzers, worth \$30m. Another notable framework agreement is with a Swiss fuel station consortium which could grow to 60-80MW. It also has a growing business in Korea. The company is pursuing various opportunities outside trucks. It is involved in a grant-funded green ammonia project with Yara and in the Swedish HYBRIT steel project.

## Speaker

Jon André Løkke has been Chief Executive Officer (CEO) of Nel ASA since 2016. Jon has previously been CEO of Norsk Titanium AS, developing and industrialising 3D printing technology for the production of titanium components for the aerospace and other industries. He has ten years' experience from the REC Group, including positions as senior vice president in REC Wafer, investor relations officer in REC ASA and CFO in REC ASA. Jon has also worked for the ABB Group and holds an International MBA degree from Glasgow University and a Bachelor degree in business and economics from Southampton University.



**Maurits van Tol**  
CTO

## Company

JM is a hydrogen triple play: green hydrogen production, blue hydrogen production and fuel cells for heavy duty mobility.

JM is one of three leading independent producers of membrane electrode assemblies for PEM fuel cells with around £35m annual sales, the technology that looks likely to dominate in hydrogen fuel cell mobility and which is highly fancied for hydrogen production from renewables (green electrolysis). It also generates around £60m of revenues p.a from process catalysts and technology used directly in fossil fuel hydrogen production or over £300m revenues if catalysts for all syngas derived molecules are counted such as ammonia and methanol. Leveraging off the know-how it has developed in ammonia and methanol JM has developed a technology package for blue hydrogen production that is being trialled in two UK government funded projects which it claims offers 40% lower capex and 15% lower energy feedstock than the traditional SMR hydrogen production process.

## Speaker

Maurits van Tol joined JM as Chief Technology Officer in October 2019.

Before joining Johnson Matthey, Maurits was Senior Vice President Innovation and Technology at Borealis. Maurits was responsible for shaping the Circular Economy business for Borealis as well as being part of the company's management board responsible for their Plastics business. Maurits was a senior leader with Borealis since 2012. Until 2012 he spent 19 years with Royal DSM in a wide variety of R&D, Innovation and Business Management roles.

Maurits has a PhD in Catalysis and an MSc in Physical Chemistry and Catalysis, both from Leiden University, the Netherlands. Parts of his studies were also performed at the University of East Anglia, and UC Berkeley. He shares our passion for science having achieved 18 patents and 30 publications and he sits on a number of Advisory Boards for Technology across the Chemicals Sector. Maurits serves on the Advisory Board of OCSiAl SA, the leading producer of Single Wall Carbon Nanotubes.



**Phil Caldwell**  
CEO

## Company

Ceres is a world-leading developer of next generation solid oxide fuel cell (SOFC) and electrochemical technology. Its asset-light, licensing model has seen it establish partnerships with some of the world's largest engineering and technology companies, such as Weichai in China, Bosch in Germany, Miura in Japan, and Doosan in South Korea, to develop systems and products for transportation, factories and buildings, data centres and everyday living. Solid Oxide fuel cells are able to work effectively with a wide variety of fuels and impure hydrogen and have the best fuel efficiency in the fuel cell sector of 60% in power mode and up to 90% with heat capture. Ceres Steelcell technology contributes to a durable device and competitive bill of materials. Recently Ceres announced an electrolysis cell development project.

## Speaker

Phil Caldwell was appointed Chief Executive of Ceres Power in September 2013. Under his leadership Ceres has grown into a world-class fuel cell business addressing climate change and air quality. The Group's market capitalisation has grown to over £1bn and headcount to over 300.

Phil has been instrumental in positioning Ceres as an asset-light licensing business; establishing partnerships with significant global engineering and technology players, such as Bosch in Germany, Weichai in China and Doosan in South Korea, to meet the urgency for low carbon power systems in industry, data centres, transportation and everyday living.

Phil has worked in the fuel cell industry for 16 years. He started his career in the Electrochemical Technology Business within ICI. He has a Master's degree in Chemical Engineering from Imperial College and an MBA from IESE Barcelona.



# BALLARD

**Randy MacEwen**  
CEO

## Company

US and Canada listed Ballard is the biggest PEM fuel cell supplier for heavy duty transport. Its fuel cell systems are in 1,000+ buses, 2,200+ buses and are being developed for 4 train projects and 5 ships under development. It has a collaboration with China truck diesel engine leader Weichai Power for truck and bus systems for which the latter is establishing a 225,000 sq ft factory near Shanghai with capacity to produce 34,000 stacks (2GW equivalent) for 20,000 vehicle modules. It recently announced a strategic collaboration also with MAHLE Group, one of the world's biggest truck powertrain component suppliers with \$12bn annual sales. It is also involved in a major European bus consortium, has a long-term contractual relationship with Audi and Volkswagen Group for development of a fuel cell engine for passenger cars and is involved various train and ship bids. PEM fuel cells are low temperature fuel cells with platinum catalysts and an engineered polymer membrane which have relatively high power density and fast responsiveness making them well suited to being the primary powertrain for heavy duty vehicles.

