

# Enapter AG

Germany / Cleantech  
 Primary exchange: Frankfurt  
 Bloomberg: H2O GR  
 ISIN: DE000A255G02

Iridium & PEM  
 electrolysis

**RATING**  
**BUY**

**PRICE TARGET**  
**€ 17.00**

Return Potential 58.1%  
 Risk Rating High

## WHY IRIIDIUM COULD MAKE THE DIFFERENCE

Enapter is the technology leader in Anion Exchange Membrane electrolysis (AEM-EL). This technology does not need iridium. This is a key difference between AEM-EL and the main competing technology, Proton Exchange Membrane electrolysis (PEM-EL), where iridium oxide is (so far) irreplaceable as an anode catalyst. The predicted strong growth of PEM electrolysis will lead to a significant increase in demand for iridium. Iridium is one of the rarest metals on earth, but standalone mining is not worthwhile due to the small volume involved. Iridium is extracted as a by-product of platinum mining (annual iridium production: approx. 7 - 9 tonnes). The supply of iridium is therefore largely inelastic. It hardly reacts to price signals. This results in two dangers for PEM-EL: 1) Iridium becomes so expensive (currently one kilogram costs about \$158,000) that PEM technology as a whole becomes relatively expensive and thus loses competitiveness; 2) Iridium scarcity limits the growth of PEM-EL. If these threats materialise, Enapter as the AEM technology leader would be a major winner as AEM-EL is similar to PEM-EL in important respects (fast responsiveness to fluctuating power supply, trouble-free part-load operation, compact design) and thus available as a substitute. If PEM-EL producers fail to adequately limit the problem of iridium scarcity by reducing the amount of iridium used per MW, by iridium recycling or by iridium substitution, a significantly faster expansion of AEM-EL technology would be a very good alternative from today's perspective. Investors who want to play the iridium scarcity theme can do so very easily by investing in Enapter shares. Enapter is the only company with a commercial product with a multi-year track record in the market and is the undisputed technology leader in AEM-EL. We reiterate our Buy recommendation with an unchanged €17 price target.

(p.t.o.)

## FINANCIAL HISTORY & PROJECTIONS

	2020	2021	2022	2023E	2024E	2025E
Revenue (€m)	2.07	8.44	14.67	27.11	58.48	147.74
Y-o-y growth	122.7%	307.8%	73.8%	84.7%	115.8%	152.6%
EBIT (€m)	-3.54	-8.62	-12.86	-16.39	-10.71	-0.01
EBIT margin	-171.2%	-102.1%	-87.6%	-60.5%	-18.3%	0.0%
Net income (€m)	-3.57	-8.70	-12.98	-19.55	-14.27	-4.92
EPS (diluted) (€)	-0.16	-0.38	-0.51	-0.72	-0.52	-0.18
DPS (€)	0.00	0.00	0.00	0.00	0.00	0.00
FCF (€m)	-6.17	-33.05	-64.89	-24.83	-36.34	-33.71
Net gearing	-32.2%	-33.8%	-2.1%	30.9%	104.2%	180.3%
Liquid assets (€m)	4.25	19.60	5.07	8.67	1.53	5.31

## RISKS

The main risks are: financing risk, technological risk, production risk, product risk, increasing competition, innovations.

## COMPANY PROFILE

Enapter produces standardised stacks & electrolysers, which are scalable to larger units based on a modular approach. Enapter's patent-protected AEM technology offers high cost reduction potential. Enapter has production sites in Pisa, Italy, & Saerbeck, Germany, and ca. 210 employees.

## MARKET DATA

As of 18 Oct 2023

Closing Price	€ 10.75
Shares outstanding	27.20m
Market Capitalisation	€ 292.35m
52-week Range	€ 10.20 / 18.50
Avg. Volume (12 Months)	7,369

Multiples	2022	2023E	2024E
P/E	n.a.	n.a.	n.a.
EV/Sales	19.8	10.7	5.0
EV/EBIT	n.a.	n.a.	n.a.
Div. Yield	0.0%	0.0%	0.0%

## STOCK OVERVIEW



## COMPANY DATA

As of 30 Jun 2023

Liquid Assets	€ 9.45m
Current Assets	€ 35.45m
Intangible Assets	€ 11.34m
Total Assets	€ 120.61m
Current Liabilities	€ 11.17m
Shareholders' Equity	€ 77.30m

## SHAREHOLDERS

BluGreen	66.1%
Sergei Storozhenko	4.1%
Johnson Matthey	3.9%
Mirabella	3.0%
Free Float	22.9%



## WHAT IS IRIIDIUM AND WHY IS IT SO IMPORTANT FOR PEM ELECTROLYSIS?

Iridium (Ir) is a very heavy, hard, brittle, silvery-white metal from the six-element platinum group metals (PGMs). This group, along with gold and silver, make up the eight precious metals of the periodic table. Iridium occurs very rarely in the continental earth's crust. The frequency is only 0.003 ppb (parts per billion), which corresponds to about 0.003 grams per 1,000 tons of rock. By comparison, the abundance of platinum is 5 ppb, or 5 grams per 1,000 tons (Schmidt (2015), p. 11). Typically, iridium accounts for only 2-4% of the total content of platinum group metals in the ore.

