



Bluestreak



A NEWSLETTER BY QAPTIS
JULY 2024

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Welcome to the Qaptis newsletter, where you can stay up-to-date on the latest company news and insights.
Looking to decarbonize your business with carbon capture technology?
We can help.

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Qaptis is among the top 3 finalists for the prestigious **Prix SUD 2024!**

This award, organized by [Le Temps](#) and [Romande Energie](#), recognizes Swiss startups with innovative and sustainable business models.

Why CO₂ capture and reuse matters

Curious to learn more about the importance of carbon capture technology in the fight against climate change? Check out our video presentation and this insightful article by Le Temps (FR):

[Les trois finalistes du Prix SUD sont connus](#)

[Watch the video here](#)



The nominees of the prix Sud 2024: Wilfried Josset, co-founder of Solarsplit, Gnanli Landrou, co-founder of Oxara and Théodore Caby, co-founder of Qaptis — © Le Temps

🏆 And the winner is... Solarsplit!

Congratulations to our peers! Qaptis may not have won the award, but we couldn't be prouder to be among the top 3 finalists. It's a wonderful recognition of our commitment to a sustainable energy transition and our desire to contribute to a more environmentally-friendly future.

Beyond HVC tax: Qaptis pushes for a wide approach to decarbonize Swiss transport

Tackling climate change requires action across all industries and the transportation sector plays a crucial role. Mid-April, Qaptis joined [swisscleantech](#) at [Google](#) in Zurich to discuss the future of heavy-duty vehicles (HDVs) and their role in achieving Switzerland's climate goals, alongside the [Federal Office of Transport FOT](#).

One of the key topics on the table?

👉 Revising the HVC tax (known in Switzerland as RPLP/LSVA, more on this [here](#)) for 2031. This performance-related heavy vehicle charge has the potential to incentivize cleaner technologies and accelerate the decarbonization of the transport industry. However, we believe the current scope might be too narrow.



Qaptis' presentation by Théodore Caby, co-founder

That's why our COO, [Théodore](#), spoke to carrier representatives, advocating for a broader approach in the upcoming tax exemption bill submitted to the Swiss Federal Council.

By including a wider range of solutions, like our innovative CO₂ capture kit, we can create a more inclusive environment that fosters a faster transition to cleaner transport. Additionally, our system's compatibility with biofuels, which may even have negative emissions, offers a promising path forward.



Green logistics working group by IKEA & swisscleantech

At Qaptis, we believe all innovations deserve a seat at the table. Our device offers a fast-to-deploy, low-cost retrofitting solution for existing heavy-duty vehicles, capturing up to 90% of carbon emissions. This technology, alongside other clean alternatives, can significantly reduce the environmental impact of the transportation sector.

Remove & Circular Valley accelerators

Early April, Qaptis joined Cohort 6 of remove to get the focused mentoring, resources and network we deserve!

The initiative: remove is Europe's leading accelerator program for early-stage carbon dioxide removal (CDR) startups.

remove

As one of the 20 chosen startups in this cohort, Qaptis is proud to stand alongside other innovative companies driving real impact in the field of CDR.

The last few weeks have been rich in meetings and learning, offering great opportunities to accelerate our development and entry into the market. Work continues following our pitch in front of a panel of investors and experts last July 9. We can't wait for what's coming next!



Remove's kick-off with our CEO, Masoud Talebi Amiri— © remove



Our team, Masoud and Mitulkumar, also joined Circular Economy's Batch 6 of Circular Valley in Germany. A two-month program culminated in a Demo Day event at the historic Wuppertal Town Hall.

Mitulkumar did a fantastic job presenting our Mobile Carbon Capture technology to a room full of industry leaders, academics & investors driving circularity forward.



Mitulkumar Suthar, Lead Engineering, pitching at the Demo Day — © Circular Valley

Those programs are a goldmine for connections with industry leaders, sparking insightful discussions on minimizing CO₂ emissions and exploring Carbon Capture, Utilization & Storage (CCUS) solutions 🌐

Whether it's long-haul trucks or heavy machinery, Qaptis is committed to providing scalable solutions that make a real impact.

