

Buy EUR 13.00	Value Indicators: EUR DCF: 12.68	Warburg ESG Risk Score: 1.3 ESG Score (MSCI based): 3.0 Balance Sheet Score: 0.0 Market Liquidity Score: 1.0	Description: White biotech company developing products for nutrition, health and the environment
	Market Snapshot: EUR m Market cap: 184.3 No. of shares (m): 19.9 EV: 205.5 Freefloat MC: 80.2 Ø Trad. Vol. (30d): 178.08 th	Shareholders: Freefloat 43.5 % Founders and Management 9.6 % Lloyd Fonds 4.3 % MP Beteiligungs-GmbH 36.0 % DAH Beteiligungs GmbH 6.6 %	Key Figures (WRe): 2020/21e Beta: 1.4 Price / Book: 13.8 x Equity Ratio: 28 %
Price EUR 9.28 Upside 40.1 %			

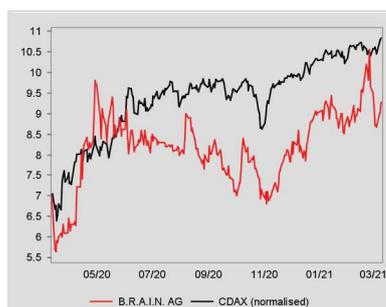
Transitioning to sustainable profitability; Initiation with Buy

BRAIN is a highly specialised bioeconomy company focusing on the development of industrial applications for natural products, customized enzymes or microorganisms for attractive niche markets. The approach of the bioeconomy, or bio-based economy, broadly involves using renewable biological resources sustainably to produce food, energy and industrial goods. BRAIN harbours substantial upside in its R&D pipeline made up of partnership projects with the potential for milestones and high-margin royalty payments. Besides an extensive technology portfolio, the company features a proprietary BioArchive, which allows BRAIN to tap nature's toolbox for bio-based solution to industrial problems. With this, **BRAIN is clearly at the forefront of the green industrial revolution and is a pure play for the sustainability super cycle.** Biologically-driven industrial processes are the future and BRAIN has the know-how to generate the required tools and participate in this trend. With a rigorous change in management in 2020, the company assumed a more retail-oriented stance and is now focused strongly on the commercial success of its products/the group.

The **BioIndustrial** segment represents the **mixing and blending and fermentation capabilities** of BRAIN and is mainly engaged in the production of bioactive enzymes for the food and beverage industry as well as other household-goods oriented businesses. In the **BioScience** segment, BRAIN takes over the **R&D services** for potential industrial partners, escorting the customer from basic research to final market maturity of the developmental asset. The aim of the collaboration is to generate **tailor-made solutions (TMS)** which are specifically designed to customer requirements in exchange for fees and research milestones.

In the past, the company invested heavily in biological solutions in highly attractive niche markets such as nutrition, health and urban mining/environment. In these areas, BRAIN has developed new and improved sugar substitutes, it has engineered microorganisms that can extract gold from electronic waste and it was able to create a highly specific enzyme solution for wound care. All of these solutions address markets of sizeable volume and with highly attractive growth rates (sugar substitution market, 2020: USD 16bn, +4% CAGR; advanced wound care (wound debridement), 2020: USD 10bn, +6.5% CAGR).

BRAIN is refocusing its business on proprietary fermentation for customers and a more streamlined R&D pipeline to leverage its technological know-how and past R&D investment. With an appetite for more sustainable business models and solutions, BRAIN can focus on highly attractive niche markets and will be able to satisfy the increasing demand for green alternatives in the appropriate scope. We expect these trends to continue and forecast average top-line growth of 11.2% p.a. over the next three years and near EBITDA-level breakeven of EUR 0.2m in 2022e. **We initiate our coverage with a price target of EUR 13.00 and a Buy recommendation.**

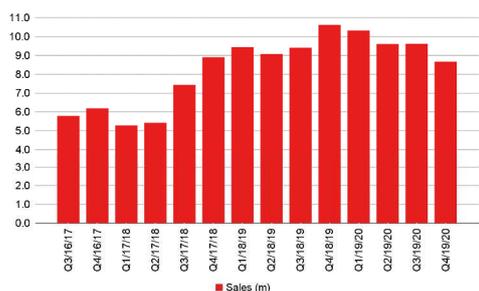


Rel. Performance vs CDAX:	
1 month:	2.0 %
6 months:	5.3 %
Year to date:	-2.6 %
Trailing 12 months:	-23.9 %

Company events:	
28.05.21	Q2
30.08.21	Q3

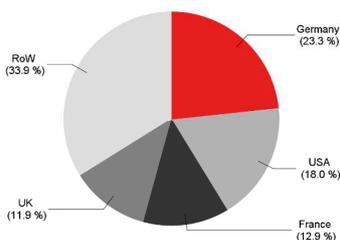
FY End: 30.9. in EUR m	CAGR (19/20-22/23e)	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Sales	11.2 %	24.1	27.1	38.6	38.2	41.7	45.7	52.5
Change Sales yoy		5.8 %	12.2 %	42.5 %	-0.9 %	9.2 %	9.5 %	14.9 %
Gross profit margin		52.9 %	49.5 %	54.8 %	55.5 %	55.7 %	56.8 %	57.5 %
EBITDA	-	-7.7	-6.6	-2.5	-3.9	-1.8	0.2	3.4
Margin		-31.9 %	-24.3 %	-6.4 %	-10.1 %	-4.4 %	0.5 %	6.5 %
EBIT	-	-9.4	-9.6	-7.2	-8.2	-6.0	-3.8	-0.3
Margin		-38.9 %	-35.4 %	-18.6 %	-21.4 %	-14.5 %	-8.3 %	-0.7 %
Net income	-	-9.6	-7.9	-11.1	-9.7	-7.0	-4.7	-1.3
EPS	-	-0.58	-0.44	-0.61	-0.52	-0.35	-0.24	-0.06
EPS adj.	-	-0.58	-0.44	-0.61	-0.52	-0.35	-0.24	-0.06
DPS	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dividend Yield		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FCFPS		-0.42	-0.37	-0.55	-0.41	-0.32	-0.19	-0.13
FCF / Market cap		-2.4 %	-1.7 %	-4.9 %	-4.5 %	-3.4 %	-2.1 %	-1.4 %
EV / Sales		10.8 x	15.0 x	5.6 x	4.8 x	4.9 x	4.6 x	4.0 x
EV / EBITDA		n.a.	n.a.	n.a.	n.a.	n.a.	977.2 x	62.6 x
EV / EBIT		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / E		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / E adj.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FCF Potential Yield		-3.1 %	-1.6 %	-1.1 %	-1.6 %	-0.9 %	0.1 %	1.6 %
Net Debt		-27.9	6.2	14.5	14.1	21.2	25.3	28.3
ROCE (NOPAT)		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Guidance:	First guidance will be announced at Q2 2021 latest							

Sales development
in EUR m



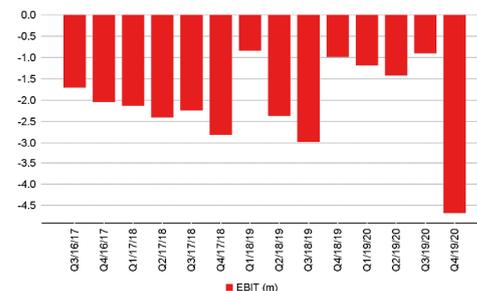
Source: Warburg Research

Sales by regions
2019/20; in %



Source: Company data

EBIT development
in EUR m



Source: Warburg Research

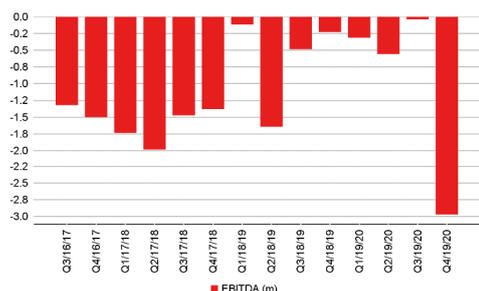
Company Background

- Founded in 1993, BRAIN today is a white biotechnology specialist, with a broad and renowned customer base. The company is headquartered in Zwingenberg, Germany and employed 324 people in 2020.
- BRAIN is focused on developing and producing biotech-based solutions for industrial applications within Nutrition, Health and Environment sectors
- Company produces enzymes, microorganisms and bioactive compounds for B2B customers in highly profitable niche markets
- BRAIN has two segments: BioIndustrial, a mixing/blending & fermentation business to generate products for sale and BioScience, a CRO unit developing tailor-made-solutions for B2B customers
- Additional upside: New Business Development pipeline utilises BRAIN's innovative capabilities to form lucrative partnerships with profit/risk-sharing agreements

Competitive Quality

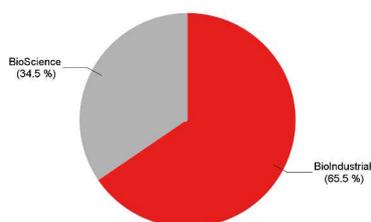
- BRAIN is engaged in highly attractive niche markets such as Nutrition, Health and Urban Mining/Environment. The company is at the forefront of the green industrial revolution.
- People at BRAIN are experts at developing and producing enzymes and microorganisms. Based on this expertise the company is able to tap into nature's toolbox to find innovative products for industrial scale applications
- BRAIN offers sustainable solutions for the nutritional and health industries based on their extensive technology and patent portfolio as well as their proprietary BioArchive
- The strong industry collaborations network with over 100 partners emphasizes the innovative abilities and corroborates the product quality delivered by BRAIN

EBITDA development
in EUR m



Source: Warburg Research

Sales by segments
2019/20; in %



Source: Company data

Net income development
in EUR m



Source: Warburg Research

Summary of Investment Case	4
Company Overview	5
Competitive Quality	6
Business model	6
BioIndustrial	8
BioScience	10
Aurase/SolasCure	11
Urban Mining	12
Analysis of Return on Capital	14
Capital employed	14
Growth	16
Addressable markets	16
Nutrition & Health	16
Aurase	18
BioIndustrial	19
BioCatalysts	20
BioScience	22
Valuation	23
rNPV: SolasCure/Aurase	23
DCF valuation	24
Company & Products	26
BRAIN-Group	26
BRAIN AG	26
AnalytiCon	26
SolasCure	26
WeissBioTech	26
L.A. Schmitt	26
Biocatalysts	26
BRAIN LLC	27
BioSun	27
Shareholder	28
Management	28
Adriaan Moelker, CEO	28
Lukas Linnig, CFO	28
History	29

Summary of Investment Case

Investment triggers

- **Execution of new management plan with focus on commercialisation:** at BRAIN's CMD at the end of 2020, CEO Moelker laid out the mid-term plans regarding profitability, top-line growth, and business focus. An integral part of this will be the development of BioCatalysts and the recently finished fermentation capacity. Positive news in this area could emphasize and reinforce ambitions going forward and renew investor confidence in BRAIN's execution
- **BRAIN expects to deliver a quantitative full-year guidance at the end of Q2 2021 at the latest**
- **SolasCure progression to clinical phase II:** beginning of the Phase IIa programme for Aurase in advanced wound treatment; possible exit between Phase IIb and Phase III (potentially in 2022/2023); our valuation currently includes in-house development and subsequent distribution
- **DOLCE:** one of the company's main R&D assets with a royalty-based business model: possible market entry in 2024e after approval in a huge market with attractive growth rates (sugar substitution; 2020 sales of USD 16bn; +4.5% CAGR)
- **Partner for urban mining project:** BRAIN has developed biological means to extract gold from electronic waste (e.g. from discarded mobile phones) and is looking for a partner to continue the development of the project to share profit/risks. A favourable closing would progress the pipeline.
- **Progress on commercialisation of the natural beverages 2 project with a renowned Japanese beverage company**

Valuation

- **DCF valuation suggests a fair value per share of EUR 12.68** – this is the basis for our initial price target
- Value contribution of SolasCure/Aurase: EUR 76.1m/EUR 3.83 per share (rNPV)

Growth

- Macro trend sustainability: **BRAIN is a pure play for the sustainability super cycle.** The company profits from fast growing markets driven by a world that is increasingly transitioning to sustainable and environmentally friendly business models. Biologically-driven industrial processes are the future and BRAIN has the know-how to generate the required tools and participate in this trend.
- Starting as a mixing & blending company, BRAIN is now transforming with the development of its own fermentation business, which offers higher margins, better moats and more sustainable growth rates, all leveraging the enzyme design expertise of the group
- Maturation of R&D pipeline and successful market entry of those projects will result in royalty and milestone payments with increased margins, finally reaping the rewards of its long-term investments

Competitive quality

- BRAIN is a bioeconomy company focusing on the development of industrial applications for natural products, customised enzymes or microorganisms with two subdivisions: BioIndustrial and BioScience. Besides an extensive technology portfolio, the company features a proprietary BioArchive, which allows BRAIN to tap nature's toolbox to find bio-based solutions to industrial problems.
- BRAIN amplifies this toolbox with an array of advanced biotechnologies such as high-throughput sequencing, big data and metagenome analysis, and directed protein engineering, as well as preparatory, intelligent process optimization options. With these technological capabilities, BRAIN is able to leverage nature's toolbox to increase yields, improve food quality and provide sustainable solutions for its customers.
- The company's workforce - experts in enzyme development – will be engaged in a) leveraging the considerable R&D investment of prior years and b) expanding into comparably larger, more attractive niche markets such as small-scale pharma production (research-grade enzymes) and protein/dairy and egg food and oil/fat modification. Consequently, BRAIN will be able to increase margins based on increasing its own fermentation business, which adds considerable value for customers

Warburg versus consensus

- Consensus expects high growth rates for BRAIN, as do we. We expect the company to grow at a dynamic rate (WRe sales 2023: EUR 52.5m vs EUR 61m cons). We expect EBITDA-level breakeven of EUR 0.2m in 2022e (vs. cons EUR 2.0m and WRe EBITDA 2023e EUR 3.4m vs. cons EUR 10.4m).

