

A smaller version of the grz: TECHNOLOGIES logo mounted on the side of the building's white facade.A large, prominent version of the grz: TECHNOLOGIES logo mounted on the white facade of the building's corner.

Yearly Report 2023



Introduction

The year 2023 was challenging at various levels. A particular disappointment was the delay in the introduction of the new renewable energy law (EEG) in Germany, which foresees substantial support for the storage of renewably produced electricity in the form of hydrogen. This had a direct impact on various potential projects targeted by GRZ. The increasing interest rates and rising inflation also led to a drop in valuation of technology startups. According to CB insights, the median tech valuation decreased by around 30% for A and B series from 2022 to 2023. Despite this challenging environment, GRZ could solidify its position as a market leader in the emerging market of solid-state hydrogen storage. Through the company's growth and numerous milestones achieved, the valuation could be maintained at the 2022 level as additional renowned investors joined the company in the course of 2023. This set up the path for new strategic collaborations at technical and commercial levels.

The competitive landscape for solid-state hydrogen storage and compression solutions was constantly monitored. The largest competitor for GRZ's DASH product

remains the company GKN, which offers a stand-alone storage system which is similar to GRZ's product. Nevertheless, GRZ is differentiating itself with the ability to offer a fully integrated hydrogen-to-power system by combining the storage unit with the fuel cell from our partner Hyundai Motor Company. Two other new players entered the market in the past year: the Italian-based company Methydor, which commercializes a medium-sized hydrogen storage system, and EIFHYTEC, a French company aiming at commercializing a metal hydrides hydrogen compressor. While at an early stage, the company seems to pursue an approach similar to GRZ's HyCo technology. Overall, the arrival of new competitors is both a threat and an opportunity: on the one hand, additional competitor will potentially gain projects instead of GRZ. On the other hand, the arrival of new suppliers also stimulates the market and supports the creation of new demand for such products. GRZ pursues its strategy to maintain a pole-position in the market by pursuing a well-thought, professional IP strategy and by ensuring a fast penetration in this growing market.



Financials

GRZ continued its investment in the industrialization of the standard DASH product line, in the realization of the first industrial projects, in the ramp-up of the operational capabilities and in the business development. In order to finance its growth,

GRZ was able to attract several additional new investors in 2023, including the Turkish conglomerate Sabanci, the Spanish equipment manufacturer AMPO and the UK-based cleantech investor Susten.

Sales & Marketing

In 2023, there was a notable shift in our company's focus from being project-oriented to transforming into an Original Equipment Manufacturer (OEM) and product-driven entity. The revised sales strategy now revolves around establishing a network of Official Partners who actively market and sell our solutions. These partners offer end-to-end solutions to customers, encompassing renewable power generation, electrolyzers, engineering, installation, and maintenance of complete systems. The Official Partners procure products directly from GRZ, integrating them into comprehensive solutions that are then delivered to the end-users. Currently, GRZ has agreements with Official Partners in Norway, Sweden, UK, Spain & Portugal, Israel, Turkey & MENA, Australia, India, America, Italy, Switzerland, and Germany. Discussions are ongoing to further expand this network.

In December 2023, the inaugural GRZ Partner Summit took place in Avenches, featuring the participation of 20 partners. This type of event will be organized on a recurring basis. Alongside the partner network, GRZ maintains direct collaborations with major clients such as Messer Gas, Gaznat, and OEMs capable of integrating GRZ products into their solutions.

In terms of marketing, the website underwent significant updates throughout the year, accompanied by the creation of brochures, technical and commercial docu-

mentation, as well as a regular newsletter issued three times. Our LinkedIn presence experienced notable enhancements, resulting in a surge in followers from 100 to 700 during the past year. GRZ now appears in over 9000 weekly LinkedIn searches, showcasing a growing daily exposure. The website is currently undergoing a Search Engine Optimization (SEO), with plans for a comprehensive update to focus on applications and provide detailed product descriptions. In June 2023, GRZ participated in the Hydrogen Forum in Berlin, sharing a joint booth with the Fisher Group. Overall, numerous sales and marketing initiatives were launched in 2023, laying the groundwork for the anticipated sales growth in 2024 and beyond.