Proton exchange membrane electrolysis (PEM-EL) uses membranes coated with catalysts to separate water into oxygen and hydrogen by means of electricity. On the anode side, i.e. the side that accepts electrons and where an oxidation reaction thus takes place, there is a very acidic and thus corrosive atmosphere. Therefore, iridium oxide ( $\text{IrO}_2$ ) is applied there as a catalyst in thin layers, because iridium is the element with the highest corrosion resistance. The German Raw Materials Agency (DERA) therefore considers iridium "currently irreplaceable" (DERA (2022), p. 12), as there is currently no alternative material with comparable activity and stability. To put it simply: current PEM electrolysis technology only works with iridium catalysts.

## IRIDIUM SUPPLY: WHERE AND HOW IS IRIIDIUM MINED? WHAT ROLE DOES RECYCLING PLAY?

Iridium is mined in only a few countries by a few companies. The iridium supply is estimated at around 7 - 9 tonnes p.a. For 2022, Johnson Matthey assumes in its PGM Market Report of May 2023 a production volume of 221,000 ounces, i.e. the equivalent of 6.9 tonnes. By comparison, annual platinum production in 2022 was around 190 t (source: Statista). South Africa is the most important producer of iridium, accounting for almost 90% of total production, followed by Zimbabwe (8%) and Russia with 3% (DOE (2023), p. 165). Platinum group metals occur mainly in two different types of deposits. In the Bushveld complex in South Africa, PGMs are the main target of mining activity (PGM-dominated deposits). In Russia, on the other hand, PGMs are by-products of the extraction of nickel and copper (nickel-copper-dominated deposits). Iridium is purely a by-product of the extraction of platinum due to the very low production volume. In South Africa, the platinum content ranges from 1.26 g/t to 3.25 g/t, while the iridium content is only 0.02 g/t to 0.1 g/t (DERA (2022), p. 16). Depending on the mining area, the ratio of platinum to iridium is thus between 22:1 and 63:1. Changes in the production quantities of platinum (and palladium) therefore also cause changes in the iridium produced as a by-product. Conversely, a shortage of iridium does NOT lead to an increase in iridium production, since iridium is not mined independently, but only as a by-product of platinum. In addition, the lead time for new PGM mines, i.e. the period from exploration to the start of mining, is five to ten years. This means that the supply of all platinum group metals is price inelastic in the short term. Price increases therefore only lead to an increase in supply after a long delay. In Russia, platinum mining is only a by-product of nickel and copper mining, so iridium is also an indirect by-product of the mining of these metals. Here, the correlation between iridium supply and demand is even looser, as iridium production is dependent on nickel and copper mining. Despite the strong increase in iridium demand, we therefore see no possibility of significantly increasing iridium production for years to come.

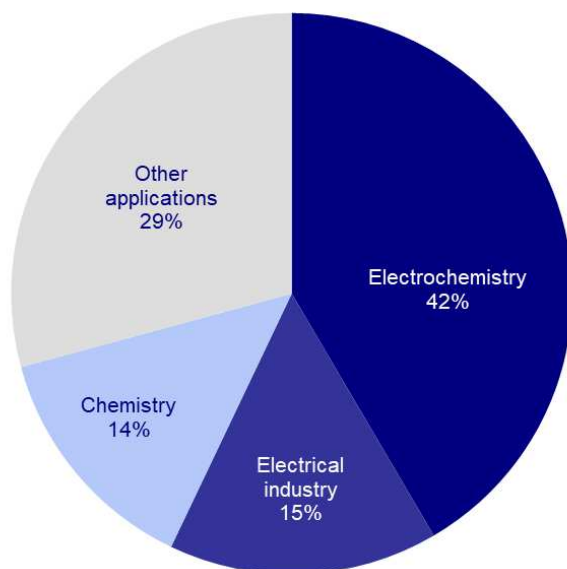
Recycling – and thus, supply from the secondary sector – plays a significant role in the global supply of iridium. Due to its high monetary value, iridium recycling can be carried out economically and is already practised very successfully in many applications. According to the report "Recycling Rates of Metals. A Status Report," published by the UN Environmental

