



Financial Review 2021

Including Board of
Directors' Review and
Financial Statements

March 30, 2022



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Terrafame reduces the carbon footprint of transport by delivering responsibly produced battery chemicals to the global battery industry. One of the world's largest production lines for chemicals used in electric car batteries is located on Terrafame's industrial site. The plant is capable of producing nickel sulphate for around 1 million electric cars per year. The carbon footprint of the nickel sulphate produced by Terrafame is among the smallest in the industry. Terrafame's integrated, unique and energy-efficient production process from the mine to battery chemicals is located on a single industrial site. It provides customers with a transparent, traceable and truly European battery chemical supply chain.

Net sales 378.4 MEUR	EBITDA, excl. non-recurring items (1) 24.2 MEUR	EBITDA, % (1) 6.4 %	Operating result excl. non-recurring items (1) -22.4 MEUR
Own personnel at the end of the year 879	All personnel on the industrial site, avg 1,800	Equity ratio, % 38.2 %	LTIFR, own personnel (2) 5.5
LTIFR, all (2) 8.9	Nickel, tn 28,582	Zinc, tn 54,353	

(1) The financial result for the year 2021 includes an impact of EUR -72.9 million from the change in the environmental provision.

(2) Lost-time injury frequency rate per million hours worked (12 months rolling).



- » The ramp-up of production at the new battery chemicals plant was started.
- » The annual production volumes of nickel and zinc remained at the same level as in 2020.
- » Net sales increased by 12% from 2020.
- » Terrafame increased the environmental provision in the Financial Statements for 2021 from EUR 159.1 million to EUR 232 million. The increase had a non-recurring negative impact of EUR -72.9 million on the financial result for the year 2021. The change in the environmental provision did not have an impact on the cash flow.
- » EBITDA excluding non-recurring items was EUR 24.2 (23.8) million. EBITDA after non-recurring items was EUR -48.8 million.
- » The ROTI project, which started in late 2020, was reflected in the company's safety performance and accidents involving Terrafame's employees decreased markedly during 2021.
- » The battery chemicals plant project of the company as well as the launch of the battery chemicals business was delayed from the original schedule due to the coronavirus pandemic.
- » In October, Terrafame signed a Memorandum of Understanding on nickel sulphate deliveries to the Renault Group. This type of direct partnership between a leading car manufacturer and a materials supplier is an operating method that further develops the value chain for battery materials.



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The year 2021 at Terrafame was the year when the battery chemicals plant operations were started. The construction of the plant, which took almost three years, was completed in summer 2021, and the ramp-up of the production began. The market situation was good for the completion of new capacity. The sales of electric vehicles doubled in 2021, compared with 2020, and a total of more than 6.5 (3.2) million electric vehicles were sold worldwide. More than half of these were sold in China, which continues to lead the way in the EV market but also in Europe, the sales of passenger cars and light commercial vehicles increased by almost 70% from 2020, totalling around 2.2 (1.3) million units.

With the start-up of its battery chemicals plant, the company was changed to a producer of special chemicals. Terrafame's strategy was also further specified. Terrafame's strategic goal is to enhance low-carbon mobility with responsible battery chemicals. Sustainability, traceability, a small carbon footprint and reliable deliveries in the supply chain are the core strengths of our strategy.

During the ramp-up phase, net sales from battery chemicals business operations amounted to EUR 27.1 (0) million during the second half of 2021. Net sales from metal intermediates business totalled EUR 351.3 (338.3) million. Total net sales were EUR 378.4 (338.3) million in 2021, with an increase of 11.8% year-on-year. The increase in net sales was limited by the impact of metal price hedging, particularly during the second half of the year.

In late 2021, we decided to increase the environmental provision on the balance sheet from EUR 159.1 million to EUR 232 million. The decision was based on an outlook that the permit authorities will change the grounds for the environmental guarantee included in the environmental permit to reflect the separate permit decision issued earlier in 2021 concerning our primary leaching area, meaning a significant increase in the guarantee level. We are expecting to receive a permit decision during March 2022.

The increase in the environmental provision had a significant impact on the result, and our EBITDA decreased to EUR -48.8 (23.8) million during 2021. EBITDA without the change in the environmental provision was EUR 24.2 (23.8) million, or 6.4% (7.0) of net sales. The ramp-up of the battery chemicals plant had a negative impact of around EUR -20 million on EBITDA.



Terrafame's battery chemicals production is fully integrated to its own mining operations and metal processing, in which the key strategic goal is for the company to be among the world's top quartile of nickel producers in terms of cost-effectiveness. In terms of the company's future, its metal intermediates business must also be efficient and profitable. In January 2022, we initiated a cost savings programme, which aims at EUR 10 million annual savings and improving cost competitiveness and profitability of the company. As an outcome of the negotiations, it has been decided that 65 person-years will be reduced on production-related and financial grounds and due to the reorganisation of operations. Out of these, 42 will be termination of employment contracts.

The continuous improvement programme, which started in late 2020, has begun to be reflected in our safety performance, especially among our own personnel, whose accident frequency rate (LTIFR) was 5.5 (8.3) per million hours worked. Development of our partner companies' safety culture has not been satisfactory, which is why we are continuing to pay special attention to the development of their safety culture."

2021 was a year of significant changes for us. With the start-up of its battery chemicals plant, the company was changed to a producer of special chemicals. The coronavirus pandemic delayed the battery chemicals plant project, but its impacts on our operations were minor, thanks to the commitment of our employees and partner companies. In 2022, our main goal is to complete the ramp-up of the battery chemicals plant and ensure the efficiency and profitability of our metal business. I would like to thank all our stakeholders for their cooperation in 2021 and wish everyone a highly successful 2022!



Joni Lukkaroinen

CEO

Terrafame Ltd



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In 2021, Terrafame took a significant step towards expanding its business amidst the COVID 19 pandemic: the production ramp-up at the new battery chemicals plant started in June, and towards the end of 2021, the company started delivering responsible and transparently produced battery chemicals to the battery production chain, addressing the needs caused by the electrification of transport.

The launch of the battery chemicals plant is significant not just for Terrafame but also for the Finnish battery cluster. Terrafame's nickel and cobalt sulphate plant is one of the most important large-scale investments about to reach production phase in the Finnish battery materials industry. I believe that Terrafame's battery chemicals plant will act as a trailblazer and will accelerate also other ongoing and future investments in the industry in Finland.

Responsible European battery chemical production has aroused a great deal of interest among customers. In the autumn of 2021, Terrafame announced that it had signed a Memorandum of Understanding (MoU) with car manufacturer Renault covering the long-term delivery of materials for the batteries used in Renault's electric cars.

I believe the importance of sustainable electric car manufacturing will grow in the future, as car manufacturers strive to bring their carbon footprint towards zero. Terrafame is at the heart of this development, along with the automotive industry and other players in the field.

In 2021, electric car sales increased at a rapid pace, and the global battery market developed even faster than we anticipated. I believe that the demand for Terrafame's battery chemical products will grow rapidly in the future.

2021 was a mixed year for business development. Terrafame's sales increased, but at the same time, the hedging made against metal price fluctuations limited the increase of net sales. EBITDA excluding non-recurring items remained at the level of 2020. The challenges in launching the battery chemicals plant were resolved during the autumn, and in early 2022, the ramp-up of the plant has proceeded according to the original plan.



Operational efficiency, constant improvement and profitability have been the most important goals for Terrafame ever since the company was founded. Our operations must be efficient and profitable even during business expansion. In 2021, Terrafame sought efficiency through various means, including an organizational restructuring. In addition, the company decided to initiate a cost savings programme at the beginning of 2022, targeting annual savings of EUR 10 million in total.

In 2021, Terrafame continued its determined efforts to advance occupational safety through the ROTI occupational safety and productivity programme. As far as Terrafame's own personnel is concerned, we achieved good results in the development of occupational safety. The number of accidents resulting in absence decreased from the previous year's 8.3 to 5.5 per one million person-hours. However, there is still room for improvement when it comes to our partner companies. In 2022, Terrafame intends to put particular effort into improving the occupational safety of its partner companies.

Terrafame continues to have a very significant positive impact on the economy of the Kainuu region. It has also been a pleasure to see how other industries, such as travel and tourism, are flourishing harmoniously with us.

I would like to warmly thank the employees and partners of Terrafame for your efforts in 2021 – the second year in a row during which the pandemic has forced us to be flexible and to look for new ways to meet our goals. At the start of 2022, Terrafame is progressing rapidly towards new business and will continue to act as an economic engine for the Kainuu region.



Lauri Ratia

Chairman of the Board

[Terrafame Ltd](#)



Board of Directors' review

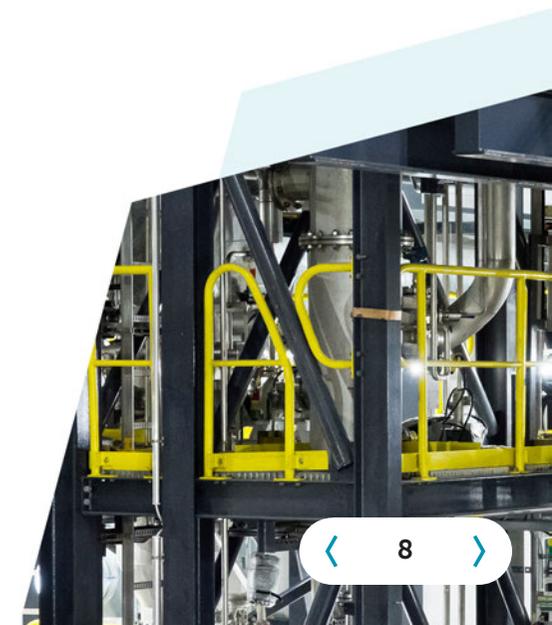
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Electric vehicle and battery markets

The global sales of electric vehicles has continued to be strong. In total more than 6.5 (3.2) million electric vehicles were sold globally in 2021. The amount of sold EVs doubled compared with 2020. The comparison figure for 2020 is affected by the decrease in production volumes caused by the coronavirus pandemic.

The sales of electric vehicles continued strong in China, where the sales of passenger cars and light duty vehicles in 2021 increased by 136% compared with 2020 and reached in total 3.2 EVs. The sales of EVs almost doubled also in the United States and Canada. In Europe, the sales of passenger cars and light duty vehicles totalled around 2.2 (1.3) EVs, which is almost 70% more than in 2020.

Including all electric vehicle categories, the sales-weighted average pack size was 45.3 kWh (46.6 kWh) in 2021. The market share of nickel-rich NCM 811 batteries increased to around 18% in 2021 from around 8% in 2020. The market share of NCM 622 batteries was around 24% in 2021 (around 36% in January–August 2020). The market share of NCM 712 batteries, which were introduced in the summer of 2020, was around 3% in December 2021.



Global EV sales

Includes battery electric vehicles (BEV) and plug-in hybrids (PHEV)

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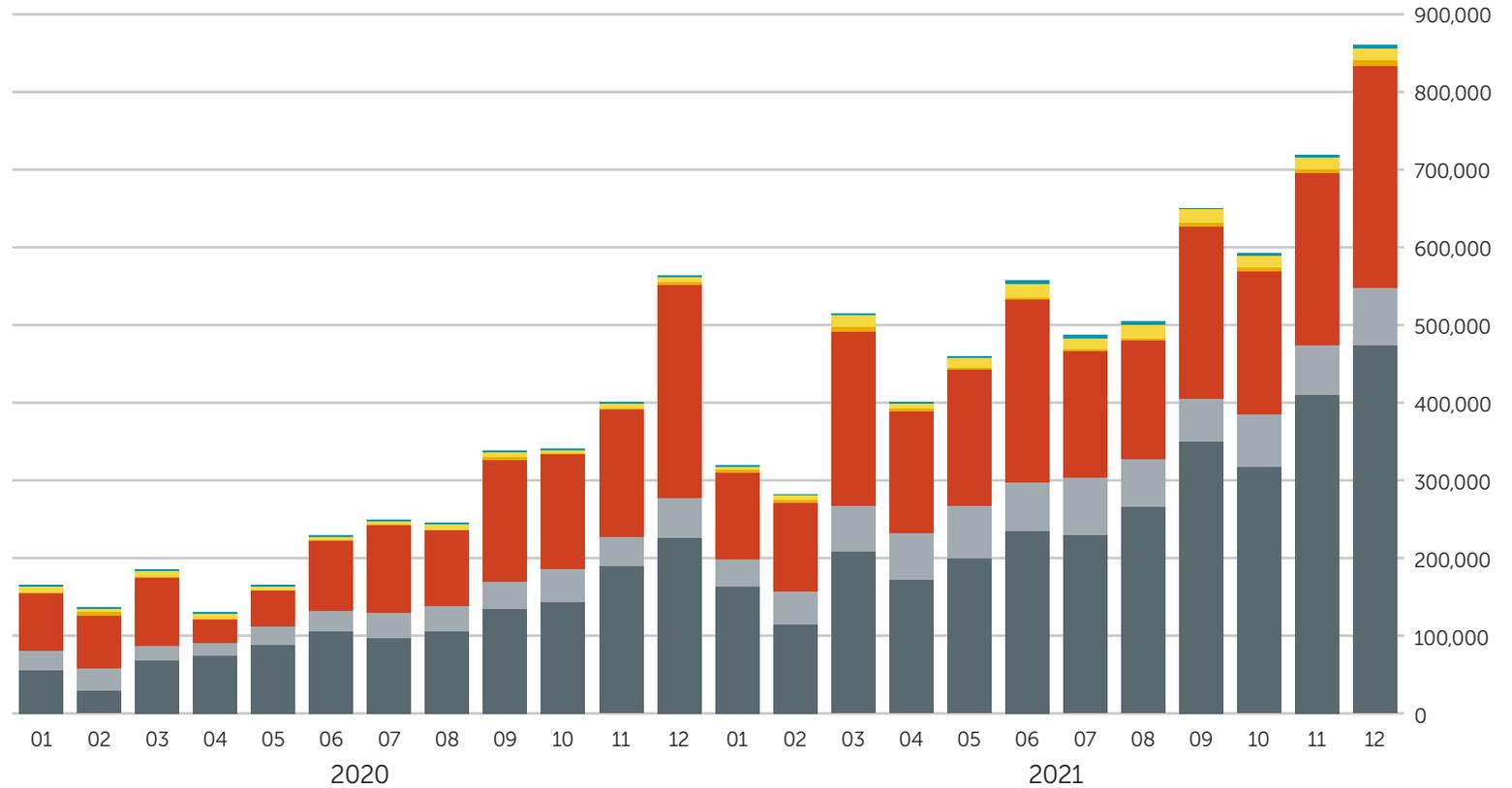
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- China
- US & Canada
- EU & EFTA
- Japan
- Asia Pacific Other
- Rest of the World

Source: Rho Motion

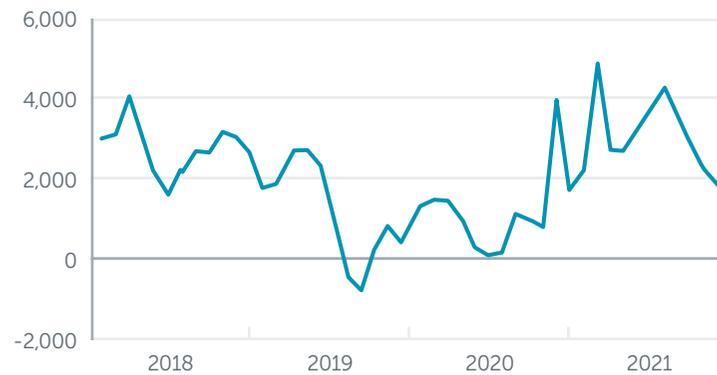


Nickel and zinc

The prices of base metals on the London Metal Exchange (LME) in the review period were markedly higher than in the corresponding period of 2020.

In 2021 the nickel sulphate premium (SPOT China) on LME price was USD 2,979 (1,086) per nickel tonne in average. In the fourth quarter of 2021 the nickel sulphate premium was USD 2,264 (1,908) per nickel tonne in average.

Nickel sulphate price premium 2018-2021 (USD/t)



The average market price of nickel in 2021 was 18,469 (13,789) USD/t, which is 34% higher than in the previous year. The average market price of nickel in the fourth quarter of 2021 was 19,821 (15,930) USD/t, which is 24% higher than in the comparison period and the highest quarterly quotation since the first quarter of 2012. The price of nickel increased by 3.6% from the third quarter of 2021 (19,125).

The average market price of zinc in 2021 was 3,006 (2,267) USD/t, which is 33% higher than in the corresponding period of 2020. The average market price of zinc in the fourth quarter 2021 was 3,364 (2,628) USD/t, which is 28% higher than in the comparison period and the highest quotation since the first quarter of 2018. The price of zinc increased by 13% from the third quarter of 2021 (2,991).