Eager to learn more about our mission and how we capture up to 90% of CO₂ emissions from HDVs? Drop us a message at info@qaptis.com!

Relive Circular Valley's Demo Day



© Circular Valley

Hello Tomorrow & ChangeNow 2024

March was a blast! Qaptis headed to two amazing global events in Paris, France, to showcase what we've been working on and meet some inspiring people.

📍 First stop at the Hello Tomorrow Global Summit, March 21-22, as a Deep Tech Pioneer startup.

📍 Second stop at ChangeNow, March 25-27, with Google Startups for Sustainable Development among the jury members.



Théodore Caby, COO & Emanuele Piccoli, Lead Scientist at Hello Tomorrow

TOP 100 Swiss Startup Award 2024: The Public Voting is open !

Help Qaptis to become a Top 100 Swiss Startup. Vote now!

Venturelab once again is selecting the #TOP100SSU and your voice counts to support us to be among the ranks.

Voting closes on July 21. The final list of the Top 100 startups will be announced at the award ceremony on September 4.

🗳️ **Vote for Qaptis** 🗳️



1. Visit www.startup.ch/qaptis
2. Log in with LinkedIn & click on VOTE NOW

Technology updates, month by month

April 2024

A third-party lab has confirmed that some of our samples have achieved 99% purity. We're thrilled to have already reached such high-purity levels with our proof-of-concept!

Feed Gas Carbon Dioxide (CO₂) Analysis Report

AAL Number: 70617-1
 Received On: 27-Feb-24
 Report Date: 08-Mar-24
 PO Number: Net 30

Sample ID: Gaseous CO₂ Feed sample; Exhaust Gas - Switzerland
 Received in Low Pressure Sampling kit: A3080 & B3080

Sample Date: N/A
 Final Test Date: 06-Mar-24

RESULTS	PARAMETER, CHEMICAL FORMULA (UNITS)	DL	Method
99+	Carbon Dioxide Purity CO ₂ (% v/v)	5	ISBT 2.0
177	Total Hydrocarbons as Methane THC (ppm v/v as CH ₄)	0.1	ISBT 10.0
176	Total Non-Methane Hydrocarbons TNMHC (ppm v/v as CH ₄)	0.1	ISBT 10.1
28	Carbon Monoxide CO (ppm v/v)	0.5	ISBT 5.0
nd	Ammonia NH ₃ (ppm v/v)	0.5	ISBT 6.0
300	Oxides of Nitrogen NO _x (ppm v/v)	0.5	ISBT 7.0
200	Nitrogen Dioxide NO ₂ (ppm v/v)	0.5	ISBT 7.1
100	Nitric Oxide NO (ppm v/v)	0.5	ISBT 7.2

Source Specific Parameters (ppm v/v)

May 2024



Our proof-of-concept model is versatile and can be used to test various engine types. Here, on the left, we have a snapshot demonstrating its application with an old crane truck! This showcases the adaptability and broad potential of our technology to retrofit and enhance the performance of a wide range of vehicles, regardless of age or type.

July 2024

Building on the success of our proof-of-concept, we're developing several additional prototypes to further advance our technology. One of these prototypes is a miniaturized Organic Rankine Cycle (ORC) system designed to convert waste heat into electricity. Take a look to your right!



All images © Qaptis

Expert opinion



Introducing our experts

Théodore Caby — Co-founder & COO @Qaptis

Dear Reader,

On this beautiful sunny Sunday, as I write to you, the European people are at the polls to elect their future representatives in the European bodies. These are the same bodies that deliberate and set the future regulations aimed at achieving net zero emissions by 2050.

The extremes have gained ground in these elections, making the future even more uncertain.

Given these uncertainties, it's prudent to favor a more robust approach, open to different technologies to build a resilient future. Carbon Capture, Utilization and Storage (CCUS) is one of those.