Programme (UNEP) as far back as 2011, the End-of-Life recycling rates (EoL-RR) of iridium in the industrial sector are around 40-50% (p. 32). The average recycled content (RC), i.e. the share of secondary iridium in the total input for iridium production, is estimated in the report at 15-20%. In view of the iridium price increase in recent years, we assume that these values are now higher. For PEM electrolysis, EoL recycling rates of 90% - as for platinum and palladium - are considered possible (Minke et al. (2021), p. 23583). Since iridium recycling is, for the most part, a closed cycle in which the companies reuse the recovered iridium themselves, the recycled iridium does not usually enter the market.

## IRIDIUM DEMAND TODAY AND IN THE FUTURE

The largest share of iridium demand in 2022 came from the electrochemical sector (42%), followed by the electrical sector (15%), and the chemical sector (14%). The remaining applications account for 29%. In the electrochemical sector, iridium is needed as an electrode material and in the electrical sector for crucibles for crystal growth and for OLEDs. In the chemical industry, the precious metal is used as a catalyst (Catvia process). As recently as 2020, there was practically no demand for iridium from the PEM-EL industry. In 2022, demand was already around 310 kg and is expected to double again by 2024, according to Johnson Matthey.

**Figure 1: Iridium demand 2022**



Source: First Berlin Equity Research, Johnson Matthey 2023

Iridium demand is expected to increase drastically in the coming decades. For example, in its "Sustainability" scenario, DERA assumes demand of approx. 34 t for PEM electrolysis alone for the year 2040, which corresponds to about five times the amount produced today (DERA (2022), p. 13 f.). Accordingly, the German Raw Materials Agency deems iridium to pose the highest supply risk with regard to the ramp-up of PEM electrolysis. Even in the "middle path" scenario, the iridium demand in 2040 would be at 10 t for PEM-EL alone. However, the study does not take into account the iridium recycling potential, nor technical progress.

The US Department of Energy (DOE) comes to a similar estimate in its "Critical Materials Assessment" published in July 2023 and assigns iridium (among other materials) the maximum value of 27 for technological risk (DOE (2023), p. 52). Like the DERA, the DOE

also justifies this with the additional demand for iridium caused by the strong growth in PEM electrolysis. The Department of Energy lists iridium among seven critical materials in the short term (2020 - 2025), as iridium is important for energy supply on the one hand and the supply risk is high on the other. In the medium term (2025 - 2035), the DOE even assumes a very high supply risk (DOE (2023), p. xiv). The DOE develops four scenarios for iridium demand, which show a demand above the iridium production capacity of 2020 in the short term and especially in the medium term.

In its Global Hydrogen Review (2022), the International Energy Agency (IEA) assumes that PEM electrolysis currently requires 0.7 kg (or 0.7 t / GW) of iridium per MW of capacity (p. 83) but considers a reduction of the specific iridium requirement by a factor of 10 to be possible. The IEA refers to the 2018 study "IndWEDe", commissioned by the German Federal Ministry of Transport, which assumes that a reduction of specific iridium demand by more than 90% is possible in the long term with a reduction of the iridium catalyst loading (today: 2 mg / cm<sup>2</sup>) by a factor of 5 to 0.4 mg / cm<sup>2</sup> and an increase of the power density (today: 3 W / cm<sup>2</sup>) by a factor of 2.7 to 8 W / cm<sup>2</sup>. This would reduce iridium demand to 0.05 kg / MW or 50 kg / GW. The study sees the reduction of iridium demand by 90% as necessary for PEM technology to become established at all. In the Global Hydrogen Review 2023, the IEA assumes, based on the announced projects, that in 2030 the total electrolysis capacity could be 175 GW (p. 70). If we assume that these projects are all implemented and 40% of them are based on PEM technology, this would be 70 GW, for which approx. 49 t of iridium would be required, according to the current state of the art. There are 7 more years until the end of 2030, so PEM technology would require an average of 7 t of iridium p.a.; i.e., the complete annual production for seven years. Assuming an average halving of the specific iridium demand by 2030, 3.5 t p.a. would still be needed.

A study by Clapp et al. on iridium demand in the PEM electrolysis industry, published in 2023 in the scientific journal *Catalysis Today*, explicitly considers the effects of improving iridium utilisation over time, iridium recycling and extended membrane electrode assembly (MEA) lifetime.