Company Overview

Segments	BioIndustrial	BioScience	Group	
Products/Services	<p>Product sales</p> <ul style="list-style-type: none"> Product sales account for 68.4% of Group sales revenues Portfolio of in excess of 100 special products for B2B markets Business model: product sales <p>Segment BioIndustrial</p>	<p>New Product Development</p> <ul style="list-style-type: none"> Pipeline of twelve R&D projects for proprietary product candidates * Business model: <ul style="list-style-type: none"> a) Product sales b) Product scalable licensing revenues via industrial partnerships <p>Segment BioScience</p> <p>*includes ongoing TMS projects</p>	<p>Tailor-made solutions</p> <ul style="list-style-type: none"> Over 100 R&D projects successfully completed with international groups Business model: access to technology, fees, and milestone or royalty payments 	
Business model	Purchase-for-resale model transitioning to own-fermentation business and subsequent product sales, which will make up the main share of revenues going forward. Production of enzymes, microorganisms and natural compounds for industrial applications	CRO business: BioScience develops biological active compounds/tailor-made-solutions (TMS) for customers on a fee-for-service basis; also includes a bio-library offering for customers interested in a fee-for-access model; includes possible milestone and royalty payments; functions as the innovation arm of the group		
Drivers	Increase in revenues with growth in attractive niche markets like nutrition (sugar substitutes/fermented beverages), health, and urban mining/environment accompanied by the introduction of new products. Transition to own-fermentation business will result in higher margins with the leveraging of production know-how. NBD pipeline maturation leads to increase in top-line and bottom-line performance	Long-term contracts with average lifetime of two years; stable revenue streams going forward; segment growth mostly driven by the closing of new deals; high potential upside due to possible milestone and royalty payments		
Competitive Advantage	Extensive patent and technology portfolio, proprietary BioArchive is a process optimization repository (Nature's toolbox); BRAIN's employees are experts in enzyme and microorganism production and development; agile company structure			
Customers (selection)				
Competitors	Amyris, Christian Hansen, Evolva, Kerry Group, Novozymes, Pure Circle, Symrise, Treatt	Brightseed, Codexis, Dyadic		
Sales 2020 (EURm)	25.0	13.2	38.2	
% of total	65.5%	34.5%		
adj. EBITDA 2020 (EURm)	2.3	-6.3	-3.9	
Margin % of total	9.2%	n.m.	n.m.	
Revenue streams				

Source: Warburg Research

Competitive Quality

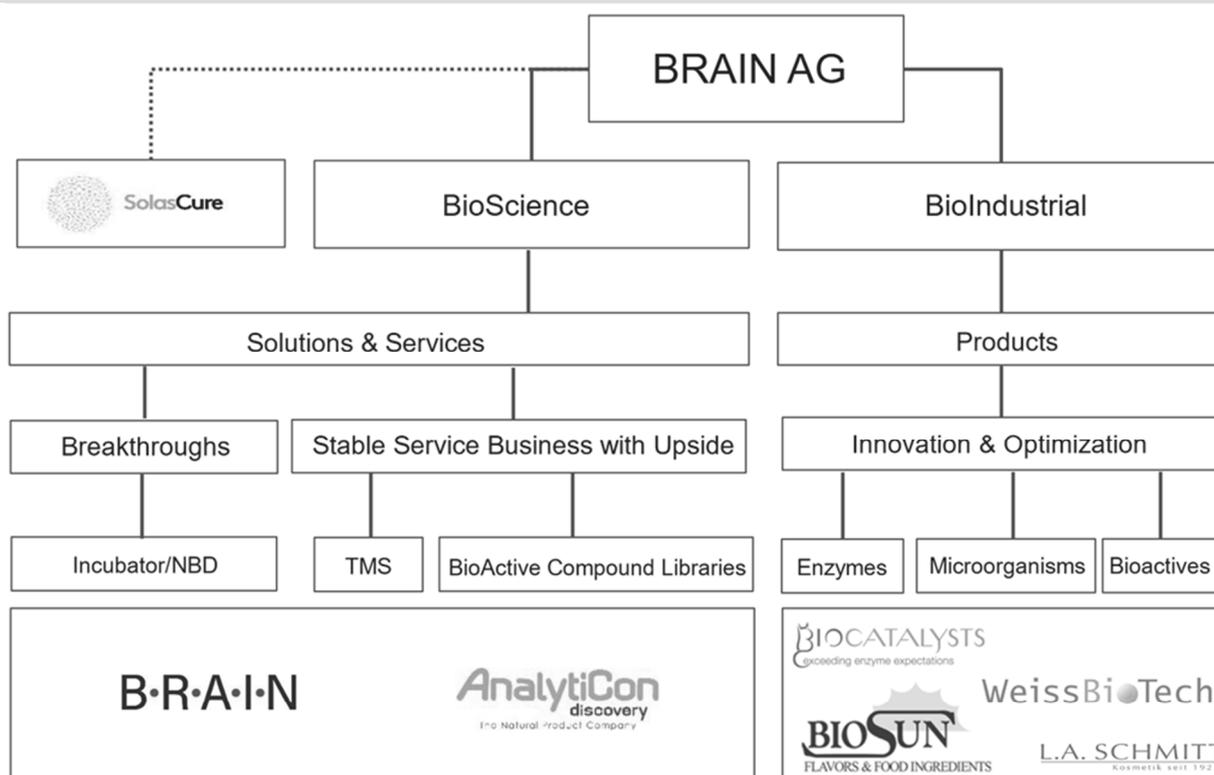
- Proprietary BioArchive which is not easily replicable and extensive patent portfolio
- Biotechnological production specialists with various host organisms
- Extensive biotechnological know-how and strong academic network

Business model

BRAIN is a company firmly rooted in the relatively new bioeconomy, or bio-based economy, which broadly involves using renewable biological resources sustainably to produce food, energy and industrial goods. BRAIN focuses on the development of industrial applications of natural products, customized enzymes or microorganisms. In this context, the company is divided into two subdivisions: BioIndustrial and BioScience. The BioIndustrial segment consistently accounts for approximately 65% of sales, while the BioScience segment contributes approximately 35%.

In the **BioIndustrial** segment, BRAIN offers a complete value chain based on its proprietary reservoir BioArchive including the extensive natural product library of AnalytiCon Discovery. The chain here extends from basic R&D of the products, through industrial manufacturing, to independent sales and marketing. This segment represents the **fermentation capabilities** of BRAIN and is mainly engaged in the production of bioactive enzymes for the food and beverage industry as well as other household-goods oriented businesses which are subsequently sold to these customers. The activities here are solely performed by the BRAIN-Group subsidiaries BioCatalysts, WeissBioTech, L.A. Schmitt and BioSun.

BRAIN-Group: Overview Value Drivers



Source: Company data, Warburg Research

In the **BioScience** segment, BRAIN offers to take over the **research and development services** for potential industrial partners and escorts the customer from basic research to the final market maturity of the developmental asset. The aim of the collaboration is to generate **tailor-made solutions (TMS)** that are specifically designed to the customer's requirements profile. The resulting products become the full property of the customer once the cooperation has concluded. This segment is best described as a services and libraries business and leverages BRAIN biotechnological know-how and its bio-repository, the BioArchive, to find process solutions for BRAIN's customers. BRAIN is basically "selling" customers its expert-level workforce, which devises solutions for the customer's production process problems. The operations of this segment are solely performed by the innovation hub BRAIN AG and the bioanalytics specialist AnalytiCon Discovery.

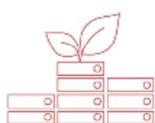
With these two segments, the marketing of self-manufactured products and the development of customer-specific solutions, BRAIN operates the Nutrition & Health, Skin Care and Industrial BioSolutions business units.

BioArchive – nature's toolbox

Among the fundamental cornerstones of the BRAIN Group's business model is a collection of approximately **53,000 thoroughly characterized microorganisms**, the BioArchive. The microorganisms were isolated from various biotopes and thrive under a wide variety of growth conditions. This results in a portfolio of enzymes with diverse optimal activity ranges with respect to a wide range of parameters, including temperature, pH and salinity. In addition, there is an extensive repertoire of secondary metabolites and other bioactive natural products. This archive represents the culmination of more than 750 man-years of analytical and curative work.

Based on this, BRAIN is able to offer potential customers a variety of bio-based solutions for a wide range of requirements. For this purpose, it uses its own extensive technology portfolio, which offers customized bio-based solutions using, among other things, high-throughput sequencing, big data and metagenome analysis, and directed protein engineering, as well as preparatory, intelligent process optimization options. With these technological capabilities, BRAIN is able to leverage nature's own toolbox to increase yields, improve food quality and provide sustainable solutions to its customers.

Technology portfolio



BioArchive

- Industry-leading collection of bio-based resources
- Genlibraries



Candidate Discovery

- *In silico* and activity based selection
- High throughput extraction and isolation
- Structural elucidation
- Sample preparation



Data Mining

- Analytics
- Bioinformatics
- Next-Generation-Sequencing



Design Optimization

- Bacterial-based Expression
- Strain Development
- Gene and protein-engineering



Production Scale-Up

- Process Development
- Process Optimisation
- Product Formulation

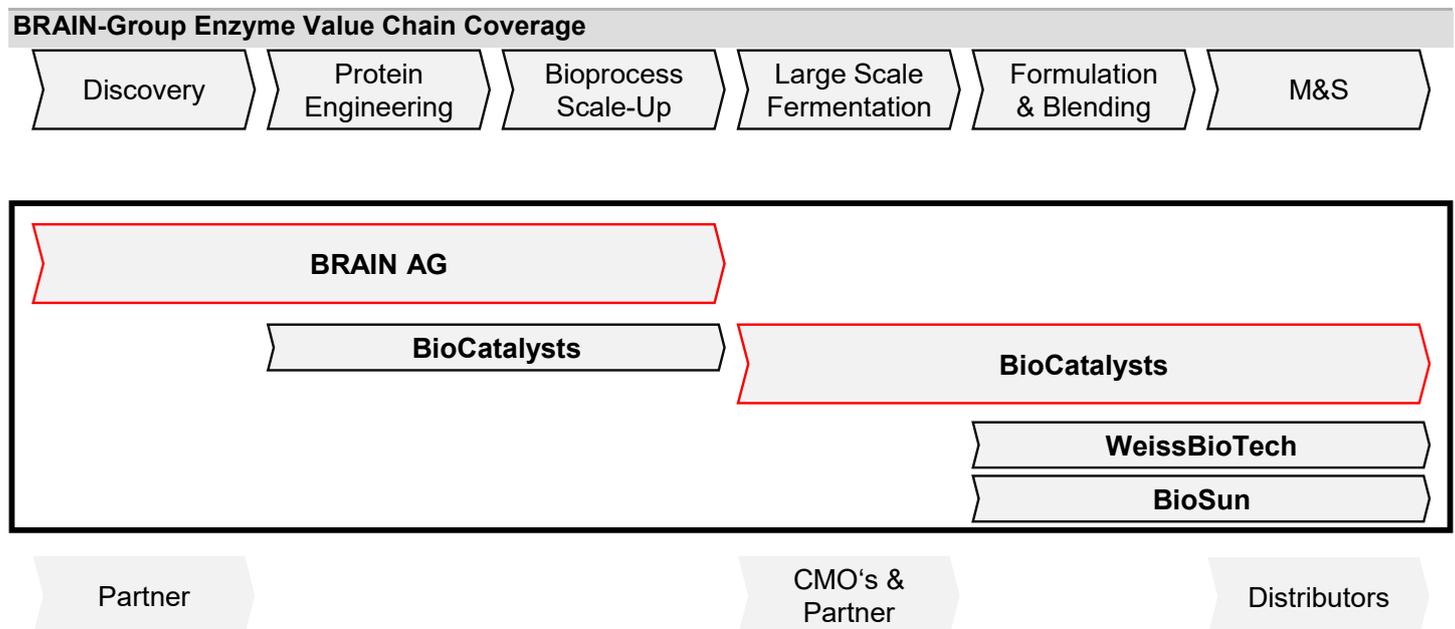
Source: Company data, Warburg Research

BioIndustrial

The products business of BRAIN covers the production (fermentation) of enzymes and other proteins. Historically, this segment’s business model was best described as a “purchase for resale” business, but the company has started to transition to a more profitable in-house production-and-fermentation business. This refocus will leverage BRAIN’s fermentation know-how, technological expertise and extensive knowledge base (BioArchive) to generate reliable revenues. The company aims to achieve peer group EBITDA margins of 25-30% for its fermentation business in the near future (2020: 9.2%).

In this segment, BRAIN covers the whole enzyme value chain, as it conducts operations in the areas of enzyme discovery, development, testing and commercial production as well as the necessary regulatory/compliance steps to bring the products to market.

Different parts of the BRAIN group are focused on different steps of the value chain: while the BRAIN headquarters in Zwingenberg, Germany, is mostly engaging in R&D and process development, the other group companies are performing the commercialization tasks of the business. The central fermentation hub, BioCatalysts, handles large-scale fermentation, formulation and blending, and M&S. WeissBioTech and BioSun are responsible for mixing and blending as well as M&S.



Source: Company data, Warburg Research

Focus on profitable niche markets

BRAIN invested considerable portions of its capex in FY 2019 and 2020 in production capabilities at BioCatalysts in Cardiff (2019: EUR 6.3m; 2020: EUR 2.8m). The site now features one 10m³, two 500L and one 50L fermenter for enzyme production using BRAIN’s proprietary high performance microorganisms. The plant has enough space for a second 10m³ installation and offers sufficient construction area for a second site and additional 10m³ fermenters. Capex for the installation of a second 10m³ is estimated to be about EUR 2.5m.

Based on these capabilities, BRAIN will refocus its future revenue streams on the fermentation business in profitable niche B2B markets with potentially higher margins (estimated EBITDA margins of around 30% for fermentation peers). Because of the necessary extensive process know-how and capex requirements this business also features higher entry-barriers than the old purchase-for-resale model.

In order to achieve a competitive position in this area, it is important to have optimized high yield production organisms that are able to produce enzymes at profitable margins. BRAIN is consistently engaged in optimizing its microorganisms and has proved its

capability to do so by developing commercially viable organisms for the production of Brazzein within its DOLCE programme in partnership with Roquette.

The BioIndustrial business is currently profitable (FY 2020 EUR 2.3m EBITDA) and is addressing attractive growing markets like nutrition & healthcare (more detail below). The immediate goal of the management is to increase margins in this area with greater utilization of self-fermented products and accretive bolt-on acquisitions (like BioSun).

The products sold from within this business can be summarised in one of the following three groups:

Bioactive Natural Products	BRAIN isolates, characterizes and develops natural substances for use in the food and skin care industry. Based on the BioArchive, BRAIN selects natural products that can function, for example, as sugar substitutes or flavour modulators (see DOLCE and Salt-Taste enhancer programme) and as active ingredients in nature-based cosmetics.
Customised enzymes	Enzymes are complex molecules that act as biocatalysts and can thus carry out targeted and efficient chemical reactions. They can perform a wide variety of different tasks such as, an active ingredient in washing detergent, an additive in food production, to improve the taste or to increase the yield of juice production, and as a wound care preparation (see Aurase project). Furthermore, they are capable of increasing the efficiency of the bioethanole production process from starch. As the enzyme products are used as lipid removing agents in household items like detergents or as texture modifying additives in food production, they function as important final product components, adding considerably to the value of the finished product while constituting only a minor fraction of the overall package. For example, a typical enzyme in a detergent formulation makes up less than 1% of the product's total mass. This makes customers less price-sensitive to BRAIN's offering because the attributed cost of BRAIN's products as an ingredient for their products is negligible compared to the importance of the ingredient.
High-performance microorganisms	Microorganisms serve as functional biomass or microscopic factories of bioactive natural products or enzymes. BRAIN identifies bacteria or fungi for their optimal application, e.g. in the field of CO2 fixation or the recovery of precious metals from waste streams or mined ores.