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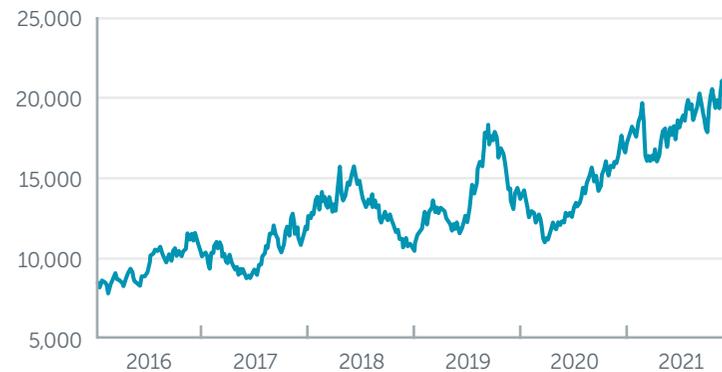
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Nickel price development 2016-2021

Day price for nickel on the London Metal Exchange (USD/t)



The total combined nickel stocks of the London Metal Exchange (LME) and the Shanghai Futures Exchange (SHFE) stood at 106,313 tonnes at the end of 2021. The stocks decreased significantly, compared with the end of 2020 (266,091). The decrease in stock levels was particularly strong during the second half of 2021. The stock level at the end of the year corresponds to demand for around 2 (6) weeks. Zinc stocks stood at 257,919 tonnes at the end of 2021, corresponding to demand for around 1 week (1). Stock levels increased somewhat from the end of 2020 (231,154), but decreased slightly from the end of the third quarter of 2021 (261,177).

Exchange rate

The average EUR/USD exchange rate for the fourth quarter of 2021 was 1.14 (1.19 in the fourth quarter of 2020). The EUR/USD rate strengthened during the fourth quarter compared with the third quarter of 2021 (1.18). The EUR/USD rate was 1.17 in the third quarter of 2020.

Zinc price development 2016-2021

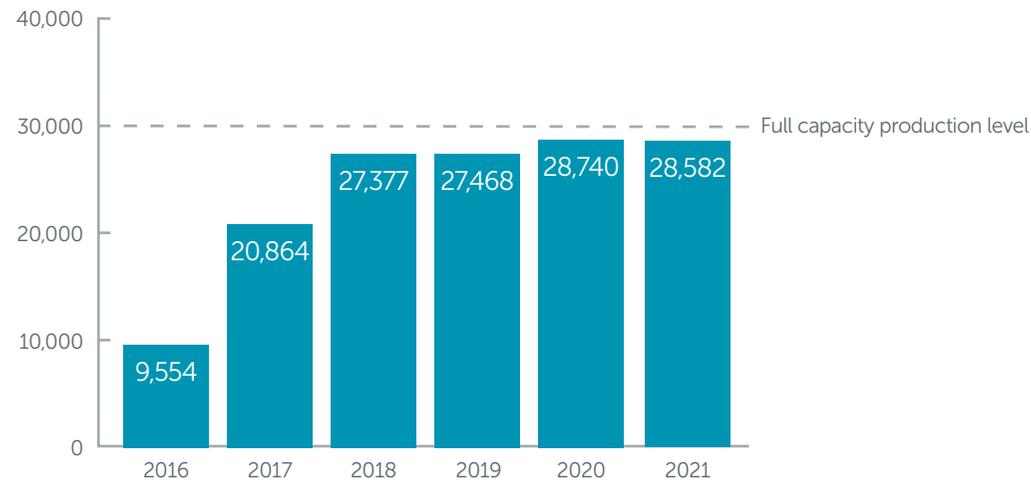
Day price for zinc on the London Metal Exchange (USD/t)



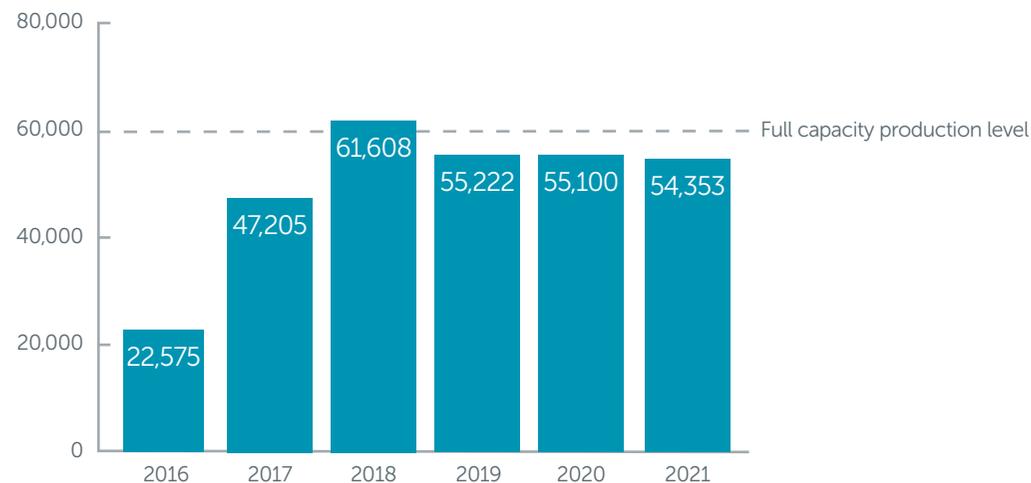
Production

Nickel production was 28,582 (28,740) tonnes, representing a decrease of 0.6% year-on-year. Zinc production was 54,353 (55,100) tonnes, with a decrease of 1.4% year-on-year. Production levels remained at the same level as in 2020. The production ramp-up of the battery chemicals plant began in June.

Nickel production (tonnes)



Zinc production (tonnes)



In 2021, the total mining volume of Terrafame's open pit was 40.2 (35.2) million tonnes.



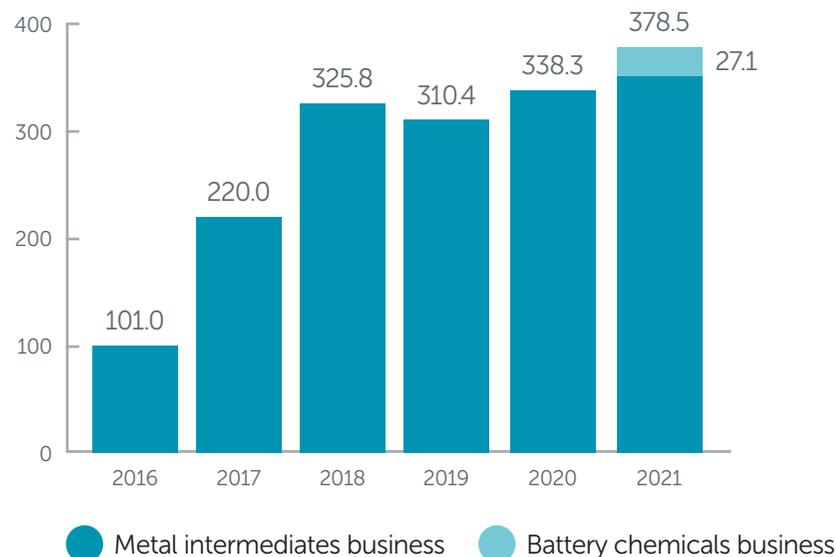
Net sales and financial performance

Net sales were EUR 378.4 (338.3) million in 2021, representing an increase of 11.8% year-on-year. The increase in net sales was limited by the impact of metal price hedging, particularly during the second half of the year.

The production ramp-up of the new battery chemicals plant began in June, followed by the deliveries of the first product batches to customers' product approval processes. The battery chemicals plant project of the company as well as the launch of the battery chemicals business was delayed from the original schedule due to the coronavirus pandemic. In 2021, Terrafame's product deliveries to end customers were made mainly through Trafigura's sales network.

In 2021, net sales of the battery chemicals business were EUR 27.1 million and net sales of the metal intermediates business were EUR 351.3 million. In 2020, total net sales came from the metal intermediates business.

Net sales (EUR million)



Terrafame increased the environmental provision in the Financial Statements for 2021 from EUR 159.1 million to EUR 232 million. The increase had a non-recurring negative impact of EUR -72.9 million on the financial result for the year 2021. The change in the environmental provision did not have an impact on the cash flow.

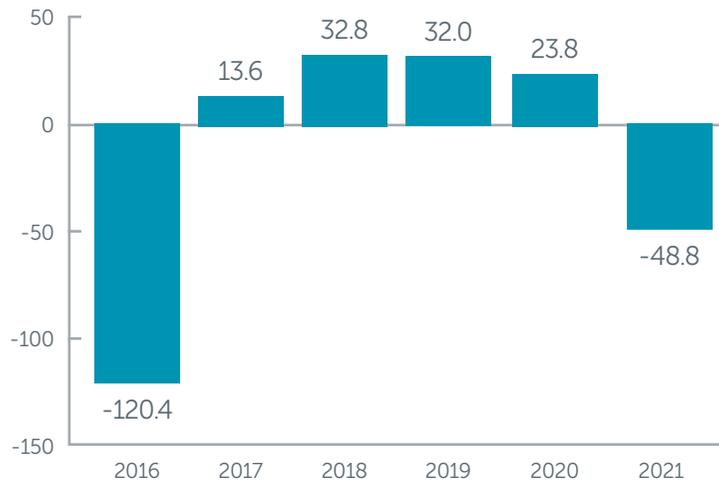


EBITDA excluding non-recurring items was EUR 24.2 (23.8) million in 2021, or 6.4% (7.0) of net sales. The impact of the battery chemicals business on EBITDA excluding non-recurring items was around EUR -20 million. Reported EBITDA for the financial year 2021 was EUR -48.8 (23.8) million.

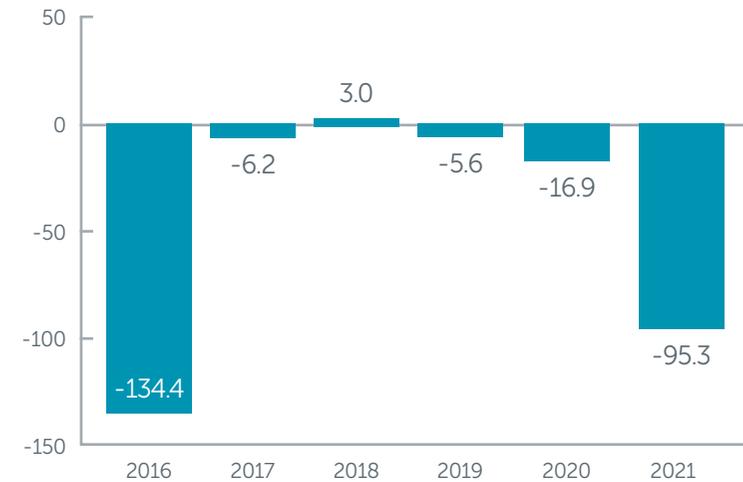
In 2021, the company's depreciation totalled EUR 46.6 (40.7) million.

The operating result excluding non-recurring items was EUR -22.4 (-16.9) million. The reported operating result for the financial year 2021 was EUR -95.3 (-16.9) million.

EBITDA (EUR million)



Operating result (EUR million)



In 2021, free cash flow from operating activities* was EUR -43.2 (13.8) million.

The company's net financial items were EUR -20.5 (8.7) million, and loss for the period was EUR -115.8 (8.2) million.

The coronavirus pandemic did not affect Terrafame's operating activities in the financial year 2021.

* Free cash flow from operating activities after sustaining capital expenditure = EBITDA – change in net working capital – sustaining capital expenditure.



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In 2021, cash flow from operating activities was EUR 35.3 (42.5) million, of which change in networking capital comprised EUR 15.4 (18.6) million. Cash flow from investment activities was EUR -136.9 (-186.9) million. Cash flow from investments increased from year 2020 when significant construction efforts in the battery chemicals plant project decreased the cash flow from investments.

At the end of 2021, the company's cash and cash equivalents totalled EUR 63.5 (58.6) million.

Terrafame's balance sheet total on 31 December 2021 was EUR 1,006.7 (918.5) million. Year-end inventories totalled EUR 233.9 (220.5) million. The company classifies its inventories into three groups: raw materials and consumables, work in progress, and finished products. The value of raw material and spare part inventories at the end of the financial period was EUR 25.6 (24.2) million. The value of work in progress was EUR 204.0 (190.2) million, and the value of the finished goods inventory was EUR 4.3 (6.1) million. The valuation principles for inventory items are presented in more detail in the Accounting principles, in section Intangible assets/ Inventories on [page 58](#).

Trade receivables totalled approximately EUR 24.2 (15.9) million at the end of the financial period. Other receivables totalled approximately EUR 0.2 (2.8) million. Prepaid expenses and accrued income totalled approximately EUR 1.1 (17.1) million.

Shareholders' equity on 31 December 2021 was EUR 384.8 (442.1) million. The total amount of debt was EUR 389.8 (317.4) million. In addition to this the balance sheet includes a rehabilitation provision for mine closure and environmental clean-up costs amounting to EUR 232.0 (159.1) million. More detailed information on the rehabilitation provision is provided in Accounting principles, in section Derivatives and hedge accounting/Rehabilitation provision for mine closure and environmental clean-up costs on [page 61](#).

Terrafame's equity ratio at the end of the financial period was 38.2 (48.1) percent, and net gearing was 42.6 (31.0) percent.



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Equity and liabilities (EUR million)



The formulas for calculating the figures and the key figures are presented on [page 48](#).



Capital expenditure

Terrafame examines capital expenditure in two categories: investments in productivity improvement and capacity growth and investments in sustaining production.

Capital expenditure, EUR million	2021	2020	Change, %
Sustaining capital expenditure	60.3	39.5	52.7
Investments in productivity improvement and capacity growth	57.6	162.3	-64.5
Total capital expenditure	117.9	201.8	-41.6

Capital expenditure totalled EUR 117.9 (201.8) million in 2021. Of this total, EUR 57.6 (162.3) million was used to improve productivity and increase capacity, and EUR 60.3 (39.5) million was used to sustain production.

The investments in capacity growth in 2021 were related to the construction of the battery chemicals plant and the extension of sections 2 and 3 of the primary leaching area by 150 metres. The ramp-up of production at the battery chemicals plant started in June.

The most significant investment projects related to sustaining production were the expansion of the Kuusilampi open pit, construction of a new section of the waste rock area, the purchase of spare parts for mining equipment and the ore crushing lines, and the increase of the pond capacity related to bioleaching and water management.

Currency and commodity hedge transactions

In the 2021 financial period, the company continued to hedge its cash flow against a decrease in the US dollar exchange rate and metal prices in line with its hedging policy.

The company used hedge accounting. Additional information on hedging is given in note 2.8 to the financial statements on [page 71](#).



Financing arrangements

In 2021, Terrafame drew out a total instalment of around EUR 92 million of the equity financing (EUR 115 million in total) negotiated with Finnish Minerals Group and Galena in August 2020. After these withdrawals, Terrafame has used the entire financing package.

The amounts presented in the following table cover all the financial items received by Terrafame from its shareholders during its time of operation, as well as debt financing items converted into equity.

	Equity financing	Converted equity	Debt financing	Total financing
Finnish Minerals Group	537.3			537.3
Galena Asset Management	225.7			225.7
Trafigura		20.2	160.6	180.8
Sampo Group		6.8	38.8	45.6
Total	763.0	27.0	199.4	989.4

Currency-denominated items have been translated into euros using the rate prevailing on the closing date of the review period.

In September 2021, Terrafame signed a USD 90 million unsecured financing arrangement with an international bank. The four-year arrangement involves an instalment-free period of 12 months. Due to the start of battery chemicals production and sales, the company estimates that its working capital requirements will increase by around EUR 100 million. The signed financing arrangement is according to plan and an important step to finance the growth of working capital. By the end of 2021, a total of USD 20 million was drawn out within the arrangement.

The company also refinanced its environmental guarantee with an international insurance syndicate in September. The agreement is for four years, totalling EUR 161 million and it covers the collateral required by the existing environmental permit.



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Terrafame has one series of shares. At the end of 2021, the company had 4,988,040 shares. Its share capital was EUR 2.0 million, and its shareholders' equity was EUR 384.8 (442.1) million.

