October 5th, 2022
Research update

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Pyrum Innovations AG

Expansion of capacities and planning of further plants progressing

Rating: Speculative Buy (unchanged) | **Price:** 59.00 € | **Price target:** 86.00 € (unchanged)

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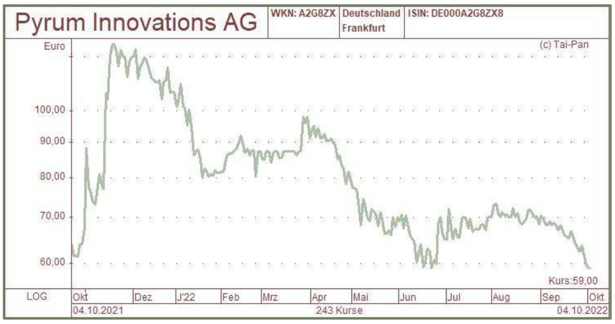
Recent business development



Basic data

Based in:	Dillingen / Saar
Sector:	Recycling
Headcount:	56
Acounting:	HGB
Ticker:	PYR:GR
ISIN:	DE000A2G8ZX8
Price:	59.00 Euro
Market segment:	Scale
Number of shares:	3.25 m
Market Cap:	192.0 m Euro
Enterprise Value:	177.6 m Euro
Free Float:	approx. 38 %
Price high/low (12 M):	125.00 / 58.00 Euro
Ø turnover (12 M FRA):	35,700 Euro

Despite challenges caused by supply bottlenecks and price increases, Pyrum continued the construction of the second and third production lines in Dillingen, which will significantly expand capacities for recycling scrap tyres from 2023, largely according to plan. As expected, the revenues from the operation of the first production line were still low in the first half of 2022 at EUR 446,000 – also because the coke produced was still stored and not sold. The reason for this is that it is to be used to produce industrial carbon black pellets – which are considerably higher-priced – once the pelletising plant is commissioned in the fourth quarter. Total output in the first half of the year nevertheless increased sharply from EUR 0.9 m in the previous year to EUR 9.2 m, reflecting the high level of own work capitalised for the plant expansion. As expected, earnings were still negative at EUR -3.5 m. While the expansion of capacities at the headquarters is underway, Pyrum has already made agreements for the construction of further recycling plants. These include a plant in Straubing as part of a joint venture (with Pyrum's share of 25 percent) as well as a memorandum of understanding with the Hamburg-based company UNITANK on the construction of ten more plants by 2030.

FY ends: 31.12.	2019	2020	2021	2022e	2023e	2024e
Sales (m Euro)	0.2	0.7	0.9	1.2	14.3	38.1
EBIT (m Euro)	-1.7	-3.5	-8.1	-6.9	2.1	25.2
Net profit	-1.8	-3.6	-8.4	-7.1	1.2	19.1
EpS	-0.77	-1.39	-2.57	-2.18	0.38	5.88
Dividend per share	0.00	0.00	0.00	0.00	0.00	0.00
Sales growth		290.5%	39.2%	34.6%	1.049.3%	167.2%
Profit growth		-	-	-	-	1,459.8%
PSR	1,131.22	289.68	208.16	154.69	13.46	5.04
PER	-	-	-	-	156.4	10.0
PCR	-	-	-	-	61.9	9.0
EV / EBIT	-	-	-	-	86.1	7.1
Dividend yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Expansion at the final stage

The construction of the second and third production line in Dillingen is shaping Pyrum's business figures in the current year. Although the company uses various suppliers for the construction of the production lines, it manages the process on its own and therefore essentially reflects the result in own work capitalised, which consequently jumped from EUR 0.5 to 8.5 m in the first half of the year. Although the company is confronted with supply bottlenecks and significant material price increases, the construction progress is largely on schedule. By the end of the year, the installation of the core unit (the thermolysis reactors) and the first steps of the commissioning of the entire plant are to be completed.