	Products with "BRAIN inside"		
	 Enzymes	 Microorganisms	 Bioactive natural compounds
Product range			
BRAIN inside	Low temperature detergent enzymes	Flavorpro™ 786P flavor creation in cheese processing	Skin anti-irritant Symsitive 1609
Industrial partner	 #3 detergent business globally	 BRAIN subsidiary	 #1 European sugar company

Source: Company data, Warburg Research

BioScience

The BioScience segment encompasses BRAIN's Services (TMS) and Libraries business, the New Business Development area as well as SolasCure.

BRAIN's customer base

 Enzymes	 Microorganisms	 Bioactive Natural Compounds

Source: Company data, Warburg Research

Tailor Made Solutions (TMS)

Based on its technological and biotechnological know-how, BRAIN offers its customers nature-based solutions to optimize processes, improve products or increase yields. The company currently has 29 active development programmes (FY 2020) with an average duration of one year. 50% of contracts are generally renewed, increasing the average project time to two years and emphasizing the high degree of customer satisfaction. The service business operates mostly on a fee-for-service basis and keeps the possibility of upside (milestones and licenses) at the low end.

Libraries Business

BRAIN offers customers from the food, pharma and cosmetics industries access to its expansive BioArchive encompassing a wide variety of thoroughly characterized microorganisms and natural compounds in exchange for service fees.

New Business Development

CEO Adriaan Moelker presented BRAIN's refocused New Business Development pipeline at the company's CMD in September 2020. The company took inventory and temporarily shelved currently far-off projects to concentrate efforts on the most promising projects in terms of possible risk-sharing partnerships, potential markets and necessary further investment.

New Business Development Pipeline

Project	Partner	R&D			Market	BRAIN rNPV*	Profit Model Options
		3-5y	1-3y	pre-launch			
Natural fermented beverages 1	Suntory					< EUR 5m	Prod, Fee, MSP
Salt taste enhancer 1	US-CPGC					< EUR 5m	Fee, MSP, Lic
Natural fermented beverages 2	JP.Bev					EUR 15m+	Prod, MSP, Prof
Perillic active, anti-microbial	ND					EUR 5-15m	Prod, Prof
Gold from waste streams/Urban Mining	none					EUR 5-15m	Prod, Prof, Fee
DOLCE	Roquette					EUR 15m+	Fee, MSP, Prof, Lic, Prod
Aurase	SolasCure					EUR 15m+	Fee, Prod, Prof

Legend: Prod: product sales; fee: research fee; MSP: Milestones; Lic: Royalties; Tec: Tech fees; Prof: Spin-off, profit participation; *company calculation

Source: Company data, Warburg Research

The projects with the largest market potential, according to BRAIN, include the Natural fermented beverages 2 project, DOLCE and the Aurase project. The first two are partnered with two different big Japanese beverage companies (one of them being Suntory) and Roquette, respectively. The “Gold from waste streams” project does not have a risk-sharing partner currently and is therefore on hold. Because it is still a prospective endeavour, BRAIN is in discussion with potential interested parties concerning a profit/risk-sharing partnership to develop the project to market maturity.

The DOLCE project recently transitioned from the R&D phase to a pre-commercial stage including the application for market approval. The project developed Brazzein, a sweetening, sugar-substituting protein for use in beverages and foods. BRAIN has engineered a host strain that is viable for commercial production. The next steps will be production scale-up and the approval process for FDA-authorization as GRAS (“generally recognized as safe”).

Aurase: superior clinical profile

Aurase/SolasCure

The Aurase project, in development with SolasCure (a 41% subsidiary of BRAIN), wants to utilize a highly specific Fibrin-degrading protease to help facilitate the rapid cleaning of chronic wounds. Chronic wounds (not healing after three months) are caused by various factors such as poor circulation, neuropathy, mobility and infection.

The treatment of chronic wounds from conditions such as venous leg ulcers, diabetic foot ulcers and pressure ulcers is an enormous unmet medical need. Current treatments include the surgical removal of necrotic tissue, autolytic treatment (Hydrogels), rudimentary enzymatic treatment (Santyl) or maggot therapy. The global cost of chronic wound care complications accounts for USD 30bn annually.

Aurase is a Fibrin-specific protease, which dissolves unfavourable wound closures in a highly specific and gentle manner, thus leading to the removal and evacuation of cellular and fibrin debris. Aurase was isolated from clinically active maggots, whose healing effect in this field has long been researched and is the basis for the debridement activity of the enzyme used in Aurase.

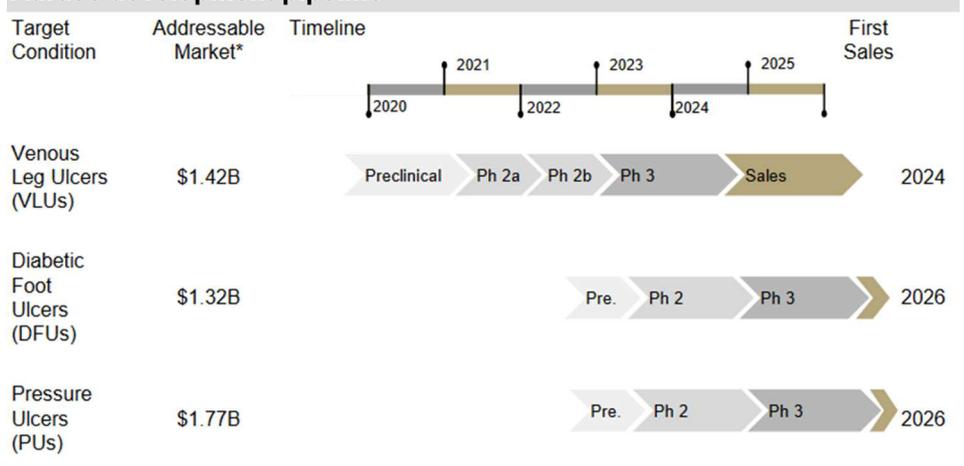
Aurase clinical performance

	Surgery	Hydrogel	Maggots	Enzymatic Debridement		
				Santyl	EscharEx	Aurase
Efficacy	●	○	●	○	◐	●
Safety / Pain	◐	●	◐	●	○	●
Patient Care Cost	○	○	○	○	○	◐
Convenience	○	◐	○	◐	●	●

Source: Company data, Warburg Research

The pre-clinical performance of Aurase so far appears to be promising. In-human clinical trials are planned to corroborate the results and prepare the product for potential market authorization.

Aurase development pipeline



Development time adjusted for delay; Source: modified from SolasCure by Warburg Research

Possible commercial models include a spin-off, a potential exit (possibly before Phase III) and/or production by BRAIN. SolasCure intends to initiate its first in-human trial in 2021.

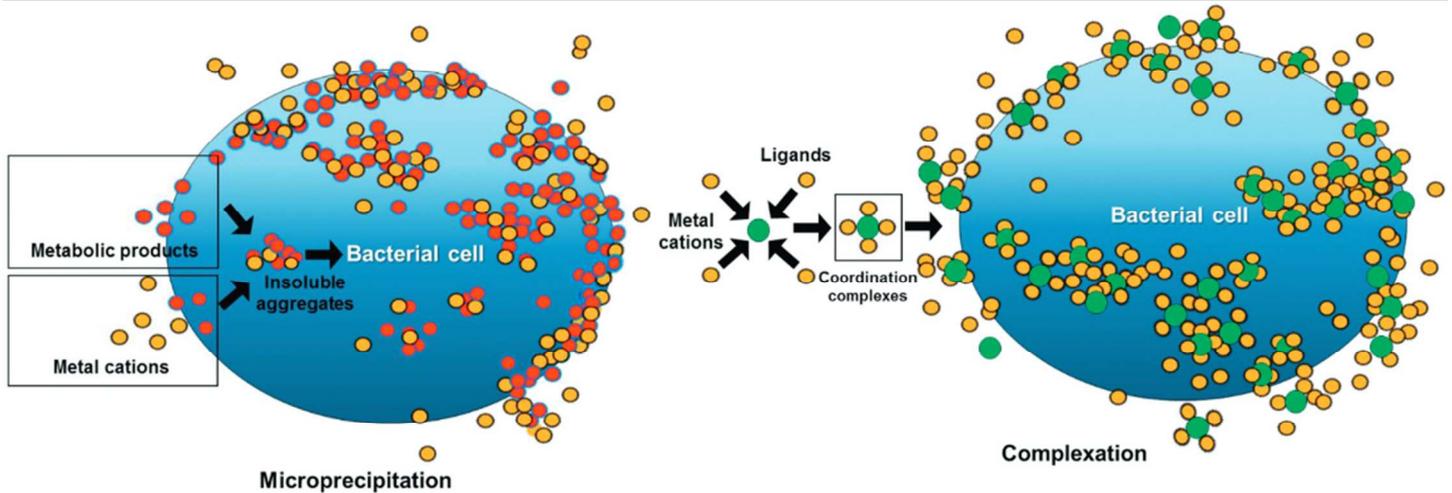
Urban Mining

The recycling of e-waste such as discarded cell phones and computer components represents attractive market potential. Compared to normal ore deposits from the earth's mantle, metal deposits from e-waste are up to 50 times more concentrated than comparable ores. For example, the concentration of gold in e-waste is 30 times higher than in gold ores (e-waste: 150 g/t; ore: 5 g/t).

According to research by the publication *The Diplomat*, only 15% of the silver and gold present in e-waste is currently recycled. With annual consumption of gold and silver for smartphones alone amounting to USD 21bn, the recovery of valuable metals from e-waste represents an attractive business opportunity.

The most important sources are landfills and, in general, incinerator ash from waste-to-energy plants. BRAIN is able to recover significant quantities of precious metals from this using a 2-step process:

Urban mining biological mechanism



Source: Jing und Kjellerup, 2018, J Environ Sci., 66, 146-154, mod. Warburg Research

In the first step, the metals are adsorbed to a metal separator via electrostatic attraction.

In the second step, the physically adsorbed metals are recovered via a biological stage using microorganisms. The process is analogous to the microprecipitation shown, in which the bacteria excrete substances that specifically bind metals and transport them into bacteria, so-called siderophores. Siderophores are organic substances that can be modified in many ways to adapt the molecule to the target metal and thus specifically enrich it.

Right now, BRAIN is seeking potential partners to continue the development of the project. A market entry could be possible within 2-3 years, should the company find a suitable partner for further development and subsequent commercialization in the near term. Potential partners could be e-waste disposal companies/plants, currently discarding gold from e-waste because, with current technologies, extraction is impossible or unprofitable.

Analysis of Return on Capital

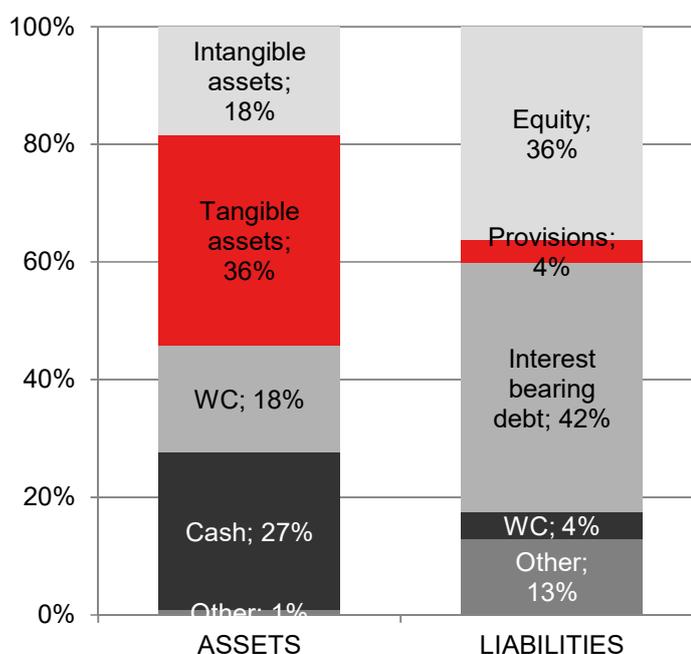
- Long-term liabilities (EUR 27m) include put options (maximum amount of EUR 12m) with the last chance to exercise in 03.2023
- BioSun acquired for EUR 0.5m
- Cash provides sufficient firepower for minor additional bolt-on M&A, Company financed until 2022e – breakeven, excluding major M&A

Capital employed

BRAIN recognizes genetic resources (BioArchive), software and property rights, and acquired technology as intangible assets, which amounted to EUR 13.3m in FY 19/20, thereof EUR 4.5m goodwill. Goodwill is fuelled by the cash-generating unit of BioCatalysts and the Natural Products Chemistry.

Tangible assets mainly reflect the classical property, plant and equipment items. This includes the newly implemented production capabilities (fermenters) at BioCatalysts and amounted to EUR 24.5m at the end of FY 19/20.

FY 2020 balance sheet



Source: Company data, Warburg Research

**Cash YE 2020/2021 WRe:
EUR 12.2m**

Cash and cash equivalents of EUR 18.9m were offset by current financial liabilities of EUR 3.3m and non-current financial liabilities of EUR 27.3m, with the majority of non-current financial liabilities (EUR 12m) relating to potential payments from the exercise of put-options.

As of end of Q1 2020, the company had cash of EUR 16.1m at hand.

The company expects the exercise date of the put-options by the non-controlling shareholders of the Biocatalysts Group to have a significant impact on liquidity planning. Based on the incentivisation of the non-controlling shareholders with rising EBITDA multiples and on the basis of expected EBITDA growth, BRAIN expects that the options will be exercised in the last possible period (1 January to 31 March 2023). Depending on the exercise date and BioCatalysts performance – the options are linked to an EBITDA multiple – financial costs would realistically amount to EUR 5-10m, according to company statements. BRAIN has stated that they would like to acquire the asset earlier.

Undrawn credit lines of EUR 7.0m were also available.

Of the interest-bearing loans, EUR 1.3m have a remaining term of up to one year, EUR 2.7m a remaining term of one to five years, and EUR 1.5m a remaining term of more than five years.

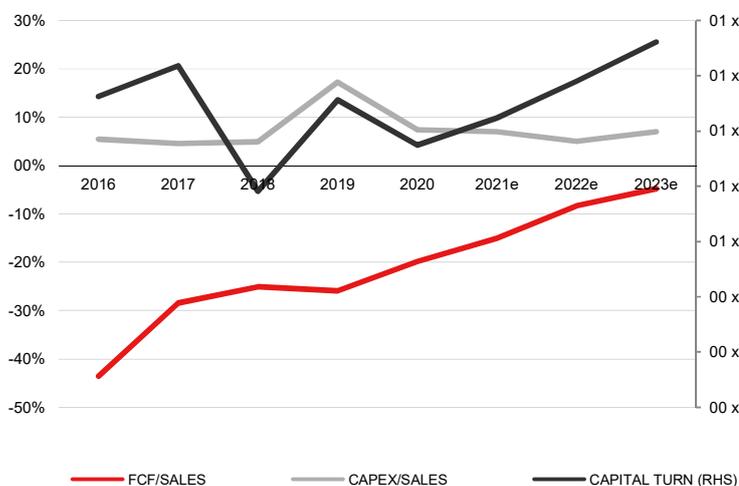
The mixing & blending company BioSun was acquired for EUR 0.5m directly from the owner mainly for its access to the US market and expertise in the area of regulatory approval with the FDA. As the deal was closed on January 1, 2021, BRAIN will record the first fully consolidated revenues from BioSun in 2021/2022 (FY ends 30.09.).

