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Paris, 23/11/2021

Reference: your letter dated 10/11/21.

Dear ShareAction group,

We acknowledge receipt of your letter dated 10/11/21. We appreciate your attention to this most serious subject and agree the urgency of action to tackle the threat climate change poses is intensifying. In this letter, we will address your 3 requests as well as shed light on the actions already implemented by the Group in the environmental fields and on our **recent commitment to carbon neutrality by 2050**.

Currently, our carbon neutrality commitment is focused on Scope 1 and Scope 2 emissions as Scope 3 emissions in the Chemicals Sector are not well defined. However, thanks to our products and solutions, Air Liquide supports customers in reducing their own emissions. Furthermore, most of our large customers have announced ambitious carbon reduction objectives on their own, thus paving the way for a direct positive impact on our Scope 3 emissions. The same can be said with Air Liquide suppliers in that many have also committed to dramatically reduce their emissions. Therefore Air Liquide, through its products, services and influence on its stakeholders as well as stakeholders own initiatives will reduce Scope 3 emissions meaningfully going forward. In July 2019, Air Liquide joined the **Science Based Targets initiative (SBTi)** and has been working with them in order to validate our trajectory. Currently, SBTi is planning to put in place a working group to define the Sectoral Decarbonization Approach (SDA) for the Chemicals sector, which we will participate in, to work on formally recording, reporting and reducing Scope 3 emissions.

As background on our current commitments, on **March 23, 2021**, we held our Sustainability Day, during which we announced ambitious ESG objectives to **ACT for a sustainable future**, based on 3 dimensions:

- **A** for Abatement of CO₂ emissions for a Low-Carbon society,
- **C** for Care for patients,
- **T** for Trust as a base to engage with our employees and build a best in class governance.

In full support of the 2015 Paris agreement, the Group's commitments address the urgency of climate change and energy transition, targeting Carbon Neutrality by 2050 with key intermediary milestones in 2025 and 2035:

- **to start reducing its absolute CO₂ emissions around 2025**
- **to reach a 33% decrease of its Scope 1 & 2 CO₂ emissions by 2035 compared to 2020**

Within this context, the Group also **maintains its existing objective to reduce by -30% its carbon intensity in kg CO₂/€ Ebitda in 2025, compared to 2015.**

With regards to your request to zero emission electrified energy consumption and use of 100 percent renewable energy, today **more than 80% of Air Liquide's primary production assets are already electrified (including > 95% of our Air Separation Units that are electrified)** and we aim to reach 100% as soon as possible. Additionally, 1/3 of our current energy consumption is low carbon energy. Air Liquide is consistently signing **Power Purchase Agreements (PPA)** securing renewable energy to rapidly increase the percentage of clean energy consumption. Following PPA agreements in the United States, Spain, and the Netherlands, a fourth PPA was just signed by the Group in Belgium in July 2021. But realistically to reach 100% renewable energy Air Liquide needs power grids to be 100% renewable in geographies in which we operate.

And finally, regarding your request to emissions-neutral hydrogen feedstock supporting the energy transition, Air Liquide has concrete examples of introducing carbon capture to existing Steam Methane Reforming units (SMRs) to vastly improve carbon emission from hydrogen production both internally and offers as a service this technology to assist third parties. Without carbon capture these plants will continue to produce hydrogen via the predominant method of SMRs used in industry today across the world.

Therefore **carbon capture is necessary for the transition period before electrolyzers are economically available at scale**. While the **ultimate goal of both Air Liquide and our customers is to advance the development and utilization of green hydrogen**, industry currently still needs to address the potential of interrupted supply caused by intermittency of many forms of renewable energy. Thus the near-term need for SMR production remains, and carbon capture offers the solution for this transitory need. We are actively working to capture CO₂ emissions from our own plants, with 3 in-house projects in northern Europe (Porthos CCS project in Rotterdam, Antwerp@C and our partnership with TotalEnergies to develop low-carbon hydrogen production in the Normandy industrial basin), while also supporting our customers on their journey towards lower carbon. We have also signed a contract with Zeeland Refinery, a joint venture between TotalEnergies and Lukoil, to provide a carbon capture and liquefaction solution in the Netherlands. Through our Cryocap™ FG solution we will enable capturing of more than 90% of the emissions from the hydrogen production and will contribute to the decarbonisation of the Vlissingen site, by capturing more than 800,000 tonnes of CO₂ per year thus not only deploying technology to decarbonize our own assets, but also those of our customers.

At the same time, we have launched **several large scale Electrolysis projects** in particular in regions where low carbon energy is available. We have **started at the end of 2020 the largest PEM Electrolyzer in the world**, in Becancourt in Canada, producing 8MT fully decarbonized hydrogen. We also have taken commitments in Europe for the development of Hydrogen production through **Electrolysis** in Normandy in **France** and in the Ruhr basin in **Germany**.