**Figure 2: Study assumptions**

Annual global primary iridium supply	7.5 t
Iridium recycling rate from EoL MEAs	linear rise: 70% im Jahr 2020 to 100% in 2030
MEA lifetime	10 years
Load factor	60%
PEM green hydrogen market share	40%
System electricity consumption (kWh / kg H <sub>2</sub> )	2022: 52.2 to 2050: 45.3

Source: First Berlin Equity Research, Clapp et al. (2023), p. 4

The study assumes an optimistic and a conservative scenario regarding the improvement of iridium use and determines the iridium demand for each year based on the IEA's two PEM electrolysis capacity projections (Announced Pledges Scenario (APS) and Net Zero Emissions (NZE)) from 2022. Compared to the APS scenario, which maps all announced national emission reduction targets, the NZE scenario assumes the achievement of the Net Zero target in 2050.

**Figure 3: PEM electrolysis capacity according to IEA scenarios in GW**

	2030	2050
APS	80	580
NZE	220	1,130

Source: First Berlin Equity Research, IEA 2022, Clapp et al. (2023), p. 1



Clapp et al. assume that an iridium loading of 0.65 mg/cm<sup>2</sup> is currently the minimum for a ten-year MEA lifetime. The conservative scenario assumes a decrease to 0.23 mg/cm<sup>2</sup>, the optimistic one to 0.04 mg/cm<sup>2</sup> (p. 3). The study sees an iridium quantity of 20% of the total annual production, i.e. 1.5 t p.a., as the quantity available to PEM electrolysis in the future without creating major pressure on the iridium market (p. 4), assuming that other sectors can reduce their iridium demand through substitution.

Study results: The good news for the PEM electrolysis industry is that in the long term (from 2037 at the latest) there will be no iridium constraints, as above a certain installed PEM-EL capacity the high recycling rate is sufficient to enable further capacity expansion. The bad news is that until about the mid-2030s, three of the four projection variants result in an iridium demand over many years that is at times significantly higher than the 1.5 t that the authors consider market-compatible (pp. 5-6). The years with the iridium demand peak are shown in figure 4.

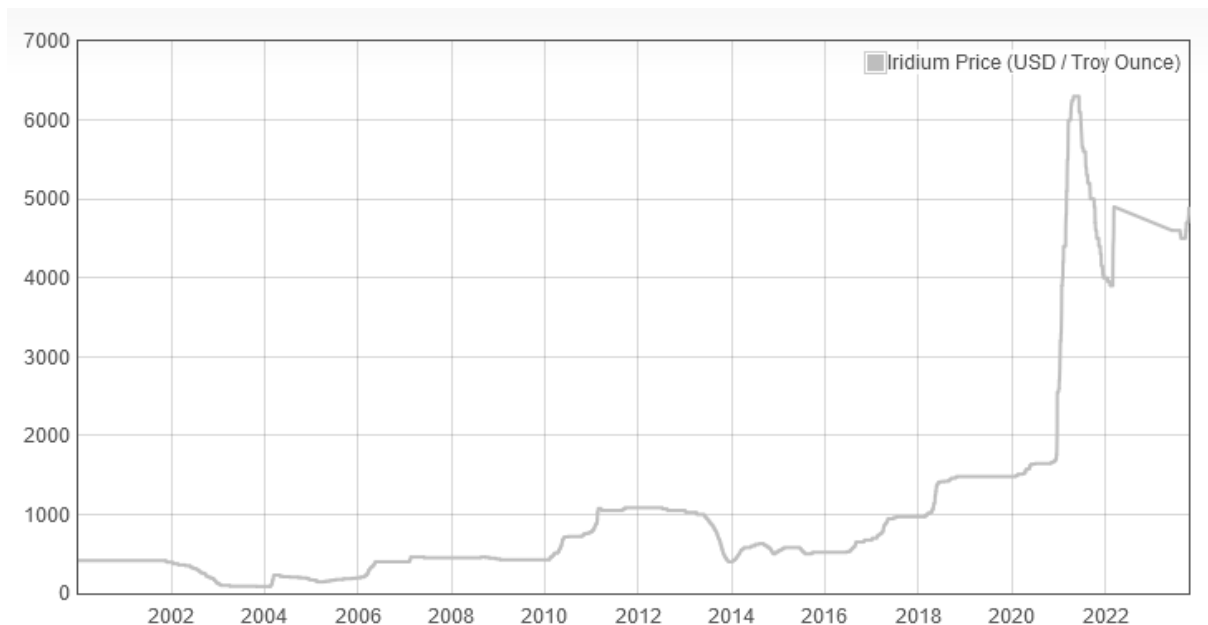
**Figure 4: Iridium demand peaks in tonnes**

	IEA APS		IEA NZE	
	conservative	optimistic	conservative	optimistic
Iridium demand peak in t (year)	4.7 (2024)	1.4 (2023)	13.0 (2029)	2.5 (2029)

Source: First Berlin Equity Research, Clapp et al. (2023), p. 5 f.