On 31 December 2021, Suomen Malmijalostus Oy ('Finnish Minerals Group', 'FMG') owned 67.1%, Galena Funds owned 31.1% and Sampo plc owned 1.8% of Terrafame. Share arrangements carried out during 2021 are presented in the following table:

	Galena 2	Galena 3	Sampo	FMG	Trafigura	Total
Holding 31 December 2020	14.1 %	17.2 %	0.0 %	1.9 %	0.0 %	100.0 %
31 December 2020	602,952	733,233	0	79,422	0	4,263,163
Changes in the number of shares during the financial year						
Equity funding	0	0	215,181	0	0	
Share transfer						
Payment of interest and arrangement fees in shares	0	0	0	8,010	0	
31 December 2021	602,952	733,233	215,181	87,432	0	4,988,040
Holding 31 December 2021	12.1 %	14.7 %	4.3 %	1.8 %	0.0 %	100.0 %

Finnish Minerals Group's holding may decrease to no lower than 50.1% in the future, if Trafigura, Galena and Sampo exercise their option rights and the interest on the loans is paid in shares. In such a case, the holding of Galena and Trafigura would be around 45.0%, and that of Sampo would be around 5.0%.



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During the financial period 2021, the company renegotiated the financing for its environmental guarantee with an international insurance syndicate and, consequently, the EUR 32.5 million counter-guarantee granted by the State for arranging collateral in accordance with environmental permits was released.

Legal and other administrative services were bought for a total of EUR 0.5 (0.5) million and administrative services for R&D projects for a total of around EUR 0.3 (0.3) million from Finnish Minerals Group.

The sales of nickel-cobalt sulphide and zinc sulphide to Trafigura Group amounted to EUR 347.9 (331.7) million and nickel sulphate to EUR 27.1 million during the financial period.

The financing arrangements realised with the related-party companies Finnish Minerals Group, Trafigura Group and Galena funds are presented in the 'Financing arrangements' section of the annual review.

All business transactions between Terrafame and its related parties conformed to accepted market practices.

A more detailed description of related party transactions is given in note 5 to the financial statements on [page 88](#).



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As a non-listed company, Terrafame follows the Securities Market Association's current Corporate Governance Code to the extent that it is applicable. The 2021 Corporate Governance Statement is published simultaneously with, but separately from, the Board of Directors' report at www.terrafame.com.

Annual General Meeting

The 2021 Annual General Meeting (AGM) was held on 11 March 2021. The AGM adopted the financial statements for 2020, decided on profit distribution in accordance with the Board of Directors' proposal and discharged the members of the Board and the CEO from liability.

The AGM confirmed the number of Board members as seven (7) and elected Lauri Ratia, Matti Hietanen, Tuomo Mäkelä, Jesus Fernandez, Emmanuel Henry, Riitta Mynttinen and Jyrki Vainionpää as members of the Board. Lauri Ratia was elected as Chair of the Board and Matti Hietanen as its Vice Chair.

KPMG Oy Ab, Authorised Public Accountants, was elected as the auditor, with Antti Kääriäinen as the principal auditor.

Leadership Team

At the end of 2021, Terrafame's Leadership Team consisted of the following members:

Joni Lukkaroinen	CEO
Janne Palosaari	Chief Commercial Officer
Seppo Voutilainen	Chief Production Officer
Ville Sirviö	Chief Financial Officer
Antti Arpalhti	Chief Technology Officer
Veli-Matti Hilla	Chief Sustainability Officer
Heini Hämäläinen	Chief People Officer



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This statement has been prepared in accordance with chapter 3a of the Finnish Accounting Act (1336/1997), which is based on Directive 2014/95/EU of the European Parliament and of the Council. The disclosure of non-financial information is optional for Terrafame.

In addition to the topics required by the Accounting Act, the statement on non-financial information includes a description of safety management at Terrafame and the company's tax footprint in accordance with the guidance issued by the Government Ownership Steering Department on 1 October 2014.

At the time of preparing this report, Terrafame's operations were not covered by the completed assessment criteria of the EU taxonomy for sustainable activities (Deleted Act supplementing Article 8 of the Taxonomy Regulation). However, the nickel sulphate chemical produced by Terrafame plays a significant role in batteries manufactured for transport use, which are covered by the taxonomy. More information about Terrafame's role in the battery value chain is provided in section Business model starting on [pages 25-32](#).

Responsibility management

Sustainability is an integral part of Terrafame's business operations. Terrafame's Board of Directors is responsible for the organisation of corporate responsibility management and the integration of corporate responsibility into Terrafame's business operations. The Board approves Terrafame's Code of Conduct and policies, as well as its sustainability strategy and programme, which also cover climate issues. The Board also approves this statement of non-financial information as part of the Board of Directors' report.

The CEO of Terrafame Ltd is responsible for implementing the policies and guidelines approved by the Board of Directors. The other members of the Leadership Team are responsible for monitoring the application and interpretation of these policies and guidelines in their respective areas of responsibility. Terrafame's sustainability policy determines operating principles for the company's sustainability work in terms of the environment and good governance. Social responsibility aspects are included in the company's personnel policy. The Chief Sustainability Officer, who is a member of the Leadership Team, is responsible for the monitoring and interpretation of sustainability policy application. The Chief People Officer, who is a member of the Leadership Team, is responsible for the monitoring and interpretation of personnel policy application.



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Terrafame's operations are guided by the company's strategy and Code of Conduct and an operating culture based on its values: safety, commitment and efficiency.

The company's operations are primarily guided by the following international initiatives and principles:

- UN Guiding Principles on Business and Human Rights
- ILO Declaration on Fundamental Principles and Rights at Work
- OECD Guidelines for Multinational Enterprises
- OECD Due Diligence Guidance for Responsible Business Conduct
- UN Global Compact initiative
- UN Sustainable Development Goals.

Terrafame's employees, as well as the employees of its partners and suppliers, must comply with Terrafame's Code of Conduct, sustainability policy and human rights policy. The implementation of the Code of Conduct, sustainability policy and human rights policy is supported by Terrafame's certified management systems (ISO 9001, ISO 45001 and ISO 14001) and more detailed operating guidelines. Terrafame's industrial site has a whistle-blowing channel for reporting violations of the Code of Conduct. Reports can also be submitted anonymously through the channel.

Terrafame engages in active dialogue with various stakeholders in the spirit of mutual appreciation. Its operations are transparent and comply with ethical principles in a sustainable manner.



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Sustainability programme

Terrafame's strategic goal is to enhance low-carbon mobility with responsible battery chemicals.

Terrafame's sustainability work is guided by its sustainability programme, which began in 2020 and sets ambitious numerical and qualitative targets for operational development for 2020–2024. The themes and targets of the sustainability programme are linked to the UN Sustainable Development Goals as far as applicable. The implementation of the sustainability programme is monitored annually in the Sustainability Review which is available on the company's website at www.terrafame.com > [Responsibility](#). The Sustainability Review also presents key figures related to the company's sustainability themes, including climate-related emission indicators (Scope 1, Scope 2, Scope 3). The next Sustainability Review will be published in the summer of 2022.

Terrafame is committed to compliance with the operating principles of the Finnish Network for Sustainable Mining. Terrafame has carried out self-assessments in accordance with the Finnish Towards Sustainable Mining (TSM) Standard since 2017. In late 2021, the company conducted a third-party verification of its TSM self-assessment. The verified results were in line with the company's self-assessment. The system applies a five-step scale (C-B-A-AA-AAA, where C = complies with the regulations, and AAA = shows excellence). On that scale, the most important aspects of the company's environmental safety (dam safety and water management) are at a good level (A).



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Risk management

Terrafame complies with the risk management principles adopted by its Board of Directors. The company identifies risks, assesses their impact on its operations and plans any necessary risk management measures. The key safety, process, environmental and operational business risks are updated annually, and the results and measures are discussed by the company's Leadership Team and Board of Directors. The company's assessment of its environmental, safety and process risks is updated comprehensively every three years by examining thousands of individual risks. Significant risks identified during risk assessment are reduced by technical improvement, investment and competence development, for example. Since 2021, the risk management process has also included climate aspects.

Climate-related risks and opportunities

Terrafame's business operations play an active role in managing climate emissions from transport. The carbon footprint of the nickel sulphate produced by the company is considerably smaller than the industry average. The manufacturers of precursor materials for battery cells can significantly reduce their carbon footprint by choosing Terrafame's product. In its business operations, the company has identified opportunities related to climate change in terms of demand for its current and potential new products and the recycling of batteries, for example.

The identified risks related to climate change management mainly concern the procurement and prices of raw materials, as well as logistics, among other factors. The alterations to legislation caused by climate change are seen as both opportunities and risks.

Business model

The strategic goal of Terrafame's business operations is for the company to be one of the world's most cost-effective and responsible producers of battery chemicals.



BUSINESS ENVIRONMENT

The cost of carbon dioxide emissions steers towards the use of carbon-neutral energy.

Europe's strong car industry lays groundwork for own regional battery value chain.

The share of nickel in batteries grow.

Concerns about climate change are directing consumers to favor electric cars.



IMPACTS

Economic value added

- Wages and salaries (incl. pensions expenses) 54.0 MEUR
- Taxes and tax-like charges, receivable 15.0 MEUR
- Purchases 426.3 MEUR
- Net financial items -11.7 MEUR

Committed personnel

- More than 40% of personnel have started in the year of Terrafame's founding in 2015 or earlier
- Training 6.1 days per person

Safe work environment

- The LTIFR of the entire industrial site decreased to 8.9 in 2021 (2020: 9.8)
- During the year, a project was continued to further develop occupational safety.

Fulfillment of customer promises

- Terrafame's nickel sulphate carbon footprint over 60 % smaller than average
- Strong sales support and logistics services
- Quality is ensured by precise process control (Statistical Process Control)

TRACEABLE PRODUCTION CHAIN, SMALL CARBON FOOTPRINT

Financial capital

- Equity 384.8 MEUR
- Equity ratio 38.2 %
- Capital expenditure 31.2% of net sales



Net sales

- 378.4 MEUR

Production

- 28,582 t nickel, 7,311 t nickel sulphate and 54,353 t zinc

RESOURCES

The largest nickel ore reserves in Europe

- 1,499 million tonnes, containing 3,9 Mt nickel and 0.3 Mt cobalt (JORC)
- Allows production to continue for decades

Skilled personnel

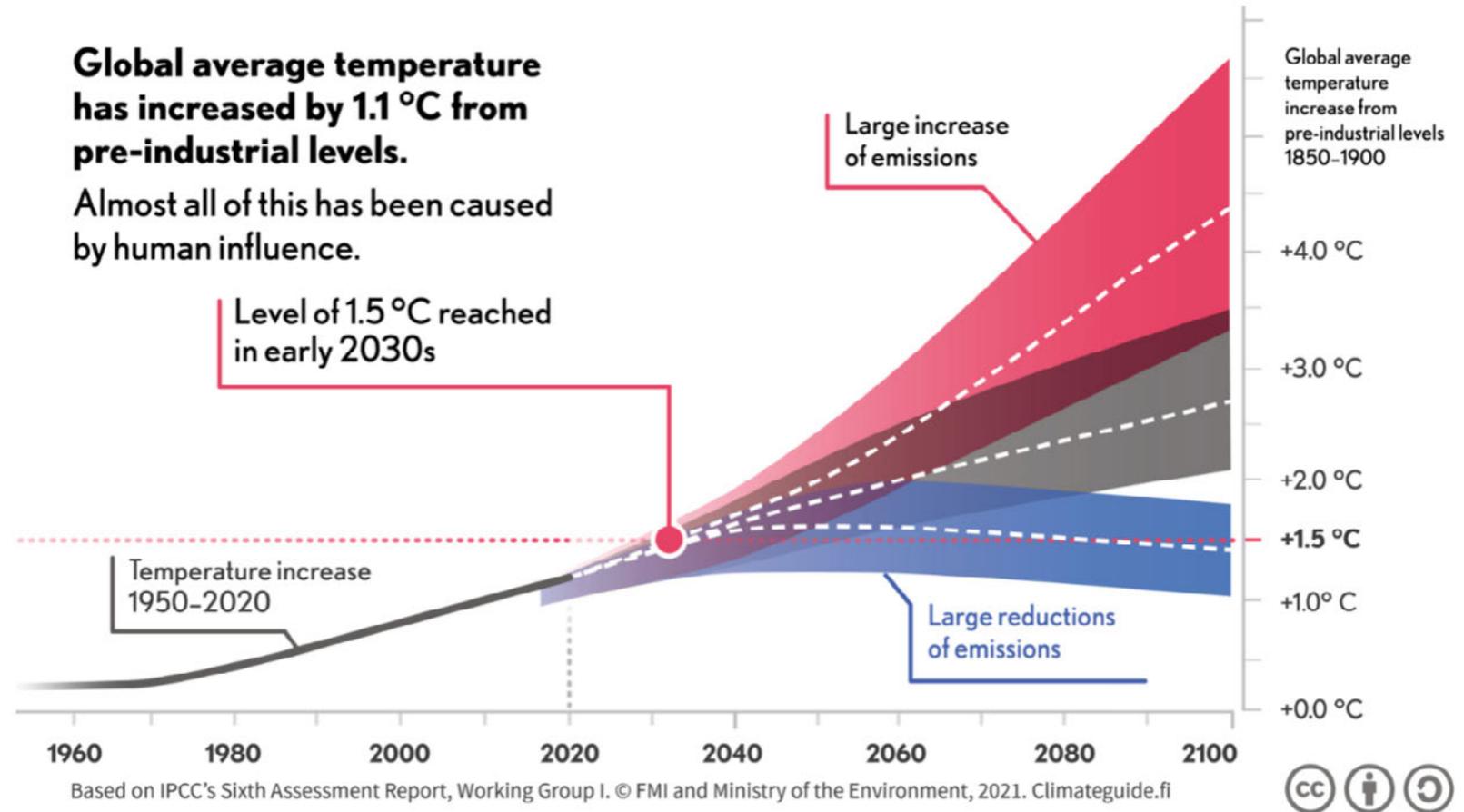
- Own personnel 879 in total
- Wide orientation and training programmes
- Certified quality and management systems

Wide partner network

- An average of 150 long-term partner companies in the industrial site
- A total of 883 employees of contractors and subcontractors
- Cooperation with academies and research institutes

Business environment

In the first part of its sixth assessment report published in August 2021, the Intergovernmental Panel on Climate Change (IPCC) states that greenhouse gas emissions from human activities have already changed the climate significantly.



Source: FMI and Ministry of the Environment, 2021. Climateguide.fi

All of the scenarios used in the report suggest that global warming is likely to exceed 1.5 °C in the early 2030s, at the latest. However, through effective, rapid and extensive measures, it is possible to limit global warming to 1.6 °C and reverse it below 1.5 °C by the end of the century. This scenario is shown in blue in the figure. In other words, the extent of future changes depends on the future development of greenhouse gas emissions, especially carbon dioxide emissions.

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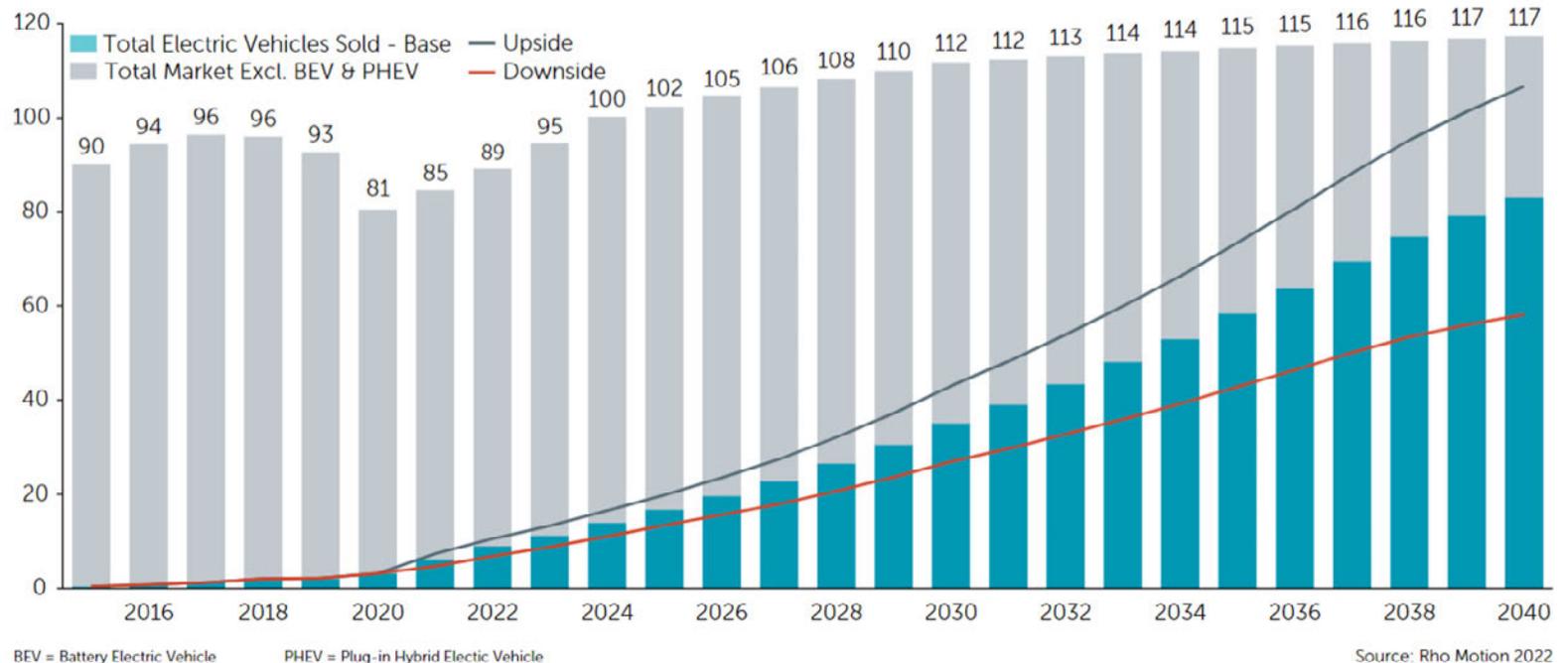
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International climate policy is guided by the UN climate agreement, the Kyoto Protocol and the Paris Agreement, as well as multilateral negotiations related to these. The most recent meeting of the Conference of the Parties (COP), the highest decision-making body within the climate agreement, was held in Glasgow in November 2021. The conference issued a new statement on zero-emission vehicles. Its signatories are committed to promoting the goal of all new passenger cars and vans sold being emission-free by 2035 or earlier. The signatories include several car manufacturers.