## Speaker

Randy MacEwen has been the President & CEO and a member of the board of directors of Ballard since October 2014. He has held executive roles in clean energy companies for over 15 years, including in fuel cells and solar.

From 2009 to 2014, Randy was Founder and Managing Director of NextCleanTech LLC, a cleantech consulting firm. From 2005 to 2009, he served as President & CEO of Solar Integrated Technologies, Inc., a commercial rooftop solar company. From 2001 to 2005, he served as Executive Vice President, Corporate Development of Stuart Energy Systems Corporation, a leading supplier hydrogen generation systems. Randy began his career as a corporate associate at Torys LLP, a leading business law firm, where he specialized in M&A and corporate finance from 1995 to 2001. He holds a Bachelor of Arts (Hon) degree from York University and a Bachelor of Law degree from the University of Western Ontario.



**Kim Brady**  
CFO

## Company

Founded in 2015, Nikola Corporation is headquartered in Phoenix, Arizona. It is a designer and manufacturer of zero-emission battery-electric and hydrogen-electric trucks and is listed on NASDAQ under the ticker NKLA. According to its investor presentations Nikola plans to launch a battery (BEV) electric truck in 2021 followed in 2023 by a hydrogen fuel cell electric truck (FCEV) once the necessary supply chain and infrastructure steps have been taken for the latter. The FCEV truck is expected to have a refuel time of 10-15 minutes, a range of 500-700 miles and hauling capacity of over 25,000 pounds. Nikola is much more than a vehicle manufacturer. It is developing the fuelling infrastructure and vehicle component and technology supply base needed to support a scaleup and is actually going to be a trucking services provider in that it plans to offer a bundled service including vehicle use, maintenance and hydrogen fuel in a 7 year, 700,000 mile, monthly lease package. Key suppliers include Nel Hydrogen, Bosch, WABCO, EDAG, AVL and Ryder.

## Speaker

Kim Brady recently served as a Senior Managing Director with SOLIC Capital Advisors, LLC. He brings over 20 years of experience in investment banking, private equity, and corporate restructuring. During the past decade, he has consummated over four billion dollars in transactions and recapitalizations and has overseen the successful performance improvements and reorganizations in over 100 businesses. He has previously served as CFO, General Manager, and Financial Advisor for various companies in manufacturing, business services, and healthcare services.

He currently serves on the board of SurePeople, LLC and as Executive Chairman of Ascentec Engineering, LLC. Kim received his bachelor of science degree from Marriott School of Management at Brigham Young University and his MBA from Northwestern University's Kellogg Graduate School of Management. He is FINRA Series 7 and Series 63 licensed.



**Val Miftakhov**  
CEO

## Company

The world's first full-scale hydrogen plane took to the skies over Britain on September 24 operated by ZeroAvia, the US-UK hydrogen aerospace fuel cell powertrain developer. The six-seater retrofitted Piper M Class aircraft took off from Cranfield airport in Bedfordshire for a 19-mile demonstration flight powered by a hydrogen fuel cell using 2kg of fuel. It was a precursor to a far more ambitious flight in the same aircraft of around 250 miles using 15kg of fuel — the equivalent of London to Edinburgh — which will be made from an airfield in the Orkney islands in early 2021. ZeroAvia's roadmap envisages the development of powertrain systems for longer range flights and bigger airframe platforms over time. The next step which will also likely attract some UK grant funding is the development of a powertrain system for a 19 seat retrofitted Dornier 228 aircraft with a target of 500 miles of range. The airframe has the advantage of having a wide body for integration of the fuelling and powertrain systems. ZeroAvia's CEO Val Miftakhov says it is feasible that within 10 years ZeroAvia systems could power a 100 seat aircraft (A320/737 segment) with 1,000 mile range. ZeroAvia designs all controls and software for the aircraft, integrates the fuel cell stack with the electrical powertrain (motors and inverters) and figures out the peak and cruise settings. It will also play a role in coordinating the airport fuelling systems required.

## Speaker

Val Miftakhov, ZeroAvia Founder and CEO, is a serial cleantech entrepreneur. Val's previous venture, eMotorWerks, developed smart vehicle-grid integration hardware and software, and was acquired in 2017. eMotorWerks' JuiceBox Smart EV charging station is the best selling product in its category in the United States for the last 5 years. Before eMotorWerks, Val held executive business strategy & operations positions at Google, McKinsey & Company, and Nielsen. He also launched and managed three startup companies, in all of which he held the CTO positions. Prior to his industry roles, Val was a high energy physics researcher at Stanford Linear Accelerator, a Department of Energy facility. Val received his PhD in Physics from Princeton University and his MS in Physics from Moscow Institute of Physics and Technology. He was a two-time winner of the Nationwide Russian Physics Competitions. In whatever spare time he gets, Val tries to get good use out of his airplane and helicopter pilot licenses.