Revenues still low

Revenues from the operation of the first production line were still low in the period from January to June at EUR 446,000 (previous year: EUR 392,000), but were nevertheless responsible for the majority of the total revenues of EUR 485,000 (previous year: EUR 398,000). The company has put most of the pyrolysis coke produced into storage for the time being, as final tests are still being carried out on the pelletising plant, which will be used to produce industrial carbon black pellets once completed. Their price is many times higher than that of pyrolysis coke. Storage was largely responsible for the inventory increase of EUR 216,000. Together with the revenues and own work capitalised, this led to a total output of EUR 9.2 m, which corresponds to a tenfold increase compared to the first half of the previous year (EUR 0.93 m).

Currently still in deficit

Since the expansion of the plant is based to a considerable extent on purchased equipment, components and services, the cost of materials also increased sharply in the first half of the year, from EUR 0.4 m in the previous year to EUR 8.4 m. There was also an increase in personnel expenses, which rose from EUR 1.5 m to EUR 2.0 m with the further expansion of the workforce, while other operating expenses fell from EUR 2.2 m to EUR 1.8 m. With slightly higher other operating income (from EUR 0.8 to EUR 0.9 m), resulting primarily from grants for research projects, EBITDA improved year-on-year from EUR -2.3 to -2.1 m. Nevertheless, the EBIT deficit of EUR -3.4 m was slightly higher than in 2021 (EUR -3.0 m), as depreciation and amortisation increased from EUR 0.7 m to EUR 1.3 m due to the completion of plants and the taking over of patents (with the acquisition of Pyrum Innovations International S.A. in Q4 2021). Taking into account the slightly negative financial result (EUR -0.1 m) and with only a minimally negative tax expense, this was almost identical to the net half-year result (EUR -3.5 m after EUR -3.1 m in the previous year).

Business figures	6M 21	6M 22	Change
Revenues	0.40	0.49	*+22.0%*
Total output	0.93	9.20	*+886.7%*
EBITDA	-2.33	-2.09	-
EBIT	-3.04	-3.37	-
Net result	-3.14	-3.49	-

In m Euro and percent; source: Company

Comfortable liquidity

The high expenses for the construction of the second and third production line shape the cash flow as well. While the cash flow from operating activities of EUR -3.2 m (previous year: EUR -2.0 m) shows that revenues do not yet cover structural costs, the capacity expansion was largely responsible for the cash outflow from investing activities in the amount of EUR -11.8 m (previous year: EUR -0.7 m), bringing the free cash flow to EUR -14.9 m (previous year: EUR -2.7 m). Including the almost balanced financing cash flow (EUR -0.1 m), in which interest and redemption payments and subsidies received almost balanced each other out, this resulted in a decline in liquidity from EUR 34.2 to 19.3 m, which nevertheless remains comfortable.

High equity ratio

This also applies to the equity ratio, which, despite the decline in equity (from EUR 39.7 m to EUR 36.2 m) caused by the half-year loss, still amounts to a very solid 75.8 percent, as the company has only made limited use of bank financing. On the assets side, in addition to liquidity, this is mainly offset by property, plant and equipment (EUR 20.0 m), of which more than half is attributable to plants under construction.

Strong growth on the horizon

According to the company, the progress of the construction work, which is largely on schedule, will mean that tyre acceptance volumes can be greatly increased from November onwards. Tests of the new pyrolysis units are scheduled for the end of the year. While the significant expansion of capacities at the headquarters is well on its way, the company is at the same time pushing ahead with preparations for the construction of further plants with partners. A first agreement for a joint venture (Pyrum stake 25 percent) with three other parties was signed in July and foresees the construction of a plant with three production lines in Straubing, which could recycle 20 thousand tonnes of scrap tyres per year. Commissioning is scheduled for 2024. One year later, at the end of 2025, another production facility is to start in Germany with a capacity of the same order of magnitude. This is provided for in the non-binding Memorandum of Understanding (MoU) with the tank terminal operator UNITANK. This would require an investment decision in the course of 2023. After that, things are to proceed in quick succession; by 2030, the MoU envisages the realisation of a total of up to ten plants, each with a capacity of 20 thousand tonnes.