GRZ Germany

The preparation to establish a German subsidiary has been underway for several months, aiming at leveraging the subsidies offered for hydrogen-based electricity storage outlined in the new Renewable Energy Law (EEG) in Germany. The goal was to position GRZ advantageously to capitalize on this opportunity by the second half of 2023. Unfortunately, introduction of this new law was delayed and the first subsidy auction originally planned for December 2023 was postponed.

A budgetary crisis following the German Federal Constitutional Court's rejection of the national government's proposed budget in November 2023 cast doubt on the availability of funding for renewable energy technology. This sparked widespread uncertainty among market participants. Despite these uncertainties surrounding the future of the German hydrogen economy, GRZ estimates that Germany remains a crucial focal point due to its dense renewable energy generation and ambitious plans to phase out other forms of electricity generation. This policy landscape has resulted in a unique generation mix, already resembling the final state of a renewables-based electricity system. A new commercial strategy tailored for the German market was developed. This strategy is structured around three core pillars: (i) Targeting municipal Distribution System Operators (DSOs) as potential users of the DASH Power product, offering decentralized electric-

ity storage solutions through both sales and potentially service-based models, (ii) Engaging existing and planned hydrogen projects with GRZ's suite of products, designed to complement electrolyzers with technologies such as DASH Storage for buffer storage applications, and (iii) Pursuing additional opportunities, including less industrialized products like the HyCo-HRS, where applicable and financially viable.

Several concrete steps for the market entry have already been planned, including the launch of a targeted marketing campaigns to municipal DSOs, reaching approximately 450 potential clients. Further, a similar outreach campaign to existing and planned hydrogen projects, targeting approximately 250 potential clients, will be carried out. The formal registration of GRZ's subsidiary in Germany is planned to be completed by the first half of 2024.



Methanation Reactor UPSOM (Project CH-020).

Project & Operations

Transfer to Avenches

An important achievement of the past year was the relocation to new facilities. This was an utterly necessary step in order to be able to deliver the projects acquired in the precedent months. A thorough evaluation process was carried out. Eventually, the option available in the municipality of Avenches was deemed the most attractive. It consists of an existing, readily available building rented from a private owner and a plot of land of 10'000 m² owned by the municipality of Avenches and reserved free of cost until December 31st,

2025, for the build of GRZ's future plant. The transfer to the new facility occurred in the spring of 2023. The official change of Canton also led to the requirement of the Canton Fribourg to reimburse the subsidies received in full, despite the fact that the new location of the company is within few kilometers of the Canton Fribourg. This was completed in 2023. On the other hand, a strong support was received from the municipality of Avenches, the local economic promotion agency (Coreb) and the Canton of Vaud. Most importantly, the full team was retained within the relocation

process and the operational capability was reached within less than two months. This enabled the realization of the largest storage system so far, namely a 200 kg_{H₂} storage system for Gruyère Hydrogen Power, which was delivered in September 2023, and the manufacturing of a DASH Power 500–3500, which will be delivered to MOVE ON Energy in the first half of 2024. Another highlight of 2023 was the delivery and commissioning of various large-scale plants. Selected projects are described in more detail below.

CH-020: UPSOM Methanation Reactor

The first large-scale methanation reactor with a production capacity of 16 kg_{CH₄}/h was delivered to our partner Gaznat SA in March 2023, just before GRZ's transfer to the new facilities in Avenches. This system is part of a larger initiative led by Gaznat to demonstrate the technical and economic viability of the full value chain starting from photovoltaic electric production and ending with the injection of synthetic natural gas to the existing grid. The project required intense efforts in the development activities of thermal, chemical and process engineering as well as in the fabrication of the reactor. The catalyst was developed by EPFL and showed a performance superior to existing, commercially available catalysts thanks to the dispersion of Ruthenium nanoparticles on a support made of alumina. The commissioning of the system turned out to be more complex than expected and required a strong effort from the technical teams, in particular in the field of electrical installation and software development. Thanks to the efforts invested by all team members, the first quantities of synthetic methane could be successfully produced in fall 2023. In 2024, the focus will be on the optimization of the reactor operation, the collection of operating data as well as the improvement of the overall system design. This will set the path for the commercialization of a standard methanation reactor. GRZ's target is to successfully sell a small series of at least five units to launch the commercialization in the course of 2024.