The transition to electric transport is seen as a significant means of combating climate change. Various incentives and increasing regulations are guiding the change towards electric transport, and technological development and changes in consumer behaviour are also being reflected in the growth of electric motoring. Around 6.5 million electric vehicles were sold globally in 2021, and the number is expected to increase to around 35 million by 2030.

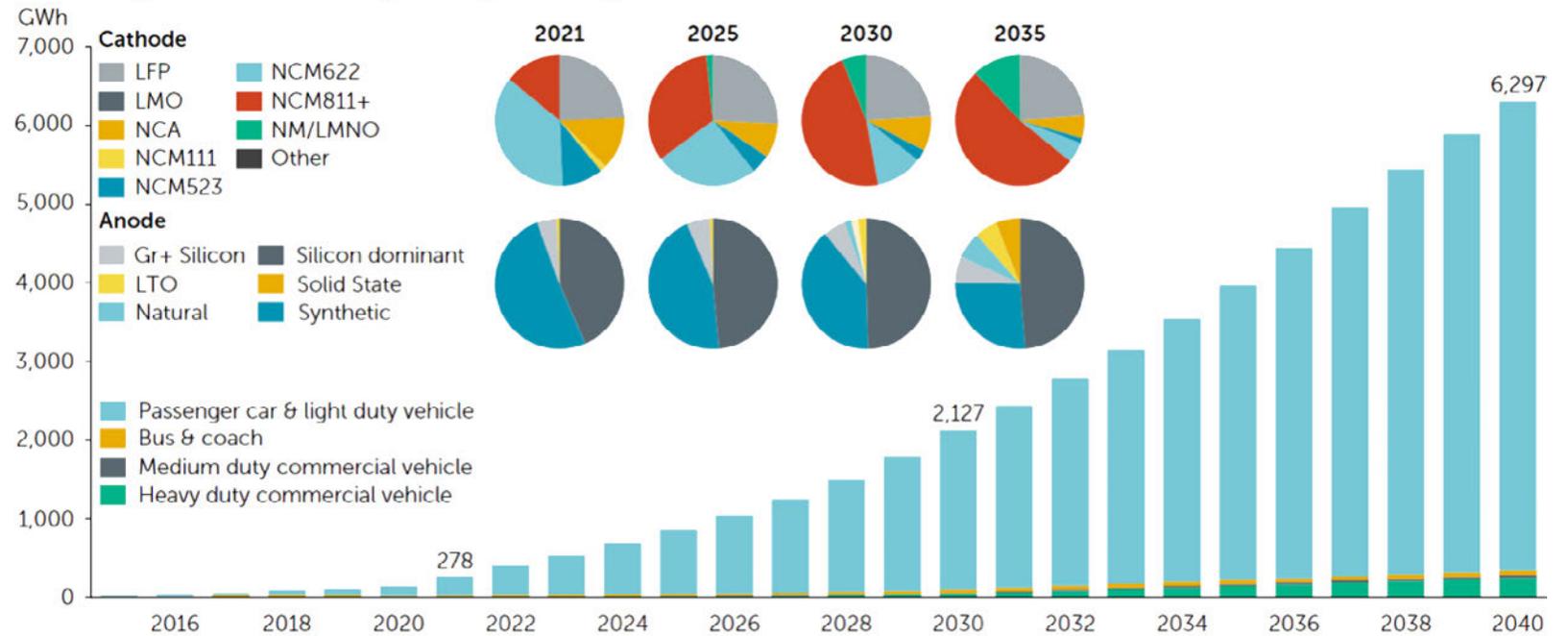
Global EV sales forecast, 2015-2040

Million units



Electric vehicles are also expected to have longer ranges, which increases the demand for batteries with a high nickel content. According to the latest estimate by Rho Motion, the demand for batteries for electric vehicles will grow by 48% in 2022 and almost triple in 2023, compared with 2021.

EV battery demand outlook by battery chemistry & vehicle class



Source: Rho Motion 2022



Terrafame is combatting climate change in cooperation with its customers

Combatting climate change is a business opportunity for Terrafame. The ramp-up of the new battery chemicals plant began in the summer of 2021. The full annual nickel sulphate capacity of the battery chemicals plant will be sufficient for around 1 million batteries for electric vehicles, and its full cobalt sulphate capacity will be sufficient for around 300,000 batteries, provided that the battery size remains at its current level (50 kWh), and that the latest battery technology (NCM 811) is used. Most modern electric vehicles are powered by various types of lithium-ion batteries. The batteries consist of battery cells. The cells consist of cathodes and anodes, which store and release energy. Cathode active materials (CAM) play a significant role in the design of the battery cells, and the properties of the cathode active material determine the battery recharge speed and time. The nickel sulphate chemical produced by Terrafame is further processed, through a precursor (pCAM), into a cathode active material.

Climate sustainability is the foundation of the entire electric vehicle industry. Analyses published in 2020 by Skarn Associates and CRU show that the nickel produced by Terrafame using a bioleaching process has the world's smallest carbon footprint among nickel producers. This makes the intermediate produced by Terrafame in its metal plant an ideal raw material for battery chemicals. An externally verified life cycle analysis by Sphera Solutions GmbH in 2020 shows that the carbon footprint of the nickel sulphate produced by Terrafame is more than 60% smaller than that of nickel sulphate production on average.

Precursor manufacturers can reduce their carbon footprint by up to 80% by choosing Terrafame's nickel nickel sulphate instead of other nickel raw materials, such as nickel cathode, nickel briquettes or nickel metal powder. Fewer chemicals and less energy are needed to produce Terrafame's nickel sulphate product, which reduces its climate impact.

Value creation

Terrafame's value creation model is based on the efficient use of resources and an integrated and energy-efficient production chain with a low carbon footprint, as well as on active positioning in the battery value chain to support customers' value creation.



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Resources

Terrafame has Europe's largest nickel ore reserves, which will enable production to continue for decades to come. There are two verified ore deposits within Terrafame's mining concession: Kuusilampi, where the company's current open-pit mine is located, and Kolmisoppi, whose utilisation is expected to begin in the late 2020s. Together, these ore deposits will enable production operations to continue for up to 50–60 years from now.

Around 800 Terrafame employees work on the company's industrial site. In addition to its own skilled personnel, the company has an extensive network of partner companies, particularly in production work, in accordance with its operating model. Through this network, around 700 people work regularly on Terrafame's industrial site. More information about our personnel and partner network is provided on [pages 35-38](#) of the Board of Directors' report.

In its production process, Terrafame seeks to use process-based side streams as effectively as possible, which reduces waste and the need for piling. Bioleaching is used in the management of metal-containing side streams and to prevent the generation of new industrial waste fractions. The reuse of process-based side streams will increase with the introduction of the battery chemicals plant. Process planning and development are guided by efforts to use waste energy streams. The industrial site has a power plant that mainly uses forest industry side streams and recycled wood as fuel.

Production and supply chain

Integrated production, from the mine to battery chemicals, at a single industrial site is a unique traceable whole that enables consistently high product quality and reliable deliveries. Responsible ways of working are ensured by requiring Terrafame's and its partner companies' employees and suppliers to comply with Terrafame's Code of Conduct and sustainability policy. The company is working continuously and systematically to further improve its operational excellence.

The start-up of commercial battery chemicals production has significant impacts on Terrafame's business model. Previously, most of Terrafame's production was delivered to end customers through the sales network of Trafigura, one of the company's two principal owners. In the new situation, Terrafame sells the battery chemicals that it produces directly to customers, with Trafigura serving as its sales agent.



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The main market areas for Terrafame's battery chemicals business are in Asia and Europe. Up until now, the production of battery cells and cathode active materials has been centralised in Asia, but a regional battery value chain is also being built in Europe. Terrafame has actively positioned itself as part of this value chain from the very beginning. In October 2021, the company announced that it had signed a Memorandum of Understanding on nickel sulphate deliveries to the Renault Group. This direct partnership between a leading car manufacturer and a materials supplier is an example of an operating method that revolutionises the value chain for battery materials. Commitment across the value chain facilitates the risk management and pricing practices of all parties.

The purity and quality of the chemicals used in battery production, as well as reliable deliveries, are critical factors for customers that set new types of requirements for the logistics chain. The ramp-up of the new battery chemicals plant began in June, followed by the deliveries of the first product batches to customers' product approval processes. Together with its partners, Terrafame has developed a comprehensive logistics solution that covers the entire supply chain from the production plant to the customer. Battery chemicals are packed in sealed sea containers and loaded into freight wagons on Terrafame's industrial site. The electrified railway network facilitates the climate sustainability of transport. Battery chemicals are delivered to a destination designated by the customer without any factory or other intermediate storage, and the containers are not opened during transport. Digital solutions and the comprehensive logistics solution, from the plant to the customer, enable high product quality and the full traceability required from the supply chain.

Economic added value

Terrafame's operations generate both direct and indirect economic benefits for various stakeholders, particularly in the company's local areas, but also more widely in the rest of Finland. Salaries and fees paid increase consumer demand, in addition to having positive multiplier effects on consumer products and services. The multiplier effects of Terrafame's operations also increase demand in other industrial sectors. In addition, tax-based revenues improve municipal economies and support the provision of municipal services. The most significant items of economic added value are presented in the graph on the [page 26](#). Terrafame's tax footprint is discussed in more detail on [pages 42-43](#) of the Board of Directors' report.

Environment and environmental permits

Terrafame seeks to continuously improve its environmental performance and reduce its environmental impact.



Environmental monitoring

Terrafame monitors the state of the environment on the industrial site in accordance with the permit decisions and the monitoring programme approved by the authorities. Our annual environmental monitoring reports are available in Finnish on the company's website at www.terrafame.fi > [Ympäristötarkkailuraportit](#). The reports for 2021 are expected to become available in March 2022.

Sulphate loading of natural waterways is one of the most significant environmental impacts of Terrafame's production. The metal and sulphate concentrations of discharge waters, as well as sulphate loading, were in line with the environmental permit conditions in 2021. In September, there was one deviation related to the release of discharge waters which was reported to the local authorities and resolved immediately.

The company has developed its operations in such a way that sulphate is recycled more effectively back into the process. The goal is to recycle 100% of the sulphate that ends up in water treatment from the production process back into the solution circulation. The two-line run model that was introduced at the centralised water treatment plant in 2020 enables the more efficient separation of collected waters. Only low-sulphate collection waters, to the extent that they are not used as raw water, are treated and directed out of the area.

Key indicators related to discharge waters	Actual 2021	Actual 2020
Purified discharge waters, Mm ³	8.86	7.94
Sulphate in discharge waters, tonnes (permitted quota 16,300 t)	14,492	13,067
Sulphate from process back into the solvent circulation, % (target 100%)	100	70

Terrafame will report its key indicators related to environmental emissions in the summer of 2022 on its website at www.terrafame.com > [Reporting](#).

The most significant environmental risks in Terrafame's operations are related to solvent circulation in bioleaching and water management.

In 2021, the two-line run model in water treatment enabled the more efficient separation of collected waters, which reduced sulphate in discharge waters.



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Maintenance work on the discharge pipe for purified discharge waters restored the pipe's pumping capacity to its original level. To enhance water management efficiency, Terrafame is seeking to further increase the discharge pipe's pumping capacity during 2022. The increased capacity will increase the volume of purified water discharged from the industrial site, but the limit values for the harmful substance content of discharge waters will remain unchanged.

The bioleaching pond capacity was also increased during 2021 to further improve solvent circulation management.

Dam safety management was further enhanced during 2021 by developing reporting practices and reinforcing resources.

Permits

On 20 January 2021, the Regional State Administrative Agency for Northern Finland granted an environmental permit to Terrafame for its battery chemicals plant.

On 22 June 2021, the Supreme Administrative Court issued its decision on the environmental permit for Terrafame's KL2 waste rock area. With its decision, the Supreme Administrative Court rejected the appeals filed against the decision issued by the Vaasa Administrative Court on 16 December 2019, meaning that the decision of the Vaasa Administrative Court remains valid. The environmental permit for the KL2 waste rock area is valid until the case concerning Terrafame's main permit has been resolved by means of a final or executable decision.

On 24 June 2021, the Supreme Administrative Court issued its decision on the uranium recovery permit granted by the government to Terrafame on 6 February 2020. The Supreme Administrative Court confirmed the permit granted by the government. The company filed a permit application for uranium recovery under the Nuclear Energy Act (990/1987) to the Finnish Government on 30 October 2017.

On 2 July 2021, the Regional State Administrative Agency for Northern Finland granted an environmental permit to Terrafame for the extension of the primary leaching area. The production use of the primary leaching area was expanded by 150 metres in sections 2 and 3 during the summer of 2021.

Terrafame has a permit process in progress with regard to the renewal of its master permit with the Regional State Administrative Agency for Northern Finland. The application was submitted in August 2017.

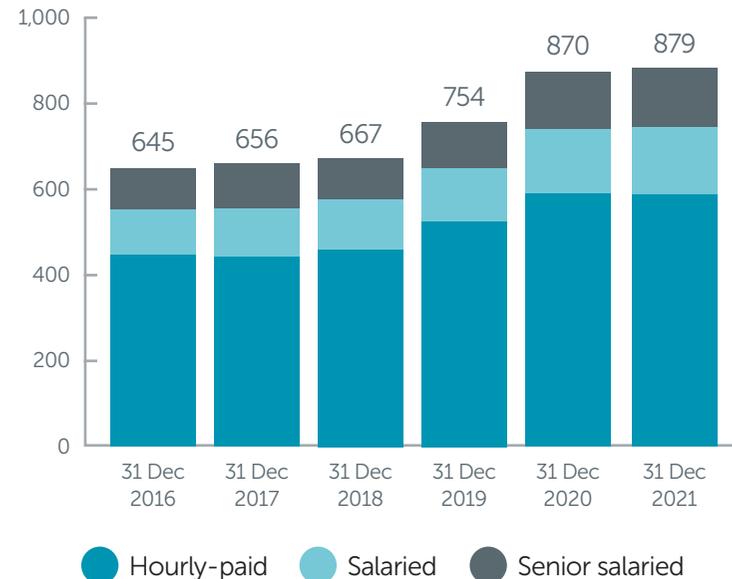


Social and HR affairs

Nearly 1,800 people were regularly employed on Terrafame's industrial site during 2021. Terrafame had 879 (870) employees at the end of the review period, of whom 56 (97) were fixed-term employees. At the end of the year, the battery chemicals plant and its support functions (such as laboratory and logistics) employed altogether 157 persons. Through the two-year apprenticeship training programme leading to a vocational qualification in the process industry and organised by Terrafame in cooperation with Kainuu Vocational College and Educational Consortium OSAO, Terrafame employed 23 persons at the end of the year. In the summer, the company provided around 80 people with a summer job.

An average of 883 (1,166) people employed by contractors and subcontractors worked on the industrial site during the review period (FTE). The reduction in the number of external personnel was mainly due to a decrease in the number of people working for the battery chemicals plant construction project. In 2021, the battery chemicals plant construction project involved up to 368 (534) employees (FTE). More information about our cooperation with partner companies is provided on [page 37-38](#) of the Board of Directors' report

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Competence development

Highly competent employees are a key resource for Terrafame.