Sales channels are being developed

This means that a strong growth in the number of recycled tyres is foreseeable in the coming years. And the company is already working on creating suitable applications for the products of the recycling process, especially pyrolysis oil and industrial carbon black (rCB). For the pyrolysis oil, a large-volume purchase agreement already exists with the shareholder BASF, which covers the output of numerous plants. The partner can thus reduce the use of fossil raw materials in production, which is also becoming increasingly important for the chemical company's customers (keyword CO2 footprint). Most recently, Pyrum was able to report that BASF is now using the pyrolysis oil (in combination with biomethane) for the production of virgin plastics, which are used for the production of components at Mercedes. Pyrum is also already working on the use of rCB in production with several companies, such as the automotive supplier Continental and the bicycle tyre producer Ralf Bohle GmbH (Schwalbe brand). It is helpful for the development of sales markets that the CO2 savings of the Pyrum process compared to the current scrap tyre recycling mix in Germany have now been independently confirmed by the Fraunhofer Institute and quantified at up to 72 percent CO2.

Doing well overall

All in all, the expansion process of Pyrum is thus progressing very well, which is why we have no major need to adjust our model. In the estimates for the current year, we have only increased own work capitalised and the cost of materials, thus taking into account the

Revenue model (m Euro)	2022	2023	2024	2025	2026	2027	2028	2029
Revenues plant Dillingen	1.2	7.4	8.6	8.6	8.6	8.6	8.6	8.6
Further own plants (total number)			*1*	*2*	*3*	*4*	*5*	*6*
Revenues further plants			4.8	14.3	23.9	33.4	43.0	52.5
SPVs (total number)	*2*	*5*	*7*	*8*	*9*	*10*	*11*	*12*
Revenues sale of plants SPVs		6.9	24.2	17.3	6.9	6.9	6.9	6.9
Other revenues SPVs (maintenance etc.)			0.6	1.5	2.1	2.4	2.7	3.0
Plants without SPV (total number)			*1*	*2*	*3*	*4*	*5*	*6*
Revenues plants without SPV				6.9	6.9	6.9	6.9	6.9
Total revenues	**1.2**	**14.3**	**38.1**	**48.6**	**48.4**	**58.2**	**68.1**	**77.9**

Estimates SMC-Research

increased costs. For 2022, we had already assumed payments for the participation in two joint ventures (a total of EUR 6 m, which can be refinanced by BASF), although it is conceivable that the majority of the capital will not flow out until 2023. In the further detailed forecast period until 2029, we have already assumed in our model the realisation of seven additional own plants and a total of 13 joint ventures with minority interest, as well as seven sales without own participation (see our revenue model on the previous page). With the first SPV plant in Straubing and the MoU for up to ten plants with UNITANK, we see this estimate well substantiated, especially since we assume that after the realisation of the first plants with third parties, the interest of potential partners will again increase significantly.

Relief on the horizon

The currently increased costs for the realisation of new plants represent a certain risk. However, these are largely the result of bottlenecks, which are now slowly easing according to recent surveys of industrial purchasing managers (source: PMI by S&P Global). The recessionary trends in Europe should help to ease the situation. Due to the ongoing downturn, the price of important commodities has also already reduced significantly, such as that of steel, which has more than halved since the peak in March (source: preistrend.net – "Steel price hot strip Euro per tonne Northern Europe"). Therefore, we leave our basic modelling for further plants unchanged for the time being. The table at the bottom of this page shows the development of the key cash flow figures in the detailed forecast period to 2029 following our model update (for a detailed description of the model, please refer to our initial study of 27 June). Further details on the estimated development of the balance sheet, income statement and cash flow can also be found in the Annex.