Methanation Reactor UPSOM (Project CH-020).



HyCo Industrial Compressor (CH-030).



HyCo Refueling Station for H₂ Forklifts (Project CH-040).

CH-030: Industrial-scale Metal Hydrides Hydrogen Compressor HyCo

This project is an ambitious endeavor to demonstrate the performance and feasibility of metal hydrides hydrogen compression at industrial scale and in a real-working environment. The project is supported by the Swiss Federal Office of Energy. In collaboration with a broadly-based consortium including Messer, Schnyder Engineering, Arxada, EPFL and Cimark, what is undoubtedly the largest metal hydrides hydrogen compressor in the world was installed on the premises of Arxada (former Lonza) in Visp. The compressor has a capacity of 30 kg_{H₂}/h and increases the inlet pressure from 10 bar at the inlet to an outlet pressure of 200 bar. The installation is directly connected to a trailer filling station. As for the UPSOM reactor, the installation and commissioning of this plant turned out to be more challenging than planned. Nevertheless, at the end of the year, the plant was completed from a hardware perspective and ready to be tested. The target for 2024 is to ensure a stable operation and to gather sufficient operating data to demonstrate the superiority of the technology

compared to the conventional mechanical compressors. This will serve as the basis for the launch of a new standard product – the *HyCo Industrial*, which will aim at addressing the growing market of industrial hydrogen compression.

CH-040: Hydrogen refueling station for a forklift based on the HyCo Technology

The project of a first hydrogen refueling station (HRS) based on the HyCo technology was completed in collaboration with Messer. The application is the refueling of a hydrogen forklift. Although of moderate size, this project convincingly shows the advantages of the metal hydrides compression in comparison to other, conventional compression methods: a silent, vibration-less thermal compression, which in addition also enables the storage of hydrogen within the same system. The HyCo compressor was commissioned in summer 2023 and compressed hydrogen up to 370 bar. The next step will be the collection of operational data and analysis of lessons learnt, which will guide the design of the standard product *HyCo HRS*.



DASH Power for Fast-charging of Electric Cars (Project CH-050).



DASH Power for Fast-charging of Electric Cars (Project CH-050).

CH-050: DASH Power for the Generation of Peak Power

After overcoming various regulatory and technical challenges, the project CH-050 with the company ewb (*Energie Wasser Bern*) is on the brink of completion. Civil works were completed by the end of 2023. The connection of the system to the city's public electricity grid as well as the third-party acceptance of the electrical installation are scheduled for early 2024. Soon after, the dedicated GRZ team will assume operations, gradually enhancing the system's autonomy. The ultimate goal is to achieve a fully autonomous operation, generating revenue for the end client as early as April 2024.

Upon reaching a stable operational state, ewb and GRZ plan to jointly communicate key achievements to the public. This communication will emphasize several groundbreaking elements: (i) First fuel cells integrated into a public utility power grid in Switzerland, (ii) Pioneering utilization of metal-hydride-based electricity storage within a public power grid in Switzerland, and (iii) Potentially the inaugural combination of hydrogen fuel cells with an electric vehicle fast-charging station.

A video recorded onsite by Hyundai Motor Company in collaboration with ewb and GRZ in October 2023 will be leveraged for the communications.

CH-170: DASH Storage as a Buffer for Electrolysis

The largest metal hydrides hydrogen storage system designed and built thus far was delivered to the company Gruyère Hydrogen Power SA, which is active in the production of hydrogen for industrial use. Located in Bulle (Switzerland), the project includes the production of green hydrogen which is then supplied to an industrial consumer. GRZ delivered a 200 kg_{H₂} storage system. This is the largest storage sys-

tem built by GRZ so far. The system was based on the standard stacks defined in early 2023; therefore, it was efficiently produced and delivered on time within less than 10 months, without major problems or delay in the production process. This supports GRZ's strategy of delivering standardized, containerized units. The system will be commissioned in the first part of 2024 and operated as an integral part of the industrial plant immediately thereafter.