**Possible fermentation capacity
expansion in 2023e**

In 2019 BRAIN reported capex of EUR 6.3m mainly due to the investment required for the production capacity expansion of BioCatalysts in Cardiff, UK. This included the installation of new 10m³ fermentation device and was accompanied by a new building. The building was designed in a way that a second 10m³ could be easily and readily added to the facility at reduced cost (WRe EUR 2.5m).

We assume the addition of the second fermenter will begin in 2023e with the above mentioned reduced capex level and we have included this assumption in our model. BRAIN is a growth company and one of its competitive advantages is the use of sophisticated technologies to probe its proprietary BioArchive and Natural Compounds Library. To maintain this selling point, the company has to continuously invest in new, emerging technologies and capacity to maintain its edge and the necessary growth profile to achieve a doubling of BioIndustrial sales by 2025 (based on 2018/2019).

Capital efficiency



Source: Company data, Warburg Research

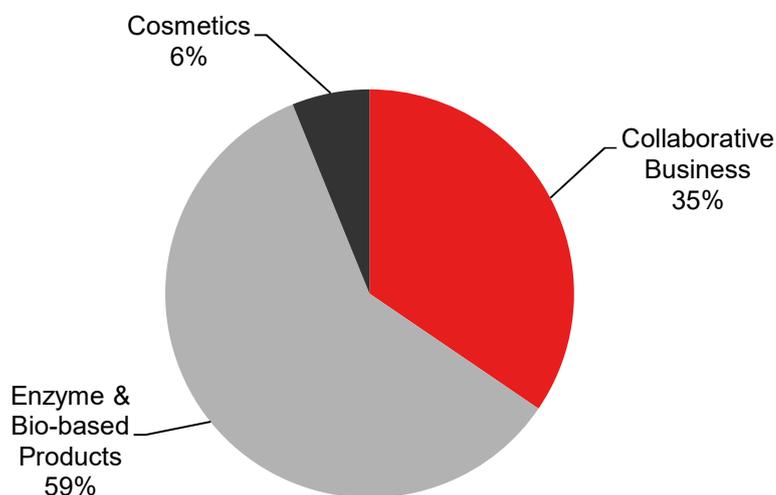
Growth

- Increased demand for sustainable production methods within the food and beverage industry will drive company growth
- Sugar substitution market to grow by 4% p.a. until 2024 – BRAIN's DOLCE product Brazzein should allow for competitive participation

Addressable markets

BRAIN currently has in excess of 100 specialty products in the BioIndustrial segment, which are sold in more than 60 countries. Sales in this segment in FY 2019/20 amounted to EUR 25.0m, developing -5.2% yoy. Product sales represent more than 65% of group revenues. In addition, increasing sales in the contract research business in Tailor-Made-Solutions (+8.2% yoy) amount to 35% of total revenues.

BRAIN revenue streams



Source: Company data, Warburg Research

The founding of BRAIN LLC in Rockville, USA in 2018 shows the strong focus that BRAIN places on its expansion into the North American market. The US branch is primarily intended to drive business development there and increase the corresponding proximity to customers. This focus was further emphasized by the recent acquisition of BioSun, a well-connected and experienced enzyme company that will boost BRAIN's sales network within the US and its food additives approval process for the North American continent.

Nutrition & Health

The aforementioned significant growth will be generated with the existing products, especially in the food modifiers and flavour modifying additives business, and with the significant growth in the TMS cooperation business. Here, BRAIN offers enzymes that specifically improve the taste experience or enable higher yields in production. Of the top 10 enzymes marketed by BRAIN, six showed growth of > +10% yoy.

High-growth product portfolio

BRAIN's enzymatic product offering (selection with highest growth rates)

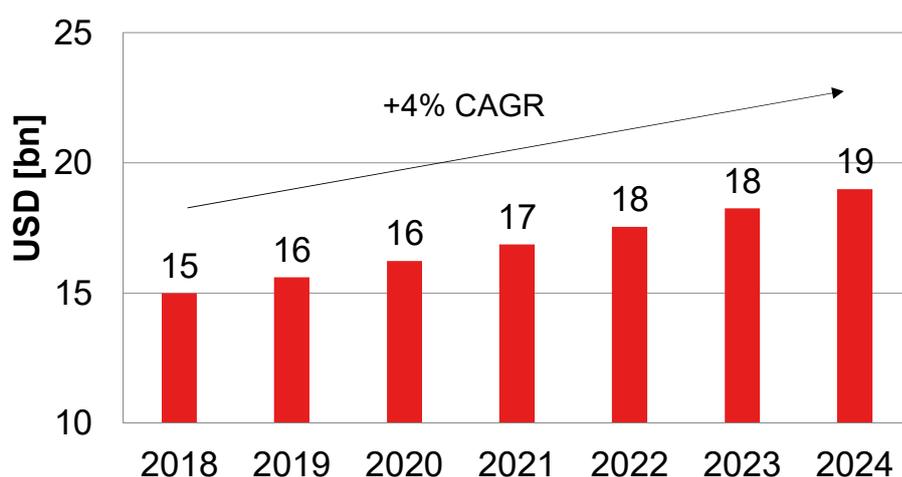
Brand	Enzyme Class	Application	Growth (yoy)
Flavorpro™	Protease/Lipase	Flavour production	>20%
Flavorpro™	Protease/Lipase	Dairy hydrolysates	>20%
Promod™	Protease	Plant Hydrolysates	>20%
Δ-zym	Glucoamylase	Starch/Bioethanole	>20%
Δ-zym	α-Amylase	Starch	>20%
NATUZYM	Pectinase	Increased juice yield	>20%
Depol™	Cellulase/Pectinase	Natural compound extraction	10 – 20%
Lipomod™	Esterase	Dairy products	10 – 20%
Δ-zym	HS α-Amylase	Starch	10 – 20%

Source: Company data, Warburg Research

BRAIN is thus already offering innovative and sought-after solutions for industrial customers and provides the foundation for new high-growth developments in future.

As part of the DOLCE programme, BRAIN is developing natural sugar substitutes that reduce the amount of sugar in beverages and other foods while maintaining the same level of sweetness, such as the plant-derived protein **Brazzein**. The substances under consideration were isolated from BRAIN's proprietary BioArchive and tested for their sweetening properties in a high-throughput process. In addition to the previous partner Roquette, a globally active French food manufacturer, another global beverage producer joined in 2019.

Global sugar substitution market growth



Source: IMARC Group, Warburg Research

In January 2021, BRAIN and Roquette announced, that the project had progressed and that Brazzein would be developed as a sweetener and sugar substitute for the global market.

The small protein is, based on its weight, 500 to 2000 times sweeter than sucrose and, except for a minor bitterness, devoid of the unpleasant aftertastes of conventional sugar

substitutes.

Both partners will develop the project, while Roquette will use its regulatory expertise and financial assets to advance the approval process and prepare for large scale production.

**Sugar substitution market:
4% CAGR until 2024**

With these developments, BRAIN will participate in the growing sugar substitution market. The use of sugar substitutes in beverages and other food products is primarily driven by the growing awareness of the disadvantages of excessive sugar consumption. IMARC Group forecasts that the global sugar substitutes market will expand from USD 15bn in 2018 to USD 19bn in 2024.

The most prominent, most recent addition to this market was Stevia, a natural, zero calorie, non-cariogenic sweetener, which has a low glycemic Index (GI). Stevia is approximately 200x to 300x sweeter than regular sugar. First Stevia products were characterised by an unpleasant bitter aftertaste which has since been mitigated to a certain degree by flavour-supporting additives and 2nd generation steviol glycoside sweeteners like Reb M.

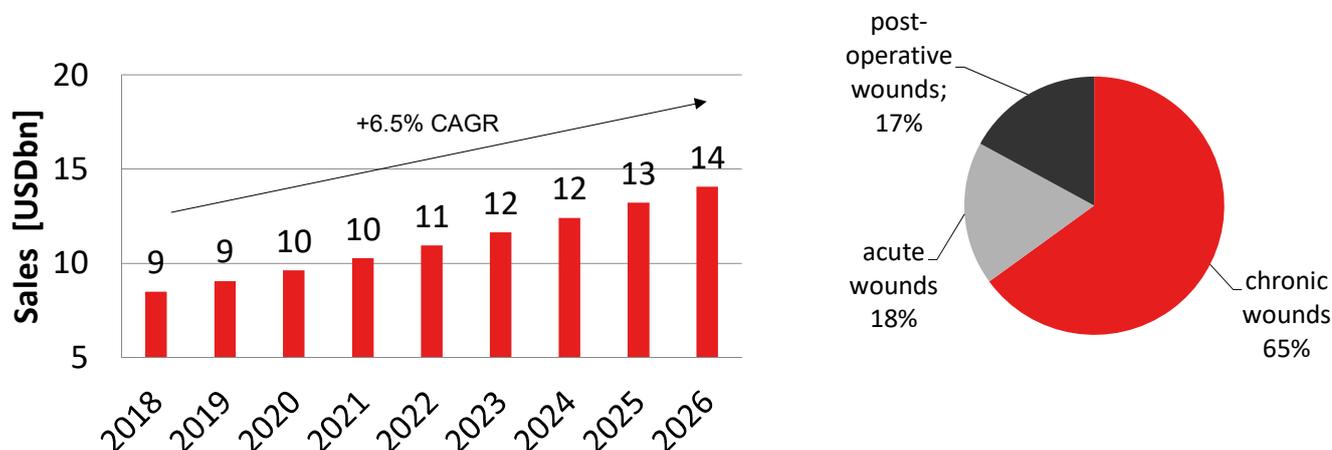
Stevia was first introduced in 2011 and has since generated revenues of USD 640m in 2018 with a CAGR of 8% thereby outperforming the overall sugar substitution market. The overall Stevia market is expected to reach USD 1bn in sales by 2026. This rapid rise emphasizes the worldwide demand for better sugar substitutes for the food industry.

Compared to 1st generation Stevia products, BRAIN/Roquette's product Brazzein has greater sweetening power (2000x) and does not produce unpleasant aftertastes. Comparing the properties of both compounds, we think it is likely that Brazzein could take about 20% of this market within the first few years. Given our assumption that BRAIN would earn a 5% royalty rate on Brazzein sales, this would result in annual high-margin royalties of EUR 8-10m p.a.. We have included this contribution in our model from 2024e onwards since we assume that an approval of Brazzein as a food and beverage additive is more likely than not.

Aurase

In the Aurase project, BRAIN is developing an enzymatic agent for the treatment of chronic wounds together with SolasCure, a spin-off of BRAIN AG. Aurase is an enzyme formulation embedded in a hydrogel whose enzyme component is to be developed by BRAIN and manufactured by BRAIN for clinical testing, approval and registration.

Global advanced wound care market



Source: Allied Market Research, Deep Research Reports, Warburg Research

Chronic wounds occur primarily when the normal healing process is hindered by pre-existing conditions such as diabetes or cardiovascular impairment, and the wound becomes covered with excessive cellular debris and fibrin deposits. This prevents the healing process and prevents the closure of the wound, which can lead to further complications, some of them serious. The U.S. Center for Disease Control (CDC) estimates that 5% of the U.S. population has type 1 diabetes and that approximately 15% of this group suffers from chronic wounds as a consequence of the pre-existing condition.

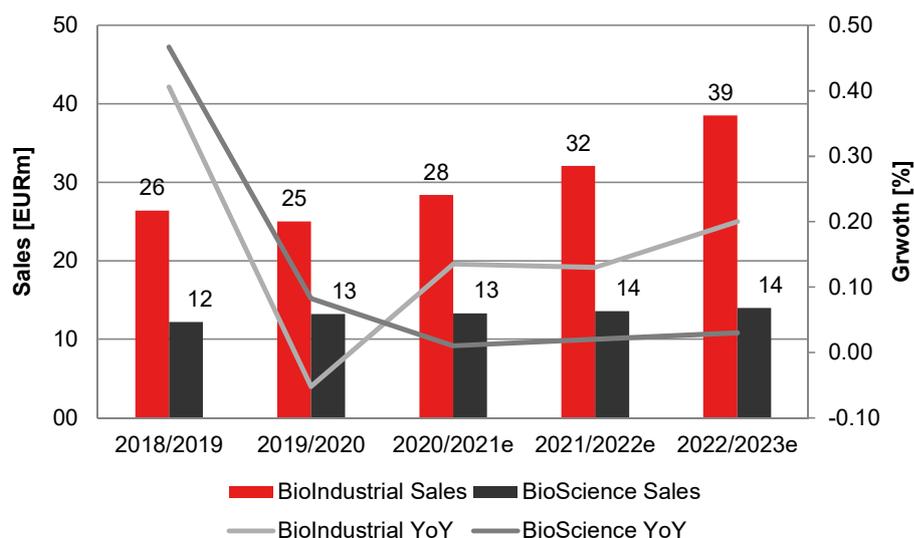
Forecasts from the Allied Market Research Institute suggest that the global advanced wound care market will grow from USD 8.5bn in 2018 to approximately USD 14bn in 2026. This represents a CAGR of +6.5%. The overall market includes both chronic and acute wounds, such as postoperative wounds.

The majority of sales are driven by traditional dressings and bandages, while the market for applications based on biological principles represents a small but rapidly growing sub-segment. According to Deep Research Reports, 65% of the total sales are attributable to chronic wounds, 18% to acute wounds and 17% to postoperative wounds.

At this time, Aurase has completed pre-clinical testing and is in preparation for clinical trials. BRAIN/SolasCure expects to potentially reach market maturity in 2024e/2025e.

Segment forecast summary

Segment sales and growth summary



Source: Company data, Warburg Research

BioIndustrial growth

BioIndustrial

For the time period 2020/2021e to 2022/2023e we forecast average annual growth of 15.5% for the BioIndustrial segment. We base this forecast on the addition of BioSun, which we incorporate with a low single-digit revenue contribution (WRe: EUR 1.5m due to partial consolidation until Q3 2020/2021 based on pro forma estimated EUR 2.5m FY contribution) and favourable market conditions in the nutrition market. After a decline in sales, partially attributable to the COVID19 pandemic-related global economic decline in 2020, a return to historic growth prospects – adjusted for baseline effects - seems prudent in our eyes. A sizeable portion of BRAIN's enzyme portfolio exhibits growth rates of 10-20%, which we regard as favourable for the product mix.