In addition to these Air Liquide's efforts, **we announced a number of key partnerships which will support development of H₂ ecosystems**. Highlighting a few of these partnerships include: a joint development agreement with Faurecia to boost hydrogen for heavy-duty vehicles; a MoU with Airbus and Groupe ADP to prepare for the arrival of hydrogen in airports by 2035; as well as working closely with Airbus and VINCI Airports to build the European airport network to accommodate future hydrogen aircrafts (The airport of Lyon-Saint Exupéry will host the first installations as early as 2023); and the joining of forces between Air Liquide and Eni to develop infrastructure necessary to allow the expansion of hydrogen mobility in Italy. Separately, Air Liquide, TotalEnergies, VINCI and a group of international companies launched the world's largest clean hydrogen infrastructure fund. All of these efforts demonstrate our level of **commitment to developing H₂ ecosystems** which is not only good for the planet but, to your first point, will have a positive impact on our Scope 3 emissions.

If you wish additional information on our ESG strategy and efforts, the [replay](#) and the [presentation](#) of our Sustainability Day are both available on our website for public observation.

Yours faithfully,



Fabienne Lecorvaisier
Executive Vice President
Supervising Sustainable Development

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France

10/11/21

Dear Mr. Benoît Potier,

We are writing to you as a group of investors and shareholders with USD \$3.4 trillion under management and under advice who, with the support of ShareAction, are initiating a collaborative engagement programme focused on the climate risks posed by the European chemicals sector. We welcome the opportunity to engage with Air Liquide about its approach to aligning its business activities with the 1.5°C goal of the Paris agreement.

The IPCC's Sixth Assessment report warns that climate change is widespread, rapid and intensifying and that the earth is approaching a series of tipping points from which recovery may become impossible¹. This would have a disastrous impact on the level of heating the earth undergoes and significantly raise the physical risks that climate breakdown poses for the global economy.

The chemicals sector is a major global emitter, responsible for 5.8 percent of GHG emissions². As a major chemicals company, Air Liquide is exposed to the financial risks associated with failing to transition its business to be Paris compliant. For example, the European Union has committed to a 55 percent decrease in emissions by 2030 and net zero by 2050. Consequently, the cost of the European Union Emission Trading System is forecasted to quadruple for the chemical industry by 2030³. However, the transition to a green economy also presents major opportunities for the chemical sector.

Air Liquide is involved in the production of ammonia, methanol, light olefins and BTX production through its provision of industrial gases, including hydrogen. The production processes for these chemicals are a significant portion of emissions and have clear decarbonisation pathways, as set out in ShareAction's report 'Slow Reactions: Chemical companies must transform in a low-carbon world'⁴. After reviewing Air Liquide's current strategy to address climate risks and impacts, we have concluded that further action is required from the company given the scale and urgency of

¹ IPCC (2021) 'Climate change widespread, rapid, and intensifying – IPCC' Available online at: <https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/> [accessed 31/08/2021]

² WRI (2020). 4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors. Available online at: <https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors> [accessed 26/05/2021]

³ ICIS (2021). European chemicals industry faces €1.5bn carbon bill. Available online at: <https://www.icis.com/explore/resources/news/2021/05/06/10635840/european-chemicals-industry-faces-1-5bn-carbon-bill> [accessed 21/06/2021]

⁴ ShareAction (2021) 'Slow Reactions: Chemical companies must transform in a low-carbon world' Available online at: <https://shareaction.org/reports/slow-reactions-chemical-companies-must-transform-in-a-low-carbon-world> [accessed 05/10/21]

the climate crisis. We believe that Air Liquide has a key role to play in this transition. Therefore, we request that Air Liquide:

1. Include Scope 3 emissions in its net zero commitment by 2050, and increase the ambition of its intermediate targets for absolute emission reductions across all scopes
2. Make a timebound commitment to zero emissions from energy consumption through electrification and 100 percent renewable energy (whether for own production or where enabling third party production)
3. Set a time-bound commitment to eliminate fossil fuels and woody biomass from the feedstock that it produces and set out a plan to do so by 2050 (whether for its own production or where enabling third party production)

1. Include Scope 3 emissions in its net zero commitment by 2050, and increase the ambition of its intermediate targets for absolute emission reductions across all scopes

We request that Air Liquide's net-zero commitment is backed up by robust and complementary intermediate emissions reductions targets, both short- and medium-term. While we recognise that tackling Scope 3 emissions is methodologically complex, they are a significant portion of the chemical sector's emissions. As such, intermediate targets should aim to reduce absolute emissions and apply across all scopes, including Scope 3. These targets should be set with the aim of keeping global temperatures within 1.5-degrees Celsius of warming⁵. The recent case of Milieudéfensie et al. V. Royal Dutch Shell PLC has shown that companies can be legally required to take all necessary steps to prevent the realisation of the risks, and to minimise the consequences, of Scope 3 emissions⁶.