Framework data unchanged

Subsequently, we continue to calculate the terminal value with a fifteen percent discount to the target margin of 2029 and a “perpetual” cash flow growth of 1 percent p.a. The discount rate (WACC) also remains unchanged at 6.8 percent. For this, we have assumed a cost of equity according to CAPM of 9.0 percent (with: safe interest rate of 1.5 percent, market risk premium of 5.8 percent and beta factor of 1.3), as well as a target capital structure of 40 percent debt, an inter-

m Euro	**12 2022**	**12 2023**	**12 2024**	**12 2025**	**12 2026**	**12 2027**	**12 2028**	**12 2029**
Sales	1.2	14.3	38.1	48.6	48.4	58.2	68.1	77.9
Sales growth		1,049.3%	167.2%	27.4%	-0.4%	20.4%	16.9%	14.5%
EBIT margin	-552.7%	14.5%	66.0%	65.4%	57.3%	57.7%	58.2%	58.7%
EBIT	**-6.9**	**2.1**	**25.2**	**31.8**	**27.7**	**33.6**	**39.6**	**45.7**
Tax rate	0.0%	5.0%	20.0%	33.0%	33.0%	33.0%	33.0%	33.0%
Adjusted tax payments	0.0	0.1	5.0	10.5	9.1	11.1	13.1	15.1
NOPAT	**-6.9**	**2.0**	**20.1**	**21.3**	**18.6**	**22.5**	**26.5**	**30.6**
+ Depreciation & Amortisation	2.6	3.4	5.5	7.6	9.7	11.8	13.9	16.0
+ Increase long-term accruals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
+ Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gross operating cash flows	-4.3	5.4	25.6	28.9	28.3	34.3	40.4	46.6
- Increase Net Working Capital	0.1	-0.8	-2.0	-1.2	-1.2	-0.9	-1.1	-1.3
- Investments in fixed assets	-25.5	-19.5	-27.0	-24.0	-24.0	-24.0	-24.0	-24.0
Free cash flow	**-29.7**	**-14.9**	**-3.4**	**3.7**	**3.1**	**9.4**	**15.3**	**21.3**

Estimates SMC-Research

est rate on borrowed capital of 5.0 percent and a tax rate for the tax shield of 33 percent.

Price target unchanged EUR 86.00

With the model adjustments, the fair value we determined is now EUR 281.8 m or EUR 86.61 per share. On this basis, we leave our price target unchanged at EUR 86.00 (a sensitivity analysis for determining the price target can be found in the Annex). On a scale of 1 (very low) to 6 (very high), we continue to rate the forecast risk of our estimates as clearly above average at five points, since the data on the operation of the industrial plant in its final design is still relatively limited and, in addition, the marketing of the plant to third parties is still in its early stages.

Conclusion

Pyrum's expansion process is clearly picking up speed in the current year. While the company is expanding the recycling plant at its headquarters in Dillingen by two more production lines and thus roughly tripling its processing capacities, it has meanwhile also been able to present its first partners for the construction of further plants. For a new production facility with three lines to be built in Straubing by 2024, Pyrum has entered into a joint venture with three other shareholders. The next plant could start operations as early as the following year − it would be the starting signal for up to ten production facilities to be realised by 2030 together with the tank terminal operator UNITANK.

We assume that interest in Pyrum's innovative recycling solution will increase significantly once the first partner projects have been successfully completed. Accordingly, we see the recent development as a good underpinning for the expansion process we have modelled, which envisages the construction of eight further own plants (in addition to the plant at the headquarters), the conclusion of 13 joint ventures (with minority stakes) and the sale of seven plants without subsequent participation by 2030.

We have thus made only minor changes to our model following the half-year figures, and the price target remains unchanged at EUR 86.00. We thus continue to see considerable upside potential for the share and reiterate our “Speculative Buy” rating. The speculative component results from a high forecasting risk, as the data on the operation of the plant in its final design is still limited and marketing to third parties is just starting.

Annex I: SWOT analysis

Strengths

- Patent-protected, innovative solution for scrap tyre recycling and the production of high-quality raw materials (pyrolysis oil, carbon black).
- The plant has been in regular operation since 2020; capacities are currently being tripled.
- Strong focus on R&D with participation in numerous important research projects (including BlackCycle with Michelin).
- Strong partners: BASF and Continental are shareholders and close cooperation partners. The chemical group also supports the expansion financially.
- The founders run the company.
- With liquidity of around EUR 20 m and an equity ratio of 76 percent (30 June), the company is very solidly financed.