Retrofitting existing vehicles with CCUS technology allows for a significant reduction in carbon emissions without the need for entirely new systems. This not only makes the transition more cost-effective but also accelerates the implementation process, as existing fleets can be adapted rather than replaced.

CCUS also promotes circularity within the economy. Captured CO₂ can be recycled and used as a raw material in various industrial processes, such as the production of synthetic fuels, chemicals, and building materials. This not only reduces the carbon footprint but also creates a more sustainable industrial ecosystem where waste is minimized, and resources are continually reused.

These insights are shared by our two experts this month, and I thank them for their analysis.

I wish you an excellent reading.



Switzerland, retrofitting pioneer on the way to EU leading deep tech nation cleantech!

Eric Plan — Secretary general @ CleantechAlps

Resources are running out, leaving society with a complex new reality and Switzerland is no exception in this regard. In the face of shortages of energy and raw materials, geopolitical tensions and the impacts of pandemics, rethinking our modes of production and consumption is now a sine qua non, not just for business but for society as a whole.

Circular economy, a real paradigm shift

In this time of change, cleantech and especially the global circular economy approach is emerging as an essential paradigm shift. It is no longer a question of simply recycling materials, as circular economy is too often considered in a false and overly simplistic way. No, it is clearly a question of completely rethinking our actions throughout the product life cycle. For example, let's reconsider product design from scratch, known as eco-design or customer product co-design. Switzerland the pioneer, with its economic fabric teeming with solutions, is at the forefront of these approaches for years. The circular economy provides us with a framework and is becoming a sort of compass that offers stability and opens up the way to a more sustainable, resilient and balanced future. In Switzerland, more than ever, solutions exist to accelerate the transition to a more sustainable society targeting net-zero emissions by 2050.

Retrofitting – applying old approaches to decarbonize industrial sectors

Re(inventing) old new approaches, like retrofitting, is part of this game. According to Wikipedia, retrofitting is *“the process of replacing old or obsolete components with newer ones, usually by changing the technology, without changing the function”*. In a previous life, as young R&D engineer working for an international power generation constructor, retrofitting of power plants’ turbines was daily business. It consisted mainly at replacing the turbo-group and inner casing preserving the outer casing and overall costly balance of plant’s infrastructure. Doing so, we could spare on several cost streams like material, time and logistics, while increasing the overall plant’s efficiency!

Transportation’s challenge

In the race to CO₂ emissions' reduction, transportation is facing a huge challenge. Actually, global freight transport is responsible for 10% of CO₂ emissions worldwide. While many climate policies are aiming for net zero by 2050, this sector is still struggling to do without fossil fuels and is therefore difficult to decarbonize quickly.

Transportation, so as several industry sectors, where the shift to a new technology is linked to massive investment, sees retrofitting as one potential elegant and clean solution to assure the transition during the conversion period.

What can we expect from CCS/CCUS technologies

It is interesting to note that if retrofitting is common since decades in the power production sector, it is quite new in the automotive industry and still not done in serial production. Electric retrofitting is no rocket science at all and consists in making possible the conversion of a combustion vehicle into an electric one, by replacing the oil engine with an electric motor and a battery. Doing this process for light (urban) vehicles does not really make sense in a pure economic point of view. For trucks, heavy duty vehicles or tractors, the context is totally different due to cost aspects. Actually when a complete float has to be changed to an expensive technology (2 to 3 times more) than the old conventional but polluting one, the global cost argument (CAPEX) become decisive and an intermediate solution like retrofitting make all its sense. With its CCS technology, Qaptis is clearly part of this game by opening the way in this sector.

In the future, I see the marine transportation sector with their MW range diesel engines also as a very interesting market for this approach.

As you've seen, the potential is vast. The challenge now lies in deploying those solutions on a vast scale and, in particular, making far-reaching changes to the legal framework to allow this to happen. Economically viable game-changing solutions are waiting in the wings. This is a major challenge, but one that Switzerland is determined to meet through its policy of collaboration open to everyone involved.