Consequently, we expect an increase in EBITDA margins from 9% in 2020 to 11% in 2021e because we forecast other expenses so remain on 2020 level. We anticipate a

continuation of this trend in the coming years reflecting cost improvement activities.

The segment displayed a mixed performance in Q1 2021. While WeissBioTech had a weak revenue development, BioCatalysts showed strong growth. This led to a Q1 result of EUR 6.1m (-2,7% YoY).

The WeissBioTech result was clouded by the loss of one customer, lower sales of bioethanol/potable alcohol and enzymes for the beer/wine industry as well as ongoing relocation issues. BRAIN has since implemented a range of measures to combat the weak performing segment, including inventory clean-out and a redefinition of the business model to higher margin products.

BioIndustrial's Core: BioCatalysts

BioCatalysts

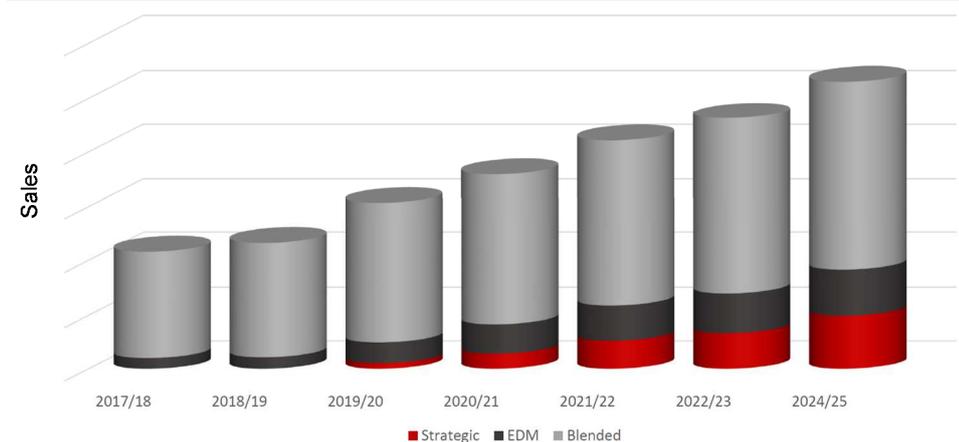
The key ingredient to BRAIN's anticipated more profitable future is the development of its single most important cash-generating unit, BioCatalysts, which contributed EUR 13.9m sales in FY 2018/19. Currently, the product/service mix consists mainly of blending of insourced products and EDM, limiting margin upside.

To accomplish its mid-term target of increasing sales by a factor of 2, the company will add strategic assets to its product range and increase the portion of products from self-fermentation, using BRAIN's own microorganisms. Because fermentation of products and their subsequent quality is highly dependent on the quality of microorganisms, BRAIN can use the advanced production organisms to generate added value for the product and its customers, which in turn translates into higher margins.

The company will leverage its recent capex investments in fermentation production capability and microorganism innovation know-how to shifting the product mix more heavily towards such in-house fermentation, thereby focusing on attractive niche markets that best suit BRAIN's smaller, more agile scale and capabilities.

Considering the scope of its recent investments, the rich pipeline and the new more focused retail-oriented company culture we deem these targets to be viable.

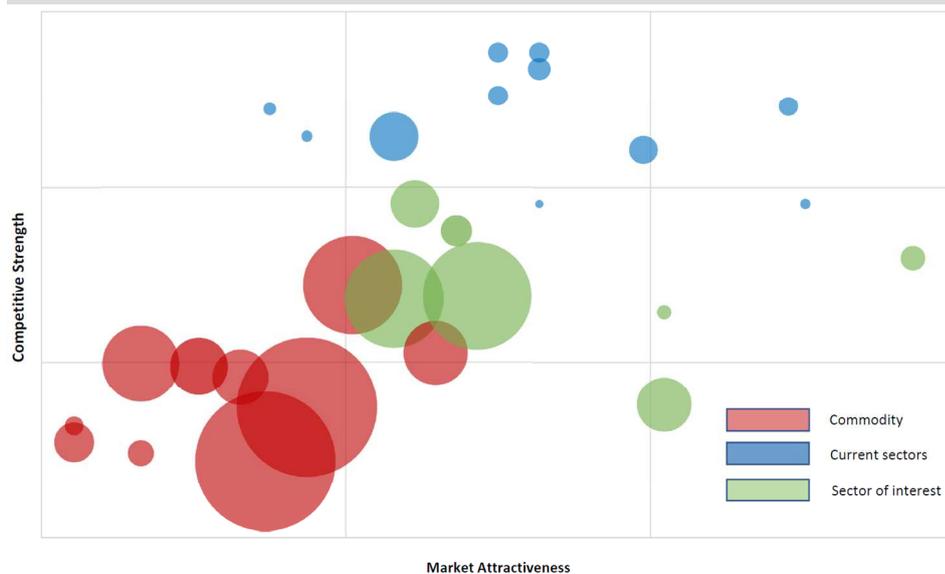
BRAIN's BioCatalysts revenue mix strategic plan



Source: Company data

With the ramp up of its new 10 m³ fermenter BRAIN/BioCatalysts increases its capacity 10x from 1.05 m³ to 11.05 m³. Typical yields of finished product range from 1-2% to 40-50%. This broad range can be explained by the highly diverse array of production organisms (e.g. bacteria, yeast) or desired end-product (e.g. research-grade enzymes or detergent-added lipases). These figures are highly dependent on the quality of the proprietary production strains.

Future target markets (illustrative)



Source: Company data

Future markets: more competition but bigger volumes

Potential new markets include small-scale pharma production (research-grade enzymes), protein/dairy and egg food and oil/fat modification. Currently, the company is focused on very narrow but highly attractive markets.

Going forward BRAIN intends to focus its efforts on broader, more competitive target markets which offer higher sales volumes (green market areas). Besides capex for production capacity expansion and innovation, strain development remains an important driver of the company’s margin-expansion strategy.

The continued investment to further increase the resulting yield of production organisms, like bacteria and yeasts, is likely to increase margins based on a more efficient fermentation process. BRAIN uses state-of-the-art techniques such as protein engineering and directed evolution to improve its organisms and has an extensive BioArchive, from which it can source ideas and solutions.

Strain development of peers like Novozymes was integral to improving the bottom line and BRAIN has the necessary toolset to mimic this development.

BioIndustrial: Sales, gross margin and EBITDA forecasts

	2018/2019	2019/2020	2020/2021e	2021/2022e	2022/2023e
Sales	26.4	25.0	28.4	32.1	38.5
<i>Growth</i>	41%	-5%	14%	13%	20%
Gross profit	13.1	11.7	13.6	16.1	20.0
<i>Gross margin</i>	50%	47%	48%	50%	52%
EBITDA	2.7	2.3	3.1	4.6	7.5
<i>EBITDA margin</i>	10%	9%	11%	14%	20%

Source: Company data, Warburg Research

BioScience growth
BioScience

After the sharp increase in sales attributed to the BioScience segment in 2019 and the subsequent return to high single-digit growth rates in 2020, we expect a meagre 1% increase in sales in 2021. The segment showed a weak Q1 2021 with reported sales of EUR 2m (-50% YoY) caused by delayed milestones. This reflects volatile nature of the milestone based business. The BioScience segment is a CRO service business fuelled by the acquisition of new contracts to develop bio-based solutions for B2B customers. The payments are milestones and fees-for-service.

With the pandemic-related global recession and the associated social distancing and travel restrictions that prevented meetings with negotiating partners, we are expecting a temporary decline in new contracts business in 2021e. Nonetheless, as BRAIN has repeatedly proven that it is able to produce superior products and solutions for its customers, this track record should provide for a healthy recovery in the rate of contracts signed.

Consequently we are expecting underlying average annual growth of 2.0% for the time period 2020/2021e to 2022/2023e. The segments revenue is expected to remain volatile due to the nature of science-based milestones payments and their considerable contribution to the overall segment performance.

The BioScience segment also recognizes BRAINs own research and development endeavours. As such, it incurs the costs for the company's necessary R&D investment into potentially highly profitable projects, such as urban mining, fermented products and advanced wound care. Historically, this investment has been extensive and therefore significantly affected the segment's bottom line (EBITDA 2020: EUR -6.3m).

The company has recently streamlined the development pipeline and now only invests in projects which have a risk-sharing partnership leading to a potential reduction in expenses for the segment. Although we expect the segment to retain its loss-making properties for the forecast period, we assume the negative EBITDA effect will decrease.

This excludes potential partial development costs associated with the clinical development of the Aurase asset (see below). The total development costs of Aurase until market entry is expected to amount to EUR 35m.

BioScience: Sales, gross margin and EBITDA forecasts					
	2018/2019	2019/2020	2020/2021e	2021/2022e	2022/2023e
Sales	12.2	13.2	13.3	13.6	14.0
<i>Growth</i>	47%	8%	1%	2%	3%
Gross profit	8.7	9.5	9.6	9.9	10.1
<i>Gross margin</i>	71%	72%	72%	73%	72%
EBITDA	-5.2	-6.3	-4.9	-4.4	-4.2
<i>EBITDA margin</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>	<i>n.m.</i>

Source: Company data, Warburg Research

Valuation

- Fair value of equity: EUR 251.91m, EUR 12.68 per share
- Long-term EBIT margins of 23%, driven by potential royalties from DOLCE, etc.
- Avg. revenue growth rates of 11.2% in the detailed forecast period due to increased fermentation capacity and high demand
- rNPV Aurase: EUR 76.1m/EUR 3.83 per share

A DCF analysis was performed to determine the intrinsic value of BRAIN AG. Here, the specific growth prospects of the company were derived on the basis of the forecast growth rates of the markets addressed by BRAIN, capex investments in production capabilities, the development pipeline, and the company's own strategic plans.

Based on the growth parameters already addressed, we forecast the top and bottom line development of the BioIndustrial and BioScience segments and apply the consolidated figures to our DCF model.

Our DCF model results in a fair value of EUR 12.68 per share. Considering BRAIN's ongoing transition to an industrial biotech company, we are expecting a profitable, sustainable future for the company.

The valuation of BRAIN is based on the parameters detailed in the earlier chapters. Near-term development will mainly be affected by the execution ability of the company to enter attractive niche markets. Based on its innovative track record, the company has the necessary foundation to discover novel solutions for customers and to produce sought-after enzymes and other natural products. The overall macro environment certainly favours companies like BRAIN. We reflect this sentiment and potential by applying above-average growth rates within the transitional period.

We are assuming EBITDA breakeven in 2021/22e and expect the consolidated company to reach an EBIT margin of 23% in the long term, similar to growth stage peers like early Novozymes.

**Santyl annual sales:
USD 350m**

rNPV: SolasCure/Aurase

BRAIN currently holds 41% interest of SolasCure. The main competitor product to Aurase is Santyl, a Collagenase formulation that is sold by Smith & Nephew and the only FDA-approved enzymatic debrider in the market. The product is sold at roughly USD 250 per package with enough material for multiple applications. The product generated annual sales of USD 350m in 2018. The asset was acquired by S&N in 2012 for USD 782m (4.1x annual product sales then). According to SmartTRAK Santyl occupied 51% of the debridement market in 2017.

rNPV valuation Aurase

	2021e	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
Santyl Sales (EURm)	409.7	436.3	464.7	494.9	527.1	561.3	597.8	636.7	678.1	722.1	769.1	819.1	872.3	929.0	989.4
Aurase % of Santyl	0%	0%	0%	0%	5%	10%	20%	35%	50%	60%	60%	60%	60%	60%	60%
Aurase Sales (EURm)	0.0	0.0	0.0	0.0	26.4	56.1	119.6	222.8	339.0	433.3	461.4	491.4	523.4	557.4	593.6
R&D (EURm)	-3.0	-3.0	-12.5	-12.5	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	3.0	4.0
COGS, M&S, SG&A (%)	30%	30%	30%	30%	30%	25%	20%	20%	20%	20%	20%	20%	20%	20%	20%
COGS, M&S, SG&A (EURm)	0.0	0.0	0.0	0.0	-7.9	-14.0	-23.9	-44.6	-67.8	-86.7	-92.3	-98.3	-104.7	-111.5	-118.7
EBIT (EURm)	-3.0	-3.0	-12.5	-12.5	14.4	42.1	95.7	178.3	271.2	346.6	369.2	394.1	420.7	448.9	478.9
BRAIN Interest (%)	41%	41%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
BRAIN Net Proceeds (EURm)	-1.2	-1.2	-3.8	-3.8	4.3	12.6	28.7	53.5	81.4	104.0	110.7	118.2	126.2	134.7	143.7
NPV	-1.2	-1.1	-3.0	-2.7	2.8	7.5	15.4	26.2	36.2	42.0	40.7	39.5	38.3	37.2	36.1
Probability of Occurrence	100%	90%	40%	40%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
rNPV	-1.2	-1.0	-1.2	-1.1	0.7	1.9	3.9	6.5	9.0	10.5	10.2	9.9	9.6	9.3	9.0
Total rNPV	76.1														
Shares outstanding	19.9														
Fair value per share	3.83														

Source: Warburg Research

**rNPV valuation of Aurase:
EUR 76.1m**

While Aurase is a highly specific fibrin-targeting protease directly aimed at the removal of unwanted wound closures, Santyl broadly removes collagen fibers with limited efficacy.

Given the apparent superior efficacy profile of Aurase in comparison to Santyl, we believe a similar market share and revenue range is well within the realm of possibility. BRAIN has stated that it would evaluate a possible exit after Phase II/Phase III trials and is willing to accept dilution of its asset in exchange for strategic investors/partners that support the development process.

To value the **Aurase** asset, we assumed that BRAIN would continue to participate in the clinical development of the asset and performed a rNPV analysis. We assume that BRAIN will accept a dilution of the asset from 41% equity now to 30% in 2022e/2023e to raise funds for the subsequent Phase III clinical development. We further forecast market entry in 2025e after a successful Phase III with 25%-probability of success (historical probability of a dermatological Phase II asset, such as Aurase, to reach the market). Future cash flows are discounted with a WACC of 10%.

These assumptions result in a valuation of the Aurase asset of EUR 76.1m or EUR 3.83 per share. We have included this figure in our consolidated company DCF in "market value of investments". This compares to BRAIN's internal rNPV valuation of EUR 15m+ (see NBD pipeline) emphasizing the considerable value of the overall pipeline and reiterates our positive investment case for BRAIN.