In 2021, the focuses of employees' competence development included the operation and maintenance of the battery chemicals plant and the development of the company's safety and management culture, as well as production reliability skills. The annual personal performance and development appraisals were conducted during the first half of the year.

The company's personnel strategy focuses on capacity building, competence development and skilful supervisory work, as well as on building effective internal cooperation across the company.

In 2021, the company continued to invest in personnel development. The new battery chemicals plant provided employees with opportunities for job rotation and career development. In addition to recruitment, employees were hired through apprenticeship training programmes. The employees of the battery chemicals plant were provided with intensive training to support the safe and efficient start-up of the plant.

Terrafame encourages its employees to develop their knowledge and skills through training. During the year, 174 employees studied alongside work to complete vocational qualifications in the process industry, the automotive industry, maintenance and the electrical and automation sector, as well as special vocational qualifications in production supervision. Other training activities also continued at a solid level, although less face-to-face training was provided than before because of the coronavirus situation. In addition to vocational training, extensive training was provided in occupational safety, chemicals and first aid, for example. Supervisory work was also further developed through training and coaching. The total amount of training provided was 6.1 (3.1) days per person. The total amount of supervisory training was 1 (1.5) days per person.

Cooperation with educational institutions

Terrafame has had three apprenticeship training groups aiming for a vocational qualification in the process industry. Two of these groups completed their studies as planned during 2021. The total number of graduates was 44, most of whom continue to work for the company under employment relationships that are valid until further notice. A total of 23 students are participating in the apprenticeship training programme in the group that started in the spring of 2020. Apprenticeship training enables Terrafame not only to train new skilled personnel, but also to further develop the professional skills of its existing employees.



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Cooperation with educational institutions was continued to ensure the availability of highly competent people. Close cooperation was continued especially with Kainuu Vocational College and Kajaani University of Applied Sciences. The most significant results of the cooperation include the regional reinforcement of training in electrical and automation engineering and the process industry, for example. The concrete forms of cooperation include practical training, summer jobs, theses and teacher visits.

Operating culture development

In 2021, the most significant investment in the development of the company's operating culture was the ROTI project, which focuses on developing the safety and management culture and production reliability. The project strengthens a culture of continuous improvement through learning, inclusion and a systematic approach. All employees – supervisors and production staff in particular – participated in the project in practice through safety discussions and safety and shift meetings, for example.

Safety and the well-being of our employees are important continuous themes in our operations. In 2021, because of the coronavirus pandemic, we continued to focus on health security in particular. In developing well-being at work, our focuses included supporting the working capacity of our highly experienced employees, developing supervisory work and maintaining recreational activities. The company offers extensive occupational healthcare services. Various exposures and working capacity risks are monitored systematically and continuously. Early support and alternative work models were actively applied in 2021. Workplace and ergonomics studies were targeted at the various task areas throughout the year. Employees' sickness absences accounted for an average of 4.3 (4.8) % of the theoretical regular working hours. To maintain mental and physical well-being, the company provides its employees with sporting and cultural benefits, as well as subsidised meals at work.

Partners

An average of around 150 long-term partner companies operated on Terrafame's industrial site during 2021. In addition to outsourced production work, production also involves significant purchases of materials, such as process chemicals and fuels. Terrafame's purchases of services and materials totalled around EUR 426 (467) million in 2021. Most of this consisted of purchases of materials and services related to the production process as well as purchases related to the construction of the battery chemicals plant. Services and materials were purchased from more than 1,000 suppliers, most of which are located in Finland and elsewhere in the European Union.



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Terrafame requires all its providers of services and suppliers of materials to operate on the basis of respect for human rights principles and values. Its partners also comply with its Code of Conduct, which determines the general responsibilities and obligations to be followed on the industrial site. These are further specified by the company's policies and guidelines. Partners are expected to share the company's values, and to be committed to high-quality operations, safety and continuous improvement of efficiency. In addition, all partners, service providers and subcontractors must comply with Terrafame's sustainability policy. The Code of Conduct and the sustainability policy are available on the company's website at www.terrafame.com > [Responsibility](#).

Terrafame assesses the operations of its partner companies through regular audits and evaluations conducted during the contract period, after the completion of work and when selecting new partners through competitive bidding. A total of 8 (3) supplier audits were carried out in 2021. In addition, a total of 16 supplier audits were conducted during the year using the tool introduced in June 2020. During 2021, four separate partner meetings were held to discuss the company's operating principles, the principles of the UN Global Compact initiative and the zero tolerance rules adopted by the company as part of its enhanced safety work in 2020. Representatives from more than 100 partner companies were present at the partner meetings. This also includes the contractors related to the construction project of the battery chemicals plant.

The company has a system in place to maintain a real-time register of the companies operating within the industrial site, as well as their subcontractors. The system monitors the companies in terms of the requirements of the Act on the Contractor's Obligations and Liability When Work Is Contracted Out. The companies are also monitored in terms of training requirements for employees. Significant omissions and violations are subject to sanctions, while good performance that promotes safety is rewarded. Partnerships are developed systematically over the long term, and partners who stand out with their responsible operations are invited to participate in tendering repeatedly.

In terms of partners, the most significant risks are related to any measures or omissions arising in the selection of partners and in the supply chain that violate Terrafame's policies and may result in financial losses, in addition to the risk of sanctions and reputation risk. The company's management and purchasing organisation play the most important role in terms of risk management. As far as possible, Terrafame seeks to identify any ethical risks related to business partners before establishing a partnership with them.



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Human rights

In its human resources management, Terrafame complies with national rules and regulations, as well as international conventions on human rights and labour markets. The company respects freedom of association and abides by legally binding collective agreements. Employee participation and consultation have been organised in accordance with national rules and regulations. The company has adopted an equality plan, which is updated periodically. Terrafame promotes equal opportunities, equal employment and career development in the spirit of the Act on Equality between Women and Men and in compliance with Terrafame's Equality Plan. Terrafame has updated its processes, policies and guidelines on the processing of personal data to comply with the EU General Data Protection Regulation (GDPR).

Partners and all parties acting on their behalf are required to comply with current legislation on occupational health and safety. Suppliers and their subcontractors must agree to comply with all applicable national and international regulations concerning ethical and responsible business operations, such as the prevention of bribery, corruption and illegal work.

Whistle-blowing channel

Everyone working on Terrafame's industrial site is responsible for the compliance of their own operations. Employees are encouraged to primarily contact their supervisor with any questions about compliance with or the interpretation of Terrafame's Code of Conduct or possible breaches of the Code of Conduct. The employees of partner companies can turn to their employer's contact person for Terrafame.

Terrafame introduced a whistle-blowing channel in early 2021. The channel is available for Terrafame's own employees and the employees of partner companies on the industrial site. Reports can also be submitted anonymously. The cases reported through the whistle-blowing channel are transferred to the service provider's experts specialising in preventing and investigating misconduct. Terrafame has no access to the information provided through the separate online platform maintained by an external service provider.

Terrafame is responsible for ensuring that there will be no harmful consequences for employees reporting violations of the law or the company's Code of Conduct or other guidelines.



Three reports were submitted through the channel in 2021. One of the reports was related to personnel matters, and two were related to compliance with the company's guidelines. All cases have been investigated and processed appropriately. The reports had no financial or legal consequences. The company was not made aware of any cases related to human rights, financial misconduct, corruption or bribery during the year.

Occupational and process safety

Safety is one of the core values at Terrafame, and the continuous development of a safety culture has been one of the main priorities since the company was established. The company's management is committed to safety work, and safety is strongly promoted by the company's Leadership Team and Board of Directors. Terrafame has a safety bonus system, which applies to all employees and is used to reward good safety performance.

Safety at work

Operations within the industrial site must be safe for both the company's own employees and those of its partners in all circumstances and situations. We aim for zero accidents.

In Terrafame's operations, the most significant occupational safety risks are related to maintenance and construction work, large machinery and the use of chemicals. However, most injuries are sustained during normal installation work, or as a result of slipping and falling in yard areas, for example.

Occupational safety indicators, 12-month LTIFR1	2021	2020	Change, %
Accident frequency rate, Terrafame employees	5.5	8.3	-33.7
Accident frequency rate, partner companies	11.8	10.6	11.3
Total accident frequency rate on the industrial site	8.9	9.8	-9.2



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The ROTI project, which started in late 2020, has begun to be reflected in the company's safety performance. Accidents involving Terrafame's employees decreased markedly during 2021. Our partner companies' performance has not been satisfactory, which is why we have paid special attention to the development of their safety culture. In late 2021, the safety bonus for Terrafame's employees was restructured so that it also takes account of accidents involving partner companies' employees. This change encourages all our employees to address any unsafe ways of working in their area, including cases that concern an employee of a partner company. The revised safety bonus was introduced at the beginning of 2022. We closely monitor our partners' occupational safety performance, and we have also established separate incentive and sanction systems for them.

All employees are subject to regular occupational hygiene measurements in accordance with the department-specific plans, and inspection and counselling visits are made to various work areas. According to the biomonitoring results for 2021, the total concentration of nickel in the urine of Terrafame employees largely corresponds to the average concentrations in Finland. In terms of water-soluble nickel, there were some slight deviations during the ramp-up phase of the battery chemicals plant.

Terrafame also requires its partner companies operating within the industrial site to organise regular biomonitoring in the same manner as Terrafame conducts the biomonitoring of its own employees.

Process safety

In terms of process safety, the most significant risks are related to the use and manufacture of chemicals. With regard to process safety, it is important that processes are run smoothly without any unexpected ramp-ups or shutdowns.

Systematic risk assessment work and development work in process safety continued during 2021. The fire and rescue plans were updated to include the operations of the new battery chemicals plant. In the spring of 2021, a major emergency drill was organised with various authorities under the supervision of the Regional State Administrative Agency. The network of chemical use supervisors and various process safety practices were developed on the industrial site.



Information security

Terrafame takes the various aspects of information security into account when developing its systems. The need for data processing is assessed on a case-by-case basis in the preparation of both technical and administrative measures, and solutions are selected and operations developed to ensure that the high information security requirements are met. Information security risks are identified, assessed and responded. Various technical methods for security risk management are applied, including firewalls, email scanning, antivirus protection and multi-factor authentication. Operating processes are developed, and employees are kept informed and urged to be careful and maintain a healthy distrust with regard to opening links and attachments.

This development is managed by an information security team of experts from different departments. Information security work is divided into themes in accordance with the annual calendar, and these themes are responded regularly.

Tax contribution

Terrafame's commitment to accountability also extends to tax matters. Terrafame has an important social duty and a regional role to play, especially in the Kainuu region. The company only operates in Finland and does not, therefore, pay taxes in other countries.

Tax reporting is based on the guidance on tax reporting issued on 1 October 2014 by the Government Ownership Steering Department of the Prime Minister's Office. The report excludes mandatory insurance premiums that are included in salary costs. These insurance premiums, which are directly related to salaries, are dealt with as direct salary costs, due to the nature of these kinds of insurance. The company does not report small amounts of value-added tax included in foreign travel and training costs.

Terrafame started the ramp-up of production in 2015, and the companies do not yet have any taxable income. However, a considerable amount of tax expenses have accumulated due to the energy and fuel taxes related to the companies' operations. In addition, the company has paid taxes related to the acquisition and ownership of assets, as normal.



Tax categories of Terrafame Ltd in 2021 and 2020 (EUR 1,000)

Taxes paid	2021	2020
Direct taxes paid	1,505	1,285
Income taxes, operating at a loss	0	0
Asset transfer taxes	22	48
Property tax	650	544
Employer's health insurance contributions	659	490
Parafiscal charges	174	203
Indirect taxes paid	3,287	5,998
Electricity taxes, net	-1,975	943
Electricity taxes	311	3,039
Electricity taxes, return	-2,286	-2,096
Insurance premium tax	536	412
Fuel taxes, net	4,723	4,642
Fuel taxes	5,478	5,393
Fuel taxes, return	-755	-750
Waste tax	3	1
Taxes collected and accounted for	20,002	-10,555
Tax withheld in advance	9,737	8,562
Value-added tax, net	10,265	-19,116
Value-added tax, sales	99,712	78,267
Value-added tax, purchases	-89,447	-97,384
Total	24,794	-3,272
Ratio of tax payments to net sales	6,55%	-0,97%

On 31 December 2021, the company had unrecognised deferred tax assets of approximately EUR 36.4 million. This consist of the confirmed but unrecognised loss of about EUR 30.2 million for the previous fiscal years which will cover for the estimated tax of about EUR 6.2 based on the taxable result for the fiscal year 2021.



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Terrafame's strategic goal is to enhance low-carbon mobility with responsible battery chemicals. The company's battery chemicals production is based on its own mining operations and metal processing, in which the key strategic goal is for the company to be among the world's top quartile of nickel producers in terms of cost-effectiveness.

Sustainability, traceability, a small carbon footprint and reliable deliveries in the supply chain are the core strengths of our strategy. Traceability is made possible by a unique combination of a mine and a battery chemicals plant. Located on the same industrial site, the integrated whole provides customers with a traceable production chain. This ensures sustainability, which is appreciated by global electric vehicle customers.

The bioleaching method is of primary importance in terms of strategy implementation. It enables us to reduce our customers' carbon footprints and improve our cost-effectiveness.

Our reliable deliveries are based on Europe's largest nickel reserves. The large reserves and one of the world's largest battery chemicals plants ensure reliable deliveries to global customers.

The competitive factors described above have made Terrafame a leader. Strengthening this leadership is an integral part of our strategy. That is why highly competent employees and partners are strategic competitive factors that drive the company forward. Our values – safety, commitment and efficiency – are therefore necessary for the realisation of the purpose of our operations.



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Terrafame carries out process research and development mainly in connection with its normal business operations, and the development measures qualify as ordinary business expenses. During 2021 the focus areas for process development have been ensuring the bioleaching process, supporting the ramp-up of the battery chemicals plant and enhancing metals recovery.

Research is also carried out in separate research projects, which are typically longer-term strategic projects. During 2021 the main research projects were: 1) developing the yield from bioleaching, 2) research on closure structures and 3) development of the battery chemicals technology.

Research on enhancing the bioleaching process by means of microbiological and mineralogical techniques continued in 2021 with the aim of maximising the yield. With regard to this, an ore fine-crushing study was started to explore the possibility of enhancing the efficiency of bioleaching by producing microcracks in ore. The pilot project on further developing the secondary leaching phase continued from the previous year. In addition, bioleaching heaps were studied to develop agglomeration, aeration and irrigation processes. The impact of ammonium nitrogen and any organic extractive agent residues on bioleaching was studied with regard to the start-up of the battery chemicals plant. The goal was to gain an understanding of the stimulating effect of added nitrogen on bacterial activity, as well as to identify critical limit levels.

Surface structure trials that were initially started in 2017, were continued in secondary leaching and the waste rock area to study various ways of covering these areas in the future. In 2021 research efforts were transferred from pilot scale test fields to production scale test fields. In addition to this, chemical modelling of the long-term impact of closing measures were continued.

Terrafame is closely involved in developing European and Finnish battery strategies. As part of the European IPCEI project, with regard to the ramp-up of the battery chemicals plant process and quality assurance, the development of process sample and end product analytics continued in cooperation with the in-house laboratory and external laboratories. As a result, process sampling, analysis methods and the quality of the final products were verified. Terrafame is also involved in national research projects, such as the BATCircle 2.0 project coordinated by Aalto University. The project examines the possibility of using by-products and recycled materials in battery chemicals production in the future.



Significant events after the end of the financial period

Terrafame announced on 4 March 2020 that it increases the environmental provision in the Financial Statements for 2021 from EUR 159.1 million to EUR 232 million. The impact of the increased provision on the operating result for 2021 is EUR -72,9 million. The increase in the provision is based on an outlook that the collateral for environmental restoration will increase in the new environmental permit. Terrafame estimates that it will receive a new environmental permit concerning all its operations in March 2022.

The change negotiations for the beginning of 2022 managed to find an annual saving of EUR 10 million to ensure economically sustainable business. The implementation of the savings programme is proceeding systematically.

Estimate of major risks and uncertainties

The company's operations are affected by various general risks related to industrial operations, including the impact of environmental permits and other official permits, as well as taxes and fees, on the company's costs. The schedules and conditions related to various permits also bring uncertainty to operations. The most significant business risks include changes in exchange rates, nickel prices and zinc prices, as well as the counterparty risk related to customers and other business partners and the risks related to the prices of significant raw materials and electricity. The key risks related to Terrafame's production operations are associated with occupational safety and the environmental safety of processes.