Weaknesses

- Relatively short period of operation of the plant in the final design.
- Revenues have been low so far, so the company is still operating at a loss.
- So far, only one joint venture for plant operation has been established with partners; especially financing issues have led to a delay in the implementation of the first customer projects.
- Small team, dependent on key people.
- Projects with tyre manufacturers to enable the reuse of recovered raw materials in the production of new tyres have not yet been completed.

Opportunities

- The strong expansion of the company's own plant in Dillingen will ensure increasing revenues with high margins. Numerous other plants are planned together with the partner UNITANK.
- The sale of plants to third parties provides revenue leverage. After a first conclusion, further contracts could soon follow.
- Due to the great need for efficient scrap tyre recycling, the demand could increase strongly after first successful projects.
- The market environment in the commodities sector is currently comfortable. Especially the demand for industrial carbon black is high, as so far 50 percent of the volume comes from Russia.
- Policy makers are pushing for the development of a circular economy in the tyre industry. A ban on thermal recycling in other EU countries or on exports of used tyres are further potential drivers of market development.

Threats

- If the current price increases for plant components turn out to be long-lasting, it could reduce investment returns.
- Bank financing of new plants is a challenging task due to the still limited database and is also becoming more expensive due to interest rate developments.
- The ambitious expansion goals could be missed and cause a disappointment of expectations.
- A significant drop in raw material prices, for example in the event of a recession, could reduce revenues (however, a minimum price for pyrolysis oil has been agreed with BASF).
- With the advances in recycling, the raw material "used tyres" could become a scarce resource.
- Alternative recycling technologies could prove more efficient.

Annex II: Balance sheet and P&L estimation

Balance sheet estimation

m Euro	2021 act.	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
ASSETS									
I. Total non-current	16.4	39.4	55.5	77.0	93.4	107.7	119.9	130.0	138.0
1. Intangible assets	7.4	6.7	6.0	5.3	4.6	3.9	3.2	2.5	1.8
2. Tangible assets	9.1	26.7	34.5	50.7	64.8	76.8	86.7	94.5	100.2
II. Total current assets	34.8	14.6	10.3	17.2	26.8	34.7	32.6	31.4	32.7
LIABILITIES									
I. Equity	39.7	32.6	33.8	53.0	73.3	90.8	96.5	101.5	106.7
II. Accruals	3.5	3.7	4.0	4.2	4.4	4.7	4.9	5.2	5.4
III. Liabilities									
1. Long-term liabilities	0.0	9.5	17.2	22.4	24.9	27.5	30.1	32.7	35.2
2. Short-term liabilities	8.1	8.2	10.8	14.7	17.5	19.4	21.0	22.1	23.3
TOTAL	**51.3**	**54.1**	**65.8**	**94.2**	**120.2**	**142.4**	**152.5**	**161.4**	**170.7**

P&L estimation

m Euro	2021 act.	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
Sales	0.9	1.2	14.3	38.1	48.6	48.4	58.2	68.1	77.9
Total output	3.7	15.2	22.7	54.9	65.4	65.2	75.0	84.9	94.7
Gross profit	1.1	2.0	12.9	38.8	47.9	46.3	54.8	63.3	71.8
EBITDA	-6.5	-4.3	5.5	30.3	38.2	35.5	42.9	50.4	57.9
EBIT	-8.1	-6.9	2.1	25.2	31.8	27.7	33.6	39.6	45.7
EBT	-8.3	-7.1	1.3	23.9	30.3	26.2	32.0	37.9	43.8
EAT (before minorities)	-8.4	-7.1	1.2	19.1	20.3	17.5	21.5	25.4	29.4
EAT	-8.4	-7.1	1.2	19.1	20.3	17.5	21.5	25.4	29.4
EPS	-2.57	-2.18	0.38	5.88	6.23	5.39	6.60	7.81	9.02

Annex III: Cash flows estimation and key figures

Cash flows estimation

m Euro	2021 act.	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
CF operating	-3.9	-4.7	3.1	21.4	25.2	24.4	30.5	36.2	41.9
CF from investments	-10.5	-25.5	-19.5	-27.0	-24.0	-24.0	-24.0	-24.0	-24.0
CF financing	38.7	9.7	9.8	7.2	4.5	4.7	-11.0	-15.4	-19.0
Liquidity beginning of year	9.5	34.4	14.0	7.4	9.0	14.6	19.7	15.2	12.0
Liquidity end of year	34.2	14.0	7.4	9.0	14.6	19.7	15.2	12.0	10.9