Conclusion

In general, the commissioning of the new plants proved to be more demanding and complex than planned. An internal analysis led to the identification of the following key reasons for that fact: (i) each installation delivered was unique and not standardized. This means that no standard documentation, testing procedure or feedback from previous projects was available; (ii) Due to various circumstances, in-house testing was limited or impossible. This led to the identification of technical issues only at the customer's site and made the troubleshooting more complex, time-consuming, and expensive; (iii) the general situation of the supply chain and the numerous delayed material deliveries caused several disruptions in our project plans. Lessons were learnt from this analysis and various initiatives were implemented to address them. In particular, a strict standardization of our product offering was decided, and a stronger emphasis has been set on the in-house testing, as far as possible.



Standard Metal Hydrides Hydrogen Storage Stack Installed in the DASH Product.



Human Resources

GRZ started the year 2023 with around 20 FTE and ended with a team size of above 30 FTE. This growth was a challenge to process, in particular to ensure a qualitative and fast on-boarding of the new team members. At the end of the year, it is clear that GRZ's team was strengthened not only in size, but most and foremost in quality. A new structure was implemented to ensure clear responsibilities. In that context, key positions such as team leader roles in various technical fields (mechanical design, electrical engineering) were filled. The management team was strengthened with

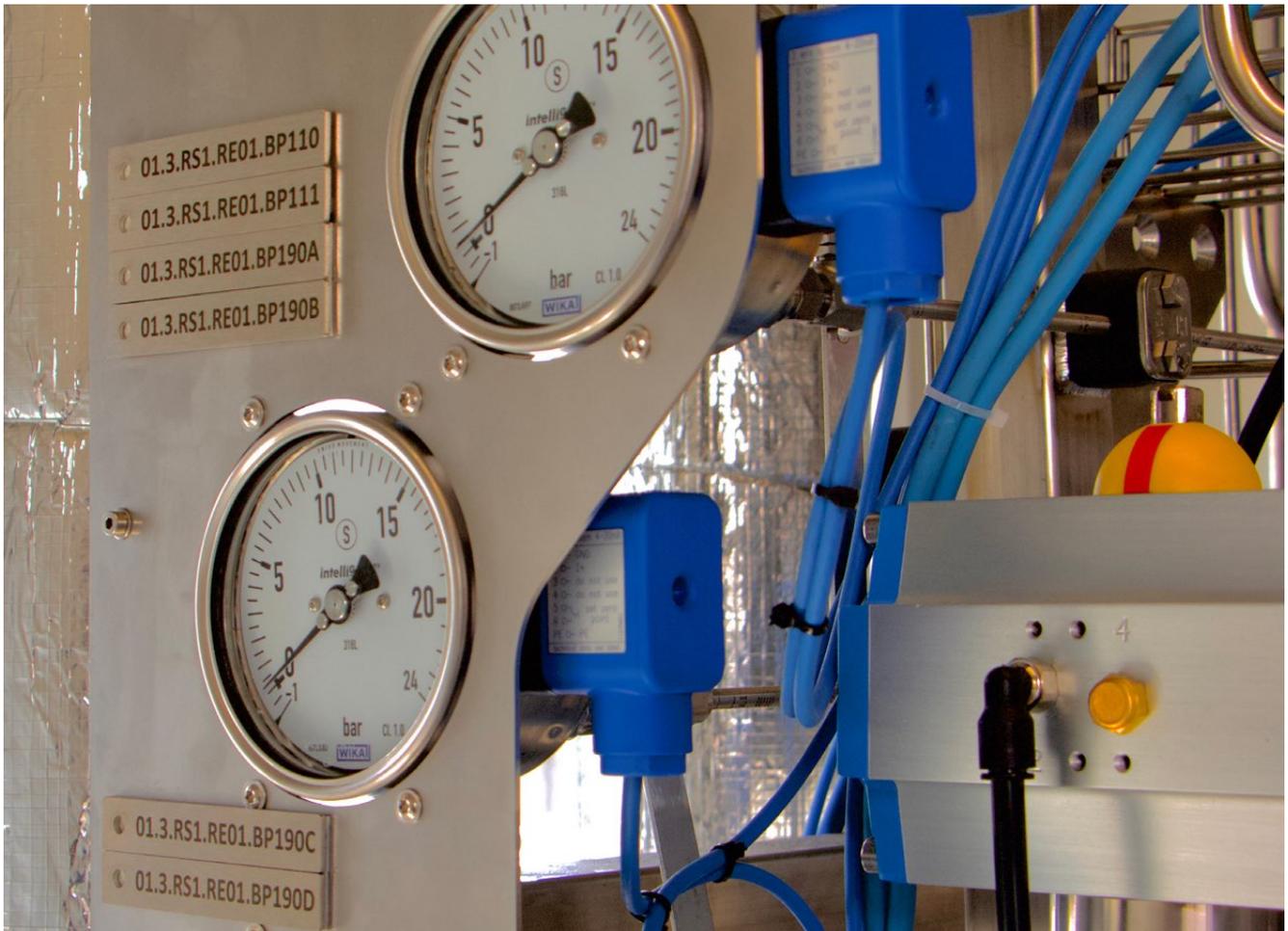
a seasoned executive as CCO in the person of Henrik Steen Pedersen. Further, a Chief Quality Officer (CQO) with decades of experience was hired. A particular aspect of his responsibilities also includes the maintenance of high standards in terms of work safety, which must enable GRZ to continue on its path of zero professional accident achieved in 2023. As the team size increases, the management of human resources and related administrative tasks become more important. Therefore, the decision was taken to launch the search for a Chief Finance and Administration (CFAO) at the