Significant risks identified during risk assessments are reduced by technical improvement, investment and competence development, for example.

Terrafame has a designated Covid-19 team that regularly discusses matters related to the pandemic to ensure the continuity of operations under exceptional circumstances. The situation is being monitored closely, and the related measures will be updated quickly when necessary.



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Terrafame has several significant customer negotiations and product approval processes in progress related to battery chemicals.

The ramp-up of production in the battery chemicals plant continues systematically.

The geopolitical situation in Europe is expected to have an increasing impact on Terrafame's production costs.

The price development of base metals and battery chemicals involves significant uncertainty even though the price development in the beginning of the year has been positive.

Terrafame continues to increase efficiency of its operations and improve profitability.

Board of Directors' proposal for the disposal of the result

Terrafame Ltd's result for the financial period for 2020 shows a loss of EUR 115 834 493.00. On 31 December 2021, Terrafame's distributable equity totalled EUR 382 831 802.03.

The Board proposes that the loss be transferred to the retained earnings/loss account and that no dividend be paid.



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Scope of operations	2021	2020	2019	2018	2017
Net sales, MEUR	378.4	338.3	310.4	325.8	220.0
Balance sheet total, MEUR	1,006.7	918.5	749.5	681.6	618.5
Total capital expenditure, MEUR	117.9	201.8	130.6	81.5	92.7
as % of net sales	31.2	59.7	42.1	25.0	42.1
Average number of personnel	910	833	722	669	694
Profitability					
EBITDA, MEUR	-48.8	23.8	32.0	32.8	13.6
EBITDA-%	n.a.	7.0	10.3	10.1	6.2
EBIT	-95.3	-16.9	-5.6	3.0	-6.2
EBIT-%	n.a.	n.a.	n.a.	0.9	n.a.
Net profit	-115.8	-8.2	-15.2	-6.2	-9.6
Profitability excl. non-recurring items					
EBITDA, MEUR	24.2	23.8	32	32.8	13.6
EBITDA-%	6.4	7	10.3	10.1	6.2
Operating result, MEUR	-22.4	-16.9	-5.6	3	-6.2
Operating result %	n.a.	n.a.	n.a.	0.9	n.a.
Solvency					
Equity ratio, %	38.2	48.1	46.7	53.6	47.8
Net gearing, %	42.6	31.0	31.7	-0.9	-5.8

Equity ratio:

$(\text{Equity} + \text{minority interest}) \times 100 /$
 Balance sheet total – short-term and
 long-term advance payments received

Net gearing:

$(\text{Interest bearing debt} - \text{cash funds})$
 $\times 100 / \text{Equity} + \text{general provisions}$

Terrafame has adopted the IFRS 16 Leases standard as permitted by section 5:5b of the Finnish Accounting Act and by the IAS Regulation (EU) in its financial accounting effective 1 January 2019, using the simplified approach. The cumulative impact of the implementation of the standard has been recognized on the balance sheet and the comparative figures have not been restated. The comparative figures for 2017-2018 regarding lease liabilities are presented according to the Finnish Accounting Act.



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Assets (EUR 1,000)

Non-current assets	Note	31 Dec 2021	31 Dec 2020
Intangible assets	2.1	440	761
Tangible assets	2.2	671,947	600,340
Non-current assets total		672,387	601,101
Current assets			
Inventories	2.3	233,854	220,486
Long-term receivables			
Deferred tax assets	2.4	11,486	2,532
Short-term receivables			
Amounts owed by group companies	2.5	60	104
Trade receivables		24,150	15,761
Other receivables		174	2,792
Prepayments and accrued income	2.6	1,088	17,088
Cash and cash equivalents		63,466	58,646
Current assets total		334,279	317,409
Assets total		1,006,666	918,510



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Equity and liabilities (EUR 1,000)

	Note	31 Dec 2021	31 Dec 2020
Equity	2.7		
Subscribed capital		2,000	2,000
Other reserves			
Invested unrestricted equity		800,469	706,032
Fair value reserve	2.8	-45,945	-10,129
Retained earnings (loss)		-255,857	-247,640
Loss of the financial year		-115,834	-8,217
Equity		384,832	442,046
Provisions	2.9	232,024	159,077
Long-term liabilities			
Loans from credit institutions	2.10	115,917	192,238
Deferred tax liabilities	2.11	0	0
Long-term liabilities		115,917	192,238
Short-term liabilities			
Amounts owed to group companies	2.12	395	286
Loans from credit institutions	2.13	111,492	3,588
Trade payables		72,233	81,002
Other liabilities		10,802	1,132
Accruals and deferred income	2.14	78,973	39,141
Short-term liabilities		273,893	125,149
Liabilities total		389,811	317,387
Equity and liabilities total		1,006,666	918,510

Income statement (EUR 1,000 €)

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	Note	2021	2020
Net sales	3.1	378,448	338,258
Cost of goods sold	3.2	-368,971	-325,350
Gross profit		9,477	12,908
Sales and marketing expenses	3.3	-3,030	-2,750
Administrative expenses	3.4	-20,098	-19,646
Other operating revenues		1,937	983
Other operating expenses	3.5	-83,632	-8,418
Operating profit/loss		-95,345	-16,922
Financial income and expenses	3.6		
Interest income and other financial income		1,396	16,945
Interest and other finance expenses		-21,885	-8,239
Financial income and expenses		-20,490	8,706
Profit/Loss before tax		-115,834	-8,217
Profit/Loss for the financial year		-115,834	-8,217



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Cash flow from operating activities	2021	2020
Result for the financial period	-115,834	-8,217
Adjustments		
Depreciation and amortisation	46,585	40,731
Unrealised foreign exchange gains and losses	14,297	-11 259
Other income and expenses, non-cash items	72,947	1,679
Financial income and expenses	6,192	2,553
Other adjustments	-76	-26
Cash flow before change in net working capital	24,111	25,461
Change in net working capital		
Change in trade and other receivables; increase (-) /decrease (+)	-2,215	-274
Change in inventories; increase (-) / decrease (+)	-13,368	-2,329
Change in trade payables and other liabilities; increase (-) / decrease (+)	31,011	21,233
	39,539	44,092
Cash flow before financial items and income tax	-4,317	-4,903
Interest paid and other financial expenses		
Interest received, operational	66	3,302
Cash flow from operating activities (A)	35,288	42,491
Cash flow from investing activities		
Investments in tangible and intangible assets	-136,981	-186,956
Proceeds from sale of tangible and intangible assets	79	33
Cash flow from investing activities (B)	-136,902	-186,924

Cash flow statement (EUR 1,000)

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Cash flow from financing activities	2021	2020
Paid increase in equity	92,000	82,999
Proceeds from long-term borrowings	17,298	66,471
Repayment of long-term borrowings and transfer of instalment lots into short-term borrowing	-111,124	0
Proceeds from short-term borrowings and transfer of instalment lots into short-term borrowings	111,124	0
Repayment of short-term borrowings	-74	-2,516
Repayment of short-term lease liabilities	-4,119	-3,388
Cash flow from financing activities (C)	105,106	143,566
Impact of exchange rate changes on the amount of foreign currency cash	1,329	-2,384
Change in cash and cash equivalents; increase (+) / decrease (-)	3,491	-867
Cash and cash equivalents at the beginning of the period	58,646	61,896
Cash and cash equivalents at the end of the period	63,466	58,646



1. Accounting principles

Terrafame Ltd is domiciled in Sotkamo, Finland. Terrafame is a group company of Finnish Minerals Group, whose parent company is Suomen Malmijalostus Oy, Helsinki, Finland. Terrafame Ltd's financial statements are available on the company's website at www.terrafame.com. Copies of the Finnish Minerals Group's consolidated financial statements are available at the Group's office, and they can be viewed on the Group's website at www.mineralsgroup.com.

Basis of preparation

The company has prepared its annual accounts in accordance with Finnish accounting legislation and Finnish Accounting Standards (FAS). The financial statement information is reported in tables and related texts in thousands of euros and in the report of the Board of Directors in millions of euros to one decimal place. The comparative figures reported in brackets are figures for the financial period 2020. All the presented figures have been rounded according to general rounding rules, so the sum of the individual figures may be different from the sum presented. Key figures have been calculated using exact values. Comparative information has been adjusted where necessary to correspond with the information of the year under review.

Translation of items denominated in foreign currencies

Transactions in foreign currencies are entered in euros at the rates prevailing at the transaction date or average rates provided by central banks. Foreign currency-denominated receivables and liabilities have been translated into euros using the rates prevailing at the balance sheet date. Foreign exchange gains and losses related to business operations are included in the corresponding items of net sales, operating expenses or financial income and expenses.

Revenue recognition

Terrafame Ltd sells battery chemicals, fertilizers and metal intermediates. Battery chemicals include nickel sulphate and cobalt sulphate, fertilizers include ammonium sulphate both in liquid form and as crystals. Metal intermediates include nickel-cobalt sulphide, zinc sulphide and copper sulphide.

Revenue is recognised from a sale when evidence of an arrangement exists, the title has been transferred to the customer, the price is determinable, and collection of the sales price is reasonably assured. Revenue is recognised net of sales-related foreign exchange gains and losses and any applicable sales taxes. Most sales are priced in US dollars. The time of revenue recognition is determined on the basis of the terms of delivery used.



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A large proportion of the company's production is sold under long-term contracts, but sales revenue is only recognised on individual sales when persuasive evidence exists that all of the following criteria have been met:

- All material risks and rewards of ownership have been transferred to the buyer;
- There is no continuing managerial involvement to the degree usually associated with ownership or effective control over goods sold;
- The amount of revenue can be reliably determined;
- The costs incurred or to be incurred in respect of the sale can be reliably determined; and
- The flow of future economic benefits to the seller is probable.

In connection with metal intermediates delivery, a preliminary invoice is drawn up based on preliminary analysis and measurement results and the market prices of the month preceding the month of delivery. Preliminary invoices are entered as sales. The final analysis and measurement results are normally obtained within a few months. Any preliminary invoices are adjusted based on the final analysis and measurement results. Furthermore, the prices of delivered metals are adjusted to correspond to the market prices of the agreed pricing period.

In connection with battery chemicals delivery, a preliminary invoice is drawn up based on preliminary analysis and measurement results and the market prices of the month preceding the month of delivery. Preliminary invoices are entered as sales at the date of embarkation. Any preliminary invoices are adjusted to correspond to the market prices when the price for the period is available. In connection with the fertilizer delivery an invoice is drawn and entered as sales.

With regard to preliminary invoices for which final analysis and measurement results that are required in the sales contracts have not yet been obtained, the sales prices and euro-denominated valuations are adjusted so as to correspond to the average market prices of the month of the financial statements and the exchange rates at the date of closure of the accounts. With regard to these deliveries, the company also considers the need to make write-downs due to the changes in market prices or in analysis and measurement results. Such write-downs were not made in the financial statements of 31 December 2021. The metal hedges for metal tonnes sold have been taken into account in the valuation of sales.



Pension obligations

The company has pension schemes in accordance with local conditions and practices. These are arranged with an external insurance company. Pension costs are entered as expenses in the year in which they accrue.

Deferred tax assets and liabilities

Deferred tax assets and liabilities are calculated on temporary differences between the book value and taxable value, using the tax rates enacted by the balance sheet date. Deferred tax assets arising from taxable losses carried forward are recognised up to the amount for which there is likely to be taxable income in the future, and against which the temporary difference can be used. Deferred tax assets or tax liabilities with respect to the fair values of derivative contracts have been recognised in the company's balance sheet. Deferred tax assets and liabilities recognised according to adaptations of Section 5:5b of the Finnish Accounting Act are presented in the notes to the income statement.

Tangible assets

Tangible assets have been recognised in the balance sheet at cost, less planned depreciation. Interest and financing costs relating to significant investment projects are capitalised in accordance with the Section 4:5.2–3 of the Finnish Accounting Act. Non-current tangible assets include, among other things, buildings, infrastructure, machinery and equipment used in mining and metal recovery operations, laboratory equipment, vehicles, roads, power lines and structures for environmental protection. Acquisition cost includes expenditure that is directly attributable to the acquisition, construction or production of the item.

Non-current assets bought from the bankruptcy estate of Talvivaara Sotkamo Ltd on 15 August 2015 have been amortised in accordance with the original depreciation plan by applying the normal planned depreciation periods, with the exception that a write-down was made on the acquired tangible assets: the net expenditure of acquired tangible assets as at 15 August 2015 was approximately EUR 202.6 million, on which a write-down of EUR 76 million was made, and the acquired tangible assets were entered in the company's balance sheet in the amount of EUR 126.6 million.

Spare parts with a useful life of more than one year have been recognised in non-current assets as of the 2017 financial statements. On 31 December 2021, their value totalled EUR 14,5 (13.9) million.



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Where parts of an item of tangible assets have different useful lives, they are accounted for as separate items.

Utilising the ore reserves in the areas specified in the mining plan requires surface material to be moved and waste rock to be mined in the open pit. Resulting costs for moving the surface material and waste rock mining have been capitalized and will be depreciated by using units of production method as the mining of recognised ore reserves progresses according to mining plan.

Work in progress or land are not depreciated. Depreciation on other assets is calculated using the straight-line method to allocate their cost over their estimated useful lives, as follows:

Asset type	Depreciation period
Roads and power lines	25 years
Buildings and structures	10–40 years
Leaching heap base structures	10–30 years
Machinery and equipment	4–25 years
Furniture, fixtures and fittings	5–10 years
Vehicles	5–10 years
Fixed asset spare parts	3 years
Structures for environmental protection	25 years

Carrying amounts are reassessed in connection with each financial statement. The reassessment is based on the company's estimates of ore reserves, mineral resources, production capacity and other relevant factors.

Gains and losses on disposals are determined by comparing the proceeds with the book value and are recognised within other operating income or expenses, respectively, in the income statement.

Implementation of the IFRS 16 Leases standard

Terrafame has applied the IFRS 16 Leases standard as permitted by section 5:5b of the Finnish Accounting Act and by the IAS Regulation (EU) in its financial accounting starting from 1 January 2019, using the simplified approach.



The standard requires that all leases be recognized on the lessee's balance sheet. As a lessee, the company is required to recognize a right-of-use asset representing its right to use the underlying leased asset and, correspondingly, a lease liability representing its obligation to make lease payments, in its balance sheet. The right-of-use asset is depreciated in accordance with a depreciation schedule determined on the basis of the lease term or useful life of the asset. Interest on a lease liability is presented in finance expenses.

The company applies the standard's exemption to the assets of short-term leases and leases of low-value and these are not recognized as right-of-use assets and lease liabilities on the balance sheet. As a result, the payments associated with such leases are recognized as an expense in the income statement on a straight-line basis over the lease term. From the lessor's point of view, lease agreements are still divided into two categories: finance leases and other leases. The company has not concluded any significant agreements as a lessor. These agreements are classified according to IFRS 16 as other leases.

As a result of the adoption of the standard, the company has recognized right-of-use assets on its balance sheet under machinery and equipment on the basis of lease liabilities concerning vehicles and mobile mining equipment.

Other intangible assets

Other intangible assets are recognised in the balance sheet at cost, less planned amortisation. Other intangible assets mainly comprise IT applications and geological data supporting the company's business operations, which are amortised over 3–5 years.

Research and development expenditure

Research expenditure is recognised as an expense as incurred. The company has not capitalised development expenditure during the financial period 2021 or earlier.

Inventories

The company classifies its inventories into three groups: raw materials and consumables, work in progress, and finished products.

Raw materials and consumables are valued at the average acquisition cost of the goods in stock. A so-called write-down on slow-moving items is made on the slow-moving goods in the raw materials and consumables inventory. If an item has been in stock for more than a year, a write-down of 25 percent is made. The write-down increases 25 percentage points annually, so the value of an item that has been in storage more than four years is zero.



Work in progress and finished products (metal content for sale) are presented in the balance sheet as valued at actual production costs but up to the net realisable value of the products on the balance sheet date. Net realisable value refers to the estimated selling price in the ordinary course of business, less the production costs necessary to making work in progress and finished products ready for sale.