## IRIDIUM PRICE DEVELOPMENT

The price of iridium can be seen daily at major precious metal dealers (e.g. <https://www.dailymetalprice.com/metalpricecharts.php?c=ir&u=oz&d=0>). While the price per ounce (= 31 g) had always been below \$2,000 since 2000, it rose to €6,300 in 2021 due to increasing demand and simultaneous supply shortages. With the advent of the new mobile phone technology 5G, the demand for iridium crucibles to grow synthetic crystals has increased. At the same time, the supply of iridium has been greatly reduced by the Corona pandemic and technical problems in South Africa. Since then, the price of iridium has fallen and is currently around \$4,900 (see figure 5 on the next page). In its "PGM Market Report" published in May 2023, Johnson Matthey suggests that higher prices have both improved the economics of recycling in the chemical industry and encouraged some substitution of iridium in crucibles used to grow crystals for electronic applications.

**Figure 5: Iridium price development since 2000**

Source: First Berlin Equity Research,  
<https://www.dailymetalprice.com/metalpricecharts.php?c=ir&u=oz&d=0>

## DANGER OF IRIIDIUM SHORTAGES AND SHARP IRIIDIUM PRICE INCREASES

Our analysis has shown that iridium is likely to be a limiting factor for the expansion of PEM electrolysis in the coming years. Previous market models have examined iridium supply and demand developments, but not the possible iridium price development. There may still be sufficient quantities for purchase in the iridium market, but at prices at which PEM electrolysis loses price competitiveness compared to competing technologies. Typically, the price of a commodity jumps upwards when demand increases and supply is largely inelastic. We would therefore not rule out another tripling, as already seen in 2021.

Currently, the cost of PEM electrolyzers is \$1.7m - \$2.0m per MW (IEA (2023), S. 74). With a current iridium demand of 667 g / MW and an iridium price of about \$4,900 / oz or \$158,000 / kg, this results in an iridium cost of about \$105,000 / MW, or about 5% to 6% of the total cost. A tripling of the iridium price would catapult the iridium costs to \$ 315,000 / MW and thus to 15% to 18% of the total costs. Even halving the specific iridium demand to 333 g / MW would only partially compensate for the price increase. The price per MW would still rise by 50% to \$158,000 / MW and cost reductions in other areas of PEM electrolysis would be counteracted. This is where we see the big opportunity for Enapter and their AEM technology, which does not require iridium. The resulting cost advantage could lead to a significant gain in market share, as the AEM technology hardly differs in its capabilities from PEM technology and can therefore substitute it very well. We recommend to Buy the Enapter share with a price target of €17.

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## VALUATION MODEL

DCF valuation model								
All figures in EUR '000								
	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Net sales	27,105	58,482	147,744	281,154	506,077	658,820	838,498	1,042,787
NOPLAT	-16,774	-10,706	-6	22,993	41,471	55,622	72,010	90,981
+ depreciation & amortisation	3,791	4,271	5,915	7,430	8,896	9,732	10,810	12,133
Net operating cash flow	-12,983	-6,435	5,910	30,423	50,367	65,353	82,820	103,115
- total investments (CAPEX, WC, Other)	-6,772	-24,141	-32,212	-48,720	-58,190	-48,460	-57,410	-65,930
<i>Capital expenditures</i>	-6,288	-21,054	-16,252	-28,115	-16,286	-20,004	-23,935	-27,871
<i>Working capital</i>	-2,783	-5,287	-18,460	-20,604	-41,903	-28,456	-33,474	-38,059
<i>Other</i>	2,300	2,200	2,500	0	0	0	0	0
Free cash flows (FCF)	-19,755	-30,576	-26,302	-18,297	-7,823	16,893	25,411	37,185
PV of FCF's	-19,246	-26,151	-19,756	-12,069	-4,532	8,591	11,349	14,585

All figures in thousands	
PV of FCFs in explicit period (2023E-2037E)	135,792
PV of FCFs in terminal period	325,923
Enterprise value (EV)	461,715
+ Net cash / - net debt	1,243
+ Investments / minority interests	1
Shareholder value	462,958
Diluted number of shares	27,195
Fair value in EUR	17.02

