

MASAN HIGH-TECH MATERIALS

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ANNUAL & SUSTAINABILITY REPORT 2020

MASAN HIGH-TECH MATERIALS



Annual & Sustainability REPORT 2020

M A S A N
HIGH-TECH MATERIALS



G O G L O B A L





Goslar - Germany



Thai Nguyen - Vietnam



Sarnia - Canada



Ganzhou - China

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MESSAGE FROM MANAGEMENT TEAM

Dear Shareholders and Stakeholders,

I am privileged and proud to present you with the 2020 Annual and Sustainability Report which represents the latest instalment in Masan High-Tech Materials (MHT) ongoing growth and development journey.

2020, what a year! As we started 2020, we were quite optimistic as to the business signs we were seeing and the orders we were receiving from our customers. With Covid-19 and the subsequent global pandemic, our optimism quickly unwound, and the year became a significant challenge. The year became one of survival, being flexible and agile in responding to customer needs, port, factory, and even entire country closures and most importantly cash management. Despite these short-term challenges, we have never taken our eye off the ultimate goal of building a leading global critical and strategic materials platform, and as a result we still went ahead with the H.C. Starck Tungsten Powders acquisition. Quite simply, if we did not buy it someone else would have and our competitive position would have been weakened in the long-term as opposed to enhanced.

What we have acquired is an excellent platform that has enabled vertical integration with Masan High-Tech Materials existing Nui Phao Mining Company and Masan Tungsten Company product streams, expanding our product mix, our technical capability, our customer base and our geographical reach. This expansion continues as we integrate the businesses.

Positively, our decision to proceed with the H.C. Starck Tungsten Powders acquisition was ratified in October 2020 with the investment by Mitsubishi Materials Corporation in Masan High-Tech Materials at a premium over the then prevailing market price of our stock.

Going Global

At the 2020 Annual General Meeting we proposed the company name change from

Masan Resources to Masan High-Tech Materials to reflect our wider global ambitions and this was approved overwhelmingly by you, our shareholders. Through the pages of the 2020 Annual Report and Sustainability report you will see the new name and logo has been progressively rolled out across our global business.

After the acquisition of H.C. Starck Tungsten Powders we held a one-week workshop with the combined management of the businesses to review and discuss integration of the respective businesses along with our strategic and tactical plans and opportunities. The workshop culminated in a recommendation by the combined management team to further update the Vision, Mission and the Values of the company to reflect an even greater global ambition. These new Vision, Mission and Values are further detailed on pages 240 and 241. The workshop was also instrumental in the team jointly identifying various short, medium and long-term value accretion and risk mitigation opportunities that will be implemented over the next two years.

While the global pandemic may have slowed us down for a short period, we are already seeing in 2021 the benefits of the integration with increased sales volumes, new customers, higher utilization and lower unit costs. The future looks bright.

Financial Performance

In 2020, Net Revenues were up 55% year on year at VND 7,291 billion due to the consolidation of H.C. Starck Tungsten Powders (from June 2020), offset by overall lower net realized prices due to the impact of the global pandemic on the downstream markets for the company's products. Copper revenues were up on the prior year as the company finally received approval to export copper concentrate from the 2018 and 2019 production years although the price was disappointing because of the global pandemic at the time of shipping and sales. Timing of the shipping and sales was dictated largely by

the export license so the company had little flexibility on the timing. The full volume of ~82,000 tonnes was shipped in accordance with the export license restrictions. Fluorspar revenues were down on the back of lower production volumes and therefore sales and slightly lower realized prices.

The 2020 year was all about Covid-19 and the global pandemic and its impact on global demand and manufacturing. Intermittently throughout the year, due to closures of ports, factories and countries the company's sales and the prices for our products have been significantly impacted. Automotive manufacturing, aerospace, oil and gas drilling, infrastructure, general engineering were all significantly impacted with many extended closures as businesses sought to protect their workers and countries their people. Customers either had limited or periodically no demand as they adjusted their supply chains to significantly lower levels. Some customers sought to operate counter cyclically and continued to manufacture at pre Covid-19 levels when they were able to operate, in a bid to set themselves up for an eventual recovery. Having key customers following this strategy certainly also helped to insulate our business from the worst effects of the slowdown.

At MHT we have sought to find a balance between ensuring we survived the global crisis, while also positioning ourselves to be at the forefront of an eventual recovery and to this end continued to invest in inventories when they could be produced or procured at commercially advantageous prices. We expect that this strategy will benefit us in the global recovery.

Strong stable operating performance at lowest cost of production

MHT maintained its throughput in the Nui Phao Mineral Processing facility at 3.87 million tonnes, up by 2.3% on 2019's throughput and only slightly behind 2018's record throughput of 3.89 million tonnes. The processing plant had an overall availability of 95.4%, up 1.3%

on 2019, and is a world class result which our people should be extremely proud of achieving. It is a testament to the pride they take in their work and the advanced maintenance practices we have implemented. We will progressively roll these advanced maintenance practices out from Vietnam to our other global operations in future.

In a production sense contained copper production was up 13% on prior years while tungsten equivalent production was up 68% with the integration of the H.C. Starck Tungsten Powders business.

From a cost perspective, the focus and drive on lowest cost production continued in 2020 with the team delivering an overall cash cost reduction in operating costs of US\$16.5m compared with 2019. Of particular note was a 14.7% improvement year on year in the unit cost per tonne milled in the Nui Phao Mining operation. Great result from the team given the circumstances of the year.

Continuously developing an integrated approach to our ecosystem

This year for the first time we have incorporated our Sustainability Report and Annual Report into one report. This reflects our view that the Financial Performance and Sustainability of the business go hand in hand and therefore should be read together.

We have continued to improve our performance across all sustainability measure, safety, environment, community, and our human resources. Our report goes into much detail about our efforts and the journey to continually improve our performance across the sustainability spectrum and I encourage all stakeholders to read it.

Of significance on the sustainability front is the fact that with the H.C. Starck Tungsten Powders acquisition over 40% of our Tungsten finished products now come from recycled tungsten materials. We expect to continue to grow this recycled proportion in future years.

Looking Forward

As we look forward into 2021 and beyond, the future looks brighter. While we are still recovering from the effects of Covid-19 globally we are seeing positive signs from our customers with steadily increasing volumes and certainly higher prices for Tungsten, Copper and Bismuth based materials and products. We are also seeing more enquiries from new customers and have been able to quickly respond to increased demand due to our unique service offer and integrated business model. With ongoing investment in infrastructure projects and renewal projects by respective world governments, increasing spend on renewables, electric vehicles, fuel cell technologies, return of automotive manufacturing demand and general engineering, the demand outlook for our suite products looks strong.

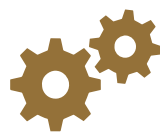
Beyond 2021, having reset the Vision and Mission of Masan High-Tech Materials we are continuing to work with various customers to further enhance and develop our advanced tungsten materials platform. We are also exploring various recycling opportunities to expand our Tungsten recycling platform, in addition to expanding our recycling platform beyond Tungsten into other materials such as Cobalt, Tantalum and Molybdenum. Regarding Cobalt, we have recently received a German Government grant for eight hundred thousand Euro to develop a new Cobalt recycling technology process. We are also exploring other strategic, critical, mineral and advanced material developments with various global leaders in innovation who are looking for long term, stable supply options to de-risk their supply chain. The future looks bright.

Once again, I would like to close by thanking our stakeholders for their trust, and you our shareholders, for investing in Masan High-Tech Materials.

Craig Richard Bradshaw
Chief Executive Officer



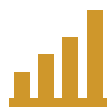
2020 KEY HIGHLIGHTS



Total throughput
3,868,995 tonnes



Operation time of Processing Plant
95.4% (target 93,75%)



VND **7,291** billion
in revenue



VND **1,478** billion
for Taxes and Fees



Successful integration
of H.C. Starck GmbH's
Global Tungsten Division and
ChemiLytics



Established a strategic alliance in the
Tungsten industry with Mitsubishi
Materials Corporation which invested
US\$ **90** million
for 10% stake in MHT



Contributed
VND **2.36** billion
into 48 community development projects
which have directly and indirectly impacted
approximately 1,100 households



Fully compliant with the Law on
Environment and zero environmental
incidents recorded



Sustainable Business in Vietnam
for 3 consecutive years



0.88
Total Recordable Injuries
Frequency Rate (TRIFR)

2020 AWARDS AND RECOGNITION

In 2020, Masan High-Tech Materials and its subsidiaries continued to be in the ranking list of the local and international prestigious organizations. MHT has constantly placed its strong footprints on its journey of going global, entrenching its position as a leading global high-tech material producer, and marking its footprint on the global mining map. Below are the awards and honors that Masan High-Tech Materials has proudly received in recognition of our progress and achievements throughout the year.



Mr. Vo Tien Dung, Director of External Relations, Community and Environment of Masan High-Tech Materials Corporation received the VNI500 Certificate of Merit



Representative of Masan High-Tech Materials proudly received the Certificate of Merit from VBCSD

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY LIMITED FOR “OUSTANDING ACHIEVEMENTS IN THE EMULATION MOVEMENT OF EXCELLENT LABOUR AND STRONG TRADE UNION ORGANIZATION BUILDING”

Voted and awarded by Vietnam General Confederation of Labor

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY LIMITED FOR “OUSTANDING ACHIEVEMENTS IN THE EMULATION MOVEMENT OF THE ENTIRE POPULATION TO PARTICIPATE IN FIRE PREVENTION AND FIGHTING IN THAI NGUYEN PROVINCE”

Awarded by the Thai Nguyen Provincial People’s Committee

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY LIMITED FOR “OUSTANDING ACHIEVEMENTS IN THE PATRIOTIC EMULATION MOVEMENT IN THAI NGUYEN PROVINCE”

Awarded by Dai Tu District and Thai Nguyen Provincial People’s Committee

CERTIFICATE OF “TOP 50 EXCELLENT ENTERPRISES IN VIETNAM” FOR MASAN HIGH-TECH MATERIALS

Voted and awarded by Forbes Vietnam

CERTIFICATE OF “TOP 100 LARGEST PUBLIC COMPANIES IN VIETNAM” FOR MASAN HIGH-TECH MATERIALS

Voted and awarded by Forbes Vietnam

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY LIMITED FOR “OUSTANDING ACHIEVEMENTS IN THE COLLECTION, CONTRIBUTION AND MANAGEMENT OF STATE BUDGET IN THAI NGUYEN PROVINCE”

Awarded by Thai Nguyen Taxation Department

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY LIMITED FOR “OUSTANDING PERFORMANCE IN NATURAL DISASTER PREVENTION AND CONTROL, SEARCH AND RESCUE”

Awarded by the Ministry of Industry and Trade

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY FOR “OUSTANDING ACHIEVEMENTS IN THE PATRIOTIC EMULATION MOVEMENT AND RED CROSS WORKS IN DAI TU DISTRICT DURING 2015-2020”

Awarded by Dai Tu District People’s Committee

CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY’s TRADE UNION FOR “EXCELLENT ACHIEVEMENTS IN THE PATRIOTIC EMULATION MOVEMENT DURING 2015-2020”

Awarded by Thai Nguyen Labour Federation

CERTIFICATE OF “TOP 50 VIETNAM BEST GROWTH” FOR MASAN HIGH-TECH MATERIALS

Voted and awarded by Vietnam Report JSC

CERTIFICATE OF “TOP 500 LARGEST ENTERPRISES IN VIETNAM” FOR MASAN HIGH-TECH MATERIALS

Voted and awarded by Vietnam Report JSC

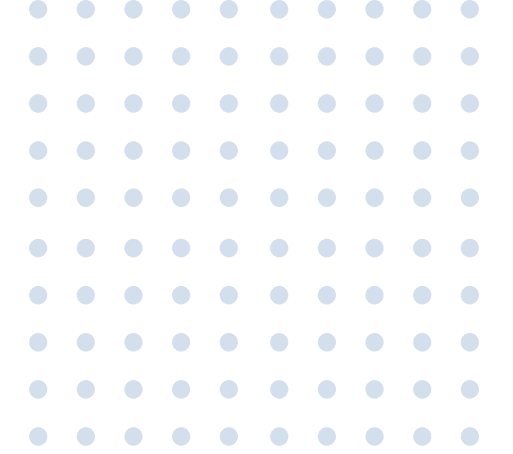
CERTIFICATE OF MERIT FOR NUI PHAO MINING COMPANY FOR “OUSTANDING ACHIEVEMENTS IN SCIENCE AND TECHNOLOGY IN THE PERIOD OF 2016-2020”

Awarded by Thai Nguyen Department of Science and Technology

CERTIFICATE OF “TOP 50 SUSTAINABLE DEVELOPMENT ENTERPRISES IN VIETNAM” FOR MASAN HIGH-TECH MATERIALS

Voted and awarded by the Vietnam Business Council for Sustainable Development - Vietnam Chamber of Commerce and Industry (VBCSD-VCCI).





BUSINESS OPERATION REPORT



Business Overview Report

2020 Business Performance

Management Team Assessment Report

Board of Directors Assessment Report

Supervisory Board's Review of The Company's Operations

Corporate Governance Report

Risk Management

BUSINESS OVERVIEW REPORT

2020 - 2021 Economic & Financial Review and Outlook

Undoubtedly 2020 was a difficult year due to COVID19 and in particular the impacts it had on the price and demand for our main Tungsten products. Whilst we have successfully navigated through the economic difficulties of the last year, MHT is now switching its focus to the future, one it firmly believes will be much brighter.

This optimism is due to a number of factors including but not limited to the development of multiple vaccines that are approved and available globally, a new administration in the US, multiple governments focused on infrastructure and climate change programs, all of which are lifting expectations and leading to a decrease in uncertainty in 2021. Thanks to unprecedented and continuing government and central bank action that commenced in 2020 global activity is recovering across many industries, though many service sector segments remain impacted by a lack of confidence. The initial employment collapse has been partially reversed, though large numbers of people remain underemployed. In most countries and companies much of the economic framework has been maintained, and could regrow quickly, but the situation remains uncertain for vulnerable people, companies, and countries.

Vietnam is one of the few countries after China to record net positive GDP growth. Despite the pandemic, Vietnam grew 2.3 percent in 2020, with the economy forecast to then continue strongly at 6.1 percent in 2021, provided the pandemic is managed globally. Vietnam's resilience is based on its strong economic fundamentals, driven by the country's dual engines for growth: domestic demand and exports, which performed strongly in the second half of 2020. The "fuel" for the engines came in part from the government's early and swift health responses to the virus. External demand sustained exports growth in 2020 (up by 6.5 percent y/y). Because goods imports declined during the year, Vietnam's trade surplus reached an estimated US\$19.1 billion. FDI commitments have continued, reaching almost US\$28.5 albeit a decline of

25% against 2019. The exchange rate was also relatively stable during the year and is expected to slightly improve during 2021.

At the time of writing, the pandemic associated global death toll has risen to 3 million (similar in size to the population of Mongolia), as multiple variants continue to evolve and spread around the world. Many countries are advancing vaccination programs, so it is with some confidence we expect an improved global outlook in 2021 and beyond. Economic activity will continue to improve but with less face-to-face interactions, and border constraint issues will likely be felt for sometime.

The IMF and other international organizations forecast that the global economy will gain momentum over the coming two years, with global GDP at pre-pandemic levels by the end of 2022. After a sharp decline in 2020, global GDP is projected to rise by around 4¼ percent in 2021 and a further 3¼ percent in 2022. China, which started recovering earlier, is projected to grow strongly, accounting for over one-third of world economic growth in 2021. OECD economies will rebound, growing at 3.3% in 2021, but recovering only partially from the deep 2020 recession. The contribution of Europe and North America to global growth will remain smaller than their weight in the world economy.

On the back of the improvement in worldwide economic sentiment and expectation of above average GDP growth, management is confident that demand will return, resulting in significant improvement in volumes and pricing across our suite of products. While our 2021 outlook remains upbeat, it is not without risk. The on-going mutations of the virus highlights the need to remain vigilant as individuals, businesses, and societies, and to be mindful that governments may be forced again to impose snap restrictions on economic activity. In this case the impact on the global economy could be severe.



2020 Industrial Metal & Chemical Markets

Tungsten Index prices continued to recover in the early part of 2020 as the industry emerged from a lengthy destocking phase that began in H2 2018. Market participants had a degree of optimism towards the future, and reasonable demand helped pull the price up to \$235-245/MTU by mid-April. Unfortunately, the Covid-19 imposed lockdowns started to have a significant impact on the major end use markets for tungsten, in particular manufacturing, and as industrial demand slowed to a crawl prices slid to a low of \$205/MTU around end of June. China's rapid recovery from Covid-19 and the easing of lockdowns in the rest of world saw a slight recovery in demand that was enough to lift prices to \$220/MTU by September, and as news broke of vaccine efficacy in October and November a cautious optimism returned to the market. Supply chains remain extremely stressed due to the lack of inventory in the system, and the close of 2020 saw the tungsten market primed for further price increases ending the year at \$230/MTU. The average Index price finished the year down approx. 7% YOY.

Fluorspar Index prices recovered slightly in the first quarter of 2020 thanks to cutbacks in China curbing the overproduction of AlF_3 seen in 2019 and a recovery in demand in ROW. Numbers above \$400/DMT were trading through to early May as the market weathered the Covid-19 crisis better than other metals, with particular strength from Fluorine Chemicals. In H2 Index prices adjusted downwards to \$380/DMT as buyers cut back on spot cargo's and inventories were trimmed, but the overall sentiment remained stable rather than negative. Fluorspar's pricing resilience in 2020 is likely due to an undersupplied market condition under normal trading conditions, the bulk and seasonal nature of the cargo's, and the difficulty and high cost of 'flexing' downstream capacities over a short time frame. Overall the average MHT sales price finished the year down approx. 17% YOY, but is not reflective of real time market conditions.

As the Copper price is so closely linked to global economic health, and a significant proportion of the open interest in the market is speculative, the price took an outsized hit as the Covid-19 crisis emerged and sentiment turned strongly negative. Prices reached a four year low of around \$4,600/MT in March. However, once the initial panic subsided the price began a rally that continued through to the end of the year, with only minor corrections on the way, before ending at \$7,700/MT a seven - year high. This impressive bull run was supported by strong recovery in China's economy, supply side issues due to lockdowns and freight shortages from key producing regions, and massive stimulus programs by global central banks resulting in USD depreciation. The average LME Cash Price finished the year up approx. 2% YOY.

Bismuth continued to suffer from oversupply and lack of demand and remained range bound \$2.45 – 2.55 through until mid-August before rallying modestly to \$2.80 in early September, then closing the year at \$2.85. Overall, the index price finished the year up approximately 1.8% year on year.

METAL AND CHEMICAL PRICES	Unit	Average 2020	Average 2019	% change	At the date of 31.12.20	At the date of 31.12.19
APT European Low*	\$/mtu	222	240	-7%	230	234
Fluorspar Acid-Grade**	\$/t	402	486	-17%	412	425
Copper*	\$/t	6,163	6,021	2%	7,742	6,156
Bismuth Low*	\$/lb	2.85	3.0	-15%	2.9	2.6

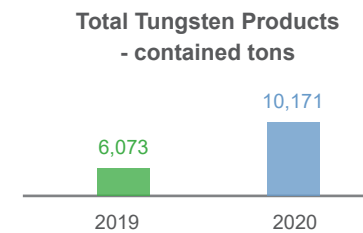
*Metals Bulletin, ** Industrial Minerals

2020 BUSINESS PERFORMANCE

Annual Production

Oxides, Powders, Carbides & Specialty Chemicals

Production of intermediate Tungsten products through Masan Tungsten Company (MTC) and H.C. Starck (HCS) totaled 10,171 tons for the year which is a 67.5% increase over 2019. The additional volume is primarily the result of the consolidation of the HCS business for seven months from June 2020.

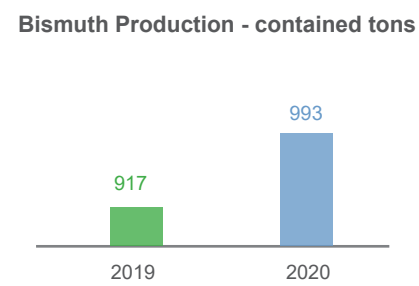
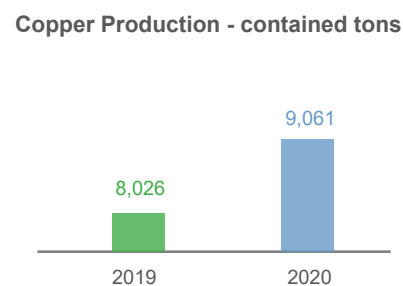
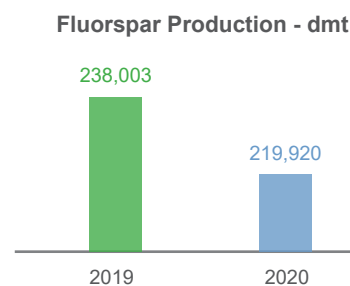


Fluorspar, Copper and Bismuth Cement

Fluorspar production was 8% lower in 2020 as compared to 2019 at 219,920 tons. Production was impacted by lower feed grades and slightly lower recoveries.

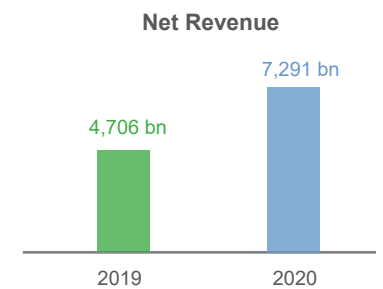
Copper production (contained tons) was significantly higher by 13% at 9,061. Head grades were 15% higher due to an increase in the mined grade for the year which was partially offset by a reduction in recoveries.

Bismuth cement production increased by 15.6% to 1,228 tons following resumption of production after the extended maintenance shutdown that began in 2019.



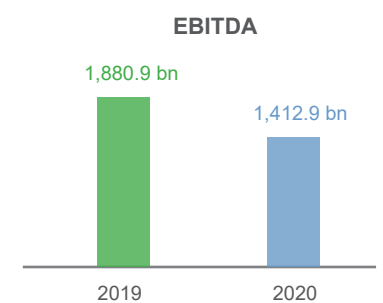
Net Revenue

Net Revenues were up 55% year on year at VND7,291 billion. Tungsten revenues were higher due to the consolidation of HCS (commencing June 2020) but offset by lower realized prices. Copper revenues were up from shipping ~82,000 tons of concentrates for export. Fluorspar revenues were down on the back of lower tons sold and slightly lower realized prices.



EBITDA

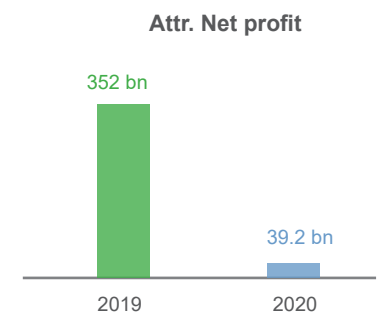
EBITDA decreased by 24% for 12M2020, primarily a reflection of low selling prices realized for tungsten and copper. Tungsten unit costs were broadly in line with 12M2019 despite 6% lower grades and 1% lower recovery, reflecting cost savings that were made during the year. Copper was sold at a loss as the contract was signed in May 2020 based on the average LME price for April following receipt of the export permit from the Government of Vietnam. Management accepted the contract conditions at that time due to the uncertainty that was occurring throughout the world in relation to Covid-19 and was looking to protect itself from further downside pricing risk and was also seeking to lock in the cash flows to support the HCS acquisition that occurred in June. Fluorspar production unit costs were 5% higher as compared to last year on 8% lower feed grades and partially offset by cost savings initiatives undertaken. Copper unit production costs were 13% lower primarily on higher feed grades.



Attributable Net Profit

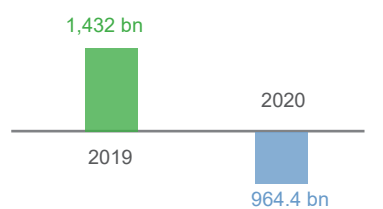
Masan High-Tech Materials delivered an attributable net profit of VND39.2 billion for 2020, a 89% decrease over last year's VND352 billion. Operational losses for the year were offset through negative goodwill being booked into other income as part of the purchase price adjustment ("PPA") exercise relating to the HCS acquisition.

PPA is the practice of revising the asset and liability values of an acquired business to their fair values at the time of acquisition. The PPA exercise revalued the assets for the HCS business by VND4,200 billion and resulted in the creation of negative goodwill impacting other income and net of deferred taxes for the year amounting to VND1,298 billion.



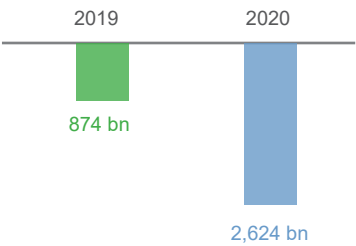
Cash Flows from Operating Activities

The Company reported cash flows from operating activities of VND964 billion, a decrease of VND2,396 billion year on year. The significant reduction in cash flows from operations was due to lower profit before tax, negative working capital movements, higher interest charges and higher income taxes paid. With an improved economic outlook we expect to see a significant improvement in operational cash flows for 2021.



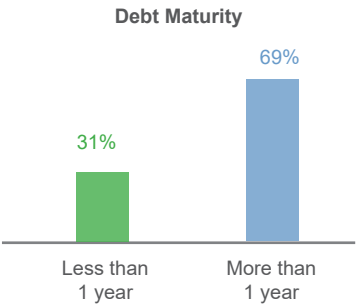
Cash Flows from Investing Activities

In 2020 the company utilized cash flows totaling VND2,624 billion for investing activities. Adjusted for long-term deposits to banks and interest earned from such deposits, the net spending on fixed assets and business combinations totaled VND2,528 billion (2019 VND888 billion), a VND 1,640 billion increase year on year. Capital expenditure in 2020 included VND1,054 billion for the H.C. Starck business acquisition net of cash received as part of the purchase. Additionally, during the year VND851 billion was paid to a Masan Group (MSN) related party for historical settlement of an intercompany loan relating to the construction period of NPMC. Other capital expenditure equal to VND623 billion was for ongoing land compensation, expansionary capital projects focused on improving efficiencies and plant performance and sustaining capital projects primarily related to the tailing’s facility.