end of 2023. The position will support the CEO in his activities and take responsibility of all financial, administrative and HR aspects. This position was also successfully filled at the end of the year, and the selected candidate started his activities at the beginning of 2024. In the process, the structure of the company was clarified as shown in the organigram appended in Figure 14. Further, the Board of Directors is composed of the following members:

- Dr. Walter Steinmann (Chairman)
- Dr. Noris Gallandat (Vice-Chairman)
- Prof. Andreas Züttel (Co-founder)
- Hans Peter Fischer (representative of the fischer group)
- Markus Müller (representative of Hyundai Motor Company)

Low unemployment rates and general scarcity of technical profiles make the recruitment of technical candidates a challenge. GRZ's tailored incentive program based on

company's shares proved an effective tool to attract and retain talented staff. The vision and mission of the company as well as the dynamic work environment are additional aspects which support recruiting activities. This is reflected by the low number of sick days (total of just under 30 sick days occurred in the year 2023, which corresponds to 1.5 sick days per employee per year). Nevertheless, the effort expected in the coming years to ramp up the team size and reach our objectives is not to be underestimated and will be a focus of our newly hired CFAO. The fluctuation rate for the year 2023 was estimated to 19% (4 terminations or resignations with a team size of 20.9 FTE at the beginning of the year). This level of fluctuation is expected given the dynamic business. However, several initiatives will be prepared and implemented, targeting at improving our attractiveness and retaining key staff members. Initial steps in that direction have been launched in 2023 already, with the organization of various social events such as a ski day, joint BBQ events or various visits, sponsored by the company.



Intellectual Property

The maintenance and strengthening of GRZ's intellectual property's portfolio are of paramount importance for the successful growth of our company. A strong emphasis is set on the professional management of our patent portfolio, which occurs in collaboration with a specialized patent attorney. The patent portfolio includes seven patent families covering a wide range of aspects, ranging from material composition to design features and control processes. A summary is provided in Table 1. In the past year, all patent families were pushed towards acceptance in the relevant countries. A particular positive news pertains to the confirmation of the acceptance of the first patent filed, which describes the control of the hydrogen pressure by selectively setting the temperature of a metal hydrides system. This patent was accepted

in every country in which the application was filed. Another positive news was the formal acceptance of a second patent related to our DASH storage system in China. Acceptance from other countries is expected to follow in the coming year. It is finally worth to mention that a fast-track process was selected to accelerate the acceptance of the patent covering the composition of the metal hydrides material used in our standard DASH storage system.

Several preliminary sketches for new patent applications have been prepared. This will be particularly important in conjunction with the launch of the new product lines *HyCo* and *UPSOM*. The registration of at least two new patents has been set as one of the strategic goals for 2024.

Projection & Outlook

The project for growth and company development were updated in the fall 2023 following the latest developments of the industry, GRZ's fundraising activities and operational capabilities as well as the status of the sales pipeline.