Terminal growth	4.0%
Terminal EBIT margin	13.3%

WACC		Terminal growth rate						
		2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%
10.9%	10.9%	28.95	30.05	31.31	32.75	34.41	36.36	38.67
11.9%	11.9%	23.43	24.18	25.02	25.97	27.04	28.28	29.70
12.9%	12.9%	19.17	19.69	20.27	20.91	21.63	22.44	23.36
13.9%	13.9%	15.80	16.17	16.58	17.02	17.52	18.07	18.69
14.9%	14.9%	13.10	13.37	13.66	13.98	14.33	14.71	15.13
15.9%	15.9%	10.91	11.11	11.32	11.55	11.80	12.07	12.37
16.9%	16.9%	9.12	9.26	9.42	9.58	9.76	9.96	10.17

\* for layout purposes the model shows numbers only to 2030, but runs until 2037





## INCOME STATEMENT

All figures in EUR '000	2020A	2021A	2022A	2023E	2024E	2025E	2026E
<b>Revenues</b>	<b>2,070</b>	<b>8,442</b>	<b>14,671</b>	<b>27,105</b>	<b>58,482</b>	<b>147,744</b>	<b>281,154</b>
Changes in Inventories	242	540	525	0	0	0	0
<b>Operating performance</b>	<b>2,312</b>	<b>8,982</b>	<b>15,197</b>	<b>27,105</b>	<b>58,482</b>	<b>147,744</b>	<b>281,154</b>
Cost of goods sold	2,320	7,874	12,013	21,955	45,031	113,763	196,808
<b>Gross profit (op. performance ./ COGS)</b>	<b>-8</b>	<b>1,109</b>	<b>3,184</b>	<b>5,150</b>	<b>13,451</b>	<b>33,981</b>	<b>84,346</b>
Own Work	2,208	3,330	6,383	3,253	3,509	2,955	1,968
Personnel costs	3,356	7,596	14,300	14,100	15,500	19,207	26,710
Other operating income	605	1,367	2,799	1,897	2,047	2,955	2,812
Other operating expenses	2,369	5,828	8,648	8,800	9,942	14,774	28,115
<b>EBITDA</b>	<b>-2,920</b>	<b>-7,619</b>	<b>-10,582</b>	<b>-12,600</b>	<b>-6,435</b>	<b>5,910</b>	<b>34,301</b>
Depreciation and amortisation	625	1,002	2,276	3,791	4,271	5,915	7,430
<b>Operating income (EBIT)</b>	<b>-3,544</b>	<b>-8,622</b>	<b>-12,858</b>	<b>-16,391</b>	<b>-10,706</b>	<b>-6</b>	<b>26,871</b>
Net financial result	-21	-88	-97	-2,772	-3,858	-5,171	-7,481
Non-operating expenses	0	0	0	0	0	0	0
<b>Pre-tax income (EBT)</b>	<b>-3,565</b>	<b>-8,709</b>	<b>-12,955</b>	<b>-19,163</b>	<b>-14,565</b>	<b>-5,177</b>	<b>19,390</b>
Income taxes	3	-8	23	383	-291	-259	3,878
Minority interests	-1	1	1	0	0	0	0
<b>Net income / loss</b>	<b>-3,569</b>	<b>-8,701</b>	<b>-12,977</b>	<b>-19,546</b>	<b>-14,273</b>	<b>-4,918</b>	<b>15,512</b>
<b>Diluted EPS (in €)</b>	<b>-0.16</b>	<b>-0.38</b>	<b>-0.51</b>	<b>-0.72</b>	<b>-0.52</b>	<b>-0.18</b>	<b>0.57</b>
<b>Ratios</b>							
Gross margin on operating performance	-0.3%	12.3%	21.0%	19.0%	23.0%	23.0%	30.0%
EBITDA margin on revenues	-141.0%	-90.3%	-72.1%	-46.5%	-11.0%	4.0%	12.2%
EBIT margin on revenues	-171.2%	-102.1%	-87.6%	-60.5%	-18.3%	0.0%	9.6%
Net margin on revenues	-172.4%	-103.1%	-88.4%	-72.1%	-24.4%	-3.3%	5.5%
Tax rate	-0.1%	0.1%	-0.2%	-2.0%	2.0%	5.0%	20.0%
<b>Expenses as % of revenues</b>							
Personnel costs	162.1%	90.0%	97.5%	52.0%	26.5%	13.0%	9.5%
Depreciation and amortisation	30.2%	11.9%	15.5%	14.0%	7.3%	4.0%	2.6%
Other operating expenses	114.4%	69.0%	58.9%	32.5%	17.0%	10.0%	10.0%
<b>Y-Y Growth</b>							
Revenues	122.7%	307.8%	73.8%	84.7%	115.8%	152.6%	90.3%
Operating income	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Net income/ loss	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.