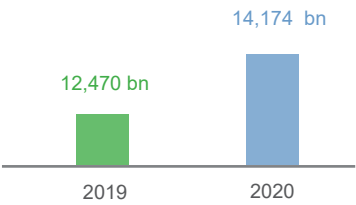
Debt Maturity

Of the Company’s total debt obligations, 31% is maturing within 1 year. The Debt/EBITDA ratio increased from 6.8x in 2019 to 9.3x in 2020 (including treating short term loans to group companies as cash like these ratios would have been 6.2x and 8.5x for 2019 and 2020 respectively), the increase in 2020 was due to a combination of reduced EBITDA and higher borrowings. Following the HCS acquisition management is focusing on improvement in this metric through a combination of improvement to EBITDA and equity capital raisings as evidenced by the recent investment of Mitsubishi Materials Corporation (MMC) into MHT of ~US\$90M for 10% of the share capital.



Net Assets & Owner’s Equity

The net assets/owner’s equity increased 14% year on year to VND14,174 billion in 2020 from VND12,470 billion in 2019. This increase was primarily due to the equity capital raising undertaken with MMC of US\$90M. Owners equity impacted by NPAT and other balance sheet foreign exchange and pension adjustments relating to consolidation of the HCS business.



MANAGEMENT TEAM ASSESSMENT REPORT

Dear Shareholders,

Despite the significant impact of Covid-19, Masan High-Tech Materials Corporation (“Company” or “MHT”) (formerly Masan Resources Corporation) net business revenue for 2020 was VND7,291 bn, a significant increase of VND2,585 bn in comparison with last year, mainly resulting from the acquisition of H.C. Starck Holding (Germany) (“HCS”) in June, 2020.

In October 2020, the Company signed an agreement with Mitsubishi Materials Corporation (“MMC”) to issue 109,915,542 of the Company ordinary shares with the result that MMC now holds 10% of the Company’s equity interest. The proceeds from new shares issuance transactions was used for enhancing financial capability, expanding operation scale and increased competitiveness, helping to form a basis for the sustainable development, safety and efficiency of the Company.

Some highlights that MHT achieved in 2020:

Net revenue increased by 55%

Tungsten equivalent product increased by 68%

Copper production increased by 13%

Tax contributions increased by 21%



We highlighted the significant outcomes delivered in 2020:

OPERATIONS



In Vietnam at our NPMC operation we consolidated our production maintaining similar tungsten, acid grade fluorspar, and copper production and overall recoveries to 2019, Overall, we treated an additional 2.1% of ore mainly due to a 1.3% increase in throughput per hour, and a 1.3% increase in plant availability to 2019. The bismuth flotation and cementation circuits were resumed from August 2020 after an intensive maintenance program to bring them up to mechanical standard.

Across the acquired HCS businesses 2020 production volumes were down 11.2% compared to 2019. In particular consumption of our products servicing the oil, gas, and petrochemical industries suffered from the global downturn. Management has been encouraged during the year by growing market share with key customers in the 3 major sales regions, based on our product quality against competitors' offerings.

Sample submissions in our ChemiLytics analytical business were down 12% year-on-year due to decreased operations of the 3 main customers accounting for 96% of revenue.

WORKFORCE



At the end of 2020 we employed a total of 2010 personnel across our global operations, spanning 7 countries.

In Vietnam, the number of direct employees was 1,403 with foreign experts accounting for 5% of our workforce, decreased by 1% as a result of improved training outcomes and operational efficiencies realized during the pandemic. In Vietnam we conducted 294 training courses, for a total of 3,010,4 training man-hours corresponding to 30,507 working hours and 17,634 attendees. Training was continued by adopting the use of offline and online classes, especially helpful amid the Covid-19 pandemic, helping to meet social distancing requirements.

In Germany 416 personnel were in our HCS Tungsten and ChemiLytics units. Due to the impacts of the pandemic on the customer base in Germany the Goslar site received Worker's Council agreement and Government approval to undertake short-time work in the second half of the year. Short-time work is an established social insurance program in Germany allowing employers to reduce employees' working hours due to temporary decrease in business activity. Despite the difficult conditions, HCS in Goslar was able to employ a total of 17 apprentices in 2020 in order to secure skilled workers in a competitive labor market in the medium to long term. In Canada employee numbers were reduced due to a significant decline in customer sales into the Oil & Gas sector, total employees at year end was 42. Of specific note our operations in China were able to stay fully employed throughout the year due to consistent customer demand and is also a source of pride for our 139 employees. We also employ a further 7 personnel focused on sales in Japan and the US.

In 2021, we will have many challenges to achieve the Company's development targets, with the internal engagement of MHT employees will continue to learn, develop, and participate in creating greater value.

SAFETY



At MHT, we are committed to safe operations, and the safety of our people; both contractors and employees. Foremost of importance is their safety and as such undergoing mandatory safety inductions prior to commencing work activities as well as regular safety inductions through the course of employment. H.C. Starck Tungsten Powders in Germany and in Ganzhou are certified to ISO 45001.

Our results monitor the rates of occupational injuries and incidents that occurred at various sites.

In 2020, the Total Recordable Injuries Frequency Rate and Lost Time Injury Frequency Rate, per million man-hours worked were 0.88 (2019: 0.97) and 0.00 (2019: 0.00) respectively. For our HCS operations the Lost Time Injury Frequency Rate was 12.7 (2019: 10.2). Within this our Canadian operations had a strong improvement with an LTIFR of 0 (2019: 10.1). ChemiLytics recorded an LTIFR of 10.3 (2019: 0) with an accident in October.

ENVIRONMENT



MHT always respects the guideline "environmental protection is the key factor for sustainable development". At NuiPhao processing plant, Masan Tungsten processing plant or HCS's factories in Germany, Canada and China, environmental protection is always closely linked to sustainable business. In 2020, the Company rehabilitated an area of 7ha at the slopes of waste dumps, buffer zones and other disturbed areas of mining and operations by using a variety of plants and materials to increase the efficiency of environmental rehabilitation and restoration works. A total of 17,710 Acacia trees were planted, 338 kg of grass seeds sown, and 18,178 kg of fertilizer used for the new planting and care of planted plants from 2018 and 2019. Since the commencement of the project to the end of 2020, NPMC has rehabilitated a total of 63.85ha, making an important contribution to environmental protection works in the mining activities.

H.C. Starck Tungsten Powders in Germany, Canada and China are certified to ISO 14001 (Environment). Furthermore, H.C. Starck Tungsten GmbH in Germany is certified to ISO 50001 (Energy), fulfilling all requirements of the standards.

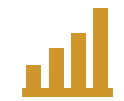
COMMUNITY
RELATIONS



In 2020, MHT has maintained our range of community engagement activities including community development program and economic restoration – ongoing commitment with MHT's pledge to the community, MHT contributed VND2,36 billion into 48 community development projects which directly and indirectly impact approximately 1,100 households, 3,000 people through various interventions such as microlivelihood models in 2020. The year 2020 marked a crucial step in the program of public consultation and information disclosure with 845 visitors from local community and stakeholders with 1,156 information items published with 112 articles. These are our innovatives to foster communications tactics promote a positive image of MHT and promote transparency to all parties. In our HCS operations we published the first edition of the new newsletter "Wir über uns" ("About us"). All newsletters are then translated into key languages in Vietnam to allow for sharing across all MHT operations.

We believe that such community development initiatives can ultimately integrate the role of mining and industry into the broader context of sustainable development and national plans to achieve the Sustainable Development Goals (SDGs).

FINANCE



In order to become sustainable, industry must find ways to ensure its long-term economic benefits. For MHT, our economic strategy is made possible with a stable and long-term business model, underpinned by our successful NPMC and MTC operations – a leading tungsten mine and factories in Vietnam, combined with the successful acquisition and integration of HCS – a global Leader in Tungsten powders and ChemiLytics analytical units into our business. This allows us to reach to the global market. Our role as a leading integrated supplier of high-tech advanced materials critical to global innovation, continues to let us take advantage of the benefits of a secure, long-term and low-cost supply chain solution, giving us a competitive advantage over other industrial product platforms. We have achieved a net revenue of VND7,426 billion over the year 2020, which is an increase of 58% compared to 2019. Accordingly, the Company delivered an attributable net profit of VND151 billion in 2020, which represents a 57% decrease over the same period last year.

BOARD OF DIRECTORS ASSESSMENT REPORT

The Board of Directors (the “BOD”) of Masan High-Tech Materials Corporation (“MHT”) is honored to submit to shareholders the BOD’s Company’s 2020 performance assessment report.

BOD’s Assessment of the Company’s Performance

The BOD’s role is to represent shareholders’ interests, and this year we are proud to advise shareholders that while the company’s performance in 2020 was negatively impacted by the global pandemic, the company was still able to deliver positively against all major commitments.

Firstly, to address the largest impact in 2020, the global pandemic. The BOD recognizes the incredible work of the management team, unions, and our employees and contractors across our global business for staying largely covid free in 2020. As a team they enacted the crisis management plans, they modified and implemented revised work practices to keep our people and environment safe, kept our operations running, drove down our cost base, and still achieved a modest profit. This was all done within the context of taking our business global whilst dealing with challenging and constantly changing frameworks provided by local agencies, as well as engaging with a global customer base under incredibly high levels of uncertainty for most of the year. The BOD would like to publicly thank our employees and contractors for their patience, persistence, and unwavering resolve in the face of the pandemic, and to our communities, suppliers, customers, governments and importantly our shareholder for their continued support.

The BOD fundamentally believes the 2020 results demonstrate that the strategy to transform our business from a miner producing commoditized products to a global integrated advanced materials supplier providing unique customer solutions remains the right strategy.

In early June 2020, as the different regions of the world started to move towards individual country-based closures in response to the pandemic, MHT through its subsidiary Masan Tungsten Company, completed the purchase of the tungsten powders business of the H.C. Starck Group GmbH (“HCS”) and the ChemiLytics GmbH analytical services business. At the end of June 2020 at our Annual General Meeting, you, our shareholders voted overwhelmingly to support the change in company name from Masan Resources to Masan High-Tech Materials reflecting our future direction. You also approved the issuance of equity which was issued in September 2020 to Mitsubishi Materials Company at a premium over the then market price of the company’s shares, ratifying the strategy and the value of the MHT Business.

The equity injection into MHT has significantly improved the balance sheet strength of the company to ensure we are well positioned to benefit from the global recovery in future years, while also strengthening our partnership with a key customer.

Although faced with significant difficulties and challenges affecting our 2020 revenues, we achieved a net revenue of VND7,291 billion over the year 2020, which is an increase of 55% compared to 2019. This was significantly positively impacted by the consolidation of the acquired H.C. Starck Tungsten Powders business which was consolidated from June 2020.

MHT continued making a significant tax contribution to both the Vietnamese State budget, and to the local economies surrounding each of our global operations. In Vietnam specifically, MHT has contributed significantly to the state budget and fulfilled its tax obligations and fee payment responsibilities to the state and provincial budget which amounted to VND1,478 billion for the 2020 year, including corporate income tax, personal income tax, royalty tax, etc.

MHT continues applying world-class standards and practices across all our businesses and areas relating to the community, health, environment, sustainability, and safety. Last year MHT’s global environment protection works remained focused on maintaining a “showcase model” in environmental protection for our partners to study and learn in the practices ranging from sustainable mining in Viet Nam through to being global leaders in the producing sustainable tungsten through recycling. In keeping with our commitment to reduce operational emissions we established renewable power contracts for our HCS & ChemiLytics operations in Germany.

In Vietnam, we continue to be publicly recognized for our significant contributions to the community development initiatives and Corporate Social Responsibility in Thai Nguyen province. Specifically, being awarded Top 50 Vietnam The Best, Top 50 Sustainable Development Enterprise in Vietnam (CSI), Top 100 Largest Public Companies in Vietnam, Top 500 Largest Enterprise in Vietnam (VNR500), Top 500 Fastest Growing Enterprise in Vietnam (FAST500).

The BOD has accomplished its duties in reviewing and approving the resolutions on the operation of the Company and its subsidiaries. In 2020, no members of the BOD received any remuneration for their duties as BOD’s members, nor have they incurred any expenses.

BOD’s Assessment of the Company Management Team Performance

The global Management Team continues to manage the Company in a manner deserving the BOD’s and shareholders on-going trust and support. The Chief Executive Officer and other managers fulfilled their duties and functions in 2020, and properly implemented all resolutions from the General Meetings of Shareholders. The appropriate sub-committees that were established in 2016, including the Sustainability Committee and the Risk Committee, have continued to fulfill their obligations in advising and assisting the BOD on matters having remarkable impacts on the Company’s operation and reputation.

BOD Plans and Directions

During the year and following the acquisition of the HCS business in June 2020 the executive management together with a number of other key managers held a global workshop and revised its vision and mission as follows.

Vision: *To be the leading integrated supplier of high-tech advanced materials critical to global innovation.*

Mission: *We aim to be the partner of choice to high-tech industries where our products are a key component in evolving and shaping the future of our world. Through the application of our materials, we will create unparalleled solutions to drive innovation and productivity which will deliver superior outcomes for all our partners and stakeholders.*

The workshop which was held as a series of online workshops due to Covid-19 brought together key managers from across the globe to discuss and debate the collection of businesses we have today and to dream about the future of these businesses. The workshop itself was enlightening in terms of the breadth of capability and intelligence we have amongst the leaders we entrust with our business. In 2020, while we achieved global scale with the H.C. Starck Tungsten Powders acquisition we are still transitioning from a commoditized materials supplier to a customer solutions company. This will take time as we work with our various global customers to position and tailor our products, materials, services, and solutions offerings to best suit their individual business needs. We are seeing strong traction with customers, but it remains an ongoing evolution. Through 2021 and into our future we will continue to invest in leading research, development, and innovation to advance our products and our processes for both our current business and customers but also position ourselves for the future to be a leader in supplying sunrise industries and global innovators their material needs. While 2020 was quiet on the patent front there are a number of advances developed through 2020 which we expect to be patenting in 2021.

The Company will also continue to promote and grow our own role in the circular economy through the adoption of “Reduce, Reuse & Recycle” philosophy; safeguarding the ecosystems of our people, our environment, our stakeholders; and ensuring superior financial results on a long- term sustainable basis. The H.C. Starck acquisition itself in 2020 has provided a significant increase in recycled material production in the overall business portfolio with over 40% of our Tungsten products now coming from recycle streams. We expect to further enhance and grow this aspect of our business over the next few years.

Given the foregoing, the BOD fully supports the Management Team’s efforts to continue to grow the company and deliver on the Vision and Mission, providing superior outcomes for all our partners and stakeholders, including you, our shareholders.

SUPERVISORY BOARD'S REVIEW OF THE COMPANY'S OPERATIONS

Review on the Accounting and Financial Operations of the Company

The Supervisory Board confirms that the financial figures presented in the report of the Board of Directors submitted to the 2020 Annual General Meetings of Shareholders are a fair reflection of the Company's and its subsidiaries' current financial situation.

Key figures of the financial situation as of December 31, 2020:

Part 1: Balance Sheet

	Group		Company	
	31/12/2020	1/1/2020	31/12/2020	1/1/2020
	VND'000	VND'000	VND'000	VND'000
ASSETS				
Current assets	9,756,298,985	7,581,595,985	1,102,056,861	711,706,777
Cash and cash equivalents	761,930,286	1,723,204,606	51,739,750	4,273,418
Short-term financial investments	-	5,900,000	-	-
Accounts receivable – short-term	2,771,124,731	1,735,574,636	1,050,317,111	707,433,359
Inventories	4,880,128,480	3,139,024,753	-	-
Other current assets	1,343,115,488	977,891,990	-	-
Long-term assets	30,352,548,829	22,193,123,896	14,156,476,389	12,454,770,460
Accounts receivable - long-term	1,298,310,451	1,303,868,898	2,000,000,000	3,000,000,000
Fixed assets	23,784,752,467	16,568,909,156	-	-
Long-term work in progress	1,467,480,229	1,694,487,259	-	-
Long-term financial investments	202,627,868	0	12,156,476,389	9,454,770,460
Other long-term assets	3,599,377,814	2,625,858,583	-	-
TOTAL ASSETS	40,108,847,814	29,774,719,881	15,258,533,250	13,166,477,237
RESOURCES				
LIABILITIES	26,029,306,779	17,304,897,615	3,101,408,455	3,068,983,519
Current liabilities	7,508,154,152	11,219,362,163	1,101,408,455	68,983,519
Long-term liabilities	18,521,152,617	6,085,535,452	2,000,000,000	3,000,000,000
EQUITY	14,079,541,035	12,469,822,266	12,157,124,795	10,097,493,718
TOTAL RESOURCES	40,108,847,814	29,774,719,881	15,258,355,250	13,166,477,237

Review on the Company's Business Performance

In 2020, the Supervisory Board did not find any abnormal signs in the Company's business operations. All of business activities were conducted in compliance with the Company's Charter, the Law on Enterprises and other, relevant legal regulations.

Business performance results and accounting figures have been carefully checked to ensure the accuracy and legality of accounting books.

The Company fully observed all current legal regulations required for information disclosure to the stock market.

Figures of business results as of December 31, 2020:

Part 2: Income statement

	Group		Company	
	2020 VND'000	2019 VND'000	2020 VND'000	2019 VND'000
Net operating (loss)/ profit	(1,366,388,336)	129,214,118	1,470,342	658,803,749
Results of other activities	1,270,177,497	336,572,225	501,547	(501,547)
(Loss)/ profit before tax	(96,210,839)	465,786,343	1,971,889	658,302,202
Income tax expense – current	20,654,658	138,562,148	(5,953,260)	6,358,690
Income tax benefits – deferred	(168,656,455)	(25,169,620)	-	-
Net profit after tax	51,790,958	352,393,815	7,925,149	651,943,512
Net profit attributable to:				
Equity holders of the Company	39,195,963	352,393,815	7,925,149	651,943,512
Non-controlling interest	12,594,995	-	-	-

Review on the Governance and Management

a. The Board of Directors:

The Supervisory Board opines that the Board of Directors has fulfilled their management responsibilities in compliance with the Company's Charter, the Resolutions of the General Meetings of Shareholders, the Law on Enterprises and other relevant legal regulations.

The Board of Directors has duly executed all resolutions of the General Meetings of Shareholders in 2020.

The Board of Directors' resolutions were issued in compliance with the legal authority of the Board of Directors and the contents of the resolutions were in compliance with the Company's Charter, the resolutions of the General Meetings of Shareholders, the Law on Enterprises and other relevant legal regulations.

b. The Management Team

The Supervisory Board opines that the Management Team has executed the Company's business operations efficiently and in compliance with the Board of Directors' resolutions.

Conclusions

The Company's operations during the 2020 were in compliance with the Company's Charter, the Law on Enterprises and other, relevant legal regulations, and were based on the Resolutions of the General Meetings of Shareholders and of the Board of Directors.

CORPORATE GOVERNANCE REPORT

Activities of the General Meeting of Shareholders

Information on meetings and resolutions of the General Meeting of Shareholders (including the resolutions of the General Meeting of Shareholders adopted in the form of collection of written opinions):

Resolution No.	204/2020/NQ-ĐHĐCĐ
Date	29/06/2020
Content	i. Approve the Board of Directors' assessment report for 2019; ii. Approve the Supervisory Board's report on the Company's business results and performance results of the Board of Directors and the Chief Executive Officer in 2019; iii. Approve the 2019 Financial Statements of the Company as audited by KPMG Company Limited; iv. Approve the 2020 business plan of the Company on a consolidated basis; v. Approve the selection of KPMG Company Limited as the auditing firm of the Company in 2020; vi. Approve the compensation for members of the Board of Directors and the Supervisory Board in 2020 being VND 0; vii. Approve the transactions between the Company and its related parties. viii. Approve the 2019 dividend distribution plan being no dividend distribution; ix. Approve the plan for new shares issuance of the Company; x. Approve the resignation of Dr. Nguyen Dang Quang from the Board of Directors of the Company and the number of members of the Company's Board of Directors for the remaining duration of the term 2016-2021 being four; xi. Approve the change of the Company's name; xii. Approve the detailed report on the result of dividend distribution to shareholders by mean of shares issuance at the ratio of 10% (as approved by Resolution of the 2019 Annual General Meeting of Shareholders dated 19 April 2019) that the Company completed in December 2019; xiii. Approve the increase of the charter capital of the Company due to the issuance of shares to pay dividend for shareholders according to the issuance plan approved by Resolution of the 2019 Annual General Meeting of Shareholders dated 19 April 2019.
Resolution No.	474/2020/NQ-ĐHĐCĐ
Date	05/11/2020
Content	i. Approve the plan for new shares issuance and plan of using proceeds of the Company; ii. Approve the increase of the Company's charter capital equivalent to the total par value of the number of actually issued shares; iii. Approve the amendment of the Charter to record the new charter capital; iv. Approve the additional securities registration and trading registration for the number of actually issued shares.

The Board of Directors

Information about the members of the Board of Directors (BOD)

No.	Member of the Board of Directors	Position	Day becoming/no longer member of the Board of Directors	Number of attendances	Percentage of attendances	Reasons for absence
1	Mr. Danny Le	Chairman	19/04/2019	12/12	100%	
2	Mr. Nguyen Thieu Nam	First Vice Chairman of the Board of Directors	18/02/2013	12/12	100%	
3	Mr. Nguyen Dang Quang	Member of the Board of Directors	18/02/2013 – 13/12/2019	0/12	0%	Dr. Nguyen Dang Quang submitted his resignation letter to the Board of Directors on December 13, 2019 and was approved at the 2020 Annual General Meeting of Shareholders on 29/06/2020.
4	Mr. Nguyen Van Thang	Member of the Board of Directors	22/4/2016	12/12	100%	
5	Mr. Craig Richard Bradshaw	Member of the Board of Directors	19/4/2019	12/12	100%	

Supervision by the BOD over the Management Team

- At the meetings of the BOD, the CEO reported the operations of the Company and the key operations of the Company's subsidiaries;
- Supervising and directing the implementation of the investment plans of the Company and its subsidiaries;
- Implementing the tasks as delegated under the resolutions of the BOD.

Activities of the Board of Directors' Committees

a. Activities of the Sustainable Committee

- Review and monitor the performance of the Company as it affects matters related to sustainability, the environment, communities and other key stakeholders;
- Review and provide guidance to management on sustainability issues and impacts and the integration of sustainability into Company's business, including innovation, manufacturing and sourcing and operations;
- Review the activities of the Company's community impact initiatives;
- Review and provide recommendations to management on reporting to shareholders and other communities regarding corporate responsibility activities;
- Review and provide guidance to management, and report to the Board regarding the involvement of signification corporate responsibility issues in major business decisions, in order to protect the Company's valuable goodwill, and human and intellectual capital;
- Review and provide recommendations to the Board on any shareholder proposal that relates to the matters overseen by the committee;
- Oversee the management of risks related to sustainability, the environment and the Company's interactions with communities.

b. Activities of the Risk Committee

- Review and discuss with management and the Company's independent auditor the Company's quarterly financial statements;
- Assess compliance with the Company's code of business practices and its code of conduct, and consider and (if appropriate) approve any waiver provided in the codes;
- Review periodically with management and the legal counsel the Company's compliance with laws and regulations, including corporate securities trading policies, legal matters, litigation or any other contingency that could have a significant impact on the Company's financial statements.
- Discuss with the Management Team the Company's policies regarding risk assessment and risk management, and the steps the Management Team has undertaken to monitor and control them.