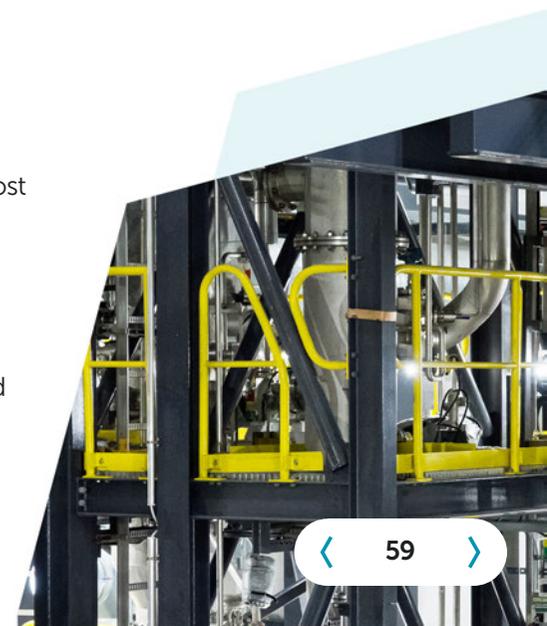
The acquisition cost of work in progress and finished products (production cost) includes the fixed and variable costs of production and maintenance that supports production, as well as depreciation on these functions, based on the realised production costs in the production process. The acquisition cost excludes borrowing costs.

Work in progress in metal intermediates business includes the metals in the ore in the primary and secondary heaps, as well as the metals in the leaching process or the metal precipitation and filtration process that can be processed for sale as a finished product. Work in progress at the battery chemicals business includes nickel-cobalt sulphide, which is used as a raw material in processing and is measured in accordance with the level of completion of the main phases of the production process (pressure leaching, solvent extraction and crystallisation).

The amount of metal contained in work in progress is measured by calculating the metal tonnes added to and removed from the production process (inventory of work in progress). The recoverable quantities of nickel, zinc, copper and cobalt included in work in progress are determined based on the estimated ore concentrations based on geological studies, the estimated recovery percentages of metals in the bioheap leaching process and the recovery percentages of the metals recovery plant, and based on the battery chemicals plant.

Ore concentrations, the amount of metals in the production process and the metals recovery percentage are reviewed monthly.

The metal intermediates inventory on 31 December 2021 was measured at acquisition cost, on a cost basis, at EUR 2.7 million, because the net realisable value was higher than the cost-based value. Since the 2017 financial statements, work in progress for metal intermediates has been measured on a cost basis whenever the cost-based value is lower than the net realisable value. The value of work in progress in metal intermediates business measured on a cost basis on 31 December 2021 was EUR 199.0 million, and the value of work in progress in battery chemicals production measured at net realisable value was EUR 5.0 million. The inventory of finished sulphated products of the battery chemicals business on 31 December 2021 has been measured at net realisable value, EUR 1.6 million, because the unit costs in the ramp-up phase of production are higher than the net realisable value.



The value of inventories determined in accordance with the principle of net realisation value includes discretionary factors related to, for instance, the measurement of metal volume in work in progress, metals recovery percentages, production costs, the production time necessary to complete sales, and sales prices.

Derivatives and hedge accounting

Derivatives

The derivatives used by the company were acquired for hedging purposes, and hedge accounting has been applied to them. Any unrealised change in the value of derivatives that are considered effective hedges are recognised, in accordance with Section 5:2a of the Finnish Accounting Act, at fair value in the balance sheet's fair value reserve as per the valuation report for the last day of the reporting period. The fair values of derivatives are based on valuations of external counterparties.

The realised earnings-related impacts of changes in the value of effective hedging instruments that are covered by hedge accounting are presented uniformly with the hedged item. In the event of any ineffective hedging, changes in the fair value of hedging instruments are recognised in profit or loss.

Hedge accounting

The company applies hedge accounting in accordance with Section 5:2a of the Finnish Accounting Act to all hedging instruments it holds. At the beginning of the hedging arrangement, the relationship between each hedging instrument and the hedged asset, as well as the risk management objectives, are documented by hedging instrument type. The effectiveness of the hedging relationship is assessed at the beginning of hedging and in quarterly accounts at a minimum.

Cash flow hedging

The company's hedging activities are entirely focused on cash flow hedging. The effective portion of changes in the fair values of derivatives acquired for the purpose of hedging forecasted cash flows are recognised in the fair value reserve under equity. Changes in fair value are recognised in profit or loss for the same periods in which hedged cash flows affect the result.



Provisions

Provisions are recognised when the company has a present legal or constructive obligation as a result of past events, and when it is probable that an outflow of resources will be required to settle the obligation and a reliable estimate of the amount of the obligation can be made.

A provision is made for mine closure costs and legal claims on the following conditions: the obligation relates to a closed or prior financial period, its materialisation is deemed certain or likely upon preparation of financial statements, the corresponding income is neither certain nor likely, the obligation is based on law or commitment to third parties, and the obligation can be identified but its precise amount or time of realisation is not known.

Rehabilitation provision for mine closure and environmental clean-up costs

Terrafame has prepared for the costs generated by the closure measures with an environmental provision, which is included in the balance sheet and updated annually. Where applicable, the provision complies with the collateral stipulated in the environmental permit as well as the area-based cost estimate for the closure issued by the Regional State Administrative Agency for Northern Finland.

A rehabilitation provision for mine closure costs is made with respect to the estimated future costs of closure and restoration, and for environmental restoration and rehabilitation to the condition required by the environmental permits granted for mining operations.

Prevention of the threat of environmental pollution entails environmental and landscaping obligations. After mining operations have ceased, any machinery and equipment, chemicals, fuels and waste involving the risk of environmental pollution must be removed from the site. This will be carried out as part of normal mining operations. In addition, open pits must be restored to the condition required by public safety.

The majority of the estimated restoration costs arises from the closure of waste rock dumps and primary and secondary leaching areas, the treatment and clean-up of primary and secondary leaching solution channels, the construction, covering and landscaping of gypsum ponds, treatment of seepage waters, the fencing of open pits and the ex post supervision of the mining site.

The mine closure plan is based on the covering of areas with water- and oxygen-impermeable material, and long-term aftercare. It is assumed that environmental monitoring of the mine will continue for 30 years after closure of the mine.



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Restoration costs have been estimated in accordance with the cost level at the date of closure of the accounts.

The bioleaching method used by Terrafame is of such a nature that the process cannot be stopped abruptly at the end of operations. In order to ensure environmental safety, bioleaching must be continued until most of the metals have been recovered at the metals production plant. Also, the safe management of solution circulation requires a phased ending. Mining and ore crushing will be terminated after the closure decision.

The shutdown of bioleaching and metals recovery processes is expected to last approximately three to four years. During the first two years, primary phase leaching will be terminated, and primary leaching ore will be transferred to the secondary heap in accordance with permit requirements. In the first two years, the metals production plant will be operated normally on hydrogen sulphide precipitation, and the resulting metals will be sold. During this time, detailed closure plans will be drawn up, and regulatory processes required for closure will be initiated.

After the third year, bioleaching will still be operational in secondary leaching, and when the metal concentrations of the solution decrease, the metals production plant will transfer to sodium hydrogen sulphide precipitation, which will continue to produce small amounts of product for sale. This phase is estimated to last from one to two years, after which the bioleaching and the operations of the metals production plant will be discontinued, and the dilute solutions formed will be treated either at the central water treatment plant or by any other suitable purification method.

An environmental provision for the closure of the mine of EUR 232.0 million has been set to cover the closure costs for thirty years from the date the actual closure measures commence. The environmental provision covers, for example, closure of bioleaching areas, necessary soil rehabilitation measures, solution and water management, and environmental monitoring. It is estimated that the central water treatment plant will be used for around ten years, after which lighter purification methods will be adopted. The company assesses the amount of the environmental provision annually. The assumption is that a decision on the closure of mining operations would have been made at the balance sheet date.



2. Notes to the balance sheet

2.1. Intangible assets (EUR 1,000)

	Intangible rights	Other capitalized long-term expenditures	Investments in progress	Total
Carrying amount at 31 December 2020	571	190	0	761
Gross carrying amount at 1 January 2021	2,521	320	0	2,841
Increase	26	0	4	30
Capitalisation for the year	0	4	-4	0
Gross carrying amount at 31 December 2021	2,547	324	0	2,871
Accumulated amortisation and impairment losses				
At 1 January 2021	1,950	130	0	2,080
Amortisation for the year	290	61	0	351
Accumulated amortisation and impairment losses				
At 31 December 2021	2,240	191	0	2,431
Carrying amount at 31 December 2021	307	133	0	440

2.2. Tangible assets (EUR 1,000)

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	Land	Buildings	Machinery and equipment	Other tangible assets	Construction in progress	Total
Carrying amount at 31 Dec 2020	2,630	45,476	94,287	187,679	256,264	586,336
Gross carrying amount at 1 Jan 2021	2,630	65,221	176,320	223,466	256,264	723,901
Increase	584	0	10,685	0	103,724	114,993
Capitalisation for the year	0	69,499	198,838	39,037	-307,374	0
Decrease	0	0	-358	0	0	-358
Gross carrying amount at 31 Dec 2021	3,213	134,720	385,486	262,503	52,614	838,537
Accumulated amortisation and impairment losses at 1 Jan 2021	0	19,745	82,034	35,787	0	137,565
Amortisation for the year	0	4,887	26,320	11,984	0	43,191
Depreciation for reductions	0	0	-355	0	0	-355
Accumulated amortisation and impairment losses at 31 Dec 2021	0	24,632	107,999	47,771	0	180,402
Carrying amount at 31 Dec 2021	3,213	110,088	277,487	214,732	52,614	658,135



2.2. Tangible assets (EUR 1,000)

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	Machinery and equipment	
	Right-of-use assets	Total
Carrying amount at 31 Dec 2020	14,004	14,004
Gross carrying amount at 1 Jan 2021	18,472	18,472
Increase	2,851	2,851
Gross carrying amount at 31 Dec 2021	21,323	21,323
Accumulated amortisation and impairment losses at 1 Jan 2021	4,468	4,468
Amortisation for the year	3,043	3,043
Accumulated amortisation and impairment losses at 31 Dec 2021	7,511	7,511
Carrying amount at 31 Dec 2021	13,812	13,812



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IFRS 16 Leases standard notes (EUR 1,000)

Maturity analyses	2021	2020
No later than 1 year	4,367	3,512
Later than 1 year and no later than 5 years	6,898	9,021
Over 5 years	0	0
Carrying amount at 31 December 2021	11,265	12,533
Items recognised in profit or loss		
Lease expenses	42	22
Lease expenses	4,228	4,565
Depreciation by item class	3,043	2,534
Interest losses from leasing liabilities	416	438
<i>Above Leasing costs are included in Other operating expenses</i>		
Items booked in Cash flow statement		
Payments from lease agreements total	8,389	7,975



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2.3. Inventories (EUR 1,000)

	31 Dec 2021	31 Dec 2020
Raw materials and consumables	25,527	24,231
Work in progress	204,043	190,150
Finished goods	4,284	6,105
Total	233,854	220,486

The value of raw materials and consumables on 31 December 2021 includes a provision of EUR 7,605 thousand for slow-moving inventory, which reduces the value of inventory. The corresponding provision on 31 December 2020 was EUR 7,160 thousand.

2.4. Deferred tax assets (EUR 1,000)

	31 Dec 2021	31 Dec 2020
Deferred tax assets	11,486	2,532

According to estimates, the company has approximately EUR 182.1 million of confirmed and to-be-confirmed losses, and approximately EUR 45.2 million of deferred depreciation. Deferred tax assets or tax liabilities for derivatives have been recognised in the company's balance sheet.



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2.5. Amounts owed by Group companies (EUR 1,000)

Trade receivables	31 Dec 2021	31 Dec 2020
Finnish Minerals Group	60	104
Total	60	104

2.6. Prepayments and accrued income (EUR 1,000)

	31 Dec 2021	31 Dec 2020
Other prepayments and accrued income	907	4,419
Derivative receivables	181	12,668
Total	1,088	17,088



2.7. Equity (EUR 1,000)

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	31 Dec 2021	31 Dec 2020
Subscribed capital at the beginning of the period	2,000	2,000
Subscribed capital at the end of the period	2,000	2,000
Fair value reserve at the beginning of the period	-10,129	-909
Increase	101,897	89,981
Decrease	137,713	99,201
Fair value reserve at the end of the period	-45,945	-10,129
Invested unrestricted equity at the beginning of the period	706,032	596,297
Investment in invested unrestricted equity	94,437	109,735
Invested unrestricted equity at the end of the period	800,469	706,032
Retained earnings at the beginning of the period	-255,857	-247,640
Retained earnings at the end of the period	-255,857	-247,640
Loss for the period	-115,834	-8,217
Retained earnings	-371,692	-255,857
Total equity	384,832	442,046



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2.7. Equity (EUR 1,000)

Restricted equity at the end of the period	31 Dec 2021	31 Dec 2020
Subscribed capital	2,000	2,000
Fair value reserve	-45,945	-10,129
At the end of the period	-43,945	-8,129
Distributable equity at the end of the period		
Retained earnings	-255,857	-247,640
Loss for the period	-115,834	-8,217
Fair value reserve	-45,945	-10,129
Invested unrestricted equity	800,469	706,032
At the end of the period	382 832	440,046

The fair value reserve comprises the market value of derivatives covered by hedge accounting.



2.8. Notes to hedging derivatives (EUR 1,000)

	31 Dec 2021			31 Dec 2020			2021	2020
	Fair value			Fair value			Notional amount USD	Notional amount USD
Currency and interest rate derivatives	Positive	Negative	Net	Positive	Negative	Net		
Foreign exchange forwards	121	7,533	-7,412	10,133	0	10,133	234,000	381,500
Metal derivatives							Tonnes	Tonnes
Nickel forward contracts	0	31,663	-31,663	2	10,783	-10,781	12,800	14,350
Zinc forward contracts	41	6,911	-6,870	2	9,481	-9,479	19,200	32,100
Derivatives total	162	46,107	-45,945	10,136	20,264	-10,128		
Long-term derivatives	0	149	-149	1,287	4,405	-3,118		
Short-term derivatives	162	45,958	-45,796	8,849	15,859	-7,010		
			31 Dec 2021			31 Dec 2020		
Balance assets, gross amount			181			12,668		
Balance liabilities, gross amount			57,613			25,329		

The fair value calculation of hedges is based on market rates and quotations on the balance sheet date in accordance with the hedging portfolio. Counterparties for derivative transactions have been approved in accordance with the company's hedging policy. Intercompany receivables and liabilities are connected on a transaction level with each counterparty and accounted for on a daily level by transaction.

The importance of hedging instruments to the company's financial position and projected profitability for the next 12 months was high on 31 December 2021. The company had set up a cash flow hedge against a weakening US dollar with a hedging rate of approximately 49 percent of its projected estimated USD denominated net cash flow. Similarly, a hedging rate of approximately 43 percent was also applied to set up a hedge against falling nickel prices for the company's projected nickel deliveries for the following year utilising derivatives and fixed-term sales agreements. For planned zinc deliveries company has set up a hedge with a hedging rate of approximately 43 percent. In addition, in line with its hedging policy, the company had set up hedges for almost all of its nickel and zinc deliveries, which had been completed and reported under sales already earlier. As a result, the change in market prices after the closing of the accounts has hardly no effect on the deliveries reported as sales for the financial period 2021.

2.9. Obligatory provisions (EUR 1,000)

Rehabilitation provision	31 Dec 2021	31 Dec 2020
At the beginning of the period	159,077	157,398
Increase	72,947	1,679
At the end of the period	232,024	159,077
Long-term total	232,024	159,077
Estimated cost of the rehabilitation provision		
Rehabilitation of bioleaching areas	122,177	37,635
Other rehabilitation work	109,847	121,442
Estimated rehabilitation costs total	232,024	159,077

Terrafame estimates that it will receive a new environmental permit concerning all its operations from the Regional State Administrative Agency for Northern Finland in March 2022. The environmental permit will also stipulate the measures for the closure and rehabilitation of Terrafame's production and waste areas as well as a euro-denominated collateral for environmental rehabilitation to ensure these measures. The collateral will secure the closure measures required by the permit in the event that the operator is unable to perform them.

In 2021, the Regional State Administrative Agency for Northern Finland granted a separate permit to Terrafame for the extension of the primary bioleaching area. In its decision, the Regional State Administrative Agency raised the area-based collateral set for the closure plan of the primary leaching area. Terrafame estimates that the increased collateral stipulated in this permit decision will also have an impact on the environmental permit concerning all its operations, estimated to be granted in March 2022, which is expected to increase the total amount of the collateral significantly.

Terrafame has prepared for the costs generated by the closure measures with an environmental provision, which is included in the balance sheet and updated annually. Where applicable, the provision complies with the collateral stipulated in the environmental permit as well as the area-based cost estimate for the closure issued by the Regional State Administrative Agency for Northern Finland.

Based on the previous permit decision described above, Terrafame assumes it is likely that the collateral for environmental restoration will increase in the new environmental permit. This has been, therefore, anticipated by the company in its 2021 Financial Statements by increasing the environmental provision from EUR 159.1 million to EUR 232 million. The impact of the increased provision on the operating result for 2021 is EUR -72,9 million.