DCF valuation

For fundamental valuation purposes, we use a DCF model with the following assumptions:

- WACC: 7.83%, equity ratio: 20.00%; cost of debt: 4.00%; market rate: 7.00%, risk free return: 1.50%
- Beta of 1.38 to account for company specific parameters of BRAIN

Our DCF analysis yields a fair value of EUR 12.68 per share

DCF model

Figures in EUR m	Detailed forecast period			Transitional period										Term. Value
	20/21e	21/22e	22/23e	23/24e	24/25e	25/26e	26/27e	27/28e	28/29e	29/30e	30/31e	31/32e	32/33e	
Sales	41.7	45.7	52.5	65.3	73.9	82.6	90.0	97.2	104.5	112.4	119.1	123.9	126.3	
Sales change	9.2 %	9.5 %	14.9 %	24.3 %	13.2 %	11.7 %	9.0 %	8.0 %	7.5 %	7.5 %	6.0 %	4.0 %	2.0 %	2.0 %
EBIT	-6.0	-3.8	-0.3	7.8	13.1	17.1	18.9	21.4	23.0	25.8	27.4	28.5	29.1	
EBIT-margin	-14.5 %	-8.3 %	-0.7 %	12.0 %	17.7 %	20.7 %	21.0 %	22.0 %	22.0 %	23.0 %	23.0 %	23.0 %	23.0 %	
Tax rate (EBT)	10.0 %	15.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	
NOPAT	-5.4	-3.2	-0.3	5.9	9.8	12.8	14.2	15.0	16.1	18.1	19.2	19.9	20.3	
Depreciation	4.2	4.0	3.7	3.7	3.6	3.6	3.9	4.2	4.5	4.8	5.1	5.3	5.4	
in % of Sales	10.0 %	8.8 %	7.1 %	5.6 %	4.8 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	
Changes in provisions	0.3	0.3	0.5	0.9	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.3	0.2	
Change in Liquidity from														
- Working Capital	0.8	1.1	1.8	2.7	2.2	2.2	1.9	1.8	1.8	2.0	1.7	1.2	0.6	
- Capex	2.9	2.3	3.7	3.3	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.2	5.3	
Capex in % of Sales	7.0 %	5.0 %	7.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	4.2 %	
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Free Cash Flow (WACC Model)	-4.8	-2.3	-1.5	4.5	8.2	10.7	12.2	13.0	14.1	15.9	17.1	18.2	20.0	20
PV of FCF	-4.6	-2.1	-1.2	3.5	5.8	7.1	7.5	7.4	7.4	7.8	7.8	7.7	7.8	136
share of PVs	-3.97 %			35.14 %										68.83 %

Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	20.00 %	Financial Strength	1.50
Cost of debt (after tax)	2.8 %	Liquidity (share)	1.50
Market return	7.00 %	Cyclicality	1.20
Risk free rate	1.50 %	Transparency	1.50
		Others	1.20
WACC	7.83 %	Beta	1.38

Valuation (m)

Present values 2032/33e	62		
Terminal Value	136		
Financial liabilities	31		
Pension liabilities	3		
Hybrid capital	0		
Minority interest	5		
Market val. of investments	76		
Liquidity	16	No. of shares (m)	19.9
Equity Value	252	Value per share (EUR)	12.68

Sensitivity Value per Share (EUR)

Beta	WACC	Terminal Growth							Beta	WACC	Delta EBIT-margin						
		1.25 %	1.50 %	1.75 %	2.00 %	2.25 %	2.50 %	2.75 %			-1.5 pp	-1.0 pp	-0.5 pp	+0.0 pp	+0.5 pp	+1.0 pp	+1.5 pp
1.61	8.8 %	10.27	10.43	10.60	10.78	10.98	11.19	11.43	1.61	8.8 %	10.09	10.32	10.55	10.78	11.01	11.24	11.47
1.49	8.3 %	11.02	11.22	11.43	11.65	11.90	12.17	12.46	1.49	8.3 %	10.90	11.15	11.40	11.65	11.91	12.16	12.41
1.44	8.1 %	11.44	11.66	11.89	12.15	12.42	12.72	13.05	1.44	8.1 %	11.36	11.62	11.89	12.15	12.41	12.67	12.93
1.38	7.8 %	11.90	12.14	12.40	12.68	12.99	13.33	13.70	1.38	7.8 %	11.86	12.14	12.41	12.68	12.96	13.23	13.51
1.32	7.6 %	12.40	12.66	12.95	13.27	13.62	14.00	14.42	1.32	7.6 %	12.41	12.70	12.98	13.27	13.56	13.85	14.13
1.27	7.3 %	12.93	13.23	13.56	13.92	14.31	14.74	15.22	1.27	7.3 %	13.01	13.31	13.61	13.92	14.22	14.52	14.82
1.15	6.8 %	14.16	14.54	14.96	15.41	15.92	16.49	17.13	1.15	6.8 %	14.41	14.74	15.08	15.41	15.75	16.09	16.42

- Includes both segments: BioScience and BioIndustrial
- PV of SolasCure/Aurase recognized under Market Value of Investments (rNPV valuation, WACC: 10%)

Company & Products

BRAIN-Group

BRAIN AG

BRAIN AG in Zwingenberg functions as the innovation and development centre of the BRAIN Group. It is home to BRAIN AG's innovative strength: the 53,000-strain BioArchive of characterized microorganisms. This provides BRAIN AG with access to nature's extensive toolbox. Through highly networked processes and development efforts, the company is able to transfer this portfolio to industrial applications and produce them on a cubic meter scale. The site in Zwingenberg is to act as an innovation hub for the entire Group in the medium term.

AnalytiCon

AnalytiCon GmbH is a specialist in the field of isolation and characterization of plant and microbial metabolites. Based on its 25,000 strain microbiological database, AnalytiCon is able to access a comprehensive library of natural products with fully elucidated structures. This enables the analytical experts to offer a broad portfolio of active ingredient discoveries and developments.

SolasCure

SolasCure Ltd, under CEO Dr. Sam Bakri, is focused on the development and commercialization of new medical products based on the wound cleansing enzyme Aurase. The company's goal is to improve the treatment of chronic wounds with the help of the highly specific protease Aurase, along the lines of the medical use of maggots. BRAIN owns 41% of the company. The company was founded in 2018 by BRAIN and other investors to facilitate the clinical development of Aurase. Major shareholders, besides BRAIN, include URGO Invent & Care, EVA Pharma, Hovione Capital, Banc and the management.

WeissBioTech

WeissBioTech develops, produces and markets food additives, yeast starter cultures and biological catalysts. In this context, the company supplies enzymes for the production of bioethanol, the processing of starch (as an auxiliary in the production of dairy and meat products) and for the beverage industry. Within the BRAIN Group, WeissBioTech acts as a partner for the industrial production of enzymes, their continuous development and the design of application scenarios.

In the newly built production facility in Büttelborn, application-oriented processes are developed in special laboratories and implemented in accordance with the latest ISO and food safety standards.

L.A. Schmitt

L.A. Schmitt is a renowned manufacturer in the wellness and cosmetics segment. The company develops and produces its own marketed product lines, but is also active as a contract manufacturer for trading companies. The latest scientific findings are always taken into account for the continued and new development of the portfolio.

Biocatalysts

Biocatalysts Ltd. specializes in the development and industrial production of specialty enzymes with over 30 years of experience. Biocatalysts sees itself as a development partner for international customers from various industries (including the food industry) and is able to provide interested customers with rapid access to up to 335 million different enzymes for specific areas of application on the basis of its extensive MetXtra metagenome library.

Biocatalysts can draw on industrial production capacities for the manufacture of enzymes and an extensive, international distribution network. In 2019, the expansion of Biocatalysts' new production facility in Cardiff progressed. Completion of the new

fermentation facilities will increase production capacity by a factor of 16 and enable direct scale-up of development from laboratory scale to commercial production.

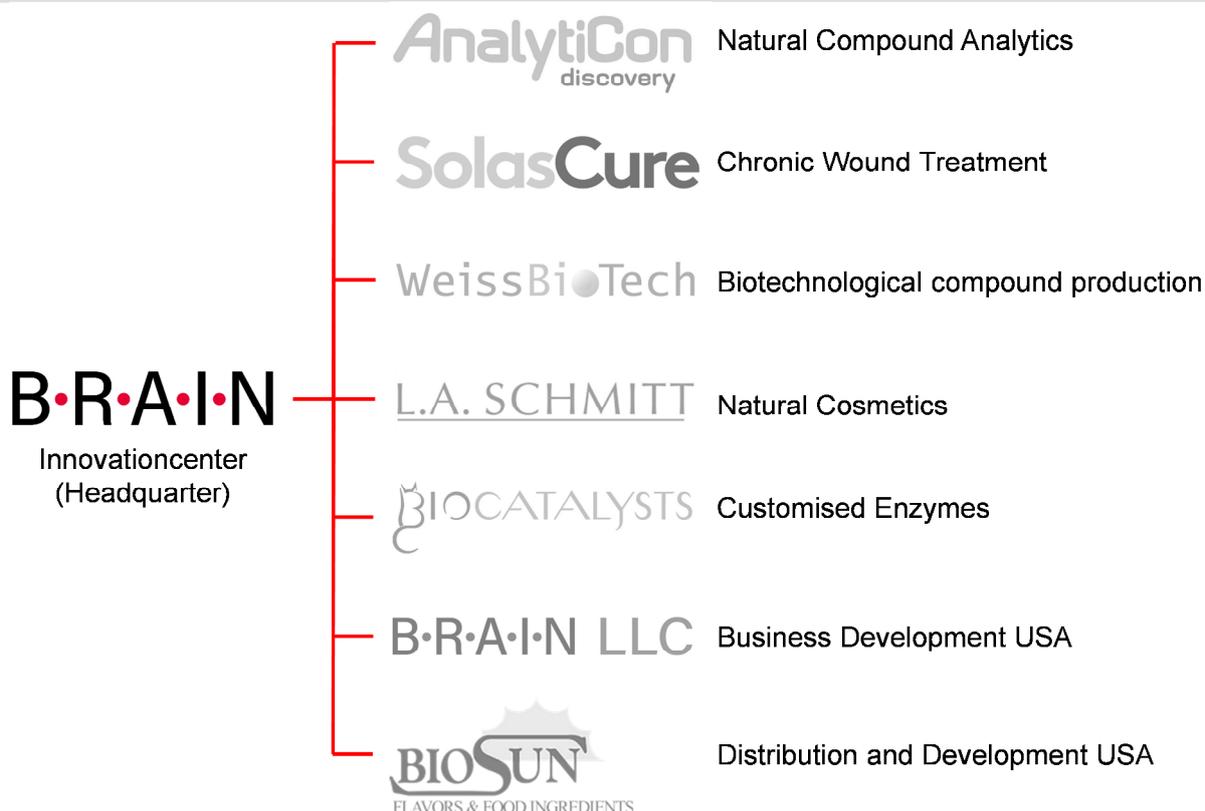
BRAIN LLC

The American branch of the BRAIN Group, BRAIN LLC, acts as a bridgehead for the American market and serves to directly strengthen business activities in North America.

BioSun

BIOSUN FFI (BIOSUN Biochemicals Inc.) distributes blends and manufactures a complete portfolio of food ingredients, including flavours, enzymes, natural colours and specialty food ingredients. In the United States, BIOSUN is one of the primary distributors of Givaudan's flavours in select industries. The U.S. company has been part of the BRAIN Group since January 1, 2021.

BRAIN Group overview

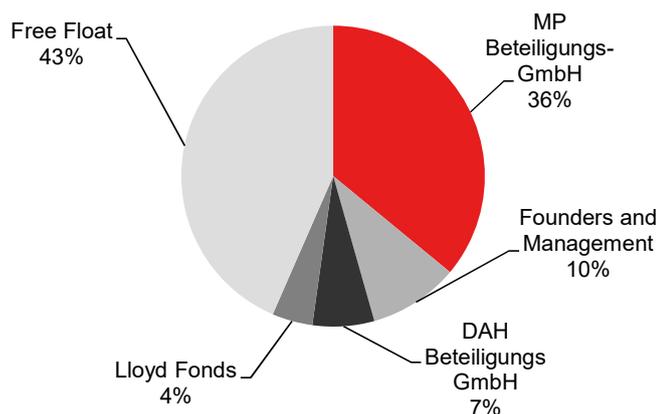


Source: Company data, Warburg Research

Shareholder

BRAIN AG (Bloomberg: BNN) has been traded on the Prime Standard of the Frankfurt Stock Exchange since February 2016. The largest shareholders are MP Beteiligungs-GmbH, the asset manager of the Putsch family, with 36%. This is followed by the company founders and the management with 9.6%. In addition to a free float of 43%, the remaining shareholder structure consists of DAH Beteiligungs GmbH, an investment vehicle of Daniel Hopp with 7% of the share capital and Lloyd Fonds with 4%.

Shareholder structure



Source: Company data, Warburg Research

Management

Adriaan Moelker, CEO



Effective February 1, 2020, Adriaan Moelker has taken over as CEO of BRAIN AG. Mr. Moelker was previously a successful and long-serving CEO of AB Enzymes in Darmstadt and led the company through its expansion process. Afterwards, the Dutch native served as Divisional President for Image Transfer Solutions and as a member of the Executive Management Team at the Flint Group. Mr. Moelker has more than 20 years of experience in industrial biotechnology and holds a degree from Nyenrode Business Universiteit.

Lukas Linnig, CFO



Before joining BRAIN AG, he was a financial advisor at the financial consulting company FAS AG. He joined BRAIN AG in 2015 in a consulting role, to support the IPO and to set up a financial controlling system. In April 2017, Mr. Linnig was given responsibility for Finance, Controlling and Legal. There, he reported directly to the Chief Financial Officer (CFO). In October 2020, Lukas Linnig became CFO at BRAIN AG.

Previously, Lukas Linnig served as project manager at Venture Stars GmbH. In this position, he supported and advised several start-up companies and founders in various market segments.

Lukas Linnig has a degree in financial economics and banking as well as statistics and applied mathematics from the University of Hagen and holds a CFA.

History

Biotechnology Research & Information Network AG (BRAIN AG) is a biotechnology company founded in 1993 by Ulrich Putsch, Holger Zinke, Gabriele Sachse and Hans-Günter Gassen in Zwingenberg, Germany.

The company changed its name to BRAIN AG in 2008 and conducted its IPO in February 2016. The cosmetics and wellness products manufacturer L.A. Schmitt GmbH has been a member of the BRAIN Group since 2009. The inclusion of the analytics company AnalytiCon-Discovery GmbH, founded in 2000, in 2013 enabled the Group to strengthen its expertise in the field of natural substance analytics. With the inclusion of WeissBioTech GmbH in 2014, capacities for the industrial production of food additives and bio-based active ingredient products were created.

Based in Cardiff, UK, and founded in 1983, the specialist company for customized enzymes Biocatalysts Ltd. has significantly strengthened the production and sales capacities as well as the development capacities of the BRAIN Group since 2018, with a focus on the discovery, development and marketing of enzymes for use in specialty areas. The U.S. commercialization activities have also been carried out by the newly established BRAIN LLC subsidiary in Rockville, USA, since 2018. SolasCure, founded in 2018 with BRAIN's participation in Cardiff, UK, focuses on the development and commercialization of the novel wound cleansing enzyme Aurase.