Resolutions of the Board of Directors

No.	Resolution No.	Date	Content	Percent-age
1	11/2020/NQ-HĐQT	15/01/2020	- Approve changes of the members of the Sustainability Committee of the Company. - Approve changes of the members of the Risk Committee of the Company. - Approve change of the Company's Secretary cum Person in charge of Corporate Governance.	100%
2	72/2020/NQ-HĐQT	27/03/2020	- Approve the proposal to extend the date of the 2020 Annual General Meeting of Shareholders of the Company.	100%
3	182/2020/NQ-HĐQT	17/06/2020	- Approve the convention of the 2020 Annual General Meeting of Shareholders of the Company on 29th June 2020 in Ho Chi Minh city. - Approve the list of matters to be submitted for approval by the 2020 Annual General Meeting of Shareholders of the Company, including: • Approve the Board of Directors' assessment report for 2019; • Approve the Supervisory Board's report on the Company's business results and performance results of the Board of Directors and the Chief Executive Officer in 2019; • Approve the 2019 Financial Statements of the Company as audited by KPMG Company Limited; • Approve the business plan of the Company in 2020; • Approve the selection of KPMG Company Limited as the auditing firm of the Company in 2020; • Approve the compensation for members of the Board of Directors and the Supervisory Board in 2020 being VND 0; • Approve the transactions between the Company and its related parties; • Approve the plan for new shares issuance of the Company; • Approve the resignation of Dr. Nguyen Dang Quang from the Board of Directors of the Company and the number of members of the Company's Board of Directors for the remaining duration of the term 2016-2021 being four; • Approve the other matters as decided by the Chairman of the Board of Directors	100%
4	224/2020/NQ-HĐQT	14/07/2020	- Agree the participation and approve all contents of the policy of centralized cash management of Masan Group Corporation; - Approve the transactions, contracts, agreements and other documents in relation to and in order to implement the Centralized Cash Management Policy.	100%

5	242/2020/NQ-HĐQT	23/07/2020	- Approve the intercompany transactions between the Company with (i) Masan Group Corporation; (ii) Masan Meatlife Corporation and/or its subsidiary companies or affiliated companies; (iii) Masan Horizon Company Limited and/or its subsidiary companies or affiliated companies; (iv) The Sherpa Limited Liability Company and/or its subsidiary companies or affiliated companies; (v) subsidiary companies or affiliated companies of the Company, and (vi) other subsidiary companies or affiliated companies within Masan Group; • Transactions of sale and purchase of goods; • Transactions of transfer of ownership, right of use with respect to trademarks, innovations, technical improvement, copy rights and other intellectual properties whether registered or not; • Transactions of cost sharing; accordingly, the shared costs shall include, without limitations, information technology services cost, management costs, other services fees, and operation costs which are actually incurred, all on an arm-length basis and allocated by agreements among the companies in a transparent, fair and reasonable manner, and in accordance with market practices and compliance with applicable laws; • Transactions of borrowing, loan, sale and purchase of bonds issued by the Company, subsidiary companies, affiliated companies within Masan Group as mentioned in the introduction paragraph of this Article, or bonds issued by other organizations; and • On the basis of optimizing the treasury and finance function of the parties, (i) the transactions of guarantees, pursuant to that any company provides a guarantee for other other companies within Masan Group; and (ii) transactions of pledge or mortgage, pursuant to that any company uses its assets to secure for obligations of other other companies within Masan Group.	100%
6	31/08/2020	28/05/2019	- Approve the re-appointment of Mr. Craig Richard Bradshaw as the CEO of the Company for the term 2020-2025 and the legitimate representative of the account holder at any banks where the Company open payment accounts.	100%
7	423/2020/NQ-HĐQT	21/09/2020	- Approve the grant of a guarantee by the Company for payment obligations of Masan Tungsten Limited Liability Company ("MTC") relating to (i) the Credit Facility Limit provided to MTC by BNPP; and (ii) Foreign Exchange Transactions between BNPP and MTC.	100%
8	427/2020/NQ-HĐQT	24/09/2020	- Approve the collection of written opinions of the Shareholders of the Company in order to approve certain matters under the authority of the General Meeting of Shareholders.	100%
9	463/2020/NQ-HĐQT	26/10/2020	- In relation to the transaction the Company issues to Mitsubishi Materials Corporation ("the Investor") 109,915,542 newly issued ordinary shares of the Company ("the Issuance Transaction"), to approve the grant by the Company of the put option to the Investor, pursuant to which the Investor shall be entitled to require the Company or a third party nominated by the Company, or both, to purchase the shares the Investor subscribes to under the Issuance Transaction; - Approve the transactions contemplated in, and the execution, delivery and performance by the Company of, all agreements, contracts and documents in relation to the Issuance Transaction and the Put Option Transaction, including but not limited to: • The share subscription agreement; • The put option agreement; • Other related agreements, contracts and documents; and • Any amendment, supplement, termination, liquidation or replacement (if any) of the above documents.	100%

10	476/2020/NQ-HĐQT	06/11/2020	- Approve the detailed plan for use of proceeds in relation to the plan for issuance of new shares and use of proceeds of the Company as approved in the Resolution of the General Meeting of Shareholders No. 474/2020/NQ-DHĐCĐ dated November 5, 2020, accordingly, the Company issues to Mitsubishi Material Corporation 109,915,542 newly issued ordinary shares (the "Issuance Transaction"); - Approve the number of issuance of the Issuance Transaction to be one time. Approve the anticipated subscription price per share to be VND19,054/share.	100%
11	477/2020/NQ-HĐQT	06/11/2020	- Approve an increase of the capital contribution of the Company in the charter capital of Masan Thai Nguyen Resources Company Limited ("MRTN") in order to increase the charter capital of MRTN to an estimate of VND11,498,770,460,161.	100%
12	516/2020/NQ-HĐQT	26/11/2020	- Approve the increase of the charter capital of the Company up to VND10,991,554,200,000; - Approve the amendment of clause 1 of Article 5 of the Company's Charter equivalent to the new charter capital.	100%
13	521/2020/NQ-HĐQT	27/11/2020	- Adjust the detailed plan for use of proceeds from the Issuance Transactions; - Approve the total amount of 109,915,542 shares issued to Mitsubishi Materials Corporation shall be restricted from transferring within 1 year from the date of completion of the issuance.	100%
14	522/2020/NQ-HĐQT	27/11/2020	- Approve the additional capital contribution by the Company to charter capital of MRTN to increase the charter capital of MRTN to VND12,156,476,389,000 and the amendment of clause 2 of Article 7 of MRTN's Charter after the completion of the additional capital contribution; this content replaces for the corresponding content approved by Resolution No. 477/2020/NQ-HĐQT; - Approve the additional capital contribution by MRTN to charter capital of Thai Nguyen Trading and Investment Company Limited ("TNTI") to increase the charter capital of TNTI to VND 2,158,702,686,000 and the amendment of clause 2 of Article 7 of TNTI's Charter after completion of the additional capital contribution; - Approve the distribution of Profit as provided in Resolution of the Board of Directors of the Company No. 244/2019/NQ-HĐQT to be completed in November or December of 2020.	100%
15	523/2020/NQ-HĐQT	27/11/2020	- Approve the capital contribution of MRTN into Nui Phao Mining Company Limited ("NPM"); - Approve the appointment and authorization to the representatives of the contributed capital of MRTN in NPM.	100%

Supervisory Board

Information about members of Supervisory Board

No.	Member of the Supervisory Board	Position	Day becoming/no longer member of the Supervisory Board	Number of attendances	Percentage of attendances	Reasons for absence
1	Ms. Doan Thi My Duyen	Head of Supervisory Board	30/9/2013	2/2	100%	
2	Mr. Nguyen Quynh Lam	Member of the Supervisory Board	22/4/2016	2/2	100%	
3	Ms. Pham Quynh Nga	Member of the Supervisory Board	20/4/2018	2/2	100%	

Surveillance activities of the Supervisory Board toward the Board of Directors, Management Team and shareholders:

(See Supervisory board's review of the company's operations from page 27).

The coordination among the Supervisory Board with the Board of Directors, Management Team and other managers:

- Attending and providing comments at meetings of the BOD;
- Supervising the implementation of the resolutions of the General Meeting of Shareholders and the BOD passed in 2020;
- Supervising compliance with regulations of the Law on Enterprises, the Law on Securities, the Company Charter, the resolutions of the General Meeting of Shareholders regarding the administration and management of the Company's business activities;
- Reviewing financial statements of 2020.

Other activities of the Supervisory Board (if any): None.

Training on Corporate Governance: None.

Transactions of affiliated person of the company with the Company

Transactions between the company and the affiliated persons or between the company and major shareholders, internal persons and related persons of internal persons:

No.	Name of organization/ individual	Relationship with the Company	Description of transaction	Notes
1	Masan Tungsten Limited Liability Company	Subsidiary	Guarantee for payment obligation of MTC relating to the credit limits between MTC and Vietnam Prosperity Joint-Stock Commercial Bank	
2	Nui Phao Mining Company Limited (NPMC)	Subsidiary	Guarantee for obligations of NPMC relating to the Termination Agreement with 5N Plus Inc and 5N Plus Asia Limited	
3	Nui Phao Mining Company Limited (NPMC)	Subsidiary	Guarantee for obligations of NPMC relating to the Prepayment Agreement with Traxys Europe S.A.	
4	Masan Thai Nguyen Resources Company Limited	Subsidiary	Capital contribution into MRTN with the amount of VND 2,701,705,928,839	

Transaction between internal persons of the Company, related persons of internal persons and the Company's subsidiaries in which the Company takes controlling power:

No.	Person executing transaction	Relationship with the internal person	Name of the subsidiary, company in which the Company takes controlling power	Description of transaction
1	Masan Group Corporation	Related person of the internal person	Nui Phao Mining Company Limited (NPMC)	Loan granted by MSN to NPMC
2	Masan Group Corporation	Related person of the internal person	Nui Phao Mining Company Limited (NPMC)	MSN guarantees for NPMC's bonds issued in May 2020
3	Masan Group Corporation	Related person of the internal person	Nui Phao Mining Company Limited (NPMC)	MSN guarantees for NPMC's bonds issued in July 2020
4	Masan Group Corporation	Related person of the internal person	Masan Tungsten Limited Liability Company	MSN guarantees for the loans by MTC at Standard Charter Bank (Singapore) Limited
5	Masan Group Corporation	Related person of the internal person	Masan Tungsten Limited Liability Company	MSN guarantees for the loans by MTC at BNP Paribas, Ho Chi Minh Branch and BNP Paribas, -Hanoi Branch
6	Masan Group Corporation	Related person of the internal person	Nui Phao Mining Company Limited (NPMC)	Loan granted by NPMC to MSN
7	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	Masan Tungsten Limited Liability Company	Loan granted by NPMC to MTC
8	H.C. Starck GmbH	Related person of the internal person	Masan Tungsten Limited Liability Company	Loan granted by H.C. Starck GmbH to MTC
9	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	Masan Tungsten Limited Liability Company	Capital contribution into MTC
10	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	Masan Tungsten Limited Liability Company	NPMC's sales of TC and HG to MTC
11	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	Masan Tungsten Limited Liability Company	NPMC's income from back-charge to MTC

No.	Person executing transaction	Relationship with the internal person	Name of the subsidiary, company in which the Company takes controlling power	Description of transaction
12	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	Masan Tungsten Limited Liability Company	NPMC's income from land sub-lease to MTC
13	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	H.C. Starck Tungsten GmbH	NPMC's sales of goods (APT/BTO/YTO)
14	Nui Phao Mining Company Limited (NPMC)	Related person of the internal person	H.C. Starck Canada Inc.	NPMC's sales of goods (APT/BTO/YTO)
15	Masan Consumer Corporation	Related person of the internal person	Nui Phao Mining Company Limited	Sales of goods to NPMC
16	Masan Consumer Corporation	Related person of the internal person	Nui Phao Mining Company Limited	Provision of services to NPMC
17	Masan Tungsten Limited Liability Company	Related person of the internal person	Nui Phao Mining Company Limited	MTC's sales of goods (APT/BTO/YTO) to NPMC
18	Masan Tungsten Limited Liability Company	Related person of the internal person	Nui Phao Mining Company Limited	MTC's sales of goods (tools and equipment) to NPMC
19	Masan Tungsten Limited Liability Company	Related person of the internal person	H.C. Starck Tungsten GmbH	MTC's sales of goods (APT/BTO/YTO)
20	Masan Tungsten Limited Liability Company	Related person of the internal person	H.C. Starck Jiangwu Tungsten Specialities (Ganzhou) Co. Ltd.	MTC's sales of goods (APT/BTO/YTO)
21	Masan Tungsten Limited Liability Company	Related person of the internal person	H.C. Starck Tungsten LLC (USA)	MTC's sales of goods (APT/BTO/YTO)
22	Masan Tungsten Limited Liability Company	Related person of the internal person	H.C. Starck Canada Inc.	MTC's sales of goods (APT/BTO/YTO)

Transactions between the Company and other objects

Transactions between the Company and companies that members of the Board of Directors, members of the Supervisory Board, or the CEO of the Company is or was a founding member, members of the Board of Directors, or the CEO of those companies (the "Related persons") in the last three (03) years (as at the time of reporting).

Year	Related person (having transactions with the Company)	Relationship with the Company	Description of transaction
2018	Nui Phao Mining Company Limited (NPMC)	BOD member of the Company is also an MC member of the related person	Business Cooperation Agreement
2018	Masan Tungsten Limited Liability Company	BOD member of the Company is also an MC member of the related person	Business Cooperation Agreement
2019	Masan Tungsten Limited Liability Company	BOD member of the Company is also an MC member of the related person	Guarantee for payment obligations of MTC relating to the credit facility limit and foreign exchange transactions between MTC and at BNP Paribas, Ho Chi Minh Branch and BNP Paribas, Hanoi Branch
2020	Nui Phao Mining Company Limited (NPMC)	BOD member of the Company is also an MC member of the related person	Guarantee for obligations of NPMC relating to the Termination Agreement with 5N Plus Inc and 5N Plus Asia Limited
2020	Nui Phao Mining Company Limited (NPMC)	BOD member of the Company is also an MC member of the related person	Guarantee for obligations of NPMC relating to the Prepayment Agreement with Traxys Europe S.A.
2020	Masan Tungsten Limited Liability Company	BOD member of the Company is also an MC member of the related person	Guarantee for payment obligations of MTC relating to the credit limits between MTC and Vietnam Prosperity Joint-Stock Commercial Bank

Transactions between the Company and the company that the related persons of members of Board of Directors, members of the Supervisory Board, Director (CEO) as a member of Board of Directors, Director (CEO): None.

Other transactions of the Company (if any) that may be beneficial material or immaterial for members of the Board of Directors, members of the Supervisory Board, Director (CEO): None.

SHARE TRANSACTIONS OF INTERNAL PERSONS AND RELATED PERSON OF INTERNAL PERSON

Transactions of internal persons and affiliated persons on shares of the listed company: None

OTHER SIGNIFICANT MATTERS

As for list of affiliated persons and related benefits, please refer to Report on Corporate Governance for 2020 as announced on website of the Company.

RISK MANAGEMENT

MHT RISK MANAGEMENT

MHT seeks to protect its many shareholders through the adoption of prudent risk management practices across all levels and locations of the businesses that it operates.

Active identification and management of both risk and opportunity are central to achieving our strategy and creating long-term value.

At MHT we seek to embed risk management into the critical business activities, functions, processes and systems of our assets through the following mechanisms:

- **Risk assessments**
We regularly identify and assess known, new and emerging risks.
- **Risk controls**
We put controls in place over material risks and periodically assess the effectiveness of those controls. We also ensure that resources are formally allocated to enable these controls.
- **Risk materiality**
We assess the materiality of a risk based on the degree of financial and non-financial impacts, including but not limited to community, health, environment, reputational and legal impacts.

We apply established processes when commencing new activities or making changes to established practices including risk assessments and supporting risk management plans to ensure potential business conduct. Issues related to corruption, statutory compliances, reputational risk, and legal exposures are diligently reported and actioned to ensure business continuity and growth consistent with the long-term vision of the organization.

For information on our principal risks, please refer below.

Principal risks

Robust risk assessment statement

The MHT Board has carried out a robust assessment of MHT’s principal risks, including those that could threaten the business model, future performance, reputation, solvency or liquidity over the next 3-year period.

The Directors believe a three-year period is the appropriate period considering the following reasons;

MHT has an annual budget, a three-year plan, and a longer-term life-of-asset outlook. It is MHT’s public view that while commodity prices will continue to remain volatile, we are optimistic on prices in the short-term. Price and exchange rate volatility results in further variability in plans and budgets. It is currently considered that a three-year period provides the appropriate balance between long-term and short-term performance drivers.

As part of the considerations the assessment considers among other things, commodity price forecasts, sensitivities; the latest funding and liquidity update; the long-dated maturity profile of MHT’s debt and the debt maturing in the next 12 months; the Group-level risk profile and the mitigating actions available should particular risks materialise; the regular Board strategy and discussions which address the range of outcomes under the capital expenditure framework; and the reserve life of MHT’s minerals assets.

In making this year’s statement, the Directors considered the 2020 acquisition and consolidated impacts of H.C. Starck Tungsten & ChemLytics, and the continuing global impacts of covid-19 and its variants. The Directors have also made certain assumptions regarding the alignment of production, capital expenditure and operating expenditure within the three-year plan forecasts and the alignment of prices with the cyclical low-price case used for balance sheet sensitivities. These assumptions will tested once change of control is exercised.

Taking account of these matters, and MHT’s current position and principal risks, the Directors have a reasonable expectation that MHT will be able to continue in operation and meet its liabilities as they fall due.

Risk factors

External risks

Fluctuations in commodity prices (including sustained price shifts) and impacts of ongoing global economic volatility may negatively affect our results, including cash flows and asset values.

The prices we obtain for our minerals, chemicals, powders and carbides are influenced or linked to global commodity markets which have historically been subject to significant volatility. Our policy is to sell our products in a mix of long-term and short-term contracts linked to the prevailing market prices. The diversity provided by our relatively broad portfolio of commodities does not necessarily insulate MHT from the vagaries of price changes. Fluctuations in commodity prices can occur due to price shifts reflecting underlying global economic and geopolitical factors, industry demand, increased supply due to the development of new productive resources or increased production from existing resources, technological change, product substitution and national tariffs. We are particularly exposed to price movements in minerals. For example, a US\$10 per mtu decline in the average APT notation would have an estimated impact on FY2021 profit after taxation of US\$6 million. Volatility in global economic growth, particularly due to the continuing covid-19 pandemic, continuing trade tensions resulting in redirection of trade flows has the potential to adversely affect future demand and prices for our commodities and industrial products. On-going geopolitical uncertainty and market-based protectionism have the potential to inhibit international trade and weigh on business confidence, which may create the risk of further constraints on our ability to trade in certain markets and has the potential to increase price volatility. The impact of sustained price shifts and short-term price volatility, including the effects of the sustained global monetary stimulus by central banks, the continued uncertainty surrounding the details of the United Kingdom’s exit from the European Union, creates the risk that our financial and operating results, including cash flows and asset values, will be materially and adversely affected by short-term or long-term volatility in the prevailing prices of our products.

Our financial results may be negatively affected by exchange rate fluctuations

The geographic diversity of the countries in which our assets are located means that our assets, earnings and cash flows are influenced by a variety of currencies. Fluctuations in the exchange rates of those currencies may have a significant impact on our financial results. The US dollar, Euro and Chinese Yuan are the currencies in which majority of our sales would be denominated, while the currency in which we present our financial performance is Vietnamese dong. Operating costs are influenced by the currencies of those countries where our assets and facilities are located and by those currencies in which the costs of labour, imported equipment and services are determined.

Results impacted by slowing Chinese demand

The Chinese market has been driving global materials demand and pricing over the past decade. A continued slowdown in China’s long-term economic growth and demand could result in further redirection of trade flows resulting in lower prices for our products and materially impact our cash flows and overall results.

Business framework impacted by political, judicial, regulatory and climate change, or alleged compliance issues within the countries in which we operate or assets in which we have an interest could have a negative impact on our business

The degree to which political, judicial and commercial stability exists in the locations in which we are operating around the globe. Risks in the locations in which we have operating assets could include terrorism, civil unrest, judicial activism, regulatory investigation or inquiry, nationalisation, protectionism, renegotiation or nullification of existing contracts, leases, permits or other agreements, imposts, controls or prohibitions on the production or use of certain products, restrictions on repatriation of earnings or capital and changes in laws and policy, as

well as other unforeseeable risks. Risks relating to bribery and corruption, including possible delays or disruption resulting from a refusal to make so-called facilitation payments, may be prevalent in some of the countries where our assets are located. If any of our operating assets are affected by one or more of these risks, it could have a material adverse effect on MHT's overall operating results, financial condition, and prospects.

Our operating assets are based on material long-term investments that are dependent on long-term fiscal stability and could be adversely affected by changes in fiscal legislation, changes in interpretation of fiscal legislation, periodic challenges and disagreements with tax authorities and legal proceedings relating to fiscal matters. The natural resources industry continues to be regarded as a source of tax revenue and can also be adversely affected by broader fiscal measures applying to businesses generally. MHT is currently involved in a number of uncertain tax and royalty matters within Vietnam. For more information, refer to note 31 'Income tax' page 232 in section "Notes to the consolidated financial statement".

Our business is affected by new and evolving government regulations and international standards, such as controls on imports, exports, prices, and greenhouse gas emissions. The nature of the industries in which we operate means many of our activities are highly regulated by laws relating to community, health, environment, and safety impacts. Increasing requirements relating to regulatory, community, health, environment and safety approvals can potentially result in significant delays or interruptions and may adversely affect the economics of new development, the expansion of existing assets and operations and the performance of our operating assets. As regulatory standards and expectations are constantly developing, we may be exposed to increased regulation and compliance costs to meet new operating and reporting standards, as well as unforeseen closure and site rehabilitation expenses.

Infrastructure, such as rail, ports, power, and water, is critical to our business operations. The impact of climate change may increase competition for, and the regulation of, limited resources, such as power and water. These factors could materially and adversely affect the expansion of our business and ability of our assets to operate efficiently.

New or evolving regulations and international standards can be difficult to predict, difficult to influence, and complex to understand. Potential compliance costs, litigation expenses, regulatory delays, rehabilitation

expenses and operational impacts and costs arising from government action, court decisions, regulatory change and evolving standards could materially and adversely affect MHT's future results, prospects and our financial condition.

We now conduct our business in a global environment that encompasses multiple jurisdictions and complex regulatory frameworks. Our governance and compliance processes (which include the review of internal controls over financial reporting and specific internal controls in relation to competition, data protection and privacy, offers of anything of value to government officials and representatives of state-owned enterprises and disclosure of state or commercial secrets) may not operate to identify financial misstatements or prevent potential breaches of law, or of accounting or governance practice. Our Codes of Conduct, together with our policies such as the anti-corruption, and competition policies, may not prevent instances of fraudulent behaviour and dishonesty nor guarantee compliance with legal or regulatory requirements. This may lead to regulatory fines, loss of profits, litigation, allegations or investigations by regulatory authorities, loss of operating licences and/or reputational damage.

Business risks

Failure to discover or acquire new resources, maintain reserves or develop new assets could negatively affect our future results and financial condition.

The demand for our products and production from our assets results in existing reserves being depleted over time. As our revenues and profits are derived in part from our minerals, our future results and financial condition are directly related to the success of our exploration and acquisition efforts, and our ability to generate reserves to meet our future production requirements at a competitive cost. Exploration activity occurs adjacent to our established asset. These activities may increase land tenure, infrastructure and related political risks. A failure in our ability to discover or acquire new resources, maintain reserves, maintain our scrap collection supply chain, or develop new assets, or operations in sufficient quantities to maintain or grow the current level of our reserves could negatively affect our future results, financial condition and prospects. Deterioration in commodities pricing may make some existing reserves uneconomic. Our actual exploration drilling activities and future drilling budget will depend on our resource and

reserve inventory size and quality, drilling results, commodity prices, drilling and production costs, lease expirations, land access, roads and other infrastructure constraints, regulatory approvals and other factors.

There are numerous uncertainties inherent in estimating mineral reserves. Geological assumptions about our mineralisation that are valid at the time of estimation may change significantly when new information becomes available. Estimates of reserves that will be recovered, or the cost at which we anticipate reserves will be recovered, are based on uncertain assumptions. The uncertain global financial outlook may affect economic assumptions related to reserve recovery and may require reserve restatements. Changes to reserve estimates could affect our asset carrying values and may also negatively impact our future financial condition and results.



Raw materials at NPMC - Vietnam

Potential changes to our portfolio of assets through merger, acquisition and divestment activity may have a material adverse effect on our future results and financial condition

There are several potential risks associated with acquisitions (or divestments). These include:

- loss of value from a poor investment decision or from a missed investment opportunity;
- adverse market reaction to the basis/timing/terms on which changes are made;
- the imposition of adverse regulatory conditions and obligations;
- commercial objectives not being achieved as expected;
- unforeseen liabilities arising from changes to the portfolio;
- sales revenues and operational performance not meeting our expectations;
- anticipated synergies or cost savings being delayed or not being achieved;
- inability to retain key staff and transaction-related costs being more than anticipated.

These factors are material considerations given our first major offshore transaction in acquiring HCS and could materially and adversely affect our financial condition, reputation, and future results.

Increased costs and schedule delays may adversely affect our capital development projects

Although we dedicate significant time, effort and resources to our project planning, approval and review processes, some of our development projects are highly complex and rely on factors that are outside our control, which may cause us to underestimate the cost or time required to complete a project. For instance, incidents or unexpected conditions encountered during development projects may cause setbacks or cost overruns, required licences, permits or authorisations to build a project may be unobtainable at anticipated costs, or may be obtained only after significant delay and market conditions may change, thereby making a project less profitable than initially projected.

In addition, we may fail to develop and manage projects as effectively as we anticipate due to both foreseeable and unforeseen challenges that may emerge.

Any of these may result in increased capital costs and schedule delays at our development projects and materially and adversely affect anticipated financial returns.



Financial risks

If our liquidity, or cash flow deteriorate significantly, it may adversely affect our ability to fund our major capital programs

We seek to maintain a strong balance sheet. However, fluctuations in commodity prices and ongoing global economic volatility could materially and adversely affect our future cash flows and ability to access capital from financial markets at acceptable pricing. If our key financial ratios and credit ratings are not maintained, our liquidity and cash reserves, interest rate costs on borrowed debt, future access to financial capital markets and the ability to fund current and future major capital projects could be adversely affected.

The commercial counterparties with whom we transact may not meet their obligations, which may negatively affect our results

We contract with many commercial and financial counterparties, including end-customers, suppliers and financial institutions in the context of global financial markets that remain volatile. We maintain a single book approach with commercial counterparties to make sure all credit exposures are quantified and assessed consistently. However, our existing counterparty credit controls may not prevent a material loss due to credit exposure to a major customer segment or financial counterparty. In addition, customers, suppliers or contractors may fail to perform against existing contracts and obligations and could negatively affect our financial condition and results of assets.

Operational risks

Unexpected natural and operational catastrophes may adversely impact our assets, functions or people

We now have production assets in several geographic locations. Our operational processes may be subject to operational accidents, such as fires, gas leaks, road and vehicle incidents, port and shipping incidents, aircraft incidents, open-cut pit wall or tailings/waste storage facility failures, loss of power supply, environmental pollution, mechanical critical equipment failures, and cyber or conventional security attacks on MHT’s infrastructure. If an operational crisis occurs, the failure to provide adequate communications response to our external stakeholders could result in Group-wide reputational damage.

Our minerals asset may also be subject to unexpected natural catastrophes, such as earthquakes, floods and typhoons.

We operate corporate offices and operations globally. A serious natural (pandemic), civil unrest, terror or criminal event in any or all of these locations could have an impact on the services provided to the Group and on our people and the local community.

Based on our risk management and the limited value of external insurance in the natural resource sector, our risk financing (insurance) approach is to purchase external insurance for certain risks, including property damage and business interruption, sabotage and terrorism, marine cargo, construction, primary public liability and employee health benefits. Existing business continuity plans may not provide protection for all the costs that arise from such events, including clean-up costs, litigation and other claims. The impact of these events could lead to disruptions in production, increased costs and loss of facilities. Where external insurance cover is purchased, third party claims arising from these events may exceed the limit of liability of the insurance policies we have in place. Additionally, any uninsured or underinsured losses could have a material adverse effect on our financial position or results of assets.