Beyond this, as part of its broader climate strategy, we are also requesting that Air Liquide:

2. Make a timebound commitment to zero emissions from energy consumption through electrification and 100 percent renewable energy (whether for own production or where enabling third party production)

Electrification and the use of renewable energy present viable emissions neutral pathways for chemical production processes. The costs of renewable energy are falling year on year, with many new solar and wind projects undercutting existing coal-fired power plants⁷. By the mid-2030s, Carbon Tracker suggests that⁸. As such, switching to renewable energy not only presents the most sustainable option, but will soon be the most economical.

⁵ Open Procurement 'The importance of Scope 3 emissions' Available online: <https://open-procurement.com/the-importance-of-scope-3-emissions/> [accessed 01/09/21]

⁶ Climate Law Blog (2021) 'Guest commentary: an assessment of the hague district court's decision in milieudéfensie et al. V. Royal dutch shell plc' Available online at: <http://blogs.law.columbia.edu/climatechange/2021/05/28/guest-commentary-an-assessment-of-the-hague-district-courts-decision-in-milieudéfensie-et-al-v-royal-dutch-shell-plc/> [accessed 01/09/21]

⁷ IRENA (2021) 'Majority of New Renewables Undercut Cheapest Fossil Fuel on Cost' Available online at: <https://www.irena.org/newsroom/pressreleases/2021/Jun/Majority-of-New-Renewables-Undercut-Cheapest-Fossil-Fuel-on-Cost> [accessed 01/09/21]

⁸ Carbon Tracker (2021) 'Solar and wind can meet world energy demand 100 times over' Available online at: <https://carbontracker.org/solar-and-wind-can-meet-world-energy-demand-100-times-over-renewables/> [accessed 01/09/21]

3. Set a commitment to produce emissions-neutral feedstock by 2050 (whether for its own production or where enabling third party production)

To tackle its Scope 1, 2 and 3 emissions, we seek confirmation that Air Liquide has committed to decarbonise the hydrogen that it produces and that it has a plan to do so by 2050. Hydrogen produced with natural gas and carbon capture and storage, or blue hydrogen, has climate and economic drawbacks. During the extraction and transportation of natural gas (used as an input for blue hydrogen), methane is leaked. This causes significant upstream emissions and, in some cases, makes natural gas even more polluting than coal⁹. As such, blue hydrogen is not a truly emissions free feedstock and should not be treated as a long-term solution¹⁰.

Similarly, woody biomass faces significant climate risks. For example, carbon released by burning wood emits more CO₂ than coal at the point of combustion and can take decades to be captured in new plant growth¹¹. This creates planet-warming gases in a decade when emissions must be cut globally by at least 45 percent on 2010 levels by 2030¹². As such, woody biomass cannot be considered a sustainable fuel source for the chemicals sector.

Conversely, we note that green hydrogen and its derivatives (produced via electrolysis, powered by 100 percent renewable energy) have the potential to replace fossil fuels and woody biomass as a feedstock. In addition, according to research by Bloomberg New Energy Finance, green hydrogen will be cheaper than blue hydrogen, its fossil-based counterpart, as soon as 2030¹³. We recommend that Air Liquide prioritises the promotion of zero emissions solutions where possible. Whether for its own production, when acquiring hydrogen and its derivatives from third parties, or when providing infrastructure for third parties.

We would welcome a response to this letter before the 10th of December, including an overview of the steps that Air Liquide is planning to take to address the requests highlighted in this letter. Please do also share any recent developments or let us know if you believe we have overlooked part of Air Liquide's recent disclosures. We would welcome the opportunity to meet with you to discuss this further. Please send your response to Helen Wiggs at Helen.Wiggs@shareaction.org.

Yours sincerely,

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Ethos Foundation

Paula Singliarova
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⁹ Greenpeace (2020). Blauer Wasserstoff. Available online at: https://www.greenpeace-energy.de/fileadmin/user_upload/broschuere-wasserstoff.pdf [accessed 07/07/2021]

¹⁰ BNEF (2021). 'Green' Hydrogen to Outcompete 'Blue' Everywhere by 2030. Available online at: <https://about.bnef.com/blog/green-hydrogen-to-outcompete-blue-everywhere-by-2030/> [accessed 21/06/2021]

¹¹ ShareAction (2019) 'The Biomass Blindspot'. Available online at: <https://shareaction.org/wp-content/uploads/2019/01/InvestorReport-Biomass.pdf> [accessed 01/09/21]

¹² IPCC (2019) 'SPECIAL REPORT: Global Warming of 1.5 °C' Available online at: <https://www.ipcc.ch/sr15/> [accessed 01/09/21]

¹³ BNEF (2021). 'Green' Hydrogen to Outcompete 'Blue' Everywhere by 2030. Available online at: <https://about.bnef.com/blog/green-hydrogen-to-outcompete-blue-everywhere-by-2030/> [accessed 21/06/2021]

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Vorsorge SERTO