GRZ targets to close substantial additional investment within a new round of funding. This will enable the acceleration of the business development activities for the DASH products. Further, the market launch of the new product lines UPSOM and HyCo will be advanced. The sales are expected to be increased by a factor of three in 2024 as compared to the previous year. This should be enabled by the new strategy of standardization and distribution through official partners. Our eyes are still focused on the European market. However, preliminary discussions with other countries including Turkey, China, Brazil, and the USA have taken place. While entering remote markets is challenging, GRZ is considering these chances and not excluding such business opportunities under the right circumstances, such as the partnership with local, established companies.

In the context of increasing sales, the production of our products also deserves particular attention. Various strategies have been discussed to ramp up the production capabilities in a short time in order to meet the expectations from the market. Several partnerships such as the production of subassemblies with the Fischer group have been set up. Further initiatives to outsource some non-critical work steps or to collaborate with external partners for specific work packages (electrical wiring, production of technical drawings from 3D models, or welding work) have been started.

GRZ is well on path to complete its mission – replacing fossil-based energy systems with safe, cost-efficient, and sustainable hydrogen solutions.



Words from the Local Authorities

It is important to me to highlight the initiatives and partnerships that contribute to the growth and progress of our community. It is with great pride that I seize the opportunity to write this article for GRZ's annual report.

GRZ technologies SA, an emblematic company in our region, embodies excellence in technological development. Since its inception, it has constantly innovated and pushed back the boundaries of technology, bringing innovative solutions and quality services to its customers around the world. The presence of GRZ technologies SA on our territory is a real opportunity, a source of economic dynamism and opportunities for our community.

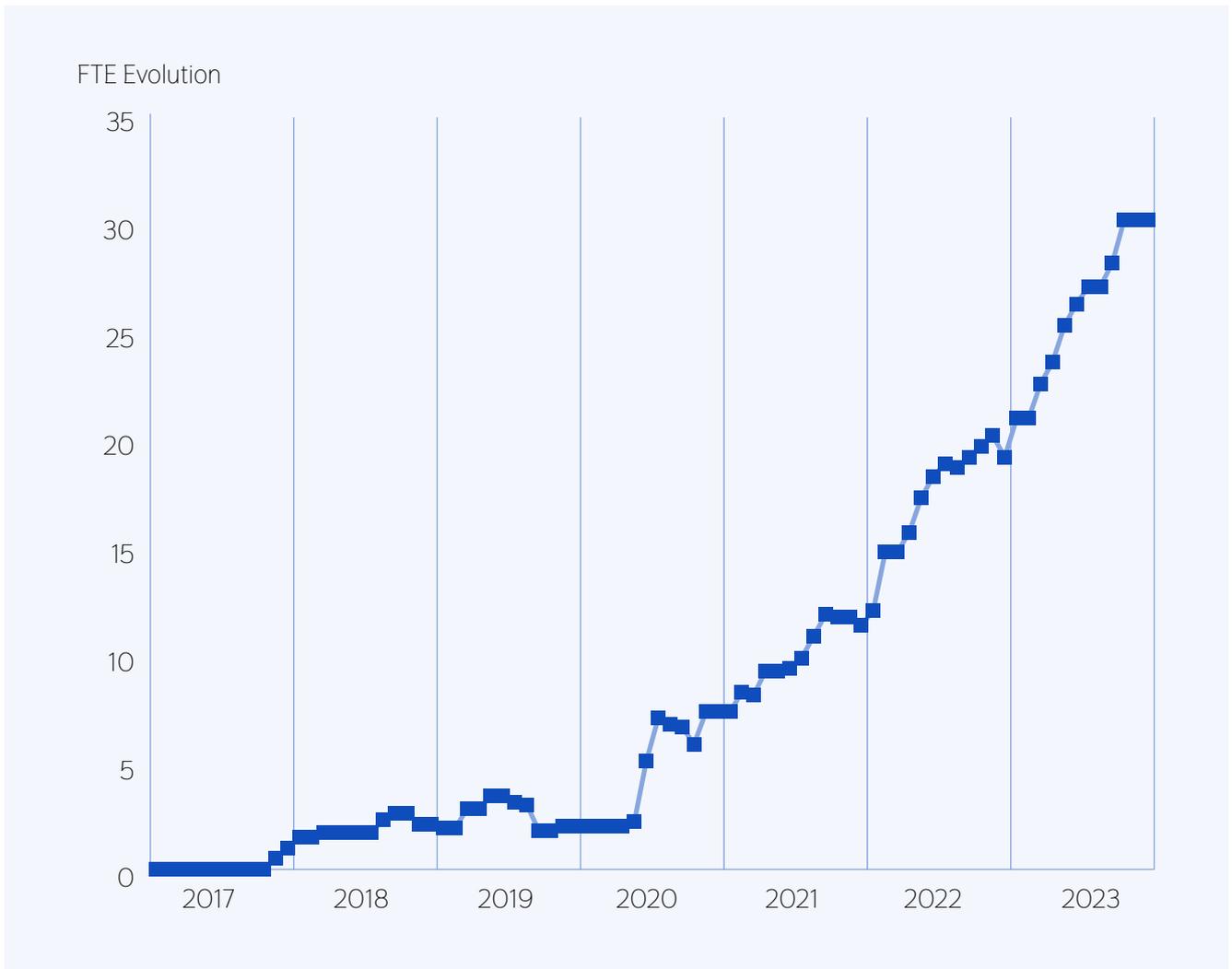
Beyond its technical expertise, GRZ technologies SA stands for values that resonate deeply with those of our community. Com-