Information technology and operational technology services are subject to cybersecurity risks and threats that may materially affect our business and reputation

Our strategy of owning and operating, long-life and low-cost assets is underpinned by our ability to become fully integrated and highly automated, from resource to end-use customer and the market. Our business and operational processes are heavily dependent on traditional and emerging technologies to improve safety, lower cost and unlock value.

Increases in the frequency and magnitude of global cyber events pose potential increased risk of sensitive information being compromised, as well as unplanned and/or extended outages to our systems and networks. These events may include (but are not limited to) exploitation of system vulnerabilities, malware, phishing and other sophisticated cyberattacks, and other incidents, for example, due to human error. Such events may result in misappropriation of funds, a negative impact on asset productivity, negative health and safety impacts, environmental damage, poor product quality, loss of intellectual property, disclosure of commercially or personally sensitive information, regulatory fines and/or other costs and reputational damage.

As Masan High-Tech Materials continues successfully realising its growth strategy, its more prominent global profile and increased online presence will likely make a more attractive target for cyber security attack.

Despite our on-going reasonable attempts to protect us from cyber events, we may be vulnerable to targeted and non-targeted cyberattacks. In FY2020, we did not detect any cyber events that led to a significant breach of our business-critical technology environment or a material disclosure of market-sensitive information.

Cost pressures and reduced productivity could negatively impact our operating margins and expansion plans

Cost pressures continue to occur across industry. As the prices for our products are influenced and driven by the global commodity markets, we have limited ability to offset these cost pressures through corresponding price increases, which can adversely affect our operating margins. Although our efforts to reduce costs and several key cost inputs are commodity price-linked, the inability to reduce costs and a timing lag could materially and adversely impact our operating margins for an extended period.

Besides secular rise in the costs, MHT’s earnings could be materially and adversely affected by disruption in supply of key raw materials, reagents and consumables. These could include the unavailability of energy, fuel or water due to various reasons, including fluctuations in climate, inadequate infrastructure capacity, interruptions in supply due to equipment failure or other causes and the inability to extend supply contracts on economic terms.

Broadly, cost and productivity pressures on MHT and our contractors and sub-contractors may increase the risk of industrial action and employment litigation. These factors could lead to increased operating costs at existing assets, interruptions or delays and could negatively impact our operating margins and expansion plans.

Commercial counterparties have their own management and operating standards may take action contrary to our standards or fail to adopt or comply with standards equivalent to MHT’s standards.

Commercial counterparties, such as our suppliers, contractors and customers, may not comply with our internal CHES standards or other standards we apply causing adverse reputational and legal impacts.

Sustainability risks

Community, Health, Environmental and Safety impacts, incidents or accidents may adversely affect our people, assets and reputation or license to operate

We now have production assets in several geographic locations. Our operational processes may be subject to operational accidents, such as fires, gas leaks, road and vehicle incidents, port and shipping incidents, aircraft incidents, open-cut pit wall or tailings/waste storage facility failures, loss of power supply, environmental pollution, mechanical critical equipment failures, and cyber or conventional security attacks on MHT's infrastructure. If an operational crisis occurs, the failure to provide adequate communications response to our external stakeholders could result in Group-wide reputational damage.

Our minerals asset may also be subject to unexpected natural catastrophes, such as earthquakes, floods and typhoons.

Community

Our assets and activities may directly impact communities and risk the potential for adverse impacts on human rights or breaches of other international laws or conventions.

Local communities may become dissatisfied with our operations or oppose our new development projects, including through legal action, leading to potential schedule delay, increased costs and reduced production. Community-related risks may include community protests or civil unrest, adverse human rights impacts, community health and safety complaints and grievances, shareholder activism and civil society activism. In extreme cases the risks may affect viability, adversely impacting our reputation and license to operate.

Climate change

The physical and non-physical impacts of climate change may affect our assets, productivity and the markets in which we sell our products. This includes acute and chronic changes in weather patterns, policy and regulatory change, technological development and market and economic responses. Fossil fuel-related emissions are a significant source of greenhouse gases contributing to climate change. We use fossil fuels in our mining and processing operations either directly or through the purchase of fossil fuel-based utilities and consumables such as electricity, reagents, etc.

Globally most national governments have already introduced, or are contemplating the introduction of, regulatory responses to greenhouse gas emissions, including the extraction and combustion of fossil fuels to address the impacts of climate change. This includes all countries where we have assets including Vietnam, Germany, Canada, China, North America and Japan. In addition, the international community completed a global climate agreement at the 21st Conference of the Parties (COP21) in Paris in December 2015. The absence of regulatory certainty, global policy inconsistencies and the challenges associated in managing our diversified businesses portfolio across a variety of regulatory frameworks have the potential to adversely affect our assets and supply chain. These proposed regulatory mechanisms may adversely affect our assets directly, or indirectly through our suppliers and customers. Assessments of the potential impact of future climate change regulation are uncertain given the wide scope of potential regulatory change in the many countries in which we do business.

The physical effects of climate change on our assets may include changes in rainfall patterns, water shortages, rising sea levels, increased storm intensities and higher temperatures. These effects could materially and adversely affect the financial performance of our assets.

Health

Health risks faced include age, fatigue, musculoskeletal illnesses and occupational exposure to substances or agents, including noise, silica, diesel exhaust particulate, cobalt, nickel and sulphuric acid mist, radiation and mental illness. Longer-term health impacts may arise due to unanticipated workplace exposures or historical exposures of our workforce or communities to hazardous substances. These effects may create future financial compensation obligations, adversely impact our people, reputation, regulatory approvals or licence to operate and affect the way we conduct our assets.

Given the global location of our assets, we could be affected by a public health emergency such as covid-19, influenza, dengue, or other infectious disease outbreaks in any of the regions in which our assets are located. Specifically, the company continues to update enacted response plans to manage the situation at its global operations with regards the Covid-19 pandemic.

Environment

Our assets by their nature have the potential to adversely impact air quality, biodiversity, water resources and related ecosystem services. Changes in scientific understanding of these impacts, regulatory requirements or stakeholder expectations may prevent, delay or reverse project approvals and result in increased costs for mitigation, offsets or compensatory actions.

Environmental incidents, historical and present and future, have the potential to lead to material adverse impacts on our people, communities, assets, reputation or license to operate. These include uncontrolled tailings containment breaches and escape of polluting substances.

We provide for operational closure and site rehabilitation. Our operating mining facilities are required to have closure plans. Changes in regulatory or community expectations may result in the relevant plans not being adequate. This may increase financial provisioning and costs at the affected assets.

Safety

Potential safety events that may have a material adverse impact on our people, assets, reputation or licence to operate include fire, explosion, or rock fall incidents, road incidents involving buses and light vehicles, incidents between light vehicles and mobile mining equipment, shipping or vessel incidents, ground control failures, uncontrolled tailings containment breaches, gas leaks and accidents involving inadequate isolation, working from heights or lifting operations.

Our employees, contractors and third parties may be subjected to safety risks when travelling to and from sites or while onsite at an asset or corporate office.

Governance and compliance

Our processes are mandated and governed by the global standards and supporting strategies and frameworks. A failure to maintain effective global frameworks and associated controls may lead to a major health, safety or environmental incident.

Management of Principal Risks

The scope of our operations and the industries in which we operate and engage mean that a range of factors may impact our results. Principal risks that could negatively affect our results and performance along with our approach to managing and mitigating these risks is outlined below.

External risks	
Principal risk	Risks arise from fluctuations in commodity prices and demand in major markets (in particular China, or the Oil & Gas market) or changes in currency exchange rates and actions by governments, including new regulations and standards, alleged compliance breaches, pandemic, and political events that impact long-term fiscal stability.
Principal mitigation approach	The diversification of our portfolio of commodities, markets, geographies and currencies is a key strategy for reducing the effects of volatility. Section Risk Management describes external factors and trends affecting our results and note "Financial risk management" in section Risk Management outlines MHT's financial risk management strategy, including market, commodity and currency risk. The Risk & Audit Committee oversees these risks as described in sections Risk Management and Principal Risks. We also engage with governments and other key stakeholders to make sure the potential adverse impacts of proposed fiscal, tax, investment, infrastructure access, regulatory changes and evolving local and international standards are understood and, where possible, mitigated. Our Codes of Conduct set out requirements related to working with integrity, including dealings with government officials and third parties. Processes and controls are in place for the internal control over financial reporting. The Legal function oversees our compliance with securities dealing obligations and continuous and periodic disclosure obligations.
Business risks	
Principal risk	Risks include the inherent uncertainty of identifying and proving reserves, adding assets and managing our capital development projects.
Principal mitigation approach	Our use of qualified 3rd parties helps us to manage the technical integrity and provide assurance for our Mineral Resource development and Ore Reserves reporting, along with meeting audit and specialist needs. We have established investment approval and monitoring processes applicable to all investment decisions, including mergers and acquisitions activities. An internal Investment Committee oversees these. Our capital expenditure request framework provides the structure and governance for adding growth options to our portfolio. Our Projects function aims to make sure projects are safe, predictable and competitive.
Financial risks	
Principal risk	Continued volatility in global financial markets may adversely impact future cash flows, our ability to adequately access and source capital from financial markets and our credit rating. Volatility may impact planned expenditures, as well as the ability to recover investments in mining manufacturing projects. In addition, the commercial counterparties (customers, suppliers, contractors and financial institutions) we transact with may, due to adverse market conditions, fail to meet their contractual obligations.
Principal mitigation approach	We seek to maintain a strong balance sheet, supported by our portfolio risk management strategy. As part of this strategy, the diversification of our portfolio reduces overall cash flow volatility. We use regular cash flow analysis to monitor volatilities and key financial ratios. Credit limits and review controls are established for all customers and financial counterparties. The Risk & Audit Committee oversees these, as described in the Finance Report which starts from page 174.

Operational risks

Principal risk	Unexpected natural and operational catastrophes may adversely affect our assets. Information technology and operational technology services are subject to cybersecurity risks and threats that may materially affect our business and reputation. Operating cost pressures and reduced productivity could negatively affect operating margins and expansion plans.
Principal mitigation approach	By applying our risk management processes, we seek to identify catastrophic operational risks and implement the critical controls and performance requirements to maintain control effectiveness. Business continuity plans and crisis and emergency management plans are established to mitigate consequences. Consistent with our risk management approach, we continue to be largely 3rd party insured for losses arising from property damage, business interruption and construction. Given we rely heavily on information technology and operational technology to operate assets, we employ a number of measures to protect, detect and respond to cyber events. A enterprise-wide cyber risk management strategy is evolving to address how we maintain the security of our technology assets that support our operations across the globe. This strategy will include activities to be undertaken, including employee cybersecurity awareness and training, monitoring of our enterprise and operational technology networks, vulnerability identification and remediation activities, secure-by-design architecture and processes for the management of 3rd party technology risks. When incidents occur, they are investigated through root-cause analysis and, as required, follow-up actions are undertaken. The Board receives periodic updates on cyber risk management activities, including relevant information on any significant cyber incidents that have occurred. We aim to maintain adequate operating margins through our strategic objective to position MHT to match our values, capabilities and competitive resources to the evolving needs of markets, to create sustainable long-term value for shareholders and other stakeholders. Our concentrated effort to reduce operating costs and drive productivity improvements has realised tangible results, with a reduction in controllable costs. The capability to sustain productivity improvements is being further enhanced through continued refinements to our operating model. The operating model is being redesigned to deliver a simple and scalable MHT, providing a competitive advantage through defining work, organisational and performance measurements. Defined global business processes, including SAP, will provide an enterprise way of working across MHT. Common processes generate useful data and improve operating discipline. Global sourcing arrangements are being established to ensure continuity of supply and competitive costs for key supply inputs. From an industrial relations perspective, detailed planning was undertaken to support the on-going integration of the HCS business into MHT.

Sustainability risks

Principal risk	CHESS incidents or accidents may adversely affect people or neighbouring communities, assets, reputation and our licence to operate. The potential physical impacts and related responses to climate change may impact the value of MHT, our assets and markets.
Principal mitigation approach	Our approach to sustainability risks is best reflected in our annual Sustainability Report summarized in section 2. The standards set out Group-wide CHESS-related performance requirements designed to support effective management control of these risks. The global CHESS planning process will look to identify gaps in these standards and inform global improvements to the CHESS framework. Our approach to corporate planning, investment decision-making and business management provides a focus on the identification, assessment and management of climate change risks. Through a comprehensive and strategic approach to corporate planning, we use scenarios to assess our portfolio. Our approach to engagement with community stakeholders is also outlined in our annual Sustainability Report. We seek to conduct internal audits to test compliance with our standards and develop action plans to address any gaps. Key findings are reported to senior management and reports are considered by the Board Sustainability committee.



HCS RISK MANAGEMENT

HCS has long been known in the tungsten market as a specialist for specialties in tungsten chemicals, tungsten metal powder and tungsten carbides. In order to be able to react more flexibly to demand and market conditions, a 2-pillar strategy was implemented a few years ago: in addition to customer-specific premium tungsten products, HCS now also offers commodity products in order to be able to sell correspondingly higher volumes on the market and thus achieve a constant utilization of the production facilities.

As part of an annual expert meeting, both the requirements of our stakeholders and the internal and external issues that come into question for our company are determined. For all items, the resulting risks and opportunities are identified and then both the requirements and the topics are assessed. Requirements and topics with a high score are then transferred into corporate objectives as relevant requirements and topics in accordance with the specifications of the integrated management system, and both potential measures and KPIs are defined for them.

The relevant requirements and topics included in the objectives subsequently form the basis for risk management, the definition of objectives and the derivation of measures at the individual sites and in the individual departments of HCS.

In the following, the relevant topics and stakeholders with their requirements as well as the resulting risks / opportunities and measures are presented.

Risk and opportunities resulting from relevant internal and external topics

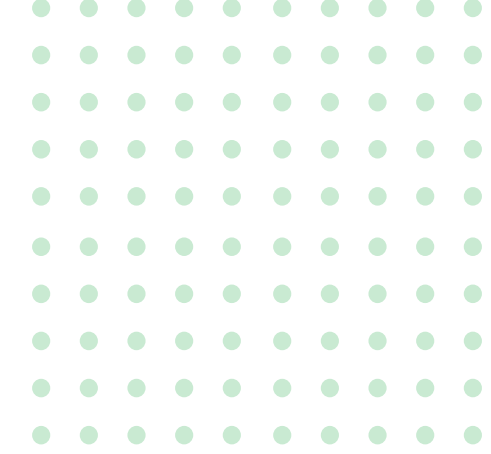
Topics	Issues	Risks (-) and opportunities (+)	Measures
Strategic Risks	Future development of global megatrends like wie miniaturisation, e-mobility, smart grids, additive amanufacturing, regenerative and renewable energies, conservation of resources and recycling, environmental protection and climatic changes	+ Acquire / retain customers + new market areas + image + innovation - loss of market share, customers, if trends are not recognized	Annual Policy Strategy, market monitoring, development projects, cooperations, joint ventures, investments in emerging markets, target valuation
Economic / Competition risks	Image / Public	+ Gaining market share through better or more innovative products + Additional customers / suppliers + fewer problems with neighbours + image + innovation drivers + simpler approval procedures - loss of market share if trends are not recognized / due to insufficient speed in development or implementation - costs (due to delay) - misunderstandings - loss of customers	Market environment analysis, annual strategy planning, strategic raw material protection, goals, diversity of products, research & development Supplier qualification, raw material concepts, RMI-accreditation, RSCM Public relations Efficient processes, innovation, cost advantage through flexible use of raw materials, SCM
Service Performance risks	Customer specifications On time delivery Inquiry management, calculation and assessment of requirements, communication	+ Customer loyalty + higher sales / price increases - high manufacturing costs for narrow specs - stocks	Customer-related processes, regular meetings, SCM, inspection planning, management of specifications, contract review, management organization, service contracts with analytics, logistics, (internal) complaint managementt, process orientated document control management
Security relating to procurement, production, storage and delivery process risks	Plant and product safety Occupational accidents, near misses	+ No production losses + innovation + lower risk of accidents, high safety awareness + image, simpler approval procedures - effort, costs - Loss of production - damage (people, environment)	Standardized management systems, high safety standards, legal conformity, emergency management, reporting of critical incidents, security checks of employees within defined security areas, regulation for the handling of occupational accidents, transparency and communication, accident and safety reports, Trainings and training management , IT security
Production risks	Zero accidents (employees, equipment) Risk-based maintenance Process efficiency Quality / quantity of raw, auxiliary and operating materials Limit values	+ Lessons learned - costs (insurance, personnel, etc.) - loss of production + No unplanned production losses / idle capacity costs + efficient plants / energy savings + cost reduction + planability + Product quality + cost savings (production, equipment) + compliance with specifications - availability / Stocks - damage to installations + image + simpler approval procedures - effort and costs	Preventive maintenance, redundancies, Lean / Six Sigma, business continuity plans (BCP), planing with 85% of capacity, redundancy, maintenance conception and efficient plant management, global SCM Lean management, suggestion improvement system, efficiency programs Supplier assessment (supplier traffic light), purchasing specification, multiple supplier strategy Immission protection, active cooperation with representatives, plant safety

Regulatory and legal risks	Emission trade / climatic change / sustainability Energy costs Customs	+ Innovation drivers (use of renewable energies) + recycling competence + process efficiency - effort and costs - competitive disadvantages	Energy efficiency, management systems Increasing energy efficiency (continuous improvement according to ISO50001:2018), tax advantages for energy-intensive production steps Anti-dumping duties, cooperation in associations
Procurement risks	Delivery reliability Conflict free sourcing, price volatility of raw materials Price volatility of energies	+/- Production reliability + customer loyalty + image + flexibility - single sourcing (security and prices) + Innovations (alternative energies) - production costs - dependence	Central technical procurement, long-term contracts and master agreements where possible, supplier qualification, supplier assessment, avoiding of single-sourcing, consignment stock + magazines, strategic raw materials protection, membership in associations (e.g. TI-CMC, iTSCi, RMI), different raw material sources (scrap, intermediates) Certified management systems (such as ISO 50001), continuous improvement
IT risks	Availability (disrupted access to information and functionality by authorized users) Confidentialty (unauthorized knowledge or disclosure of confidential information)	+Innovation drivers + speed + AI for complex processes + transparency - loss of production (and period) - loss of know-how / loss of data / loss of money - increase in mental stress - work-life balance (constant availability)	Risk assessment according to ISO 27001 as well as hazard catalog basic protection BSI, BSI-standard 100-3), access restrictions, adequacy of IT-systems (IT-landscape, roadmap), redundancies; risk assessment of mental stress; separation of office and production network
Personnel risks	Health risks, addiction, pandemics Motivation and workload, psychological stress Knowledge management Shift/working time models Generation change	- Production / personnel loss + Motivation / effectiveness / efficiency + resilience + creativity - Burn out of staff + Know-how remains in the company + innovation + work safety + quality and speed - loss of know-how + 24/7 production / sales + employee retention + openness for innovations + identification with company - stress on production staff / loss - loss of production	Education, risk assessment, health counselling, vaccination prevention, addiction counselling, health management Health management, risk assessment, assessment of physical workload, work-life balance, reconciliation of family and career, flexible working time models, management cultureKnowledge management (securing know-how), succession planning, recruiting, process management and document control Work-life balance, compatibility of family and career, flexible working time models
R&D risks	Sustainable technology development Projects	+ Market shares, customer acquisition and retention - loss of customers if trends are not recognized / development takes too long	Cooperation with scientific institutions, participation in conferences and expert meetings, strategic planning Application engineering, development with customers on the market, project management, participation in standardisation committees

Risk and opportunities resulting from stakeholder expectations

Stakeholder	Expectations	Risks (-) and opportunities (+)
Customer		+ Customer loyalty + higher sales / price increases - high manufacturing costs for narrow specs - stocks
	Goods according to specification / punctual delivery / flexibility	+ Customer satisfaction and loyalty + market knowledge + differentiation from the competition
	Support / complaint management	- costs + Image
	Sustainability	+ efficiency and costs + innovation / subsidies
	Innovations	+ Progress + differentiation from the competition + customer loyalty + image - undesirable development / costs
Supplier	Planning security	+ Delivery reliability / adherence to delivery dates + planning security - long delivery times / fixed purchase quantities
	Long-term relationships	+ Security of supply + short throughput times (DLZ), faster processing + joint innovations - dependence
Public / politics		+ credibility + simpler approval procedures - time
	Cooperation / transparency / contact persons / information	+ Image + opening of market areas
	Responsible sourcing of raw materials	+ lobbying - security of supply
	Emergency management / reconnaissance	- costs + Grehearsed procedures
	Ethical practice	+ image + risk minimization with regard to environment, people, liability, ...
	Reduction of environmental impact / sustainability / conservation of resources	+ Minimization of the liability risk - plant closure / penalties for non-compliance - overregulation
Capital (Banks, Insurance, Trade associations, Tax authorities, ...)	Preventive measures / precaution	+ Image + Subsidies / Innovation - Costs + Image
	Fast reaction on damage events	+ Low sick leave + minimization of occupational diseases + image + employee retention - costs for measures and implementation + Minimizing the consequences of damage + guarantee of production capability + existing emergency management

Organizations (Net-works, Schools and universities, Trade unions, employers' assocoations)		+ Innovation (new business ideas, development of new products with own materials) + Lobbying + Image - time and money - wrong development / wrong focus + Fair payment + transparency + availability of qualified employees + reliable planning / fixed framework conditions - administrative burden and costs - no influence on collective bargaining +Qualified employees + reduction of the average age (demography) + image + employee retention + knowledge management - headhunters (poaching well-trained employees) - employee structures - expectations
	Innovation projects	
	Compliance with collective agreements	
	Training / jobs	
Management	Corporate development / Securing and expanding the market position	+Long-term strategy + customer loyalty + positive revenue / revenue development +/- growth
Staff		+ Satisfied, motivated employees + image - lack of flexibility + Qualified professionals, + employee retention vs. loss of know-how, + fewer accidents + innovations + image
	Secure jobs / takeover prospects	- costs, time + Satisfied, motivated employees + employee retention + work-life balance
	Qualified education / trained instructors / training and further education	- costs - reduction of the available labour force + Consideration of all interests + control of decisions + avoid rumours - speed and flexibility is lost - disproportionately high administrative expenses
	Fair, collectively agreed remuneration / flexible work-ing time models	+ Employee retention + qualified employees + customer loyalty - envy, targeted troubleshooting (NGOs)
	Information, right to a say	
	Attractiveness / image of the company	



SUSTAINABILITY PERFORMANCE REPORT



- Our Community and Social Development Objectives
- Sustainability Framework
- Sustainability Governance Structure
- Energy Management Committee
- Sustainability Through Innovation
- Sustainability Mining & Raw Materials
- Sustainability Processing
- Sustainability Supply Chain Management
- Sustainability Human Resources
- Sustainability Health & Safety
- Sustainability Environment
- Sustainability Community

OUR COMMUNITY AND SOCIAL DEVELOPMENT OBJECTIVES

Masan High-Tech Materials have found us in a challenging context composed of issues related to the environment and social and governance policies on the one side, and profit making and business viability on the other. We firmly endeavor to integrate sustainability into our development strategy and make sustainability a fundamental part of everyone's daily activities.

This is an integral part of the annual context analysis of H.C. Starck, according to all the standards to which we are certified together with financial aspects. As part of the context analysis, we identify the expectations and needs of our stakeholders and all the issues that are relevant to the company. The relevant aspects become binding commitments for H.C. Starck, for which we identify the risks and opportunities and define measures at both corporate and departmental level, the status of which is regularly reviewed and reported.

To identify relevant sustainability issues and understand how these are linked to our business

To commit to performance targets, monitor and report annually to stakeholders, and feed stakeholder perspectives back into the Company strategy

To address the issues, we define action plans to implement business cases with performance targets



SUSTAINABILITY FRAMEWORK

The sustainability framework makes our approach more effective by enabling us to benchmark our performance and continuously improve our sustainability initiatives.

Our core values govern our approach, meaning that we place equal importance on investor returns, people and community, the environment and sound governance that adheres to our ethics.

Masan High-Tech Materials are committed to compliance with international standards of corporate governance for the sustainable and long-term development of the Company. Therefore, the company and its subsidiaries are all developed in a manner that complies with the local regulatory requirements and World Bank guidelines/policies on social and environmental safeguards, the IFC Sustainability Framework and the Sustainable Development Framework issued by the ICMM for the mining and high-tech materials sector. We do so by integrating these practices into all our business areas towards the highest standards of transparency and consistency.

At H.C. Starck Tungsten Powders, we attach particular importance to the origin of the primary raw materials we use to supplement the secondary materials obtained from cycling. We are members of the ITRI Tin Supply Chain Initiative (iTSCi) and the Responsible Minerals Initiative (RMI) and a founding member of the Tungsten Industry - Conflict Minerals Council (TI-CMC), where we also provide a Director of the Board.

In the MHT-HCS strategy talks the consistency of the goals of the two-pillar strategy with the global focus of the MHT strategy was identified. The two-pillar strategy was therefore confirmed.

We are convinced that our sustainable success is based on a multitude of different factors: Starting with the qualification of our employees, through active health and safety management, economic and ecological efficiency, energy efficiency, product and process quality, to the consideration of ethical and social aspects. These can be summarized in four principles.

As part of our integrated management system, we are therefore committed to the continual improvement of our products and manufacturing processes in terms of quality, energy-related performance, minimization of risks and effects on the environment, safety and health of our employees, customers and the public, and compliance with all binding legal and self-imposed requirements. The resources required for this are provided by the company accordingly.

Principle 1 - Occupational health and safety

We provide a safe working environment for all our employees and workers. In order to maintain this safety continually, we rely on intensive information and training as well as active involvement of our employees. Any kind of safety deficiencies, near misses and accidents at work are analysed in detail and regular risk assessments are carried out in order to eliminate sources of danger early and sustainably. Occupational safety and health protection are important criteria even at the design and procurement stage of new processes and technologies.