In January 2021 BRAIN acquired BioSun, a US-resident distributor, blender and manufacturer of food additives such as aromas, enzymes, coloring agents and food additives. By acquiring BioSun, BRAIN expanded its US footprint and its north American distribution and approval capabilities.

DCF model

Figures in EUR m	Detailed forecast period			Transitional period										Term. Value
	20/21e	21/22e	22/23e	23/24e	24/25e	25/26e	26/27e	27/28e	28/29e	29/30e	30/31e	31/32e	32/33e	
Sales	41.7	45.7	52.5	65.3	73.9	82.6	90.0	97.2	104.5	112.4	119.1	123.9	126.3	
Sales change	9.2 %	9.5 %	14.9 %	24.3 %	13.2 %	11.7 %	9.0 %	8.0 %	7.5 %	7.5 %	6.0 %	4.0 %	2.0 %	2.0 %
EBIT	-6.0	-3.8	-0.3	7.8	13.1	17.1	18.9	21.4	23.0	25.8	27.4	28.5	29.1	
EBIT-margin	-14.5 %	-8.3 %	-0.7 %	12.0 %	17.7 %	20.7 %	21.0 %	22.0 %	22.0 %	23.0 %	23.0 %	23.0 %	23.0 %	
Tax rate (EBT)	10.0 %	15.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	30.0 %	
NOPAT	-5.4	-3.2	-0.3	5.9	9.8	12.8	14.2	15.0	16.1	18.1	19.2	19.9	20.3	
Depreciation	4.2	4.0	3.7	3.7	3.6	3.6	3.9	4.2	4.5	4.8	5.1	5.3	5.4	
in % of Sales	10.0 %	8.8 %	7.1 %	5.6 %	4.8 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	4.3 %	
Changes in provisions	0.3	0.3	0.5	0.9	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.3	0.2	
Change in Liquidity from														
- Working Capital	0.8	1.1	1.8	2.7	2.2	2.2	1.9	1.8	1.8	2.0	1.7	1.2	0.6	
- Capex	2.9	2.3	3.7	3.3	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.2	5.3	
Capex in % of Sales	7.0 %	5.0 %	7.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	5.0 %	4.2 %	
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Free Cash Flow (WACC Model)	-4.8	-2.3	-1.5	4.5	8.2	10.7	12.2	13.0	14.1	15.9	17.1	18.2	20.0	20
PV of FCF	-4.6	-2.1	-1.2	3.5	5.8	7.1	7.5	7.4	7.4	7.8	7.8	7.7	7.8	136
share of PVs	-3.97 %			35.14 %										68.83 %

Model parameter

Derivation of WACC:		Derivation of Beta:	
Debt ratio	20.00 %	Financial Strength	1.50
Cost of debt (after tax)	2.8 %	Liquidity (share)	1.50
Market return	7.00 %	Cyclicality	1.20
Risk free rate	1.50 %	Transparency	1.50
		Others	1.20
WACC	7.83 %	Beta	1.38

Valuation (m)

Present values 2032/33e	62		
Terminal Value	136		
Financial liabilities	31		
Pension liabilities	3		
Hybrid capital	0		
Minority interest	5		
Market val. of investments	76		
Liquidity	16	No. of shares (m)	19.9
Equity Value	252	Value per share (EUR)	12.68

Sensitivity Value per Share (EUR)

Beta	WACC	Terminal Growth							Beta	WACC	Delta EBIT-margin						
		1.25 %	1.50 %	1.75 %	2.00 %	2.25 %	2.50 %	2.75 %			-1.5 pp	-1.0 pp	-0.5 pp	+0.0 pp	+0.5 pp	+1.0 pp	+1.5 pp
1.61	8.8 %	10.27	10.43	10.60	10.78	10.98	11.19	11.43	1.61	8.8 %	10.09	10.32	10.55	10.78	11.01	11.24	11.47
1.49	8.3 %	11.02	11.22	11.43	11.65	11.90	12.17	12.46	1.49	8.3 %	10.90	11.15	11.40	11.65	11.91	12.16	12.41
1.44	8.1 %	11.44	11.66	11.89	12.15	12.42	12.72	13.05	1.44	8.1 %	11.36	11.62	11.89	12.15	12.41	12.67	12.93
1.38	7.8 %	11.90	12.14	12.40	12.68	12.99	13.33	13.70	1.38	7.8 %	11.86	12.14	12.41	12.68	12.96	13.23	13.51
1.32	7.6 %	12.40	12.66	12.95	13.27	13.62	14.00	14.42	1.32	7.6 %	12.41	12.70	12.98	13.27	13.56	13.85	14.13
1.27	7.3 %	12.93	13.23	13.56	13.92	14.31	14.74	15.22	1.27	7.3 %	13.01	13.31	13.61	13.92	14.22	14.52	14.82
1.15	6.8 %	14.16	14.54	14.96	15.41	15.92	16.49	17.13	1.15	6.8 %	14.41	14.74	15.08	15.41	15.75	16.09	16.42

- Includes both segments: BioScience and BioIndustrial
- PV of SolasCure/Aurase recognized under Market Value of Investments (rNPV valuation, WACC: 10%)

Valuation	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Price / Book	6.1 x	17.0 x	13.2 x	8.1 x	13.8 x	22.8 x	30.1 x
Book value per share ex intangibles	2.43	0.25	-0.03	0.40	0.08	-0.12	-0.17
EV / Sales	10.8 x	15.0 x	5.6 x	4.8 x	4.9 x	4.6 x	4.0 x
EV / EBITDA	n.a.	n.a.	n.a.	n.a.	n.a.	977.2 x	62.6 x
EV / EBIT	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EV / EBIT adj.*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / FCF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / E	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
P / E adj.*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Dividend Yield	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FCF Potential Yield (on market EV)	-3.1 %	-1.6 %	-1.1 %	-1.6 %	-0.9 %	0.1 %	1.6 %
*Adjustments made for: -							

Consolidated profit & loss

In EUR m	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Sales	24.1	27.1	38.6	38.2	41.7	45.7	52.5
Change Sales yoy	5.8 %	12.2 %	42.5 %	-0.9 %	9.2 %	9.5 %	14.9 %
Increase / decrease in inventory	-0.1	0.3	-0.1	-0.4	0.0	0.0	0.0
Own work capitalised	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Sales	24.0	27.3	38.5	37.8	41.7	45.7	52.5
Material expenses	11.2	14.0	17.4	16.6	18.5	19.8	22.3
Gross profit	12.7	13.4	21.1	21.2	23.3	25.9	30.2
<i>Gross profit margin</i>	<i>52.9 %</i>	<i>49.5 %</i>	<i>54.8 %</i>	<i>55.5 %</i>	<i>55.7 %</i>	<i>56.8 %</i>	<i>57.5 %</i>
Personnel expenses	16.5	14.9	17.6	19.1	20.6	21.4	22.9
Other operating income	3.0	3.1	2.7	1.4	2.2	2.0	2.4
Other operating expenses	6.9	8.2	8.7	7.3	6.8	6.2	6.3
Unfrequent items	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EBITDA	-7.7	-6.6	-2.5	-3.9	-1.8	0.2	3.4
<i>Margin</i>	<i>-31.9 %</i>	<i>-24.3 %</i>	<i>-6.4 %</i>	<i>-10.1 %</i>	<i>-4.4 %</i>	<i>0.5 %</i>	<i>6.5 %</i>
Depreciation of fixed assets	1.4	1.5	1.4	2.0	2.7	2.8	2.7
EBITA	-9.1	-8.1	-3.9	-5.9	-4.5	-2.6	0.7
Amortisation of intangible assets	0.3	1.5	1.5	1.9	1.5	1.2	1.0
Goodwill amortisation	0.0	0.0	1.8	0.4	0.0	0.0	0.0
EBIT	-9.4	-9.6	-7.2	-8.2	-6.0	-3.8	-0.3
<i>Margin</i>	<i>-38.9 %</i>	<i>-35.4 %</i>	<i>-18.6 %</i>	<i>-21.4 %</i>	<i>-14.5 %</i>	<i>-8.3 %</i>	<i>-0.7 %</i>
EBIT adj.	-9.4	-9.6	-7.2	-8.2	-6.0	-3.8	-0.3
Interest income	0.3	1.7	0.9	1.5	0.0	0.0	0.0
Interest expenses	0.3	0.4	3.1	0.9	0.9	0.9	0.9
Other financial income (loss)	0.0	-0.1	-1.8	-2.4	0.0	0.0	0.0
EBT	-9.4	-8.4	-11.1	-9.9	-7.0	-4.7	-1.3
<i>Margin</i>	<i>-39.0 %</i>	<i>-31.0 %</i>	<i>-28.7 %</i>	<i>-25.9 %</i>	<i>-16.7 %</i>	<i>-10.3 %</i>	<i>-2.4 %</i>
Total taxes	0.3	-0.2	0.0	-0.9	0.0	0.0	0.0
Net income from continuing operations	-9.7	-8.2	-11.1	-9.0	-7.0	-4.7	-1.3
Income from discontinued operations (net of tax)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net income before minorities	-9.7	-8.2	-11.1	-9.0	-7.0	-4.7	-1.3
Minority interest	-0.1	-0.2	0.0	0.7	0.0	0.0	0.0
Net income	-9.6	-7.9	-11.1	-9.7	-7.0	-4.7	-1.3
<i>Margin</i>	<i>-39.9 %</i>	<i>-29.3 %</i>	<i>-28.7 %</i>	<i>-25.2 %</i>	<i>-16.7 %</i>	<i>-10.3 %</i>	<i>-2.4 %</i>
Number of shares, average	16.5	18.1	18.1	18.7	19.9	19.9	19.9
EPS	-0.58	-0.44	-0.61	-0.52	-0.35	-0.24	-0.06
EPS adj.	-0.58	-0.44	-0.61	-0.52	-0.35	-0.24	-0.06

*Adjustments made for:

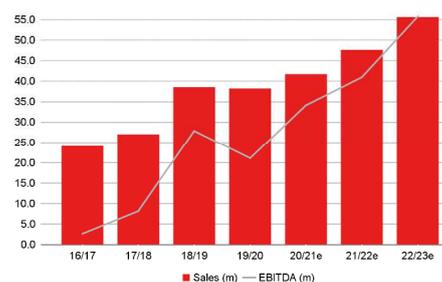
Guidance: First guidance will be announced at Q2 2021 latest

Financial Ratios

	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Total Operating Costs / Sales	131.4 %	125.4 %	106.3 %	109.2 %	104.4 %	99.5 %	93.5 %
Operating Leverage	-5.6 x	0.2 x	-0.6 x	-16.4 x	-2.9 x	-3.9 x	-6.1 x
EBITDA / Interest expenses	n.m.	n.m.	n.m.	n.m.	n.m.	0.2 x	3.7 x
Tax rate (EBT)	-2.9 %	2.7 %	0.1 %	9.4 %	0.0 %	0.0 %	0.0 %
Dividend Payout Ratio	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Sales per Employee	113,689	109,518	137,224	117,978	125,333	137,224	157,730

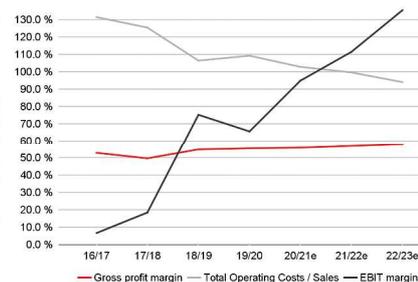
Sales, EBITDA

in EUR m

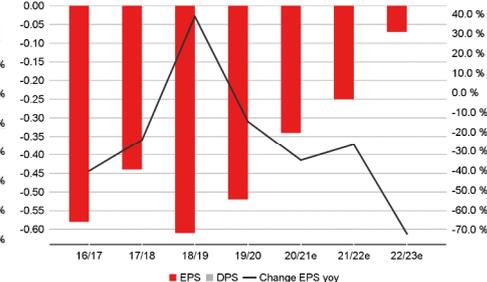


Operating Performance

in %



Performance per Share



Source: Warburg Research

Source: Warburg Research

Source: Warburg Research

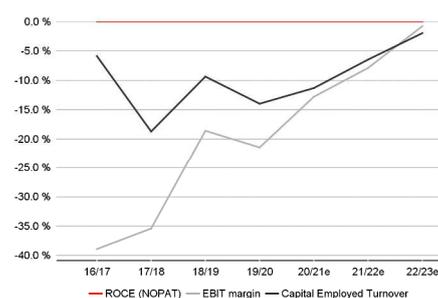
Consolidated balance sheet

In EUR m	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Assets							
Goodwill and other intangible assets	7.1	19.1	15.8	13.3	11.8	10.5	9.5
thereof other intangible assets	4.4	12.7	11.2	8.8	7.3	6.1	5.0
thereof Goodwill	2.7	6.4	4.6	4.5	4.5	4.5	4.5
Property, plant and equipment	7.6	12.0	17.1	24.5	25.2	24.7	25.7
Financial assets	0.2	2.0	1.4	1.0	1.0	1.0	1.0
Other long-term assets	0.1	0.3	0.8	0.3	0.3	0.3	0.3
Fixed assets	14.9	33.4	35.2	39.1	38.3	36.6	36.5
Inventories	7.2	8.0	8.0	7.0	7.6	8.3	9.6
Accounts receivable	6.5	6.5	6.4	6.2	6.7	7.4	8.5
Liquid assets	39.2	25.8	15.4	19.3	12.5	8.7	6.2
Other short-term assets	0.6	0.7	1.2	0.6	0.6	0.6	0.6
Current assets	53.6	41.0	30.9	33.0	27.4	25.0	24.9
Total Assets	68.5	74.4	66.1	72.1	65.7	61.5	61.4
Liabilities and shareholders' equity							
Subscribed capital	18.1	18.1	18.1	19.9	19.9	19.9	19.9
Capital reserve	78.0	64.6	65.2	78.4	78.4	78.4	78.4
Retained earnings	-47.7	-59.1	-67.9	-77.5	-84.5	-89.2	-90.5
Other equity components	-1.1	0.0	0.0	0.0	-0.5	-1.0	-1.7
Shareholders' equity	47.2	23.5	15.3	20.8	13.3	8.1	6.1
Minority interest	0.2	4.9	4.9	5.4	5.4	5.4	5.4
Total equity	47.4	28.4	20.2	26.1	18.7	13.5	11.5
Provisions	2.3	4.8	4.0	3.5	3.8	4.1	4.6
thereof provisions for pensions and similar obligations	1.7	4.2	2.9	2.8	3.1	3.4	3.9
Financial liabilities (total)	9.7	27.8	27.0	30.6	30.6	30.6	30.6
thereof short-term financial liabilities	1.5	2.4	3.6	3.3	3.3	3.3	3.3
Accounts payable	2.4	2.9	4.4	3.2	3.5	3.8	4.4
Other liabilities	6.7	10.5	10.5	8.7	9.1	9.6	10.3
Liabilities	21.1	46.0	46.0	46.0	47.0	48.0	49.9
Total liabilities and shareholders' equity	68.5	74.4	66.1	72.1	65.7	61.5	61.4