mitment to excellence, integrity and respect for the environment are at the heart of our actions. This responsible and ethical approach is not only commendable, but also inspires our community to follow the same path towards a sustainable and prosperous future.

In conclusion, I would like to express my gratitude to GRZ technologies SA for its outstanding contribution to our region, and for its ongoing commitment to excellence and the values we hold dear. I am convinced that our partnership will continue to flourish and benefit all those who work with us.

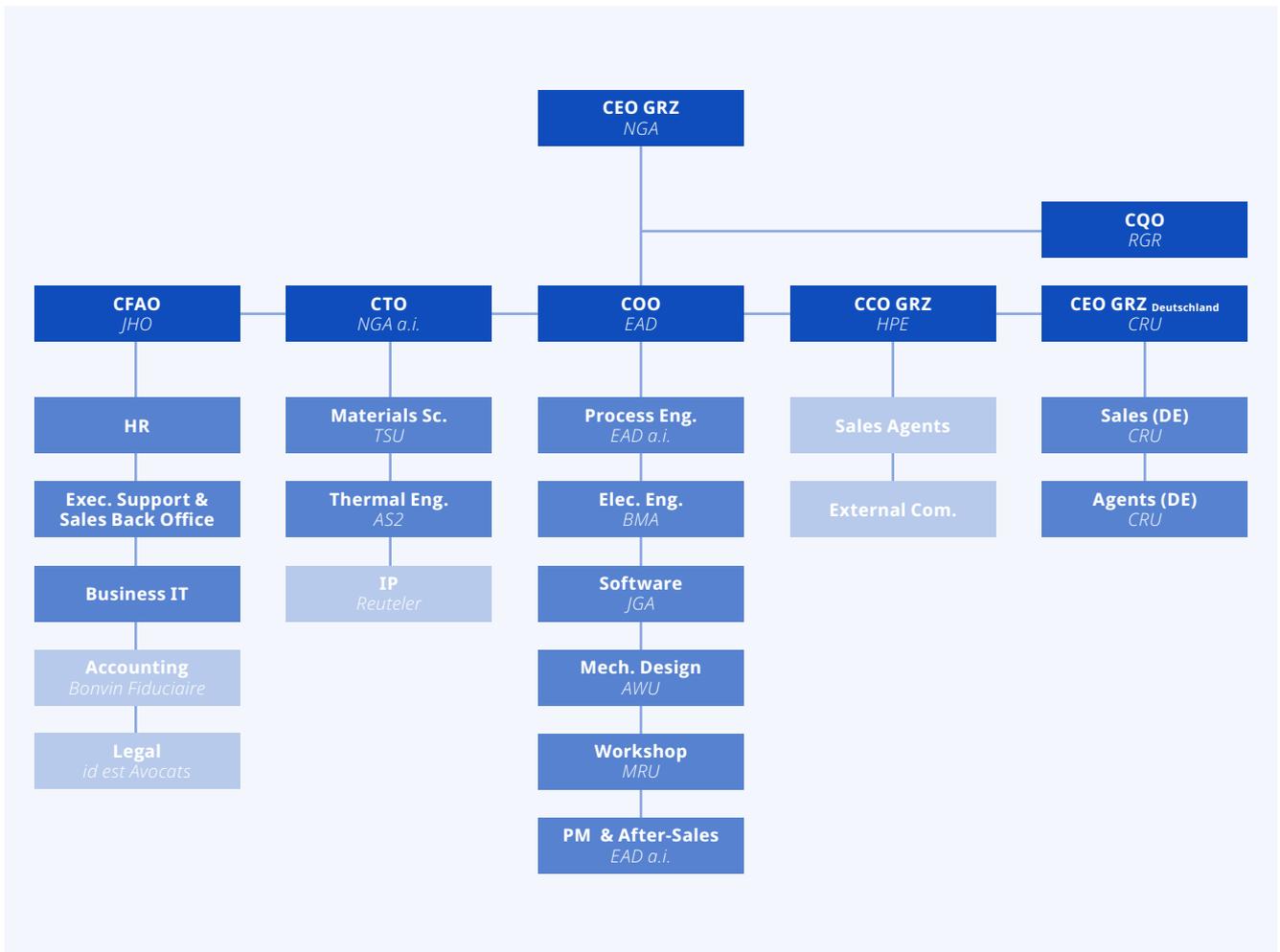
Gaetan Aeby
Mayor of Avenches

FTE Evolution



Evolution of GRZ's Full-time Equivalent (FTE) from company creation to the end of 2023.

Organigram of GRZ Technologies SA



Audit Report

Gefid Conseils SA

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Rapport de l'organe de révision sur le contrôle restreint à l'assemblée générale ordinaire de GRZ Technologies SA, Avenches

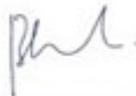
Marly, 27 février 2024
Réf: CB

En notre qualité d'organe de révision, nous avons contrôlé les comptes annuels (bilan, compte de résultat et annexe aux comptes annuels) de GRZ Technologies SA pour l'exercice 2023 arrêté au 31 décembre 2023.

La responsabilité de l'établissement des comptes annuels incombe au Conseil d'administration alors que notre mission consiste à contrôler ces comptes. Nous attestons que nous remplissons les exigences légales d'agrément et d'indépendance.