Principle 2 - Quality awareness

We commit and develop our employees to quality and cost-conscious action. This enables us to assure our customers the expected or specified quality by using our experience and competence. Since quality is created at the source, we select our suppliers of raw materials, products and services in a targeted manner and develop them further in the sense of a long-term partnership. We continually develop the quality of our processes and products according to the PDCA cycle.

Principle 3 - Environmental protection and energy use

By using appropriate technical and economic processes in development, production and all other accompanying activities, we ensure that the environment and the resources available to us are treated with care. In the conflict-free sourcing of raw materials, the recycling of our products (closed loop) as well as of other tungsten-containing scrap is a priority for us. Furthermore, we are committed to minimizing environmentally harmful effects and specific energy consumption and to avoiding waste. We also pay attention to energy efficiency already in the procurement process. In this way we can offer our customers environmentally friendly products.

Principle 4 - Communication

Communication is the foundation for success and for a trusting co-operation. That is why we promote employee satisfaction through an open culture of discussion and are committed to the consultation and participation of our employees. We inform our stakeholders openly and transparently. We communicate our corporate policy on request. We inform the relevant parties about the goals derived from this and all binding obligations.

Sustainability Goals reflected in MHT Policies and Regulations

At the highest level, policies are designed to define the standards of measurement. Procedures are derived to monitor adherence to the Company’s standards, while indicators enable top management and stakeholder to track our performance transparently. Targets are periodically reviewed and updated to align with our aspirations. Finally, reports are consolidated to present the information to our stakeholders.

Our commitments and initiatives have been demonstrated through the following objectives.

- Operating in a consistent manner in line with leading international practices in all business areas towards transparency and consistency of corporate governance;
- Building and maintaining enduring relationships based on recognition and respect with the stakeholders and contributing to the long-term economic, social and institutional development of our communities;
- Seeking continual improvement in safety, health and environmental performance through robust management systems.

We embed our sustainability framework into all our operations. The sustainability framework is implemented at the employee level by aid of a document which outlines in a clear and transparent way the values employees need to demonstrate in their day-to-day activities. Our policies set out what we believe in and what we promise to achieve in the areas of health and safety, environment, community relations and supply chain management.



Sustainability Goals reflected in HCS Policies and Regulations

We are a global leader in the production of tungsten powders and chemicals. In order to sustain and continuously improve all our processes and functions we focus on the following:

- **Customer Satisfaction:**
We increase customer satisfaction and loyalty by responding:
 - » Flexibly,
 - » In the desired quality (Zero defect strategy) and
 - » Competitively on customer requirements.
- **Occupational Safety:**
Our employees enjoy a working environment in which they:
 - » Stay healthy and
 - » Are actively involved in its improvement.
 - » Embrace a Zero accidents strategy.
- **Employee Satisfaction:**
We promote employee satisfaction through:
 - » A safe working environment
 - » Performance based remuneration
 - » An open culture of conversation
 - » A culture of coexistence
- **Sustainability:**
We commit to work responsibly with the resources at our disposal. For this purpose, we:
 - » Use our recycling expertise, offer our customers a “closed loop” process and buy our raw materials responsibly (Conflict free sourcing)
 - » Increase our process efficiency of energy use and availability of our production equipment through preventive maintenance
 - » Avoid negative environmental impacts and react quickly to emergency situations
 - » Offer our employees flexible working hours, good training and needs based education

- **Competitive Ability:**
We maintain our competitive advantage in the marketplace, on the basis of our Code of Conduct and in compliance with the applicable legal requirements, by:
 - » Demonstrating a high level of security of supply through a “multi-supplier” strategy in which we continuously develop our suppliers
 - » Continuously increasing process efficiency
 - » Innovations in technologies and products.
 - » Maintaining our know-how through active knowledge management
 - » A strong corporate culture
- **IT Safety:**
Availability of systems and data is ensured by negating third party criminal influence. Both personal and company data is handled responsibly
- **Applicable Standards:**
 - » The mentioned ones (MHT Sustainability Report 2019)
 - » ISO standards (ISO 9001, ISO 14001, ISO 45001, ISO 50001)
 - » OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas
 - » Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas
 - » Modern Slavery act
 - » REACH, RoHS

SUSTAINABILITY GOVERNANCE STRUCTURE

Following the success of the activities in 2019, the role and influence of CHES (Community, Health, Environment, Safety & Sustainability) in 2020 have been strengthened in all the areas. The implementation of 3 key measures of CHES: Health and safety for employees, Environmental protection, and Fostering communication transparency with surrounding communities, has been getting positive results, which demonstrates that the program is on the right track to our businesses and contractors.

Towards 2021 in consideration of all business aspects to improve our sustainability governance structure, MHT is committed to:

- Developing the CHES activities to enhance the values of safety and environmental sanitation for their employees and contractors.
- Implementing the CHES policies to undertake commitments and support employees, contractors, customers, business partners and local communities in sharing the responsibilities to meet the related requirements.
- Implementing the control measures towards hazard-free target assessed by local communities and bringing about socio-economic and environmental benefits to the society.

CHES COMMITTEE

Since its establishment in 2018, CHES has been effectively engaged across departments and divisions in the Company and its subsidiaries in order to implement the sustainability initiatives as well as to provide further oversight and strategic guidance.

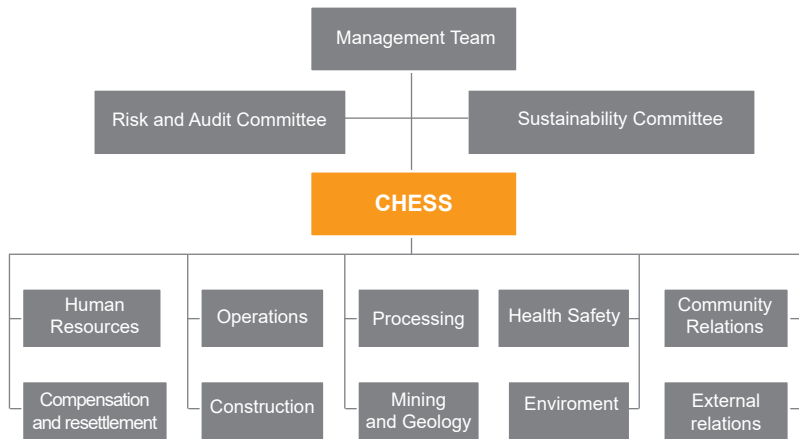
The transfer of 2nd tenure of CHES in August 2020 marked a successful operating cycle and high performance to ensure the health and safety for our people, the environment, and the community. To maintain and promote the achievements, CHES (term 2020-2022) has actively organized the communication activities, monitored and assessed the performance of CHES through periodic meetings (monthly and quarterly) with the participation of the managers of the Company.

2020 is a very difficult and fluctuating year, but each CHES member as a representative of internal departments proactively participated in the movements such as Covid-19 prevention and control; Local community firefighting; HW No. 37 traffic accident emergency response near Nui Phao Mining; Communication activities in the local community and schools, etc.



CHES Committee quarterly meeting

The “Monthly Safety Award” has been rolled out and applied since July 2020. This Award is to recognize employees and contractors’ outstanding contributions, initiatives and typical hazard report to ensure the safety and environmental sanitation at the workplace. This is aligned with the goal of ensuring everyone working at Masan High-Tech Materials returns home safe and healthy every day.



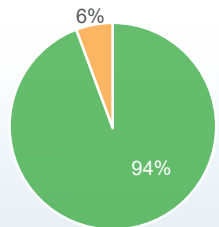
CHES ACTIVITIES

In 2020, the focus was on providing CHES Committee members with various upskilling training courses to enhance their safety capabilities and knowledge to become a representative in their work areas and well understand the CHES requirements, then instruct other co-workers. The main training activities for CHES representatives in 2020 included:

CHES training

No.	Training topic	Attendee	Percentage of attendee (%)
1	CHES Induction	37/37	100%
2	CHES Constitution	37/37	100%
3	Workplace inspection	32/37	86%
4	5S training	37/37	100%
5	Risk assessment	24/37	64%
6	CHES Audit	24/37	64%

A total of 36 issues were raised during the CHES meetings including 34 issues fixed (94%) and 2 ongoing issues (6%).



2021 FOCUS

In 2021, the CHES Committee and its members will continue their personal development and strengthen the engagement activities, including the assessment and voting for notable candidates for “Month Safety Award”. The regular CHES meetings will be maintained as an active employee engagement mechanism enabling the Company to continue delivering on its commitments.

ENERGY MANAGEMENT COMMITTEE

MHT Energy Committee

Energy is currently a key factor, playing an important role in all activities of organizations and businesses. At MHT, the Energy Management Committee was established in 2019 and has brought into full play its operation in 2020 with a specific action plan to use energy economically and efficiently.

In 2020, the Energy Management Committee has issued an energy policy to manage energy effectively and sustainably through the application of science and high technology to production activities. The energy policy reflects the Company's commitment to achieving improvements in energy efficiency, commitment to compliance with legal requirements and other relevant requirements.

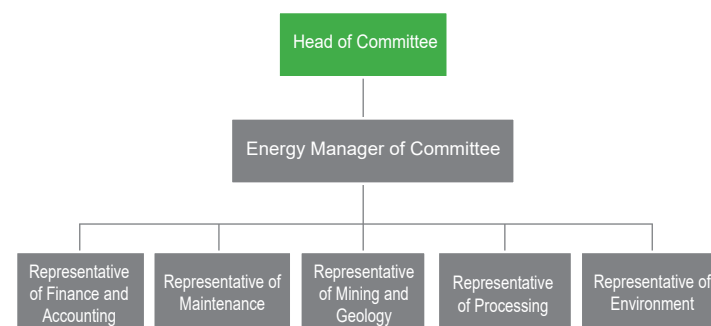
In particular, the Energy Management Committee has established and developed an energy management handbook consisting of 07 steps of effective energy management.

Each department in the Company is responsible for monitoring energy usage in their area and proposing at least 3 initiatives to use energy economically and efficiently. The Energy Management Committee meets on a quarterly to review and select the most optimal solutions to focus on implementation during the year.

By perfecting the energy management system and operating the system in the coming years, we believe that the Company's energy consumption target will be improved and optimized more and more. This not only helps the company save costs, but also use resources responsibly, thus minimizing environmental and social impacts.



Energy Committee quarterly meeting



HCS Energy Committee

The site in Germany is the only one within H.C. Starck Tungsten Powders that is certified to ISO 50001. Since the recertification of the management systems of H.C. Starck Tungsten GmbH in 2020 was the first audit of energy management according to the revised standard ISO 50001:2018, the focus 2020 was on the conversion of energy management.

The aim of the energy management system (EnMS) in accordance with ISO 50001, which we are committed to complying with, is to continuously improve energy performance. As part of the energy management system (EnMS), all facilities and processes were assessed, in particular those with significant energy use (SEUs).

In order to meet the requirements of ISO 50001:2018, an energy team was founded in 2019, headed by the new energy management officer. The SEU's of the company were identified and measures set up. In addition, a total of three employees of H.C. Starck Tungsten GmbH passed their examination to become energy management officers.

The Energy Team is assigned the following responsibilities and authorities:

- Ensure effective implementation, maintenance and improvement of the EnMS.
- Implementing and maintaining action plans that result in continuous improvement of energy-related performance
- establishing criteria and procedures necessary to ensure effective operation and management of the EnMS, such as:
- Promoting awareness of the EnMS and energy goals across divisions
- Delegation of tasks
- Planning energy efficiency projects and monitoring project implementation (schedule, time, cost control).

The energy management system representative with the energy team,

as well as the department heads, are also responsible for the consistent further education and training of all company employees.

Since energy management is teamwork for us, the energy team consists of the energy management system officer as leader and representatives of the following divisions:

- Operations (Technical Services, Production)
- Maintenance
- Process Control Technology
- Engineering
- Procurement
- Technology & Innovation
- Controlling
- Site Management
- Quality Management
- Supply Chain Management
- ITLC

The energy team consists mainly of people who have knowledge of the energy-intensive processes and technologies in our company. Their knowledge is to be used to positively influence energy consumption in our companies in the long term.



SUSTAINABILITY THROUGH INNOVATION

Innovation has long been central to economic growth and social welfare, however, only quite recently it has been recognised by industry leaders and policy makers as the key to making significant improvements in corporate environmental performance and sustainability. Masan High-Tech Materials has understood the importance of innovation in sustainability since its inception and consequently has a well-established platform for cultivating a strong culture of technological innovation.

During 2020, significant contributions towards Masan High-Tech Materials' sustainability goals were made through the activities of the company's dedicated Research and Development centres. Masan High-Tech Materials operates two state-of-the-art research facilities with one located in Germany and the other located in Vietnam. These facilities are focused on technology and innovation across the entire mineral and metal processing chain and recognised as a key pillar in Masan High-Tech Materials' success in the business arena and maintaining long-term sustainability. This commitment to research and innovation not only secures the company's global technological leadership position in minerals and metal processing but also expands it further into new and different areas.

Substantial funding and manhours are dedicated to the support and optimisation of Masan High-Tech Materials' global network of processing facilities with the objective of improving the consistency of product quality and production efficiency. Superior and more precise production processes result in increased product yields, reduced waste, and minimisation of important environmental factors. Consumption of items such as energy, water, reagents, and other auxiliaries can all be reduced and the production of waste and by-product streams minimised, therefore improving the sustainability of the processes being utilised.

Sustainability is also fostered through focusing on new and alternative product development. Special sustainable R&D issues are also shaped within an ongoing dialogue with selected key accounts. We always have an open ear to help our customers to develop - under mutual confidentiality - new and innovative products for the future. By mindful listening to the market we do advanced research and development to accurately adapt the chemical and physical properties of our powders according to given customer needs and requirements: precise degree of purity, functionality and appearance of the powders are most important.

By collaborating with customers, observing global trends and through our own internal research and development activities, new and innovative products for the future are continually being identified and developed. The new products can be tailored to the customers' existing needs or developed specifically to enable new manufacturing techniques or the production of new materials. Consequently these products then also enable Masan High-Tech Materials' customers to become more sustainable through superior production efficiency.

Masan High-Tech Materials' commitment to advanced technological development and innovation is not only demonstrated through the highly efficient and highly automated processing facilities that it operates around the world. But also, through the issuance of over 105 patents for the manufacturing of innovative products. Its Vietnamese MTC production facility has also been granted Hi-Tech Enterprise status by the government of Vietnam.



Lab technicians working for the R&D Centre and Hard Metal Application Laboratory in Ganzhou Plant

Sustainability Through Innovation

To achieve and maintain its focus on research and development, Masan High-Tech Materials utilises the latest in analytical laboratory technology in combination with extensive pilot plants that can mimic all parts of its own and customers manufacturing processes. With the ability to conduct research and development activities for hydrometallurgical, pyrometallurgical and classical physical metallurgical process technologies, these facilities are pivotal in refining and improving our products and processes.

Tungsten is one of the main commodities produced by Masan High-Tech Materials and the Tungsten process chain can roughly be divided into 6 parts:

Mineralogical extraction and concentration of primary tungsten minerals into ore concentrates.	Pyrometallurgical recycling of secondary resources (scrap and industrial wastes) to generate crude Sodium Tungstate (ST)
Hydrometallurgical processing and purification of ore concentrates and crude ST to generate pure Ammonium Paratungstate (APT). From this intermediary product additional Tungsten chemicals (like Tungstic Acid or Ammonium Meta-tungstate) can be produced through additional steps of hydrometallurgical refinement.	Thermal high-temperature treatment of APT to produce Tungsten Oxides, Tungsten Metal and Tungsten Carbide Powders over the whole range of particle sizes and distributions: from nano to ultra-coarse powders.
Reduction of the oxide to tungsten metal powder (WMP)	Carburization to produce WC or WSC from WMP

As can be seen the recycling of tungsten scraps and wastes plays an important part and is one of the foundations of Masan High-Tech Materials sustainability within the industry. This not only enables it to access low-cost tungsten units and prevents these materials being disposed into landfill, but also enables primary resources of tungsten to be preserved.

In this regard, below are some of the research and development activities undertaken by Masan High-Tech Materials during 2020 to increase the effectiveness and efficiency of its current and future recycling capabilities.



Manufacturing Associate completing a sieve setup



INNOVATION

Optimisation of Tungsten Soft Scrap Mixing within The Scrap Recycling Section

One important source of recycled tungsten is called “soft scrap”. This category of scrap consists of a broad spectrum of different soft scrap types and ranges from dry materials such as pre-sintered tungsten carbides and production leftovers, to wet or oily materials such as grinding sludges. The unique parameters of each of the soft scrap types makes them difficult to consistently and efficiency process. The amount of variability inherent with this type of scraps makes it unattractive for most tungsten recyclers, however, the efficient recycling platform in Goslar allows this material to be recycled economically.

To maintain a high degree of input flexibility and to maintain the highest throughput through the soft scrap recycling process a project was undertaken in collaboration with the Goslar engineering and operations departments to develop a new mixing system. A key aspect of this project was to ensure a homogeneous mixture of the different soft scrap components despite their extremely differing densities as well as enabling the direct adjustment of the caloric value of the mixture. Utilising new mixing equipment and via the sophisticated optimisation of both the density and calorific parameters of the soft scrap the project was able to ensure consistent oxidation of the material at high throughputs while minimising the overall energy consumption of the process.



Increased Efficiency in Drill Bit Recycling

Another type of unattractive and difficult to recycle scrap are drill bits which are categorized as hard scraps. These drill bits originate from such activities such as oil and gas exploration and are usually too large to be recycled directly in a pyrometallurgical smelting process. Additionally, with a low tungsten content below 70% they contain more additional metal elements such as Cu, Ni, Fe and Mn in comparison to other widely used hard metal scraps. These additional metal elements can cause unwanted slags in the smelting process and ultimately lead to a reduced capacity.

A project to determine the optimal sized material for the smelting process was undertaken for the Goslar recycling process. The size of this material was specifically tailored according to the unique kinetic requirements for its dissolution during the smelt digestion process. This resulted in a significant reduction in slag generation and an increase of the overall capacity. Furthermore, the flexibility of the drill bit scrap to be processed in combination with other hard scraps also greatly improved.

More Efficient Recycling of Internal By-Product Streams

During the production of Ammonium Paratungstate (APT) a solid by-product is formed that is traditionally recycled back to the start of the production process. Reprocessing of this material incurs additional costs and product losses as well as reducing productivity of the entire circuit.

A research project to evaluate alternative methods to reprocess the by-product was undertaken and resulted in an innovative process alternative for retreating the material which no longer required it to be recycled back to the start of the process. This resulted in a significant reduction in energy and reagent consumptions as well as improved overall metal recovery of the APT process.

Processing of Low-grade Tungsten Containing Tailings

As extraction and processing technologies advance over time it makes the retreatment and recycling of historical low grade tungsten mine tailings a significant opportunity to source additional primary tungsten units in a more sustainable manner.

Masan High-Tech Materials has not only completed extensive test work on its own tailings to evaluate the economic extraction of additional Tungsten units in the future but is also participating in a joint research project investigating the recycling low-grade Tungsten containing tailings in Brazil. Partners in the project include multiple government departments, universities and industry players from both Germany and Brazil.



Overview of MHT waste water treatment plant in Vietnam

Participation in Government Sponsored
Recycling and Sustainability Projects



Masan High-Tech Materials’s prowess in the fields of technology and innovation is well recognised and as such its technical experts are regularly nominated and participate in global initiatives and collaborative work groups focusing on the topics of recycling and sustainability.

The work groups consist of multi-disciplinary teams sourced from industry, scientific institutions, and local authorities. These include groups and organisations such as the European Recycling Industries’ Confederation (EuRIC), the European Raw Materials Alliance (ERMA) and REWIMET whose imperatives are to ensure the availability of raw materials through sustainable recycling. They also focus on topics of emissions reductions through researching the use of rare earth materials in magnetically driven electric motors and energy storage and conversion devices.

Energy Efficiency

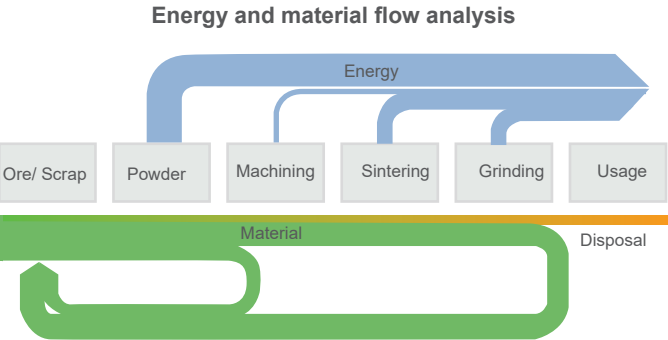
Energy efficiency is also a focus area of Masan High-Tech Materials’ research and development activities. Innovation in this area not only delivers a reduction in the company’s direct and indirect CO₂ emissions but also deliver substantial costs savings to the business. Some of the key areas of innovation in energy efficiency are discussed below:

● Implementation of Membrane Technology in the AMT Production Process

In 2020 R&D continued to attend to support the detailed engineering phase for the implementation of a membrane technology concentration of Ammonium Meta-tungstate (AMT) in production scale. This process was developed by TIG earlier on in 2017 from lab to pilot-scale in close cooperation with an industrial supplier. End of 2018 a substantial investment funding of the German Federal Ministry for the Environment, Nature Conversation and Nuclear Safety (BMU) was granted. Besides debottlenecking of the existing production plant, the introduction of this innovative concentration approach using modern environ-mentally friendly membrane technology allows to significantly reduce the energy consumption within the AMT production line, which corresponds to yearly savings of more than 900 t of CO₂ emissions.

● Participation in Global Energy Reduction Programs

As a responsible corporate citizen, Masan High-Tech Materials, actively engages in government and industry programs to reduce energy consumption across its global footprint. This is not only done at each for its individual operating centres but also in a holistic approach covering the entire life cycle of the materials that it produces.



As part of this activity Masan High-Tech Materials, in combination with other industry leaders, universities and research institutes have jointly proposed a three-year research and development project and applied to participate in a German government sponsored “Innovation for Energy Revolution” program. The project will investigate innovative technology to increase the energy efficiency of the hard metal production process from ore/scrap to finished tools.

Using an annual basis of 4,300t hard metal production in Germany, the ambitious target of the project is to reduce energy consumption by more than 100 GWh/a and to lower the CO₂ footprint by more than 50.000 t/a. To achieve this goal the project will be focused on developing new innovative production processes such as optimized green machining, alternative sintering techniques, and additive manufacturing. It will also be focusing on working with equipment manufacturers to improve the efficiency of significant energy using equipment such as furnaces.

Successfully embracing a culture of technological development and innovation within a company not only requires support from company directors and funding of strategic work programs. It also requires a sustainable supply of intelligent and skilled individuals capable of developing these innovative solutions for not only for the benefit of the company but also the industry and the world. This is recognised by Masan High-Tech Materials and to ensure that it has access to the required talented individuals, it cultivates close relationships and works collaboratively with universities, scientific institutes and local schools in both Vietnam and Germany. This involves establishing joint projects, providing access to company resources, sponsorship of key awards and events and regular tours and site visits to each of our production and research facilities. These activities nurture and support the development of young academics and scientifically interested students into the field of technological innovation therefore ensuring its sustainability into the future.



Innovation plays a major part in achieving and improving the sustainability of a business. Not only does it deliver improvements in environmental practices and performance but also improvements in social welfare and economic growth. Masan High-Tech Materials is very cognisant of this fact and is why it places such a high importance on ensuring the company has a strong culture of innovation.

SUSTAINABLE MINING

Mining in 2020, achieved approximately 5.60M bcm of material mined resulting in slightly over 3.50Mt of mineral ore or 1.12M bcm of ore and 4.48Mbcm of waste for a strip ratio of 4. The Mining & Geology Department (M&G) continues to focus on delivering sustainable mining outcomes by reducing cost, minimize ore loss and dilution, provide fresh ore to the processing and look at opportunities to generate revenue projects that will help reduce cost or increase revenue. In addition to making the pit economically viable, M&G department has an obligation to meet environmental and community compliance standard.

In 2020 M&G has achieved the following results:

- Complete 2020 TSF construction lift to 112mRL for OTC, 133mRL for STC and 109mRL for HSD ahead of time.
- Continuing to receive praise for the professional completion of the TSF by ITRB board.

The TSF construction is to raise the walls of the dam to ensure the tailings deposited in the TSF does not breach the height of the walls, thus ensuring safety for the community living close to our site. The walls act as a safety barrier to hold back tailings material and also help capture water for processing to use. In completing the dam wall ahead of time we are making the dam more stable and secure from the risk of tailings material overflowing into the surrounding areas.



Overview of NPMC tailing dam in Vietnam

Sustainability
Mining & Raw Materials

- Drilling Horizontal holes on 0mRL resulting in 20% water level reduction allowing for stable walls



Day-time mining at the NPMC open pit (Vietnam)

- Able to mine additional ore generating \$1.2M in additional revenue



NPMC open pit at night (Vietnam)

- Northern Waste Dump: The stability of NTW helped minimize impacts to the surrounding community

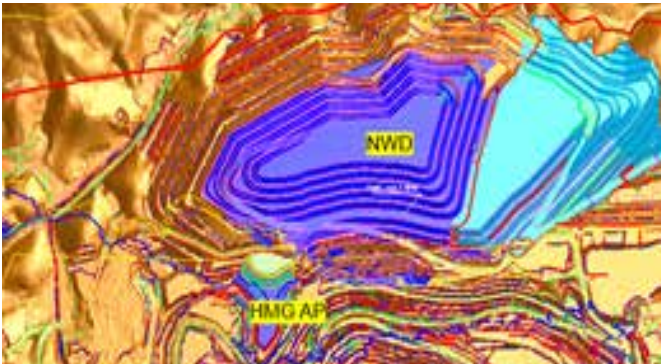
The northern Waste Dump stability is reviewed using prism monitoring. The location of the Northern waste dump is a fair distance from local community buildings. The dump has been designed inside Nui Phao compensated area.