Key figures

percent	2021 act.	2022e	2023e	2024e	2025e	2026e	2027e	2028e	2029e
Sales growth	39.2%	34.6%	1049.3%	167.2%	27.4%	-0.4%	20.4%	16.9%	14.5%
EBITDA margin	-707.1%	-347.2%	38.3%	79.4%	78.6%	73.5%	73.7%	74.0%	74.3%
EBIT margin	-883.4%	-552.7%	14.5%	66.0%	65.4%	57.3%	57.7%	58.2%	58.7%
EBT margin	-904.6%	-571.8%	9.1%	62.8%	62.3%	54.2%	55.0%	55.7%	56.3%
Net margin (after minorities)	-905.6%	-571.8%	8.6%	50.2%	41.8%	36.3%	36.9%	37.3%	37.7%

Annex IV: Sensitivity analysis

	Perpetual cash flows growth				
WACC	2.0%	1.5%	1.0%	0.5%	0.0%
5.8%	140.08	123.48	110.36	99.74	90.95
6.3%	119.00	106.32	96.05	87.57	80.44
6.8%	102.44	92.51	**86.61**	77.42	71.54
7.3%	89.10	81.17	74.51	68.83	63.94
7.8%	78.16	71.72	66.23	61.49	57.37

Disclaimer

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Charts
The charts were made with Tai-Pan (www.lp-software.de).

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II) Preparation and updating

The present financial analysis was prepared by: Dipl.-Kfm. Holger Steffen

Participants in the preparation of the present financial analysis: -

The present analysis was finished on 04.10.2022 at 6:15 pm and published on 05.10.2022 at 8:15 am.

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Strong Buy	We expect an increase in price for the analysed financial instrument by at least 10 percent. We assess the estimation risk as below average (1 to 2 points).
Buy	We expect an increase in price for the analysed financial instrument by at least 10 percent. We assess the estimation risk as average (3 to 4 points).
Speculative Buy	We expect an increase in price for the analysed financial instrument by at least 10 percent. We assess the estimation risk as above average (5 to 6 points).
Hold	We expect that the price of the analysed financial instrument will remain stable (between -10 and +10 percent). The forecast risk (1 to 6 points) has no further impact on the rating. The rating "hold" is also used in cases where we perceive a price potential of more

	than 10 percent, but explicitly mentioned temporary factors prevent a short-term realisation of the price potential.
Sell	We expect that the price of the analysed financial instrument will drop by at least 10 percent. The forecast risk (1 to 6 points) has no further impact on the rating.

The expected change in price refers to the current share price of the analysed company. This price and any other share prices used in this analysis are XETRA closing prices as of the last trading day before publication. If the share is not traded on XETRA, the closing price of another public stock exchange is used with a separate note to that effect.

The price targets published within the assessment are calculated with common methods of financial mathematics, especially with the DCF (discounted cash flow) method, the sum of the parts valuation and a peer group analysis. The valuation methods are affected by economic framework conditions, especially by the development of the interest rates.

The rating resulting from these methods reflects current expectations and can change anytime subject to company-specific or economic changes.

More detailed explanations of the models used by SMC Research can be found at:
http://www.smc-research.com/impressum/modellerlaeuterungen

An overview of the recommendations prepared and distributed by SMC Research in the last 12 months can be found at: http://www.smc-research.com/publikationsuebersicht

In the past 24 months, sc-consult GmbH has published the following financial analyses for the company:

Date	Rating	Target price	Conflict of interests
03.08.2022	Speculative Buy	86.00 Euro	1), 3)
27.06.2022	Speculative Buy	88.00 Euro	1), 3), 4)

In the course of the next twelve months, sc-consult GmbH will presumably prepare the following financial analyses for the company: one update and three comments.

The publishing dates for the financial analyses are not yet fixed at the present moment.

Exclusion of liability

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