As a summary, sustainability is no longer simply an objective; it is a necessity. Switzerland, with its commitment to clean technology, is forging a path to a greener future.

I strongly believe in this collective quest for a more sustainable society in which the circular economy, so as retrofitting innovative solutions, will guide us towards resilience, balance and a regenerative economy!

About CleantechAlps

Comprising more than 1,000 businesses, [CleantechAlps](#) is Western Switzerland's cleantech & sustainability cluster. Its network provides dedicated access to the cleantech communities so as potential industrial partners in the clean technologies and sustainability sector. CleantechAlps drives the Swiss innovation ecosystem towards the objective of Switzerland's being the leading Deep Tech Nation Cleantech in Europe. This network plays a decisive role in cleantech innovation and encourages key players to create the conditions most likely to ensure the development and growth of businesses facing the challenges of the energy transition and climate change. CleantechAlps mission is clearly to speed up the transition from the old fossil world the new decarbonized one !



The role of Carbon Capture and Utilisation for mitigating climate change

Célia Sapart — Scientific Director
@CO2 Value Europe

From decarbonisation towards “defossilisation”

For several decades, exponential growth in the use and combustion of fossil carbon has emitted billions of tons of greenhouse gases to our atmosphere and has become the main cause of the climate disturbances we are facing.

As discussed in the Intergovernmental Panel on Climate Change (IPCC) assessment reports, the most efficient way to rapidly mitigate climate risks and avoid massive environmental and societal degradations is to phase out urgently all uses of fossil carbon to slow-down the accumulation of greenhouse gases in our atmosphere and finally reach climate neutrality.

This objective is highly challenging, but solutions exist today for all sectors of our economy. While increasing sobriety, circularity and efficiency in term of raw material and energy use are priorities, the fossil fuel demand should also be replaced to solve the cause of human-induced climate change. Many transport sources and industrial processes can easily be electrified using renewable or low carbon electricity. But some sectors like chemical, materials (e.g. lime and steel), aviation and maritime transport will continue to use carbon and the fossil used today will need to be substituted. This means that there is an urgent need for significant development of renewable and low carbon energy sources, but also for alternative non-fossil and renewable carbon feedstock such as captured carbon dioxide (CO₂) via the concept of Carbon Capture and Utilisation (CCU).

The creation of a carbon circular economy

CCU represents a large set of technologies in which carbon is captured or at point sources or in the air and used to produce essential products. Carbon is usually captured from concentrated industrial waste gases in the form of CO₂ or, sometimes carbon monoxide (CO). CO₂ can also be captured from the air in a process known as direct air capture (DAC). The captured carbon can then be converted into different types of products that have traditionally been made from fossil carbon sources, such as building materials, synthetic fuels and chemicals.

CCU technologies have existed for several decades, such as in the production of urea, but only started to be seriously considered as a potential solution to mitigating climate change in the last decade. In recent years, there has been an exponential technological evolution and recognition. To date, no exhaustive quantification exists on the global climate mitigation potential of CCU technologies, because of the uncertainties in the evolution of renewable electricity availability and cost and because of the low granularity of models to simulate the complexity of the different CCU options.

One challenge is that CCU is often assessed in a linear way (as Carbon Capture and Storage (CCS), only considering its decarbonisation potential, while the main objective of these large set of technologies is not only to reduce emissions, but mainly to substitute fossil feedstock with renewable carbon and create a circular carbon economy.

CCU can lead to:

- Net reduction of CO₂ emissions with respect to conventional pathway (use of fossil feedstock) to produce the same final product, but with renewable carbon feedstock.
- Net zero CO₂ emissions when CO₂ emissions used as feedstock for the production process are stored durably in products (e.g. through mineralisation), or when they are re-emitted at the end-of-life of the product but then recaptured and recycled, or when CO₂ is captured from the atmosphere and returned to it at the product's end-of-life.
- Net CO₂ removal when CO₂, which is captured from the atmosphere or from the treatment of biomass, is durably stored in products via mineralisation processes.