- Categorizing mining waste to reuse and save resources

We have different waste categorization such as 3S, 3O, High Sulfur, Low Sulfur, Soil and Soft Rock. All these different waste rocks are separated and placed in different areas of the mine. For example, 3O is used to build the TSF embankment of OTC and 3S is used to build the upstream embankment of STC. The reason for waste separation is to ensure the potential sulfur impact into the environment is contained to a specific area. There is potential for 3O waste rock to be sold in the future, similar to the soil project.

- Waste dump management plan being developed

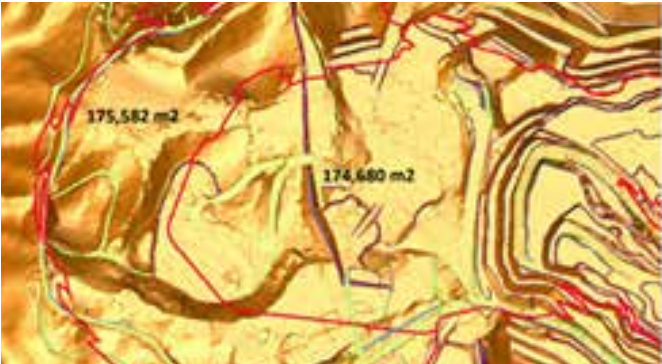
In planning for our future waste placement, we understand the impact of disturbance we have in our mining license, thus developing plans to engage environment and community to support us in preparing the areas to be cleared or compensated ahead of time. The waste dump management plan allows us to have tighter control of our mine sustainability as we have future foresight of the areas that affect land disturbance.



Waste dump map of Nui Phao mine in Vietnam

- Commenced Soil project to sell to local customers to save on mining cost

The Business case contains the volume and estimated savings of more than \$4M USD dollars over two years.



Waste dump map of Nui Phao mine in Vietnam



RAW MATERIALS

H.C. Starck Tungsten Powders’ raw material sourcing is based on two principles: the continuous expansion of recycling activities and a fair, ethical, and environmentally friendly raw material sourcing.

The stringent, globally applicable procurement guidelines detailed in the Responsible Supply Chain Management System (RSCM) guarantee that H.C. Starck Tungsten Powders buys raw materials only from suppliers who comply with strict requirements with regard to environmental protection, occupational safety and social responsibility.

H.C. Starck Tungsten Powders condemns all activities in connection with the unlawful exploitation of mineral resources, no matter where such activities take place. As part of this commitment we have implemented an on-going policy of only purchasing raw materials that are conflict-free and that always meet the requirements of the OECD (relevant version of the “OECD Due Diligence Guidance for Supply Chains of Minerals from Conflict-Affected and High-Risk Areas”), and the “Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas”.

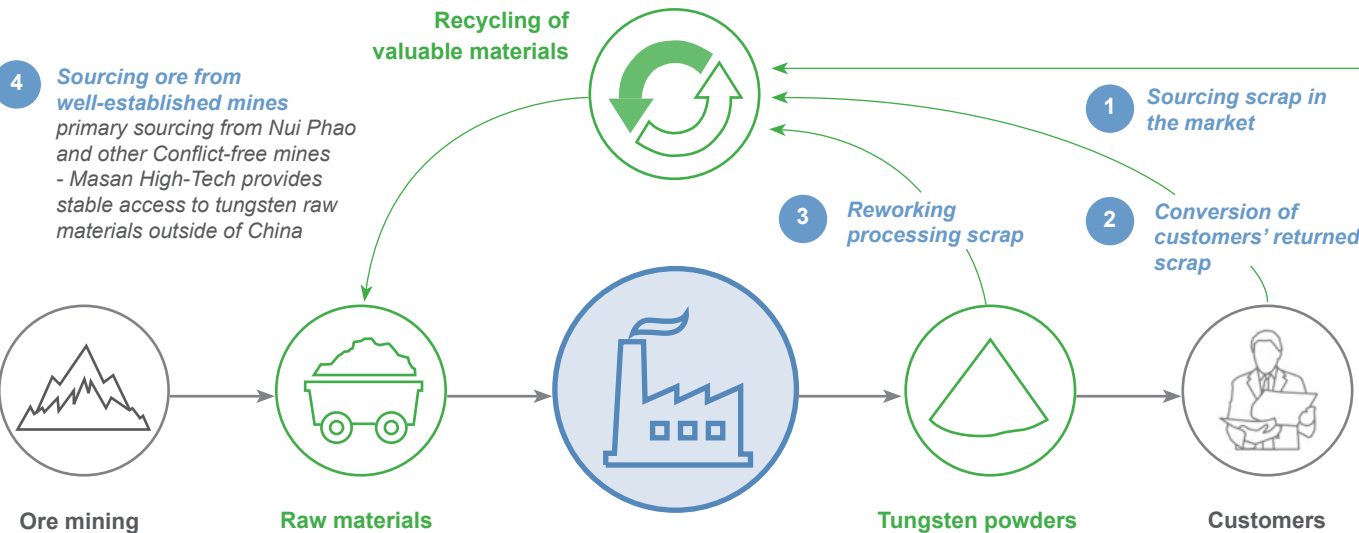
Before starting new business with a supplier, there is a detailed check by the procurement and the legal department to confirm that this potential supplier fulfils all legal requirements and the requirements of the RSCM process. This check is repeated on a regularly basis during the whole time of the business relationship. Also, H.C. Starck Tungsten GmbH has incorporated due diligence requirements into legally binding agreements with direct suppliers. H.C. Starck Tungsten Powders has repeatedly been awarded the certificate for the processing of “conflict-free” Tungsten raw materials. The corresponding evaluation was done by the independent auditors on behalf of the Responsible Minerals Initiative (RMI), a joint effort by the Responsible Business Alliance (RBA) and the Global e-Sustainability Initiative (GeSI).

At the Golsar site, the focus is on the recycling of scrap metal as a raw material, which we obtain both on the free market and from our customers. Intermediates such as APT or tungsten oxides are purchased from MHT. While the plant in Sarnia gets tungsten oxide exclusively from Masan High Tech Materials, the site in Ganzhou is currently supplied by JV Partner in Ganzhou.

The global end-of-life recycling rate of tungsten is approximately 30 % and, thus, belongs to the top third of the recycled metals.^[1] With our highly efficient recycling platform in Goslar we further seek to push this recycling rate. Research efforts in Central Technology & Innovation Global (TIG) Department focused in 2020 therefore also on expanding the currently processable scrap base in terms of flexibility and throughput. For more details, have a closer look at the chapter “Sustainability Through Innovation” in this report.

[1] B. Zeiler, W.-D. Schubert, A. Bartl, Recycling of Tungsten – Current share, economic limitations and future potential, ITIA Newsletter May 2018, International Tungsten Industry Association, 2018.

Backed by decades of experience we are able to recycle almost all our products and compounds after use

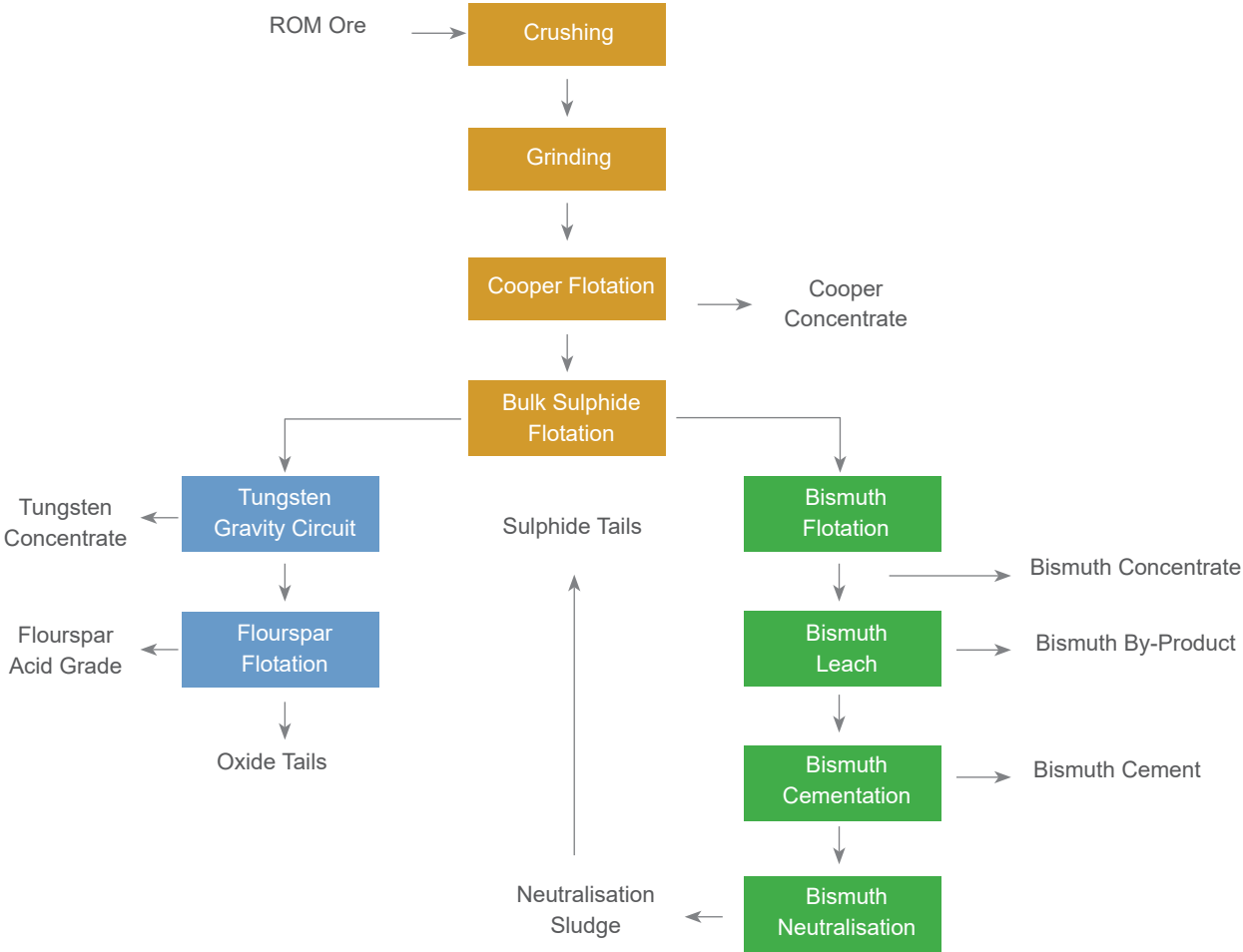


Sustainability Processing

In 2020 with the acquisition of H.C. Starck GmbH's global tungsten business (including production facilities in Europe, Canada and China) the Nui Phao processes (NPMC and MTC) have become a critical part of the global tungsten companies named Masan High-Tech Materials Corporation (MHT). This has allowed the development of a holistic approach to tungsten product development commencing in Vietnam with mining to concentration and then high-end specific tungsten products delivered to the world.

MHT PROCESSING

NPMC Processing Flow Chart



Producing More with Less

The unique challenges that faced the global business markets (and the world at large) allowed for opportunities for identifying solutions to sustainability challenges including processing of previously marginal resources. Difficult times can provide opportunity with utilization of lower grade and technically problematic feed materials to make saleable products. With the increase in High Gravity (HG) recovery the value of this asset was realized by re-purposing downstream equipment assets.

Our mine processes around 3.5 million tonnes of ore per year, containing tungsten, bismuth, fluorspar and small amounts of copper and gold. It is a polymetallic orebody, and given the nature of the minerals, the challenges in our mining operations differ from other mines in the way the ore is presented and processed sequentially.

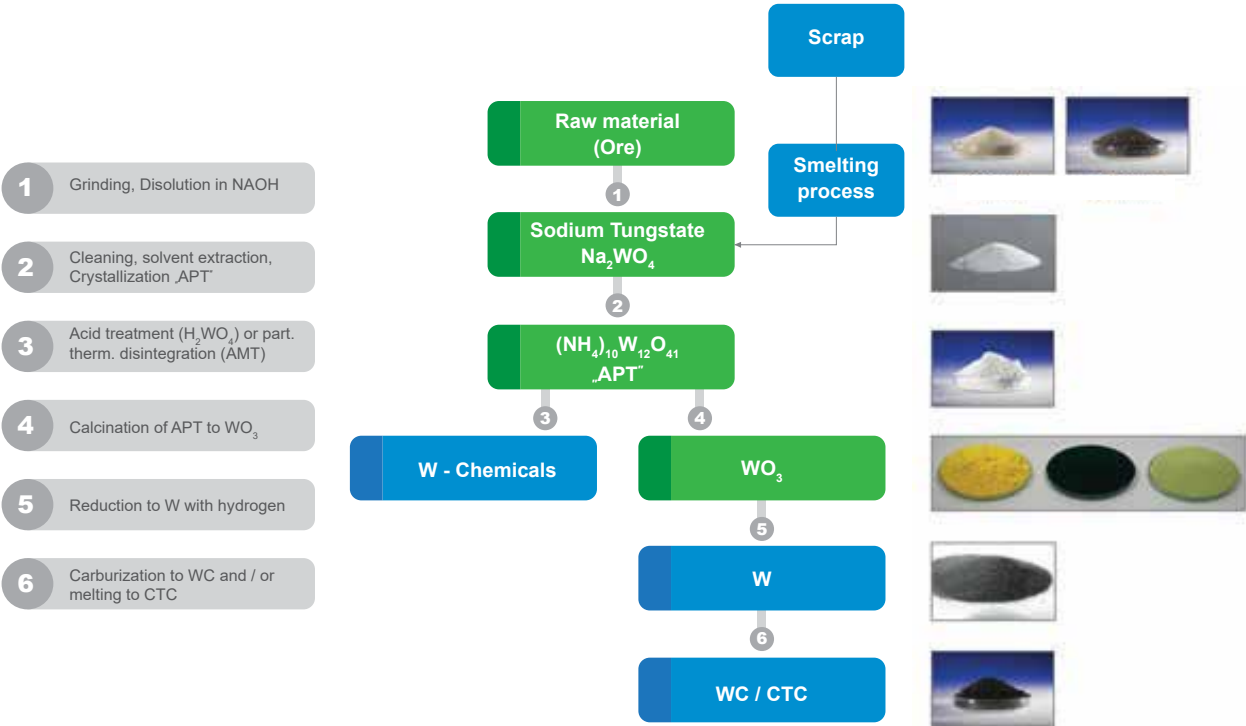
In 2020, Masan High-Tech Materials replicated previous year's high production achievements despite the changing global landscape. This included maintaining similar copper, tungsten and acid grade fluorspar production and recoveries. In addition, the bismuth flotation and cementation circuits were brought back online after an intensive maintenance program to bring it up to mechanical standard to ensure metallurgical performance. Ongoing continuous improvement (CI) strategies across the business units have yielded successes with stabilized production which has in turn enhanced efficiency and metal recovery performance.



95.4%
Actual rate of tungsten recovery
(feed grade 40.2%)

94.4%
target
(feed grade 35.9%)

MTC/HCS Processing Flow Chart



Integration of H.C. Starck Global Tungsten Business

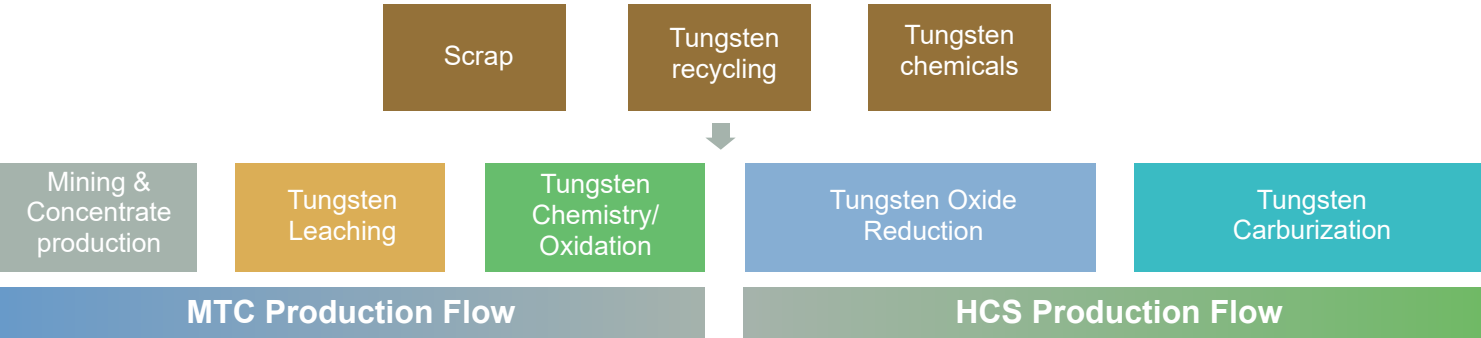
In 2019, Masan Tungsten Limited Liability Company (MTC), a wholly owned subsidiary of MHT, completed the purchase the tungsten business of H.C. Starck Group GmbH. Activities during 2020 involved the first successful stages of the integration of these globally separated business units. Despite the challenges in 2020 associated with international travel there has been much success with identifying technical and business opportunities during the year.

With the purchase of H.C. Starck, MHT is a leading manufacturer of high-tech tungsten metal powders and carbides (midstream tungsten products). Including production hubs in Europe, North America, and China serving customers across the globe. A highly qualified and professional team of experts in R&D, application engineering, coupled with modern automated manufacturing processes ensure its customers benefit from the highest and consistent quality products. MHT have inherited HCS's intellectual properties relating to the manufacture of innovative products such as ultrafine size tungsten compounds.

In addition, MHT is now one of few companies in the world with comprehensive, environmentally sound tungsten scrap recycling platform backed by proprietary intellectual property.

This transaction is a strategic step in executing MHT's vision to become a leading vertically integrated high-tech industrial material platform in the world. Including low cost, stable primary supply of APT combined with dominant recycling scrap platform will provide MHT a global competitive edge.

MHT has become a leading midstream tungsten product supplier across critical industries such as mechanical engineering and tool making, mining, automotive and energy, aviation and the chemical industry.



MTC Processing plant in Vietnam



H.C. Starck Canada – Sarnia plant

Advanced Management Software

At MHT, we are applying advanced processing technology and all processed products are recognized by the Ministry of Industry and Trade as industrial products: tungsten, bismuth, fluorspar and other products. Especially, our MHT is the only enterprise in the mining industry in Vietnam that applies the world's advanced mining and processing management software to minimize resource losses and optimize value of mineral resources by operating the German technology-based tungsten chemical production line.

Committed to R&D Investment

The application of modern technology and advanced production and processing lines at MHT ensures minimization of resource losses and optimisation of the value of natural resources, with a mineral recovery rate of over 96%. Tungsten chemical products such as APT, YTO, BTO are recognized by the Ministry of Industry and Trade as an industrial product with a purity of over 99%.

The mining and metals industry is considered relatively mature from the technological point of view, since its spending on R&D is usually low. In recognition of NHTCM's contribution to Vietnam's development of high-tech industries, Vietnam's Ministry of Science and Technology has awarded the Company with a "High-Tech" Certificate. After the acquisition, Masan Tungsten (MTC) became one of the leading producers and a global supplier of tungsten chemicals (Ammonium Paratungstate ("APT"), Blue Tungsten Oxide ("BTO") and Yellow Tungsten Oxide ("YTO")). In order to reinforce our globally recognized brand and reputation of a trusted supplier, MTC undertook to keep investing into R&D expenditure as per statutory requirements, to maintain our "High-Tech" certification. A well-equipped laboratory was established in late 2017 to carry out the research and innovation activities on the effectiveness, efficiency and new technological solutions for our production lines in both MTC and NPMC.



ChemiLytics R&D expert checking tungsten micro-structure

Examples of Improving the Efficiency of Our Refining Process

In the MTC Solvent Extraction process a solid by-product is made, which accumulates as an Ammonium Paratungstate (APT) sludge in a vessel designed to capture this sludge (BA603/605). According to the original process design, this sludge is removed and recycled back to the start of the APT process by turning into unpurified Sodium Tungstate Solution (STS). In this way, some 270t of APT must be recycled every year, incurring a processing cost.

MTC R&D scientists devised an alternative process for re-treating this sludge, so it can be added directly to the APT product without recycling, by using a chemical treatment with ammonia solution and then washing the sludge. The product from this re-treatment operation can be used as a direct additive to APT being produced without need for additional processing. This results in saving for the company at least 70% of the present cost of re-cycling the material, plus removing the recovery losses with reprocessing.

The change improves the financial performance of MTC, reduces the process energy costs and amount of chemicals used in the process. These changes not only help the business in terms of costs, but also reduce the environmental footprint of the operation. As such, all outcomes from this innovation are positive.



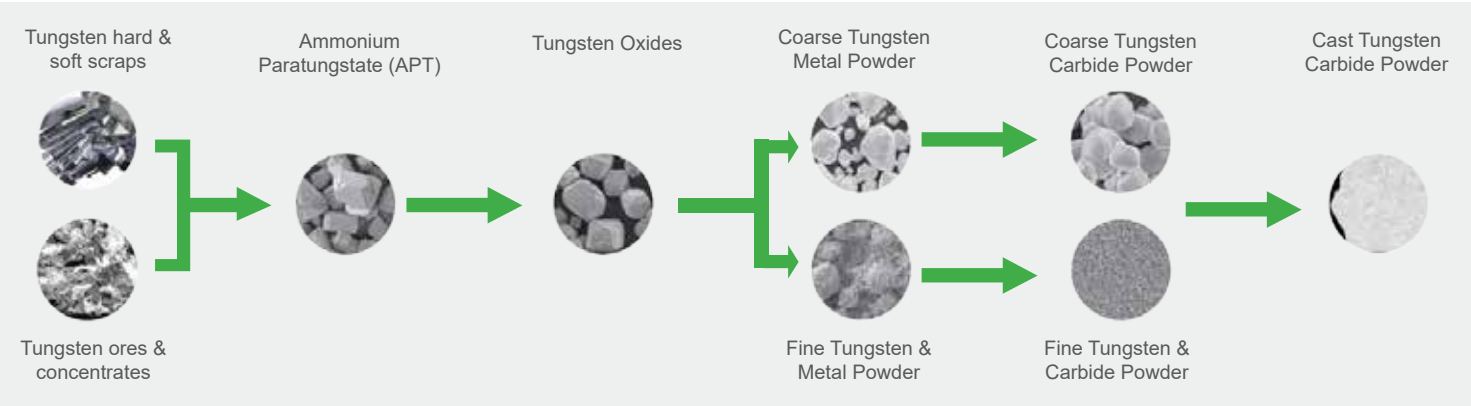
R&D Expert of HCS Technology & Innovation Global checking new tungsten products

HCS PROCESSING

The first step in the chemical process is the generation of sodium tungstate solution from our primary and secondary raw materials to form APT (Ammonium Paratungstate) which is the first intermediate traded in the market. While MTC is starting from ore, H.C. Starck Tungsten produces tungsten products mainly out of secondary raw materials. Using innovative technologies, the recycling facilities are using increasing volumes of post-industrial waste, slags, and scraps by turning them into high quality and high-performance technology metals. Thus recycling enables a secure, long-term raw material supply with stable costs.

Based on APT different production routes can be utilized. Besides the chemicals as Tungsten acid, AMT (Ammonium Meta Tungstate), Sodium Tungstate and yellow or blue Tungsten Oxide the value chain is completed with the production of Tungsten Metal powders with a wide range of well-defined particle sizes and Tungsten Carbide.

Tungsten ores and concentrates only from Masan High-Tech-Materials



Product Application

The tungsten chemicals are used in the chemical end market, e.g. as catalysts in crude oil refining or in the pigment industry.

Tungsten metal powder is suitable for a wide range of heavy metal and mill products used in aviation, the electronic, electrical and medical industry and the application for gas and oil exploration.

Tungsten carbide is the most important tungsten compound in terms of volume. Depending on customer specification, we offer a product range covering nano/ ultrafine powders to very coarse powders. The exceptionally hard and resistant tungsten carbide is the material of choice for production of cutting edge cemented carbides used in tools.