2.10. Long-term loans from credit institutions (EUR 1,000)

Installment credit	31 Dec 2021	31 Dec 2020
At the beginning of the period	239	313
Increase	0	0
Decrease	-114	-75
At the end of the period	125	239
Leasing liabilities		
At the beginning of the period	9,021	11,887
Increase	1,918	528
Decrease	-4,041	-3,394
At the end of the period	6,898	9,021
Long-term loans I		
At the beginning of the period	60,739	66,345
Increase	0	0
Decrease	-70,000	0
Valuation	9,261	-5,607
At the end of the period	0	60,739
Long-term loans II		
At the beginning of the period	81,493	62,311
Increase	0	27,013
Decrease	-26,802	0
Valuation	7,114	-7,831
At the end of the period	61,805	81,493

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2.10. Long-term loans from credit institutions (EUR 1,000)

Long-term loans III	31 Dec 2021	31 Dec 2020
At the beginning of the period	40,746	0
Increase	0	42,519
Decrease	-12,766	0
Valuation	2,922	-1,773
At the end of the period	30,902	40,746
Long-term loans IV		
At the beginning of the period	0	0
Increase	17,298	0
Decrease	-1,442	0
Valuation	330	0
At the end of the period	16,187	0
Long-term loans total	115,917	192,238



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Option and other special rights

(pcs)	31 Dec 2021	31 Dec 2020
Batch 7		
Maximum number of shares to be issued	1 034,008	1,034,008
Batch 8		
Maximum number of shares to be issued	582,033	582,033
Batch 9		
Maximum number of shares to be issued	21,518	21,518
Batch 10		
Maximum number of shares to be issued	21,518	0
Batch 11		
Maximum number of shares to be issued	21,518	0
Batch 12		
Maximum number of shares to be issued	21,518	0
Batch 13		
Maximum number of shares to be issued	21,518	0
At the end of the period	1 723,631	1,637,559

The subscribed Option Rights may be transferred by each Warrantheader to a Permitted Transferee. No subscribed Option Rights may, directly or indirectly, be pledged. The subscription prices for the Option Rights are 10 percent higher than the subscription price at the time of the closing of the financing arrangements and they are not required to be used in one lot and may also be used in parts. The Option holders are not entitled to dividend or other funds that are distributed from the Company's invested unrestricted equity. The subscription period for batch seven has been split in two: 55% (7 1) 27 August 2020 – 31 December 2023 and 45% (7 2) 27 August 2020 – 24 April 2024. For batch eight subscription period has been split in two accordingly: 84% (8 1) 27 August 2020 – 31 December 2023 and 16% (8 2) 27 August 2020 – 31 December 2024. For batch nine subscription period is 27 October 2020 – 30 June 2024. For the batches 20-13 the subscription period started immediately and continues until 30 June 2024.

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2.11. Deferred tax liabilities (EUR 1,000)

	31 Dec 2021	31 Dec 2020
Deferred tax liabilities	0	0

2.12. Specifications of Group liabilities (EUR 1,000)

Short-term liabilities to group companies	31 Dec 2021	31 Dec 2020
Trade payables		
Finnish Minerals Group	395	286
Total	395	286



2.13. Short-term loans from financial institutions (EUR 1,000)

Instalment credit	31 Dec 2021	31 Dec 2020
At the beginning of the period	76	137
Increase	114	75
Decrease	-75	-135
At the end of the period	115	76
Leasing liabilities		
At the beginning of the period	3,512	3,360
Increase	4,974	3,540
Decrease	-4,119	-3,388
At the end of the period	4,367	3,512
Short-term loans I		
At the beginning of the period	0	28,434
Increase	70,000	0
Decrease	0	-27,015
Valuation	-4,193	-1,419
At the end of the period	65,807	0
Short-term loans II		
At the beginning of the period	0	0
Increase	26,802	0
Decrease	0	0
Valuation	-315	0
At the end of the period	26,488	0

Short-term loans III	31 Dec 2021	31 Dec 2020
At the beginning of the period	0	0
Increase	12,766	0
Decrease	0	0
Valuation	477	0
At the end of the period	13,244	0
Short-term loans IV		
At the beginning of the period	0	0
Increase	1,442	0
Decrease	0	0
Valuation	30	0
At the end of the period	1,472	0
Short-term loans from financial institutions total	111,492	3,588

2.14. Current liabilities/Accruals and deferred income (EUR 1,000)

	31 Dec 2021	31 Dec 2020
Interests	1,299	1,732
Salaries, fees and other expenses	8,733	6,951
Other expenditure balances	4,081	1,100
Other accrued liabilities	7,247	4,029
Derivative liabilities	57,613	25,329
Total	78,973	39,141

3. Notes to the income statement

3.1. Net sales (EUR 1,000)

Industry distribution	2021	2020
Metal intermediates business	351,322	338,258
Battery chemicals business	27,126	0
Total	378,448	338,258

Geographical distribution	2021	2020
Europe	351,332	338,275
Asia	27,101	0
United States	15	-17
Total	378,448	338,258



3.2. Cost of goods sold (EUR 1,000)

Raw materials and consumables	2021	2020
Purchases during the financial year	-129,183	-114,479
Change in stocks	1,296	-785
	-127,887	-115,264
External services	-75,495	-70,257
Total	-203,382	-185,521
Change in Inventory		
Change in Work in progress	13,893	3,913
Change in Finished goods	-1,821	-799
Total	12,072	3,114
Personnel expenses		
Wages and salaries	-38,755	-31,820
Pensions expenses	-6,596	-5,139
Other personnel expenses	-1,017	-1,083
Total	-46,368	-38,042
Depreciation		
Depreciations	-46,044	-40,087
Total	-46,044	-40,087
Other expenses		
Other Cost of goods sold expenses	-85,250	-64,814
Total	-85,250	-64,814
Cost of goods sold total	-368,971	-325,350



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3.3. Sales and marketing expenses (EUR 1,000)

Personnel expenses	2021	2020
Wages and salaries	-1,148	-940
Pensions expenses	-194	-147
Other personnel expenses	-33	-31
Total	-1,374	-1,118
Depreciation		
Depreciation	-116	-62
Total	-116	-62
Other expenses		
Other Sales and Marketing expenses	-1,540	-1,569
Total	-1,540	-1,569
Sales and Marketing expenses total	-3,030	-2,750

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3.4. Administrative expenses (EUR 1,000)

Personnel expenses	2021	2020
Wages and salaries	-3,552	-3,424
Pensions expenses	-605	-615
Other personnel expenses	-284	-229
Total	-4,441	-4,268
Depreciation		
Depreciation	-312	-311
Total	-312	-311
Other expenses		
Other Administrative expenses	-15,160	-14,923
Total	-15,160	-14,923
Auditors' remunerations		
Audit	-94	-92
Certificates and reports	-3	-3
Tax consultancy	-3	0
Other services	-84	-49
Total	-185	-144
Administrative expenses total	-20,098	-19,646



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3.5. Other operating expenses (EUR 1,000)

Personnel expenses	2021	2020
Wages and salaries	-1,026	-762
Pensions expenses	-143	-121
Other personnel expenses	167	-25
Total	-1,002	-908
Depreciation		
Depreciation	-113	-271
Total	-113	-271
Other operating expenses		
Other operating expenses	-82,517	-7,239
Total	-82,517	-7,239
Other operating expenses total	-83,632	-8,418



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Personnel expenses total (EUR 1,000)

	2021	2020
Wages and salaries	-44,457	-38,833
Pensions expenses	-7,607	-6,279
Other personnel expenses	-1,894	-1,399
Total	-53,958	-46,512
Wages and fees for Members of Board of Directors	-297	-293

Average number of company personnel

Salaries and senior salaried	297	267
Blue-collar	613	566
Total	910	833

Depreciation, amortisation and impairment charges total (EUR 1,000)

	2021	2020
Intangible assets	-290	-469
Other capitalised long-term expenditure	-61	-36
Total	-351	-505

Tangible assets

Buildings	-4,887	-4,093
Machinery and equipment depreciation	-26,320	-22,721
Machinery and equipment depreciation right-of-use assets	-3,043	-2,534
Other tangible assets depreciation	-11,984	-10,877
Tangible assets total	-46 234	-40,226
Total	-46,585	-40,731



3.6. Finance income and finance cost (EUR 1,000)

Financial income	2021	2020
Other interest and financial income	1,396	16,945
Total	1,396	16,945

Other interest and financial income include exchange rate profit	1,396	16,774
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Finance income for the financial period include interest income of approximately EUR 46 thousand and interest gains of EUR 1,350 thousand. Of the unrealised foreign exchange gains on finance income, EUR 1,330 thousand consists of the valuation of FX denominated loans using the exchange rate at the balance sheet date. Correspondingly, of the comparative period's foreign exchange gains, EUR 13,643 thousand derives from the valuation of FX denominated loans using the exchange rate at the balance sheet date.

Finance expenses	2021	2020
Other interest and financial income	-21,885	-8,239
Finance expenses total	-21,885	-8,239

Financial expenses to others include exchange rate losses	-15,691	2,410
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Financial expenses include interest losses from leasing liabilities	-416	-438
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Financial income and expenses total	-20,490	8,706
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The finance expenses for the financial period include EUR 6,194 thousand of interest and finance expenses and 15,627 thousand of unrealised exchange rate losses on the valuation of FX denominated loans using the exchange rate at the balance sheet date. The finance expenses for the comparative period include EUR 5,829 thousand of interest and finance expenses and EUR 2,384 thousand of unrealised exchange rate losses on the valuation of FX denominated loans using the exchange rate at the balance sheet date.

4. Notes to the commitments (EUR 1,000)

Contingent and off-balance sheet liabilities

	Amounts payable on rental and leasing agreements 31 Dec 2021	31 Dec 2020
No later than 1 year	332	391
Later than 1 year and no later than 5 years	410	598
Total	742	989
Other liabilities		
Fixed assets serving as collateral for installment credit	150	328
Installment credit		
No later than 1 year	115	76
Later than 1 year and no later than 5 years	125	239
Total	240	315
Other service agreement liabilities		
No later than 1 year	7,978	8,341
Later than 1 year and no later than 5 years	3,680	5,600
Total	11,658	13,941
Bank deposit	150	150

Securities complying with environmental and mining permits (EUR 1,000)

		31 Dec 2021 Amount of security total	31 Dec 2020 Amount of security total
Beneficiary	Type of security		
Kainuu Centre of Economic Development, Transport and the Environment; securities in accordance with permit condition 117	Credit insurance	133,245	127,945
Security in accordance with permit decision no. 52/2013/1	Bank guarantee	1,500	1,500
Security in accordance with permit decision no. 43/2014/2	Bank guarantee	6	6
Security in accordance with permit decision no. 43/2015/1	Bank guarantee	100	100
Security in accordance with permit decision no. 3/2017/1	Bank guarantee	50	50
Security in accordance with permit decision no. 76/2017/1	Bank guarantee	100	100
Security in accordance with permit decision no. 133/2020	Bank guarantee	10	0
Security in accordance with permit decision no. 5/2021	Bank guarantee	200	0
Security in accordance with permit decision no. 5/2021	Bank guarantee	20	0
Decision of the Finnish Safety and Chemicals Agency Tukes, 30 June 2014, KaivNro: 2819	Bank guarantee	100	100
Decision of the Finnish Safety and Chemicals Agency Tukes, 30 June 2014, KaivNro: 2819	Bank guarantee	35	35
Decision of the Finnish Safety and Chemicals Agency Tukes, 30 June 2014, KaivNro: 2819	Bank guarantee	50	50
Total		135,416	129,886
Other securities	Bank guarantee	1,545	2,453
Real estate investments' VAT refund liability		15,894	2,690
Business mortgages		320,000	320,000
Real estate mortgage		1,200,079	1,200,079
Mining certificate, mine register number 2819, mining concession	Pledged	yes	yes

Business mortgages and Real estate mortgages are pledged for Company's long term financing agreements.

5. Related party transactions

Terrafame's key related parties include the following entities: Suomen Malmijalostus Oy – Finnish Minerals Group, the State of Finland, Galena Private Equity Resources Investment 2 L.P., Galena Private Equity Resources Investment 3 L.P. funds and Galena Private Equity Resources Investment 4 L.P. funds, as well as Trafigura Group. In addition, Terrafame's related parties include the members of the Board, the CEO and the members of the Leadership Team, persons responsible for Terrafame Ltd's commercial agreements, and the immediate family members of the persons referred to here, as well as entities over which they or their immediate family members have control. Terrafame's related parties also include entities in which the State of Finland exercises control or considerable influence. Terrafame has applied an exemption pursuant to which it only reports significant transactions with Government-related companies.

Financing arrangements are in place between the company, Trafigura Group and Galena Private Equity Resources Investment 2 L.P., Galena Private Equity Resources Investment 3 L.P. and Galena Private Equity Resources Investment 4 L.P. – as well as between the company and Finnish Minerals Group. The value of the company's related-party borrowings connected with the financial arrangement is EUR 159.7 million. The commercial agreements between Terrafame and Trafigura NatGas Limited. generated EUR 437.6 million in sales during the financial period. The company has acquired legal and other administrative services worth EUR 0.5 million and management services for product development projects worth EUR 0.3 million from Suomen Malmijalostus Oy. During the financial period 2021, the company renegotiated the financing for its environmental guarantee with an international insurance syndicate and, consequently, the EUR 32.5 million counter-guarantee granted by the State for arranging collateral in accordance with environmental permits was released.

All business transactions between Terrafame Ltd and its related parties were market-conform.



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Business transactions with related parties (EUR 1,000)

Goods and services sold	31 Dec 2021	31 Dec 2020
Associate and joint ventures	10	10
Other related party ventures	437,603	318,665
Ventures total	437,613	318,675
Total	437,613	318,675
Goods ad services purchased		
Associate and joint ventures	863	1,040
Other related party ventures	33,504	31,972
Ventures total	34,367	33,013
Total	34,367	33,013
Credits		
Other related party ventures	159,720	147,420
Ventures total	159,720	147,420
Total	159,720	147,420

Board of Directors' proposal for the measures to be taken owing to the loss for the financial period

Terrafame Ltd's result for the financial period shows a loss of EUR 115,834,493.00. The Board of Directors proposes to the Annual General Meeting that no dividend be distributed, and that the loss be retained in shareholders' equity.

In Sotkamo, March 3, 2022

Lauri Ratia

Chairman of the Board

Matti Hietanen

Riitta Mynttinen

Tuomo Mäkelä

Jesus Fernandez

Emmanuel Henry

Jyrki Vainionpää

Joni Lukkaroinen

CEO



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A report on the audit has been issued today.

CEO'S REVIEW

In Sotkamo, 9 March, 2022

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KPMG Oy Ab

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Antti Kääriäinen

AUDITOR'S REPORT

APA



Auditor's Report

To the Annual General Meeting of Terrafame Oy Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Terrafame Oy (business identity code 2695013-5) for the year ended 31 December 2021. The financial statements comprise the balance sheet, income statement, cash flow statement and notes.

In our opinion, the financial statements give a true and fair view of the company's financial performance and financial position in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements.

Basis for Opinion

We conducted our audit in accordance with good auditing practice in Finland. Our responsibilities under good auditing practice are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the company in accordance with the ethical requirements that are applicable in Finland and are relevant to our audit, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of the Board of Directors and the Managing Director for the Financial Statements

The Board of Directors and the Managing Director are responsible for the preparation of financial statements that give a true and fair view in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements. The Board of Directors and the Managing Director are also responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.



In preparing the financial statements, the Board of Directors and the Managing Director are responsible for assessing the company's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting. The financial statements are prepared using the going concern basis of accounting unless there is an intention to liquidate the company or cease operations, or there is no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with good auditing practice will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with good auditing practice, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.



- Conclude on the appropriateness of the Board of Directors' and the Managing Director's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events so that the financial statements give a true and fair view.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



Other Reporting Requirements

Other Information

The Board of Directors and the Managing Director are responsible for the other information. The other information comprises the report of the Board of Directors. Our opinion on the financial statements does not cover the other information.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. Our responsibility also includes considering whether the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

In our opinion, the information in the report of the Board of Directors is consistent with the information in the financial statements and the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

If, based on the work we have performed, we conclude that there is a material misstatement of the report of the Board of Directors, we are required to report that fact. We have nothing to report in this regard.

Sotkamo, Finland 9 March 2022

Antti Kääriäinen

Authorised Public Accountant, KHT

KPMG Oy Ab





Terrafame

Board of Directors' review and financial statements 2021

March 30, 2022