## BALANCE SHEET

All figures in EUR '000	2020A	2021A	2022A	2023E	2024E	2025E	2026E
<b>Assets</b>							
<b>Current assets, total</b>	<b>6,633</b>	<b>29,920</b>	<b>27,577</b>	<b>29,989</b>	<b>29,551</b>	<b>52,511</b>	<b>85,163</b>
Cash and cash equivalents	4,248	19,604	5,071	8,672	1,529	5,315	10,537
Short-term investments	0	0	0	0	0	0	0
Receivables	184	2,638	8,014	7,426	9,613	16,191	30,811
Inventories	1,300	3,604	8,421	7,820	12,337	24,934	37,744
Other current assets	901	4,073	6,071	6,071	6,071	6,071	6,071
<b>Non-current assets, total</b>	<b>7,917</b>	<b>32,221</b>	<b>80,237</b>	<b>82,916</b>	<b>99,844</b>	<b>110,326</b>	<b>131,055</b>
Property, plant & equipment	2,870	23,985	67,900	70,944	87,990	98,365	117,767
Goodwill & other intangibles	3,977	7,110	10,272	9,907	9,789	9,896	11,223
Right-of-use assets	1,033	1,055	909	909	909	909	909
Other assets	72	1,156	1,156	1,156	1,156	1,156	1,156
<b>Total assets</b>	<b>14,550</b>	<b>62,141</b>	<b>107,814</b>	<b>112,905</b>	<b>129,395</b>	<b>162,837</b>	<b>216,218</b>
<b>Shareholders' equity &amp; debt</b>							
<b>Current liabilities, total</b>	<b>4,452</b>	<b>10,397</b>	<b>16,070</b>	<b>13,226</b>	<b>16,644</b>	<b>17,358</b>	<b>28,259</b>
Short-term debt	1,415	1,186	871	2,000	4,000	4,000	8,075
Leasing liabilities	109	155	116	116	116	116	116
Accounts payable	947	6,387	11,191	7,218	8,636	9,350	16,176
Current provisions	239	516	1,243	1,243	1,243	1,243	1,243
Other current liabilities	1,851	2,309	2,765	2,765	2,765	2,765	2,765
<b>Long-term liabilities, total</b>	<b>1,353</b>	<b>5,224</b>	<b>5,290</b>	<b>32,770</b>	<b>60,116</b>	<b>97,761</b>	<b>124,730</b>
Long-term debt	21	2,708	2,371	27,371	52,371	87,371	114,296
Leasing liabilities	568	575	471	652	798	943	987
Other liabilities	278	512	605	2,903	5,103	7,603	7,603
Deferred revenue	486	1,428	1,844	1,844	1,844	1,844	1,844
<b>Minority interests</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Shareholders' equity</b>	<b>8,744</b>	<b>46,518</b>	<b>86,454</b>	<b>66,908</b>	<b>52,635</b>	<b>47,717</b>	<b>63,229</b>
Share capital	22,269	24,406	27,195	27,195	27,195	27,195	27,195
Capital reserve	-6,771	37,615	87,586	87,586	87,586	87,586	87,586
Other reserves	-37	-83	69	69	69	69	69
Treasury stock	0	0	0	0	0	0	0
Loss carryforward / retained earnings	-6,716	-15,418	-28,396	-47,942	-62,216	-67,134	-51,622
<b>Total consolidated equity and debt</b>	<b>14,550</b>	<b>62,141</b>	<b>107,814</b>	<b>112,905</b>	<b>129,395</b>	<b>162,837</b>	<b>216,218</b>
<b>Ratios</b>							
Current ratio (x)	1.49	2.88	1.72	2.27	1.78	3.03	3.01
Quick ratio (x)	1.20	2.53	1.19	1.68	1.03	1.59	1.68
Equity ratio	60.1%	74.9%	80.2%	59.3%	40.7%	29.3%	29.2%
Net debt	-2,812	-15,711	-1,830	20,698	54,841	86,056	111,834
Net gearing	-32.2%	-33.8%	-2.1%	30.9%	104.2%	180.3%	176.9%
Return on equity (ROE)	-40.8%	-18.7%	-15.0%	-29.2%	-27.1%	-10.3%	24.5%
Days of sales outstanding (DSO)	32	114	199	100	60	40	40
Days inventory outstanding	205	167	256	130	100	80	70
Days in payables (DIP)	149	296	340	120	70	30	30