Tungsten Powder

Tungsten Carbide
Tungsten Metal
Tanta & Niobium Carbides

Cast Tungsten Carbide
Tungsten Metal

Tungsten Metal
Tungsten Carbide

Tungsten Chemicals,
incl. APT, AMT, WO₃
H₂WO₄

Typical Applications & Marrkets

● Inserts
● Round tools
● Micro Tools
● Wear parts
● Drilling heads
● Mining tips
Cutting Tools & Wear Parts

● Fixed cutter drill bits
● Roller cone drill bits
● Shaped charges
Oil & Gas Exploration Tools

● Lighting
● Contacts
● Shielding
● Weights
● Sputtering targets
Heavy Metal & Mill Products

Catalysts for:
● Refinery processes
● NOx reduction
● Oxidation
● Hydro generation
Chemical End-Uses

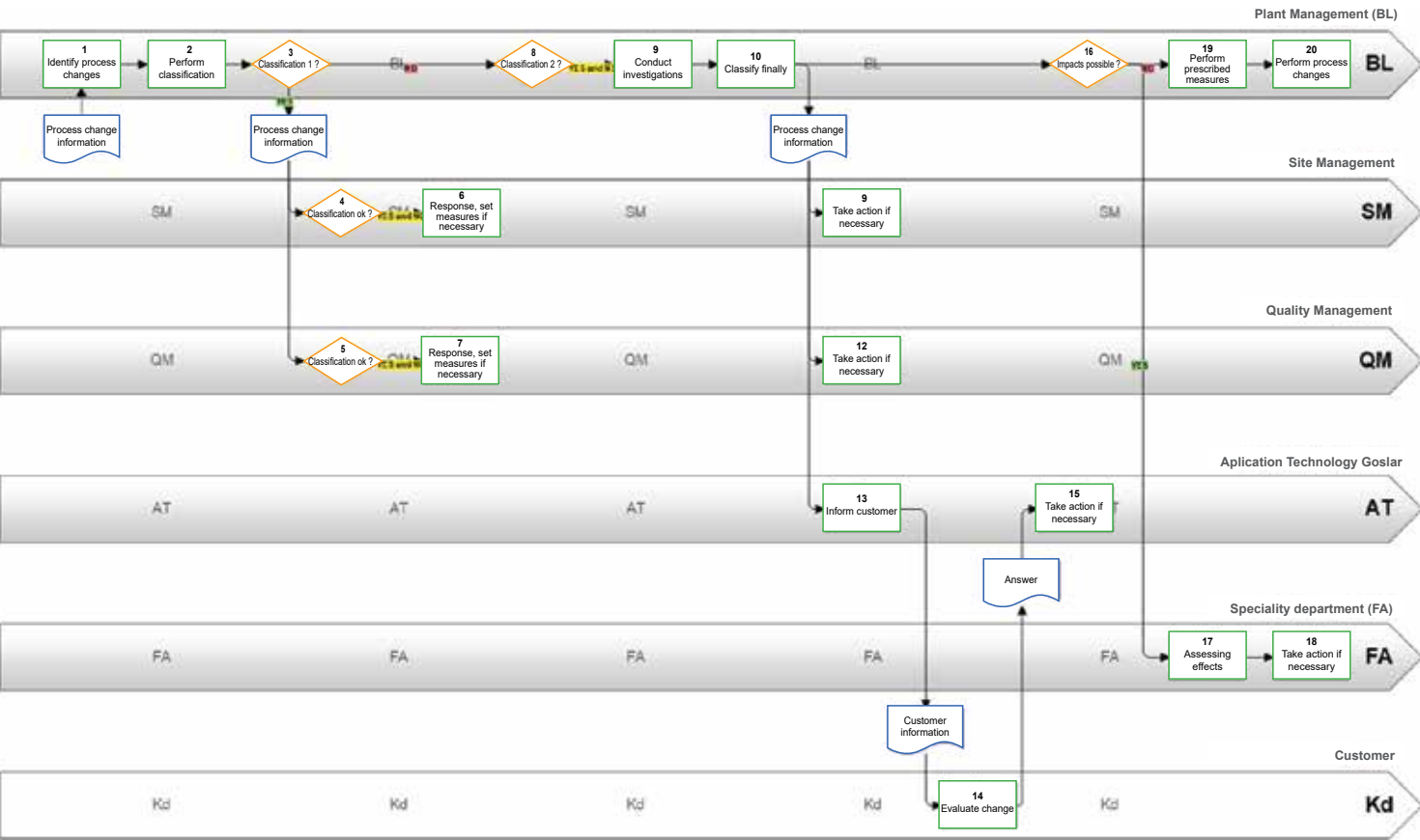
End Industries

Automotive	
Energy	
Aerospace	
Electronics	
Chemical Industry	
Medical Technology	
Other Industries	

New Document Control System

To implement the integrated management system of H.C. Starck Tungsten Powders with its processes and documents efficiently and successfully, a powerful and user-friendly software is required. At the beginning of 2019, the SYCAT IMS software solution was initially introduced in Goslar, and in the course of the year also at the Samia and Ganzhou sites. It is a process-oriented system which meets the requirements of the standards ISO9001, ISO14001, ISO45001 and ISO50001. It is the first system to be implemented at all HCST sites and is a prerequisite for multisite certification. With the tool Sycat MTM (Measures and Tasks Management), all measures resulting from audits, security rounds or complaints are processed and tracked.

Change management



RESEARCH AND DEVELOPMENT (R&D)

In 2020 R&D activities included both targeted pure product research, and dedicated development support for Masan High-Tech Materials' efforts in the area of sustainability.

With continuously high expenditures in the area of technology and innovation over the whole Tungsten related process chain, Masan High-Tech Materials not only secures the technology leadership position in Tungsten processing but also expands it further step-by-step.

More than half of the total budget of the Central Department Technology & Innovation Global (TIG) of H.C. Starck Tungsten GmbH was spent in 2020 for the optimization of processes and support of operational sites worldwide, mainly aiming on further increase of hit rates and on improving the overall production efficiency. Better and more exact processability goes in general along with higher room-time-yields and therefore also with a minimization of environmentally significant and important key figures: fine tuning of the minimization of energy consumption, the reduction of auxiliaries and also by-products (like inorganic process salts, sludges and/or powder dusts) as well as improvements with regard to the processing water balance have to be mentioned here.

Special sustainable R&D issues are also shaped within an ongoing dialogue with selected key accounts. We always have an open ear to help our customers to develop - under mutual confidentiality - new and innovative products for the future. By mindful listening to the market we do advanced research and development to accurately adapt the chemical and physical properties of our powders according to given customer needs and requirements: precise degree of purity, functionality and appearance of the powders are most important.



HCS Technology & Innovation Global - Main Technical R&D Centre
(Goslar, Germany)



HCS Technology & Innovation Global - High Temperature Pilot Plant
(Goslar, Germany)

Besides the very latest laboratory technology, as a global leader on all types of chemicals and powders of the refractory metal Tungsten, TIG maintains also extensive pilot plants, where we are constantly in the process of refining and improving our intermediates, products and processes, particularly under sustainable aspects.

The H.C. Starck Tungsten's research and development activities cover not only all kinds of pyrometallurgical and hydrometallurgical process technologies but also the operation of a state-of-the-art technical thermal R&D center, providing manifold high-temperature furnaces as well as mixing, milling and classifying equipment in lab and pilot scale.

Below some activities of the H.C. Starck Tungsten GmbH in 2020 are high-lighted which strongly foster effectiveness and efficiency of processes as well as quality of produced grades, by moving forward innovative technological solutions.

The Tungsten process chain can roughly be divided into 3 parts, and for all these 3 areas, selected sustainability related projects for TIG are exemplarily described:



Pyrometallurgical recycling of secondary resources (or processing of ore concentrates) to generate crude Sodium Tungstate (ST) solutions.



Hydrometallurgical processing of ST solutions for production of pure Ammonium Paratungstate (APT), and out of this intermediate partly further refining to Tungsten chemicals (like Tungstic Acid or Ammonium Meta-tungstate).



Thermal high-temperature treatments of APT mapping calcination to different Tungsten Oxide qualities and further down streaming to Tungsten Metal and Tungsten Carbide Powders over the whole range of particle sizes and distributions: from nano-powders over ultrafine, fine and medium grades to coarse and ultra-coarse powders.



HCS technician in the Hard Metal Application Laboratory of Ganzhou Plant, working on powder pressings



Pyrometallurgical Recycling

Since at the Goslar production site in Germany clear focus is put on the recycling track three important activities of Central Department TIG can be listed with regard to a sustainable handling of the technology metal Tungsten and the protection of its natural primary deposits:

- New Mixing Device for Tungsten Soft Scraps in the Goslar Smeltery (*)
- Increased Efficiency in Drill Bit Recycling (*)
- Processing of Low-grade Tungsten Containing Tailings (*)

** Details of these activities can be found in Sustainability through Innovation section, Page 66-73.*

Hydrometallurgical Processing

TIG researchers are also joining an external project “ReWoRK” dealing with the recycling of low-low-grade Tungsten containing tailings out of Brazil, which is funded by the Federal Ministry for Education and Research (BMBF) of Germany. Project is led by CUTEC (Environmental Engineering Research Center of Clausthal) as coordinator, other project partners are the Federal Institute for Geoscience and Natural Resources (BGR) of Germany and from brazilian side the mining operator Mineração Tomaz Salustino Mina Brejui, the Federal University of Rio Grande do Norte (UFRN) and the engineering company Equilibrium Engenharia e Meio Ambiente (EEMA). Overall goal is to bring Tungsten units (potential value of about 500 mio USD) from previously unused mining residues in Brazil, deposited since several decades, back into the Tungsten circuit by developing competitive innovative concentration and extraction technologies. Particular H.C. Starck Tungsten task is to perform alkaline digestion experiments of - at CUTEC pre-concentrated – samples in an autoclave system and proof its feedstock performance in the commercial tungsten processing. Unfortunately, because of strict restrictions in travelling for German project partners BGR and CUTEC to Brasilia (due to Covid-19) representative sampling could not be done as originally planned in 2020 and project schedule had to be prolonged.



Thermal Treatments

An important activity in TIG regarding a sustainable value chain is currently in preparation for next year, an extensive file has been applied in October 2020. Background is that the German Federal Ministry of Economics (BMWi) is subsidizing application-oriented research projects, which deal with increasing energy efficiency, decreasing carbon footprint or fostering in general a more sustainable economy within its "7th Energy Research Program of the Federal Government of Germany/Innovation for Energy Revolution". Together with a variety of other tungsten-related German research institutes and industrial partners and under the coordination of the Leibniz University Hannover – Institute for Production Technology and Tooling Machines (IFW), H.C. Starck Tungsten is co-applying for a 3-year funded project to increase the energy efficiency downstreaming the hard metal production from ore/scrap to tool.

The overall target is – assuming a hard metal production of 4300 t/a in Germany - to decrease the energy consumption by more than 100 GWh/a and to lower the CO₂ footprint by more than 50.000 t/a. To reach these ambitious goals, different approaches will be taken by the project consortium in case funding will be approved. Besides lowering energy consumption in the production chain from ore/scrap to WC it is intended by the participating tool manufacturers to develop an optimized green machining and improved sintering methods. The planned tasks for HCST within this project are versatile and range from a more generic efficiency level analysis of the "Significant Energy Users" (SEUs) over corresponding developments in the area of innovative furnace modifications in the tungsten metal powder fabrication. The latter one is done in close cooperation with the Fraunhofer Institute for Ceramic Technologies and Systems (IKTS) as selected project partner with excellent expertise in this field.

Eventually, Central Department TIG is also a participating in the newly formed interdivisional Energy Team, which main task it is to push environmentally important issues into greener directions across all functions of the H.C. Starck GmbH for the site Goslar.

Basic goals

Annual
energy
savings of
site-wide **2** %

Meet the high
standards for an
Energy Management
System according
to the provisions
of the International
Organization for
Standardization (ISO).





The second objective was achieved already in September 2020, when H.C. Starck Tungsten GmbH was certified according to DIN EN ISO 50001:2018 and DIN EN 50003:2016.

Besides the research and development topics shown above closely related to operational business of the H.C. Starck Tungsten GmbH, the TIG Head has been nominated and accepted in September 2020 as technical expert to support the Secretary General of the European Recycling Industries' Confederation (EuRIC) in the work of the European Raw Materials Alliance (ERMA). ERMA kick-off event took place mid of November 2020 (for Covid-19 protection measures via TEAMS). Workstreams and two first clusters, to start with, were defined on European level: one on "Rare Earth Magnets & Motors" and the other one on "Materials for Energy Storage and Conversion".

TIG also participates regularly in events and meetings of the REWIMET e.V., which is a regional network cluster of companies, scientific institutions and local authorities. Its main purpose is to ensure the availability of all kinds of raw materials through recycling. In the REWIMET board H.C. Starck Tungsten is represented by Dr. Hady Seyeda as 2nd Chairman.



Dr. Hady Seyeda - 2nd Chairman of the REWIMET

On behalf of H.C. Starck Tungsten GmbH, Central Department TIG cultivates also a close relationship to cross-regional universities and scientific institutes as well as local schools to foster contacts to young academics, students and scientifically interested pupils. Regrettably, due to Corona Pandemia, originally for 2020 scheduled plant tours through Goslar-site for the Karlsruhe Institute of Technology (KIT) (the research university of the Helmholtz Association) and for the Technical University of Dresden (TUD)/Solid State Chemistry Department – both parts of the German Excellence Initiative - had to be postponed from 2020 to 2021. The same fate suffered to an excursion under the topic "From Ore to Metal" of a science-based secondary school located in Goslar, the "Christian-von-Dohm-Gymnasium" (CvD), which in fact was already fully organized by TIG but then cancelled due to Covid-19 precautionary measures. Therefore, we can only show in this 2020 report a picture from a plant visit (R&D and Operations) in 2019 of the Technical University of Clausthal (TUC) under the roof of the "18th Pupils Preparation Seminar of Clausthal for the Selection Rounds of the 52nd International Chemistry Olympics in Turkey", which was also sponsored by H.C. Starck Tungsten in 2019.



The H.C. Starck Tungsten Award for an outstanding PhD thesis in the area of inorganic chemistry introduced in 2019 is granted on a biennial base by the Section of Solid State Chemistry and Materials Science of German Chemical Society (GDCh).



Award Ceremony at the 2019 GDCh Science Forum in Aachen

SUSTAINABILITY FROM A MAINTENANCE PERSPECTIVE

Masan High-Tech Materials in Vietnam

The organization's maintenance strategy continued to target improvements in overall equipment performance through increased equipment availability, improvements in process automation and optimization of maintenance strategies. A strategy of eliminating machine downtime through improvements in material selection contributed to an ensuing reduction in waste generation. As a result, through a dynamic maintenance management strategy, the operation was able to achieve high overall processing plant availability (95.3%) to support production targets at a significantly lower cost base. In addition to this, initiatives were undertaken to optimize the functionality of the automated process plant control systems to further contribute towards the sustainability of the operation.

The organization's maintenance model is designed to meet current production needs without compromising the longer sustainability. The organization has developed a sustainable programmatic framework to ensure long- term asset sustainability without detracting from other core business objectives. Two, strategic total plant shutdowns were safely executed to maximize equipment mean time between failure and minimize mean time to repair.

One of the challenges faced by the organization includes, maximizing asset life, and reducing both operational and maintenance costs, as well as capital costs. Corrosion management is key to the site's ability to achieve these goals and ensure safe and reliable performance while minimizing expenses. A corrosion management program was developed to further optimize the overall long term life cycle sustainability of the asset. The approach is designed to deliver cost-effective asset management by incorporating corrosion control into the company's existing maintenance management strategy.

A previously implemented organizational structure focused on the reliability engineering function has come to fruition with a targeted focus on equipment performance and failure analysis. The maintenance engineering function has been instrumental in driving a reliability centered model to cost effectively increase the availability of the operating asset. Maintenance management continued to implement employee mentoring programs, succession planning and technical development strategy to bolster the available skill sets within the organization.



MHT Maintenance engineers working on site (Vietnam)

The organization continued its focus on improving the utilization of its automated process control system. Progressive reviews continue to be undertaken to further evolve the site's advanced process control system for the purpose of improving overall processing efficiency. Automated process control contributes significantly to both equipment and process efficiencies, with a direct impact on the sustainability of the organization. A number of important process control initiatives targeting increased processing circuit stability are currently in the definition phase.

Several maintenance energy saving initiatives were also identified as part of the organizations commitment to sustainable energy management. The initiatives involve both technology selection and operational philosophies aimed at reducing equipment power consumption in order to improve the overall efficiency of the process.

H.C. Starck Tungsten Powders

Different and changing challenges have an impact on a company and therefore on the availability of the equipment. The machinery at H.C. Starck Tungsten GmbH consists of continuous, quasi-continuous and batch-operated machines. Therefore it is essential that the maintenance programme is flexible and specifically designed for each machine. For this reason, a strategy mix of reactive, preventive and condition-oriented maintenance is used and will be continuously improved.

Measures are taken at different stages of equipment life cycle to extend its service life, strengthen management is applied to improve their utilization rate. We prepare a detailed maintenance schedule for all key equipment, such as changing wear parts, implementing new functions and technical modifying to reduce energy cost. Moreover, improving the reliability of equipment by reasonable redesign, to reduce the abnormal downtime and to provide support to achieve production goals.

Due to good cooperation between sales, production planning and the team from operations, a maintenance and shut-down schedule can drawn up every year. This allows both resources and materials to be used in specific areas, and unplanned downtimes in the facilities have been significantly reduced.

Not only unplanned shutdowns could be reduced through this good cooperation, but also the energy consumption. The energies used can be visualised more transparently through optimised displays and change effects are immediately visible.

In 2020, a new platform was implemented. It allows maintenance notifications to be reported in a simple and standardised way and it is possible to view the processing status at any time. In daily workshops, the received reports are discussed, prioritised and responsibilities and executing trades are defined. Completed work can be reported back immediately and directly on site. Thanks to this system, which is transparent in all directions, both efficiency and employee satisfaction have increased.



Welding work at H.C. Starck Tungsten Powders' Ganzhou plant

In order to be prepared for new challenges in terms of IT security, availability and optimisation of the equipment and processes, the process control systems were updated. For this task, new standards were introduced in the programming of the control system. The use of this modular system ensures standardised programming, which also has a positive effect on costs and effort.

As part of the restructuring and modification of the maintenance strategies, it was therefore possible to have a positive influence on operating and maintenance costs.

The objective of our maintenance is to increase the availability and reliability of the equipment in the long term, and we will continue work towards this goal.

Sustainability Supply Chain Management

Beginning of 2020 was embraced by MHT supply chain with excitement of integration with the H.C. Starck Supply team. However, due to Covid-19 pandemic the integration plans were impeded. The two parallel verticals took this opportunity and have started communicating towards understanding the operations to achieve sustainable goals.

In Vietnam hint of Covid-19 pandemic was observed and the unexpected tide of disruption triggered a strategical shift in supply chain approach. The new approach adopted was to confront the state of events heads on and to make it sure that the core business verticals remain un-affected.

The greatest of the challenges to business continuity was short supply of life saving personal protective equipment. Excessive demand and crippled manufacturing resulted in the situation. However, availability of sanitizers, facemasks was essential to keep the operations running. During the initial phase Supply chain collaborated with local garment manufacturing companies. Masks were manufactured and delivered to all employees.

The essential supply of reagents to manufacturing too was at risk, however SCM maintained higher inventory levels anticipating delays during TET. The high inventory levels of reagents helped to keep the show running during the initial wave of emergency stops that were applied the worldwide transportation resources.

Towards the end of 2020 the manufacturing business worldwide re-launched operations. However, as the logistics resources all over the world are dis-placed, Supply Chain challenges are just as bigger and unprecedented. Major world seaports are either congested or dis-organized. The major ports feeding Vietnam [China & Singapore]

are amongst the most congested ports and the situation is adversely affecting MHT supply lines. MHT Supply department once again is facing the situation heads on and has implemented several inventory and logistics strategies.

Advanced orders for critical reagents have been issued until May 2021. Frequent communication with core verticals of processing and maintenance are active and inventory awareness is helping in avoid any surprises. As the sea routes are congested, freight is being delivered by alternate means of road and air. In some cases, alternative products and suppliers are also being investigated and established.

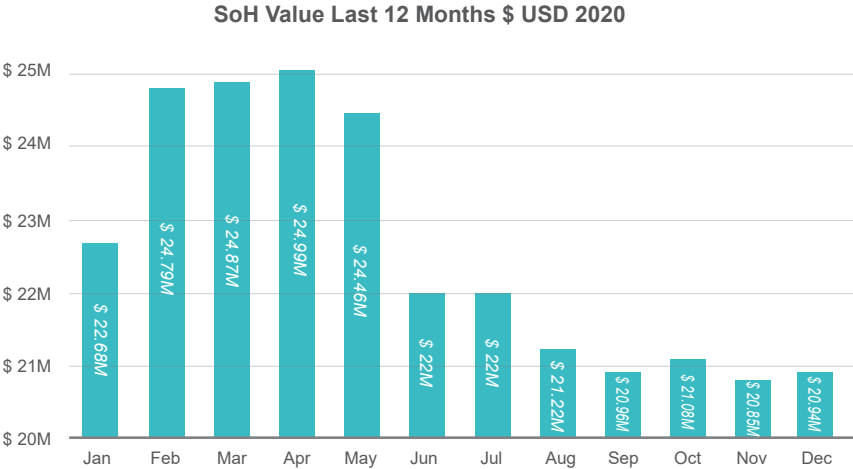
While dealing with the unprecedented situation supply department during the year has delivered a staggering performance and has achieved all its KPI's.

- Contracts, Procurement, and logistics have achieved a contractual savings of \$7.08m.
- Logistics have succeeded to keep a tight leash on Fluorspar freight and have reduced the freight costs by 5%.



	2020	2021	2022
Contract	\$ 0.96M	\$ 0.87M	\$ 0.27M
FPA	\$ 0.73M	\$ 0.69M	\$ 0.54M
Reagent	\$ 0.53M	\$ 0.42M	\$ 0.35M
Procurement	\$ 0.57M	\$ 0.00M	\$ 0.00M
Logistic	\$ 1.16M	\$ 0.00M	\$ 0.00M
Total	\$ 3.94M	\$ 1.98M	\$ 1.16M

- Inventory values from Jan'20 to Dec'20 have decreased by \$1.74m.



Logistic preparation for ore product transportation in Nui Phao mine (Vietnam)

The MHT Supply Chain department at H.C. Starck Tungsten during the year made it sure that demand and supply were aligned while continuously optimizing the entire supply chain with regards to various factors such as inventory levels, transportation and storage of goods, and energy consumption.

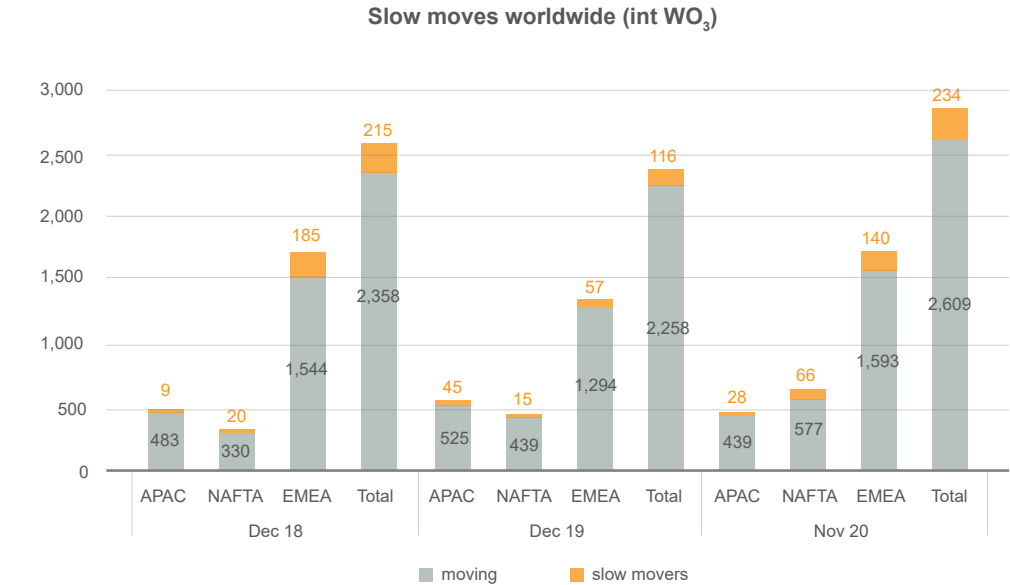
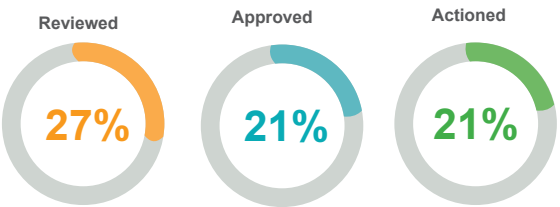
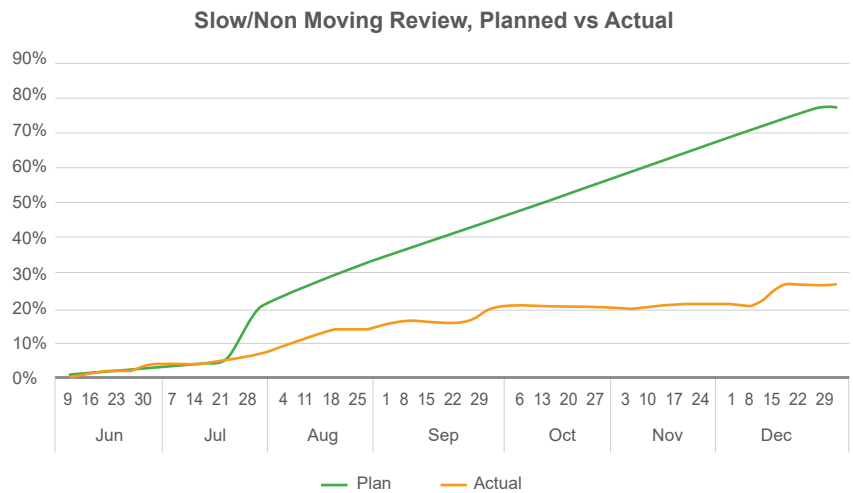
From Raw Material & Inventory Planning (RMIP) to Distribution Management (DM) and Production Planning (PP) – processes were made more sustainable at each of these parts of the supply chain.

RMIP plans requirements of raw materials, i.e., scraps as well as intermediates considering technical capabilities, inflow from customers, inventory targets and lead times. Managing inventories is one of the core tasks. At H.C. Starck Tungsten, inventory levels are optimised inventory to ensure continuous operations and realizing sales plans while reducing inventory in the pipeline. Over the years, an inventory management tool that links the operational and financial side was developed & implemented. It simulates the development of inventories across all H.C. Starck Tungsten plants and warehouses. With that visibility into all production processes supply chain efficiencies are enhanced delivering cost savings throughout the chain.

The tight control of slow-moving inventory directly impacts sustainable inventory optimization. H.C. Starck Tungsten supply chain aims at a rate of 5 percent slow-moving inventory, this was successfully achieved in 2019. On a regional level, EMEA and NAFTA regions even fell below the 5 percent quota. The Supply Chain department tracks slow-movers on a global scale, assigns responsibilities across the company and tracks the implementation of action items to reduce slow-movers. Action items range from blending slow movers in related production, exploring sales options together with the Sales team to recycling inventory back into the supply chain.

Achieving inventory reductions and especially a slow-mover quota of 5 percent has been challenging in 2020 because of the effects that the Covid-19 crisis had on worldwide inventories. Sudden decreases in customer demand, for example in the oil and gas industry, quickly increased slow-moving inventories, especially in the warehouses in Japan and the US. Products that had already been produced and shipped in anticipation of demand remained in stock longer than expected. With recovering markets and continuing efforts, H.C. Starck supply chain will achieve even more aggressive targets on a regional level in 2021 and expand view on slow-moving non-WO₃ inventory such as special carbides or packaging.