The role of CCU in the EU

CO₂ Value Europe, the non-profit association representing the CCU community in Europe, has launched earlier this year, a first quantitative assessment of the CCU contribution towards climate neutrality in the EU based on the results of a newly developed open-access model called 2050 Pathway explorer for CCU. The main results show that, in the EU, about 21% of the technological effort to reach climate neutrality by 2050 will need to come from CCU and that Europe will be able to use at least 173MtCO₂/year to answer the demand for 53% of the fuels, 30% of the chemicals, 75% of bricks and 20% of concrete by 2050.

Moreover, even though CCU related technologies required a significant amount of low carbon electricity, especially for hydrogen synthesis and direct air capture, the model results show that the EU has the potential to produce more than half of the CCU fuels demand by 2050.

In short

CCU is recognized by the IPCC as a climate-mitigating solution to carbon-intensive sectors e.g., process industry, aviation, maritime and construction where no or very few alternatives exist to reduce emissions and move away from fossil resources. These solutions should not substitute large-scale efforts to prevent greenhouse gas emissions especially when more energy-efficient solutions are available, but they should be seen as significant opportunities to reduce emissions in sectors that will continue to be reliant on carbon-based feedstock and fuels. Moreover, to ensure real emission reductions over their entire value chain, the climate-mitigation potential of CCU technologies should be based on a full life-cycle analysis.

Startup life

FSE Vaud meeting on decarbonization and CO₂ capture

Last April 25 our COO, Théodore, took part in a panel discussion with WasteOlas and Holcim on decarbonization and CO₂ capture! Organized by the Fédération Suisse des entreprises (FSE), the present audience in Lausanne learned more about the latest technologies and innovations, as well as the challenges and solutions for a more sustainable future 🌱



© Fédération Suisse des entreprises



Masoud's keynote — © Venturelab

🎤 Venture Briefing's speech

'Nurture the culture you want to see in your company'

May's Venture Briefing at Campus Energypolis featured Samantha Anderson (DePoly) & Masoud Talebi Amiri (Qaptis) sharing startup advice and urging students to build the company culture they crave.

Team day

On June 26, the Qaptis team came together to kick off the summer festivities. The day started with a trivia battle at the [Quiz Room](#) in Lausanne, which put our knowledge (and a little competitive spirit) to the test. Who knew Masoud & Emanuele Giusti were trivia champions? They crushed the competition!

After the game, we enjoyed a delicious lakeside BBQ and raised a toast to Qaptis's 3rd year and for many more!

Many thanks to the entire team - [Marie](#), [Emanuele Piccoli](#), [Mitulkumar](#), [Théodore](#), [Stéphanie](#), [Masoud](#) and [Emanuele Giusti](#) - for a memorable day of fun together ❤️



© Qaptis

Other events we attended:

May 3, Portes Ouvertes de Friderici Spécial — With Théodore Caby & Emanuele Piccoli

June 5-6, Carbon Removal Summit by Climeworks — With Théodore Caby

*July 9, B! UP Accelerate event on on the Mobility Shift: Driving Transformation
— With Théodore Caby*

Get in touch with us at info@qaptis.com!

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Further readings

- › swisstech: [Switzerland's pioneering journey towards sustainable mobility](#)
- › Le Temps: [Clément Friderici: «Nous aurons bientôt quatre 40 tonnes électriques»](#)
- › CleantechAlps: [Swiss Cleantech Report — 4th edition](#)
- › ClimateHack: [50 Climate Founders in Vaud, Switzerland to Watch](#)
- › EPFL: [EPFL Valais Wallis, un pari réussi](#)
- › Qaptis: [Beyond smog: Why the shipping industry needs a green revolution](#)
- › University of Oxford's Smith School of Enterprise: [The State of Carbon Dioxide Removal - Edition 2](#)
- › Qaptis: [Our very own Dictionary of Abbreviations](#)

Feedback & suggestions

We hope you enjoyed this newsletter!

We would love to hear your thoughts for articles on topics you are interested in.

[Email us](#) and say hello.

— The Qaptis team