## CASH FLOW STATEMENT

All figures in EUR '000	2020A	2021A	2022A	2023E	2024E	2025E	2026E
<b>EBIT</b>	<b>-3,544</b>	<b>-8,622</b>	<b>-12,858</b>	<b>-16,391</b>	<b>-10,706</b>	<b>-6</b>	<b>26,871</b>
Depreciation and amortisation	625	1,002	2,276	3,791	4,271	5,915	7,430
<b>EBITDA</b>	<b>-2,920</b>	<b>-7,619</b>	<b>-10,582</b>	<b>-12,600</b>	<b>-6,435</b>	<b>5,910</b>	<b>34,301</b>
Changes in working capital	528	-1,136	-6,476	-2,783	-5,287	-18,460	-20,604
Other adjustments	255	758	1,594	-3,155	-3,567	-4,912	-11,359
<b>Operating cash flow</b>	<b>-2,137</b>	<b>-7,997</b>	<b>-15,464</b>	<b>-18,539</b>	<b>-15,289</b>	<b>-17,463</b>	<b>2,338</b>
Investments in PP&E	-1,830	-21,570	-44,989	-5,421	-19,884	-14,774	-25,304
Investments in intangibles	-2,208	-3,483	-4,436	-867	-1,170	-1,477	-2,812
<b>Free cash flow</b>	<b>-6,175</b>	<b>-33,050</b>	<b>-64,889</b>	<b>-24,827</b>	<b>-36,343</b>	<b>-33,715</b>	<b>-25,778</b>
Acquisitions & disposals, net	0	0	0	0	0	0	0
Other investments	250	-11	-65	0	0	0	0
<b>Investment cash flow</b>	<b>-3,789</b>	<b>-25,064</b>	<b>-49,490</b>	<b>-6,288</b>	<b>-21,054</b>	<b>-16,252</b>	<b>-28,115</b>
Debt financing, net	1,240	2,463	-653	26,129	27,000	35,000	31,000
Equity financing, net	6,189	48,304	52,998	0	0	0	0
Dividends paid	0	0	0	0	0	0	0
Other financing	1,390	-2,350	-1,924	2,300	2,200	2,500	0
<b>Financing cash flow</b>	<b>8,819</b>	<b>48,417</b>	<b>50,421</b>	<b>28,429</b>	<b>29,200</b>	<b>37,500</b>	<b>31,000</b>
FOREX & other effects	0	0	0	0	0	0	0
<b>Net cash flows</b>	<b>2,894</b>	<b>15,356</b>	<b>-14,534</b>	<b>3,601</b>	<b>-7,143</b>	<b>3,785</b>	<b>5,222</b>
Cash, start of the year	1,354	4,248	19,604	5,071	8,672	1,529	5,315
<b>Cash, end of the year</b>	<b>4,248</b>	<b>19,604</b>	<b>5,071</b>	<b>8,672</b>	<b>1,529</b>	<b>5,315</b>	<b>10,537</b>
<b>Y-Y Growth</b>							
Operating cash flow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Free cash flow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Financial cash flow	89.8%	449.0%	4.1%	-43.6%	2.7%	28.4%	-17.3%

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Category		1	2
Current market capitalisation (in €)		0 - 2 billion	> 2 billion
Strong Buy <sup>1</sup>	An expected favourable price trend of:	> 50%	> 30%
Buy	An expected favourable price trend of:	> 25%	> 15%
Add	An expected favourable price trend of:	0% to 25%	0% to 15%
Reduce	An expected negative price trend of:	0% to -15%	0% to -10%
Sell	An expected negative price trend of:	< -15%	< -10%

<sup>1</sup> The expected price trend is in combination with sizable confidence in the quality and forecast security of management.

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Report No.:	Date of publication	Previous day closing price	Recommendation	Price target
Initial Report	21 September 2020	€6.50	Buy	€8.90
2...6	↓	↓	↓	↓
7	6 May 2022	€18.50	Buy	€29.00
8	2 June 2022	€18.30	Buy	€30.00
9	2 August 2022	€16.15	Buy	€28.00
10	13 September 2022	€15.25	Buy	€26.00
11	15 December 2022	€14.60	Buy	€20.00
12	14 February 2023	€15.50	Buy	€20.00
13	29 June 2023	€11.90	Buy	€19.00
14	11 September 2023	€12.50	Buy	€17.00
15	Today	€10.75	Buy	€17.00

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