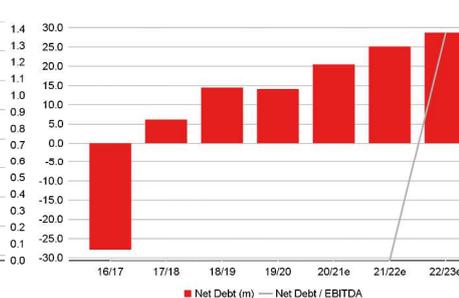
Financial Ratios

	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Efficiency of Capital Employment							
Operating Assets Turnover	1.3 x	1.1 x	1.4 x	1.1 x	1.2 x	1.3 x	1.3 x
Capital Employed Turnover	1.2 x	0.8 x	1.1 x	0.9 x	1.0 x	1.2 x	1.3 x
ROA	-64.3 %	-23.7 %	-31.5 %	-24.7 %	-18.2 %	-12.9 %	-3.5 %
Return on Capital							
ROCE (NOPAT)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
ROE	-26.0 %	-22.5 %	-57.0 %	-53.5 %	-40.8 %	-44.1 %	-17.9 %
Adj. ROE	-26.0 %	-22.5 %	-57.0 %	-53.5 %	-40.8 %	-44.1 %	-17.9 %
Balance sheet quality							
Net Debt	-27.9	6.2	14.5	14.1	21.2	25.3	28.3
Net Financial Debt	-29.6	2.0	11.6	11.3	18.1	21.9	24.4
Net Gearing	-58.8 %	21.7 %	71.8 %	54.0 %	113.3 %	187.7 %	246.2 %
Net Fin. Debt / EBITDA	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	718.6 %
Book Value / Share	2.9	1.3	0.8	1.1	0.7	0.4	0.3
Book value per share ex intangibles	2.4	0.2	0.0	0.4	0.1	-0.1	-0.2

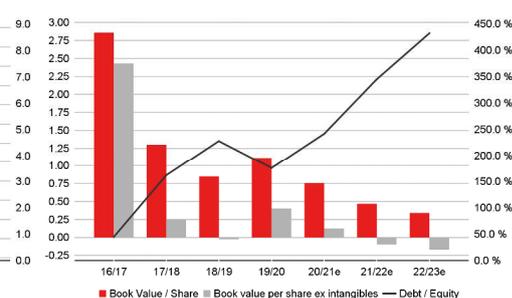
ROCE Development



Net debt in EUR m



Book Value per Share in EUR



Source: Warburg Research

Source: Warburg Research

Source: Warburg Research

Consolidated cash flow statement

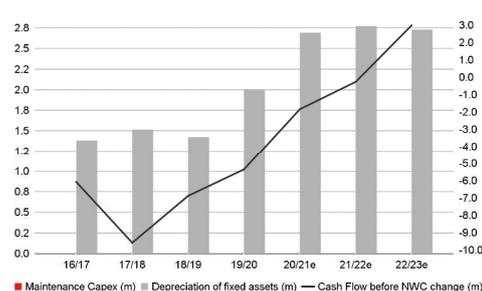
In EUR m	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Net income	-9.7	-8.2	-11.1	-9.0	-7.0	-4.7	-1.3
Depreciation of fixed assets	1.4	1.5	1.4	2.0	2.7	2.8	2.7
Amortisation of goodwill	0.0	0.0	1.8	0.4	0.0	0.0	0.0
Amortisation of intangible assets	0.3	1.5	1.5	1.9	1.5	1.2	1.0
Increase/decrease in long-term provisions	0.3	-0.5	-0.6	0.7	0.3	0.3	0.5
Other non-cash income and expenses	1.6	-3.9	0.1	-1.4	0.0	0.0	0.0
Cash Flow before NWC change	-6.1	-9.6	-6.9	-5.3	-2.5	-0.4	3.0
Increase / decrease in inventory	-0.1	0.2	-0.9	0.7	-0.6	-0.7	-1.3
Increase / decrease in accounts receivable	-0.8	1.3	-0.2	0.1	-0.5	-0.7	-1.1
Increase / decrease in accounts payable	-0.4	-0.1	1.7	-1.3	0.3	0.3	0.6
Increase / decrease in other working capital positions	1.7	2.6	2.9	1.1	0.0	0.0	0.0
Increase / decrease in working capital (total)	0.3	4.1	3.5	0.6	-0.8	-1.1	-1.8
Net cash provided by operating activities [1]	-5.8	-5.4	-3.4	-4.8	-3.4	-1.5	1.2
Investments in intangible assets	-1.1	-0.1	0.0	0.0	0.0	0.0	0.0
Investments in property, plant and equipment	0.0	-1.3	-6.6	-2.8	-2.9	-2.3	-3.7
Payments for acquisitions	-0.2	-10.5	0.0	0.0	-0.5	0.0	0.0
Financial investments	-10.0	0.6	0.0	1.9	0.0	0.0	0.0
Income from asset disposals	0.0	-0.2	0.0	0.2	0.0	0.0	0.0
Net cash provided by investing activities [2]	8.8	-12.6	-6.7	-4.5	-3.4	-2.3	-3.7
Change in financial liabilities	-0.4	4.7	-0.3	-1.5	0.0	0.0	0.0
Dividends paid	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchase of own shares	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital measures	28.0	0.0	0.0	14.6	0.0	0.0	0.0
Other	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Net cash provided by financing activities [3]	27.8	4.7	-0.3	13.1	0.0	0.0	0.0
Change in liquid funds [1]+[2]+[3]	30.8	-13.4	-10.3	3.8	-6.8	-3.8	-2.5
Effects of exchange-rate changes on cash	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash and cash equivalent at end of period	39.0	25.5	15.2	19.0	12.2	8.4	5.9

Financial Ratios

	2016/17	2017/18	2018/19	2019/20	2020/21e	2021/22e	2022/23e
Cash Flow							
FCF	-6.8	-6.8	-10.0	-7.6	-6.3	-3.8	-2.5
Free Cash Flow / Sales	-28.4 %	-25.0 %	-25.9 %	-19.8 %	-15.1 %	-8.3 %	-4.8 %
Free Cash Flow Potential	-8.0	-6.3	-2.5	-2.9	-1.8	0.2	3.4
Free Cash Flow / Net Profit	71.3 %	85.4 %	90.3 %	78.6 %	90.2 %	80.6 %	196.3 %
Interest Received / Avg. Cash	1.0 %	5.1 %	4.6 %	8.9 %	0.0 %	0.0 %	0.0 %
Interest Paid / Avg. Debt	3.2 %	2.1 %	11.2 %	3.0 %	3.0 %	3.0 %	3.0 %
Management of Funds							
Investment ratio	4.5 %	5.0 %	17.2 %	7.4 %	7.0 %	5.0 %	7.0 %
Maint. Capex / Sales	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
Capex / Dep	64.9 %	44.5 %	141.2 %	65.3 %	69.8 %	57.0 %	98.1 %
Avg. Working Capital / Sales	43.1 %	41.8 %	27.7 %	25.8 %	24.7 %	24.7 %	24.2 %
Trade Debtors / Trade Creditors	266.0 %	224.6 %	144.3 %	194.4 %	191.4 %	194.7 %	193.2 %
Inventory Turnover	1.5 x	1.7 x	2.2 x	2.4 x	2.4 x	2.4 x	2.3 x
Receivables collection period (days)	98	87	60	59	59	59	59
Payables payment period (days)	79	75	93	70	69	70	72
Cash conversion cycle (Days)	246	221	133	141	138	141	143

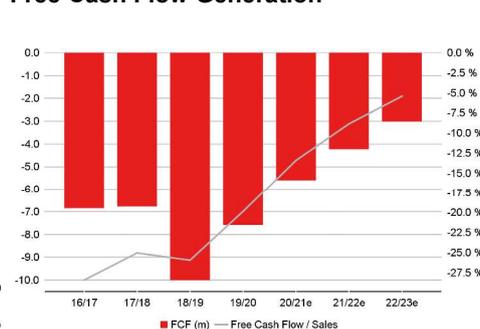
CAPEX and Cash Flow

in EUR m



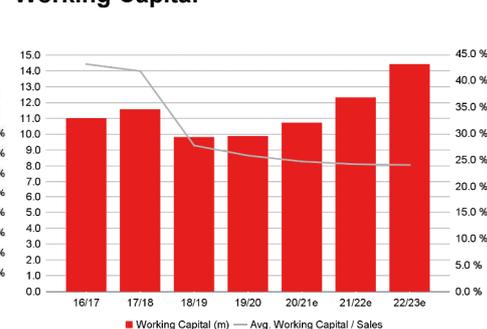
Source: Warburg Research

Free Cash Flow Generation



Source: Warburg Research

Working Capital



Source: Warburg Research

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Company	Disclosure	Link to the historical price targets and rating changes (last 12 months)
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Investment recommendation: expected direction of the share price development of the financial instrument up to the given price target in the opinion of the analyst who covers this financial instrument.

-B-	Buy:	The price of the analysed financial instrument is expected to rise over the next 12 months.
-H-	Hold:	The price of the analysed financial instrument is expected to remain mostly flat over the next 12 months.
-S-	Sell:	The price of the analysed financial instrument is expected to fall over the next 12 months.
“-“	Rating suspended:	The available information currently does not permit an evaluation of the company.

WARBURG RESEARCH GMBH – ANALYSED RESEARCH UNIVERSE BY RATING

Rating	Number of stocks	% of Universe
Buy	132	64
Hold	62	30
Sell	7	3
Rating suspended	6	3
Total	207	100

WARBURG RESEARCH GMBH – ANALYSED RESEARCH UNIVERSE BY RATING ...

... taking into account only those companies which were provided with major investment services in the last twelve months.

Rating	Number of stocks	% of Universe
Buy	39	80
Hold	7	14
Sell	0	0
Rating suspended	3	6
Total	49	100

PRICE AND RATING HISTORY B.R.A.I.N. AG AS OF 11.03.2021


Markings in the chart show rating changes by Warburg Research GmbH in the last 12 months. Every marking details the date and closing price on the day of the rating change.

EQUITIES

Matthias Rode +49 40 3282-2678
Head of Equities mrode@mmwarburg.com

RESEARCH

Michael Heider +49 40 309537-280
Head of Research mheider@warburg-research.com

Henner Rüschemeyer +49 40 309537-270
Head of Research hrueschmeier@warburg-research.com

Stefan Augustin +49 40 309537-168
Cap. Goods, Engineering saugustin@warburg-research.com

Jan Bauer +49 40 309537-155
Renewables jbauer@warburg-research.com

Jonas Blum +49 40 309537-240
Telco, Media, Construction jblum@warburg-research.com

Christian Cohrs +49 40 309537-175
Industrials & Transportation ccohrs@warburg-research.com

Dr. Christian Ehmann +49 40 309537-167
BioTech, Life Science cehmann@warburg-research.com

Felix Ellmann +49 40 309537-120
Software, IT fellmann@warburg-research.com

Jörg Philipp Frey +49 40 309537-258
Retail, Consumer Goods jfrey@warburg-research.com

Marius Fuhrberg +49 40 309537-185
Financial Services mfuhrberg@warburg-research.com

Mustafa Hidir +49 40 309537-230
Automobiles, Car Suppliers mhidir@warburg-research.com

Ulrich Huwald +49 40 309537-255
Health Care, Pharma uhuwald@warburg-research.com

Philipp Kaiser +49 40 309537-260
Real Estate pkaiser@warburg-research.com

Thilo Kleibauer +49 40 309537-257
Retail, Consumer Goods tkleibauer@warburg-research.com

Eggert Kuls +49 40 309537-256
Engineering ekuls@warburg-research.com

Andreas Pläsier +49 40 309537-246
Banks, Financial Services aplaesier@warburg-research.com

Malte Schaumann +49 40 309537-170
Technology mschaumann@warburg-research.com

Oliver Schwarz +49 40 309537-250
Chemicals, Agriculture oschwarz@warburg-research.com

Simon Stippig +49 40 309537-265
Real Estate sstippig@warburg-research.com

Cansu Tatar +49 40 309537-248
Cap. Goods, Engineering ctatar@warburg-research.com

Marc-René Tonn +49 40 309537-259
Automobiles, Car Suppliers mtonn@warburg-research.com

Robert-Jan van der Horst +49 40 309537-290
Technology rvanderhorst@warburg-research.com

Andreas Wolf +49 40 309537-140
Software, IT awolf@warburg-research.com

INSTITUTIONAL EQUITY SALES

Marc Niemann +49 40 3282-2660
Head of Equity Sales, Germany mniemann@mmwarburg.com

Klaus Schilling +49 40 3282-2664
Head of Equity Sales, Germany kschilling@mmwarburg.com

Tim Beckmann +49 40 3282-2665
United Kingdom tbeckmann@mmwarburg.com

Lea Bogdanova +49 69 5050-7411
United Kingdom, Ireland lbogdanova@mmwarburg.com

Jens Buchmüller +49 69 5050-7415
Scandinavia, Austria jbuchmueller@mmwarburg.com

Alexander Eschweiler +49 40 3282-2669
Germany, Luxembourg aeschweiler@mmwarburg.com

Matthias Fritsch +49 40 3282-2696
United Kingdom mfritsch@mmwarburg.com

Maximilian Martin +49 69 5050-7413
Austria, Poland mmartin@mmwarburg.com

Christopher Seedorf +49 69 5050-7414
Switzerland cseedorf@mmwarburg.com

Sophie Hauer +49 69 5050-7417
Roadshow/Marketing shauer@mmwarburg.com

Juliane Niemann +49 40 3282-2694
Roadshow/Marketing jniemann@mmwarburg.com

SALES TRADING

Oliver Merckel +49 40 3282-2634
Head of Sales Trading omerckel@mmwarburg.com

Elyaz Dust +49 40 3282-2702
Sales Trading edust@mmwarburg.com

Michael Ilgenstein +49 40 3282-2700
Sales Trading milgenstein@mmwarburg.com

Marcel Magiera +49 40 3282-2662
Sales Trading mmagiera@mmwarburg.com

Bastian Quast +49 40 3282-2701
Sales Trading bquast@mmwarburg.com

Jörg Treptow +49 40 3282-2658
Sales Trading jtreptow@mmwarburg.com

MACRO RESEARCH

Carsten Klude +49 40 3282-2572
Macro Research cklude@mmwarburg.com

Dr. Christian Jasperneite +49 40 3282-2439
Investment Strategy cjasperneite@mmwarburg.com

Our research can be found under:

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Capital IQ www.capitaliq.com

For access please contact:

Andrea Schaper +49 40 3282-2632
Sales Assistance aschaper@mmwarburg.com

Kerstin Muthig +49 40 3282-2703
Sales Assistance kmuthig@mmwarburg.com