Notre contrôle a été effectué selon la Norme suisse relative au contrôle restreint. Cette norme requiert de planifier et de réaliser le contrôle de manière telle que des anomalies significatives dans les comptes annuels puissent être constatées. Un contrôle restreint englobe principalement des auditions, des opérations de contrôle analytiques ainsi que des vérifications détaillées appropriées des documents disponibles dans l'entreprise contrôlée. En revanche, des vérifications des flux d'exploitation et du système de contrôle interne ainsi que des auditions et d'autres opérations de contrôle destinées à détecter des fraudes ne font pas partie de ce contrôle.

Lors de notre contrôle, nous n'avons pas rencontré d'éléments nous permettant de conclure que les comptes annuels ainsi que la proposition concernant l'emploi du bénéfice ne sont pas conformes à la loi suisse et aux statuts.



Signature électronique qualifiée - Droit suisse

Gefid Conseils SA
Claude Brodard
Expert-réviseur agréé

Annexe(s)

+ Comptes annuels 2023

Conseils d'entreprise,
audit et fiscalité

Membre
d'EXPERTSuisse

ASR 501419
CHE-107.877.335 TVA

BCF Fribourg
CH63 0076 8011 0051 6440 2

Overview of GRZ's Patent Portfolio

December 31st, 2023

Ref. Nr.	Application Date	Title	Product
P2551	16.11.2018	Metal hydride compressor control device and method	HyCo, (DASH)
P2354	07.04.2020	Hydrogen storage system	DASH
P2553	01.02.2022	hHydrogen storage system	DASH, HyCo
P2611	02.08.2022	AB5 type based hydrogen storage alloys, methods of preparation and uses thereof	DASH, HyCo
P2612	02.08.2022	AB2 type based hydrogen storage alloys, methods of preparation and uses thereof	DASH, HyCo
P2609	18.08.2022	Metal hydrides hydrogen des compressor	HyCo



GRZ Technologies

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