- Slow/Non-moving inventory review is progressing and has achieved completion of 21%.



DM deals with the replenishment of warehouses in the US and Japan. DM also makes sure production plants in China and Canada are supplied with intermediates, additives, and spare parts. Finally, DM is responsible for the planning of outsourced production. Carbon dioxide is considered one of the main drivers for climate change.

In H.C. Starck supply chain worldwide distribution, sea freight has become the main transportation mode in order to save costs and reduce CO₂ emission. During the distribution planning phase H.C. Starck supply chain works closely with Logistics service providers to consolidate shipments and use container space efficiently.

From 2018 to 2020, the percentage of airfreight shipments could be reduced from 11% in 2018 to 4% in 2019 and currently 1% in 2020 in terms of gross weight. Whereas airfreight costs still made up 68% of total net freight costs in 2018, it has been reduced to 31% in 2019 and further to 15% in 2020.

Production Planning refers to long-term capacity utilization and global alignment with other plants as well as the short - to medium-term production plans to meet customer timelines. Customer requirements

such as product quality, quantity and delivery date are decisive factors in how production is planned. However, PP also supports the pursuit of sustainability goals by planning production in such a way that is conserving energy, economically viable and safe. PP is part of the Energy Team at H.C. Starck Tungsten since 2019. PP also aligns with Sales, Operations and Maintenance to schedule planned shutdowns and avoid costly unplanned downtime. PP generally aims to avoid re-packing finished goods as this is often hazardous and may lead to safety incidents. Today, energy use is optimized by, for example, bundling production, ensuring smooth transitions from one product line to the next on a furnace (no large jumps of grain size) and optimizing furnace utilization. In the future, we plant build production planning tools that more specifically include energy as a parameter in our production schedules.

An improved management of production as well as graphite consumables by supplier consolidation and utilizing turn key supplier management inventory when available had led to estimated annual costly savings of ~ 75.000 Can\$ / Yr. in Samia.

In Ganzhou the control according the spare part inventory was optimizes using the SAP system. After sorting and classifying the spare parts in warehouse, all spare part numbers which were not included in the SAP system during the start-up period were added.

		Percentage Gross Weight	Percentage Net value
2018	Airfreight	11%	68%
	Seafreight	7%	5%
	Truck	82%	27%
2019	Airfreight	4%	31%
	Seafreight	18%	24%
	Truck	77%	39%
2020*	Airfreight	1%	15%
	Seafreight	19%	38%
	Truck	80%	48%

* data for the period 01/01/2020 24/06/2020



Sustainability Human Resources



2,010
Employees



15
Kaizen Awards



3,010
training hours



47
monthly STAR
Awards



100
internal transfer
& promotions



20+
Employee
Engagement Activities

2020 marks an important turning point in the Company's human resources management (HRM) under the strategic model of Human Resources Business Partners (HRBP) to align the HR strategy with the Company's business goals, and to enhance the optimal efficiency in line with the Company's core values of Respect - Action - Result. Besides the "Monthly Star Award", individuals and groups of employees with positive initiatives in identifying potential risks, emergency warnings and proactive measures relating to work safety have also been recognised and honoured with "Safety Award" (effective from August 2020).

2020 is in fact a challenging and difficult year in terms of human resources for both local and global enterprises due to the impact of Covid-19 pandemic. However, at MHT, we attach great importance to listening to employees' opinions by working with the internal Trade Union to organise quarterly employee dialogues so that we could improve and maintain a favourable work environment, ensuring benefits and policies for our employees in a transparent and fair manner.

The total number of employees in MHT globally has significantly increased since we completed the acquisition of the global tungsten business of H.C. Starck GmbH in September 2019.

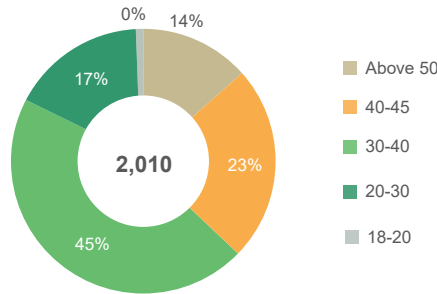
Year	2016	2017	2018	2019	2020
Total number of employees of MHT globally	1,343	1,363	1,403	1,403	2,010

MHT currently employs 2,010 staff members from different countries, of all ages, gender and religious diversity. The company values diversity and respects differences. It applies no discrimination in the treatment of employees and fosters a culture of mutual respect to create conditions for employees to promote their role in production and business activities, thus building a diverse and inclusive organization for sustainable development.

EMPLOYEE STRUCTURE

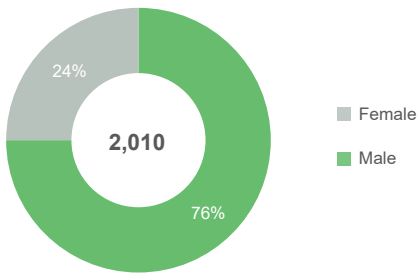
By Age

The Company's employee age ranges within the golden working age, mostly from 30 to 40 years old, accounting for 45%. The number of employees over 50 years old accounts for 14%.



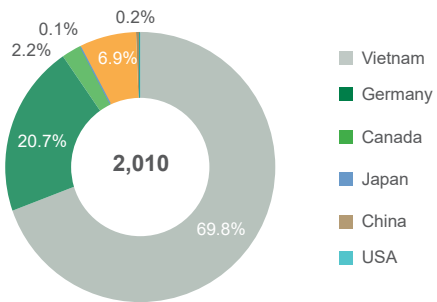
By Gender

Due to the characteristics in a heavy industry and mining company, the number of female employees remains stable, accounting for 24% of the total workforce in 2020.



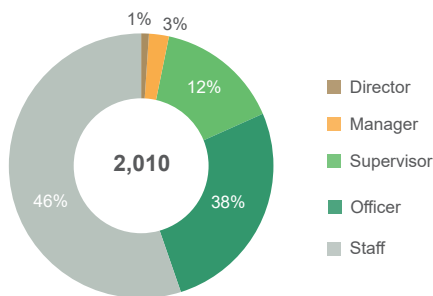
By Countries

Majority of workforce at MHT are from its subsidiaries in Vietnam, accounting for 69.8%, followed by HCS in Germany, accounting for 20.7% of the total workforce. The workforce percentage from the rest of the world is small, ranging from 0.1 to 6.9%.



By Rank

The Board of Directors is 1% of the total workforce. The managerial team, including supervisors and middle managers is 15%. The highest percentage in the MHT's workforce structure is officers/technicians and workers, accounting for 84%.



In 2020, our employee number in totality remained stable over the same period last year, especially there was no employee made redundant due to the Covid-19 impact. The average income for Vietnamese employees slightly increased by 0.1% compared to 2019 as a result of internal transfer and promotions for some positions in our organizational structure.

Number of employees and average income at MHT in Vietnam

Year	2016	2017	2018	2019	2020
Employee number in totality	1,343	1,363	1,403	1,403	1,403
- NPMC	1,027	1,072	1,150	1,157	1,096
- MTC	316	291	253	246	307
Of which					
- Vietnamese employees	1,236	1,261	1,303	1,309	1,329
- Expats	107	102	100	94	74
Average income (VND million per month) for Vietnamese employees	10.3	11.1	11.4	11.8	11.9

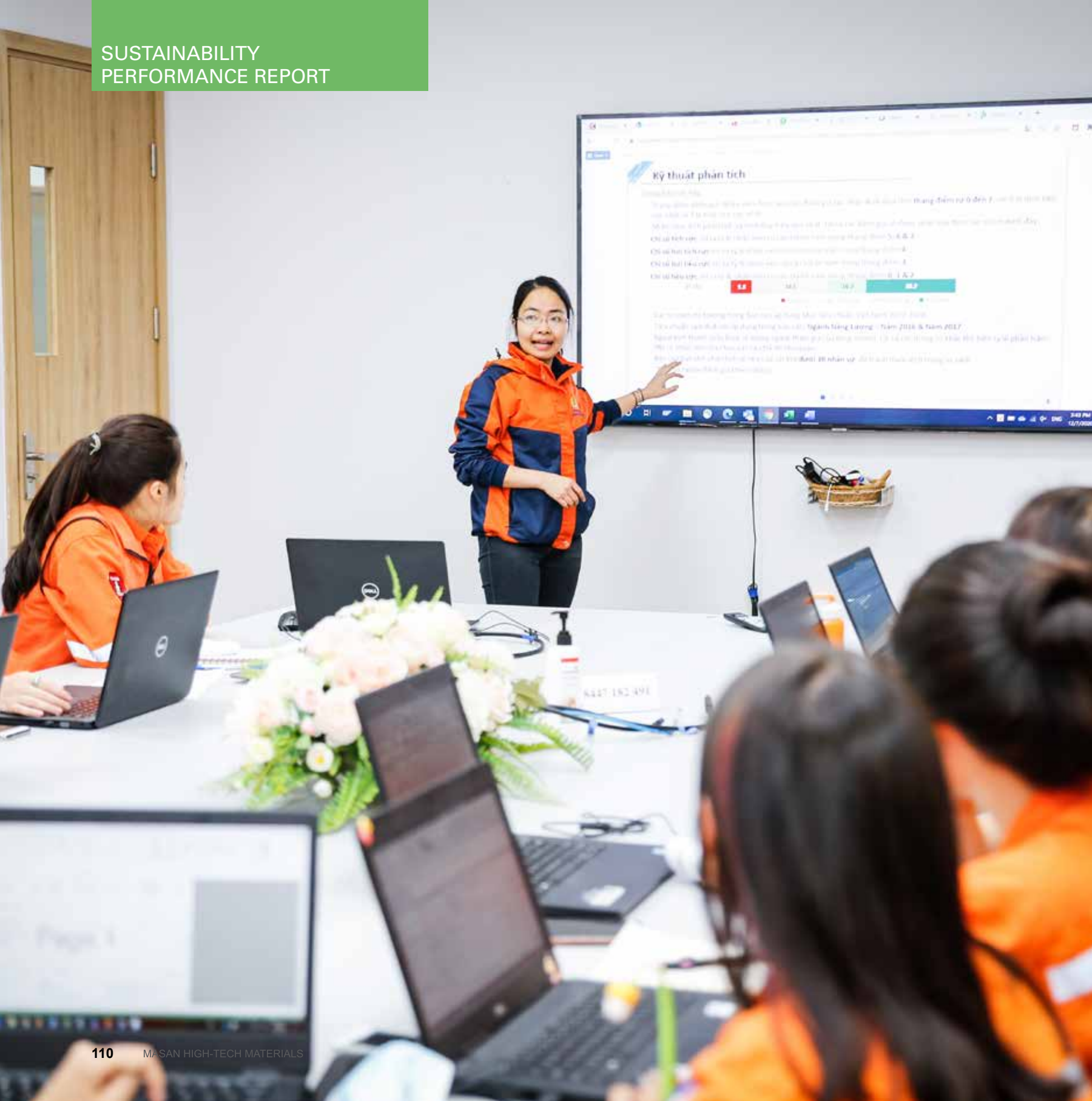
RECRUITMENT

In 2020, in most of the countries where MHT operates, our recruitment was impacted by Covid-19 pandemic during 2020. It was suspended in some periods, and also resumed at intervals but the number of newly hired employees was not high. For example, at MHT Vietnam, the total number of newly hired employees in 2020 is 132 (of which, 110 for NPMC; 22 for MTC), achieving 92% of the recruitment plan 2020; Total number of positions decreased by 23% compared to 2019; Total recruitment cost decreased by nearly 90% compared to 2019.

Faced with challenges in the coming time as well as meeting requirements of MHT's long-term development strategy, the Human Resources Department continues focusing on improving capabilities, reducing recruitment costs by optimizing free-of-charge recruitment channels and developing a diverse recruitment source for various ranks and occupations. In addition, we focused on hiring quality personnel with strong capacity and experience combined with providing training courses to develop a specialized and diversified workforce, thus creating a positive, engaged working environment for employees to learn and share experiences at work.



An interview to recruit local workers for MTC processing plant in Vietnam



TRAINING AND DEVELOPMENT

Human resources training and development is one of the top priorities in MHT. In general, the training in most of MHT's subsidiaries is focused and carried out through both internal and external training courses with well-known training establishments. Furthermore, we focused on developing and maintaining the Occupational Health and Safety (OHS) management system through various training courses to ensure a safe working environment for employees.

Depending on the nature of each subsidiary, training methods can be different to suit the actual conditions.

In Germany, vocational training for young people is of particular importance, and so is it at H.C. Starck. What they all have in common is that the training in each case consists of a combination of practical in-house training and activity and theoretical-school courses and must be completed with an official certificate examination by a commission at the Chamber of Industry and Commerce in order to be recognised as a vocational qualification in Germany. At present, a total of 17 young people are employed within the Tungsten organisation, spread over four different apprenticeship years. This year we have added the profession of industrial mechanic.

In Canada, the Company cooperates with the Canadian Management Training Center which is one of 20 members of the Industrial Educational Cooperative (IEC), providing many opportunities for employees to learn and exchange high quality training methods and effective practice methods to improve the qualifications and capabilities of the employees.

During the Covid-19 pandemic, a variety of training methods have been applied to ensure the employee's safety, limit the risk of social contact and spreading the epidemic, such as flipped classroom model, online training via Zoom and Microsoft team or both offline and online training, E-learning by computer or mobile phone through Wechat or other applications for employees to be proactive in choosing suitable time, location, etc. and grant training certificates for learners. We also developed an online training course on the health management to reduce risks during Covid-19 outbreak.

In Vietnam, by the end of 2020, 326 training contents have been delivered with a total of 3,010.4 professional training man-hours, equivalent to 30,507 training man-hours for all employees and 17,634 attendees. Besides the periodic training activities, the Company also organized other activities such as:

- Gift giving to 243 internal trainers on the occasion of the Vietnamese Teachers' Day (November 20)
- Site tour for new employees
- Competency training guidance for Processing Department

In parallel with HR training, talent development, succession development plan, creating opportunities for career development are also strengthened in most of the internal departments. In which, we must mention the important role of the foreign specialist team in the process of transferring experience, knowledge and skills to Vietnamese employees. In 2020, the number of expats was 28 lower compared to 2019, especially 100 Vietnamese employees have been promoted to higher positions and transferred to other roles to meet the requirements of business.



The closing ceremony of the MHT internal English Language course (Vietnam)

EMPLOYEE ENGAGEMENT AND AWARDS

In 2020, TOGETHER we tirelessly strived to maintain and develop our business production operation as well as ensure spiritual and material life, health and engagement for all employees during the Covid-19 pandemic outbreak.

MHT in Vietnam

Firstly, the alignment of the human resources management system on One-Masan platform with Masan Group helped us follow the right track of orientation and development of human resources to realize our business strategies in a more efficient manner. In July 2020, we also merge two internal Trade Union units of Núi Pháo Mining Company and Masan Tungsten Company into one. This helped strengthen its unity, optimize the role of internal Trade Union as a platform towards a stronger and engaged development based on cooperation, equality and mutual respect in order to realise the common goals, and harmonise the interests between the Company and employees.

Some annual events of the Company are as below: Company's Day celebration (June 18); Summer trip for employees; International Women's Day (March 8), Vietnamese Women's Day (October 20); Blood donation. During the Covid-19 pandemic, the Company jointly worked with the Trade Union to organize a series of events to inspire, motivate and strengthen the faith of our employees for the first time, specifically:

- The writing contest "MHT in my heart"
- The drawing contest themed "I'm a young Masaner"
- The "Beloved Family" photo contest
- The "MHT in my heart" blog radio
- The "Beloved Shutdown" Program
- The morning exercise program "STRONG MHT"

During 2020, we have provided a wonderful working environment to encourage employees to contribute more initiatives and ideas in the improvement of the plant efficiency, cost reducing as well as recognize their outstanding contribution and achievements through Monthly Star Awards, Kaizen Award and Safety Award.

Other than the internal engagement activities, the Company actively participated in charity programs in the community, supported social security, helped disadvantaged people and raised a flood relief fund for Central Vietnam, etc.

The positive results from these activities demonstrated a high stability of workforce and long-term service to the Company. In 2020, the turnover rate decreased from 10.5 % to 8 % over the past year, of which voluntary and compulsory turnover rates were 5.54% and 2,48% respectively.



Monthly Star Award



International Women's Day March 8



Blood donation



"Beloved Shutdown" Program



The "I'm a Masaner's child" drawing contest

HCS in China

Many meaningful engagement activities were held to motivate our employees with a wide participation such as:

- Healthy running competition
- Year-End Party for all employees, including giving “5th anniversary staff service award”
- Talent Show on the occasion of the Children’s Day
- Donation appeal to the disadvantaged employees in the Company

The Company successfully passed the labour inspection by the Government in 2020 and awarded the “A Law-abiding integrity unit”. Moreover, with low unemployment rate, the Company has also received the Government’s employment allowance and Post-stability allowance for Enterprises, therefrom the Company is entitled for a decrease or free of charge of social insurance fee during the pandemic period.

In addition, the Company focused on adding benefits on health care, birthday allowance and annual medical checks; controlling and restricting disputes and conflicts in labour relations; conducting annual workplace satisfaction survey through communication, discussion and activities such as parties, sports and team building to improve employee engagement.



Healthy running competition



Year-End Party



Talent Show on the occasion of the Children’s Day

HCS in Germany

The Company participated in a “Step Counter Challenge” which is generally held with worldwide participation; however, due to Corona, this year it was only held between teams from the companies operating in the Metallurgiepark Oker.

A total of 19 teams started the competition with a total of 120,462,085 steps equivalent to around 2.4 circumnavigations of the earth. In addition, the company health management includes many other offers such as yoga classes, massages, ergonomics support, the “mobile break”, fruit baskets, etc.



HCS in Canada

Many internal engagement and charity activities were organized during 2020. These included:

- Family Plant Tour
- Local River Boat Cruise
- Christmas Events - Kids and Adult Celebrations
- Annual Golf Tournament
- The Charity activities for community: Christmas Food Drive - on-site for Inn of Good Shepherd; Santa Clause Parade Sponsor; Celebration of Lights - Set-up of annual light display in central community park; Little League Sponsorships - Hockey and Baseball; Adopt- a-Family (Christmas Gifts) - Inn of the Good Shepherd.

Each activity is very meaningful in the employee engagement at each subsidiary of MHT where employees are the foundation of business success and the long-term sustainable development. Together we work to build a friendly working environment where everyone can learn from each other, engage, unite and determine to take MHT reach further and go global.



Annual golf tournament



Local river boat cruise

HR BUSINESS PARTNER

The Human Resources Business Partner (HRBP) model is an important turning point in HR management at MHT Vietnam in 2020.

Since November 2019, in Vietnam, the HRBP model has been applied and brought significant changes against the previous traditional HR management model. It aims to the HR development aligned with the business strategy of the Company. Based on the actual situation and challenges in the long-term development of the Company, HPBP proactively works with the internal departments to perform the following key tasks:

- HRBP plays a role as Strategic Partner, a frontline to connect information amongst the internal departments to ensure the communication streams in a transparent, clear and consistent manner. It also helps the departments to make a plan for their organizational structure or restructuring aligned with our set strategy, goals as well as recruiting and allocating personnel to meet the actual demands.
- HRBP takes prompt response to emergency cases, especially during the complicated situation of Covid-19 pandemic. This is combined efforts from the internal departments and all employees in strictly adhering the preventive and control measures given by MHT's Steering Committee of Covid-19 prevention and control. Its outstanding achievements in the Covid-19 prevention and control were recognized by local government and company.
- As a consultant representing the voice of the employees, HRBP encourages, makes favorable conditions and creates opportunities for employees to ultimately develop personal abilities. They also work closely with the departments to control and settle labor regulation violations and internal conflicts in a reasonable manner, minimize the violation of internal labor regulations, build an engaged working environment.
- In Operation Management, HRBP drives the departments towards the strict cost management contributing to enhancing efficiency and reducing operating costs. In addition, they also communicate with the departments to set KPIs (Key Performance Indicator) consistent with each department, team or individual to review their performance of the year. It is also as a basis for the Company to link to the policies such as salary review, total reward and promotion, etc., in a fair and transparent manner.

HR RISK MANAGEMENT

All MHT's subsidiaries are always proactive in the identification and management of risks, as well as application of appropriate and effective risk management measures because this directly affects our business performance.

In 2020, the fluctuation of global economic growth was significantly impacted by the Covid-19 pandemic, especially the Covid-19 was first discovered in China, therefore the company here strictly implemented the control measures given by the local Government. During the spring festival holidays in January, the management team decided to enforce work from home and virtual meetings, establish an emergency response team, make an epidemic emergency plan, business continuity plan. With the efforts and contributions to overcome the crisis, MHT met the basic requirements and obtained the Government's approval on February 15th, 2020 as one of the enterprises given a priority to resuming our domestic operations. In addition, we also applied the Government's support policy to decrease or exempt the social insurance fee for employees during the pandemic. As one of the major tungsten enterprises in Ganzhou city, Jiangxi province, China, local Governments always pay a special attention through many visits to encourage and motivate the Company to overcome negative impacts caused by Covid-19 in 2020.



Furthermore, we continue to maintain preventive and control measures of Covid-19 to keep people and workplace safe such as disinfection of office buildings, scanning body temperature for employees and visitors, contactless attendance machine, lining up one meter apart in the canteen area, etc.

Similarly, in Vietnam, the Steering Committee for Covid-19 prevention and control is established from the early days of the outbreak to promptly and timely issue directions and guidance to all employees on strengthening measures to protect their health from Covid-19. A series of measures to control the risk of infection have been implemented such as: Medical information declaration, travel approval system, working from home for office workers, enforcement of "5K" message from the Ministry of Health; social distancing on our daily shuttle buses, changing the rosters of employees to minimize the risks of close social contact, installing BlueZone app for self-protecting and community protection; using time-sheet cards, etc. All information related to the situation of the epidemic is regularly updated and notified our employees, partners and contractors in a timely and efficient manner.

In Germany, strict requirements of health protection measures for employees are provided, and all employees must adhere to the standards of occupational health and safety. In addition, we also have healthcare workers and doctors who are experienced, willing to care for employees' health, give advice and help prepare tests of physical health and workplace assessment, especially giving advice on the Covid-19 prevention and control measures. Because most of office workers work from home, we developed an online training course as a further measure in the sense of health management and protection for employees.

Controlling the risks for people, employees' health will contribute to creating a safe working environment, maintaining a stable workforce, ensuring our continuous production and business as well as bringing more opportunities for business expansion and ability of our assets to operate efficiently.

Sustainability Health & Safety

HEALTH AND SAFETY AT MASAN HIGH-TECH MATERIALS

SAFETY

From Company to Community

At MHT we follow a safety philosophy that is people-focused that is committed to continuous improvement which drives our organizational safety evolution forward in a sustainable manner.

In terms of health and safety 2020 was a remarkable year with a strong positive trend with the achievement of reducing all recordable occupational work injuries by 50% year on year as well as recording no Lost Time Injury throughout the year. This performance improvement was obtained thanks to HSE's endeavor to approach safety from both perspectives:

- **Traditional perspective of safety:** where it is solely deemed a compliance discipline with a focus on the use of proactive safety tools across all operational work groups.
- **Revolutionary perspective of safety:** where safety is the ultimate goal of protecting the health and safety of the organization's employees, contractors, other stakeholders, and the local community at large.

Leadership in the field promoted safety awareness and inspired workers to conduct work activities in a safe manner. This active safety approach has allowed us, as a company, to improve safety awareness, develop a robust safety culture within the organization that assists to reduce occupational injuries and incidents. All these safety synergies encourage positive safety behaviors thus creating a strong foundation of safety towards an injury-free and impeccable working environment.

Stewardship in Industrial Safety

In the 4th quarter, the Department of Firefighting acknowledged our Emergency Rescue Team members (ERT) for their valued contributions towards the nationwide campaign in firefighting and prevention and presented them with an award for excellent achievements in fire prevention and firefighting in Thai Nguyen province. Moreover, the Thai Nguyen Communist Party highly appreciated MHT's contribution towards fire prevention & firefighting and as such handed over a certificate of appreciation to our company.

In addition to the award afore mentioned, the Thai Nguyen Provincial People's Committee saw fit to award MHT in recognition of our contribution to safety and secure radiation management activities for 5 years from 2016 to 2020.



MHT firefighting training (Vietnam)

Well-managed Coronavirus (Covid-19) Hazard in the Workplace

In the midst of the Coronavirus (Covid-19) pandemic, normal daily life as well as business has already been affected in a number of ways. However, at MHT, we have been attempting to prevent the spread of the virus to ensure our business continuity and health & safety for the employees & contractors, by:

- Establishing a Covid-19 Steering Committee with the participation from front-line level to top level of MHT to promptly instruct and implement a wide range of preventative actions ranging from administrative controls such as washing hands, social distance, fumigation and travel declaration in preparation for the worst scenarios.
- Ensure plans in place covering business continuity & emergency response plan.
- Keep learning about the virus and how the situation is unfolding. Communicate with personnel at all levels. And implement controls and monitor response plans throughout.



MHT employees complying with social distancing measures amid the Covid-19 pandemic

Safety Regulatory Compliance

In 2020, MHT received two delegate groups from Government authorities to conduct regular inspections with one covering fire and chemicals carried out by Thai Nguyen Fire Police and a second covering safety & occupational health that was carried out by Safety Bureau. Inspection outcomes identified no shortcomings which is a clear indicator of MHT's pursuit in strict compliance to statutory requirements.

Relevant regulatory reports were well prepared and submitted in a timely and proactive manner.

A site-wide safety auditing system was implemented that included several in-the-field monitoring programs that ranged from an in-depth internal auditing of company operational areas, CHESS representatives' operational audits, individual hazard and task observations and a group or team pre-task job safety analysis (called a "Take 5").

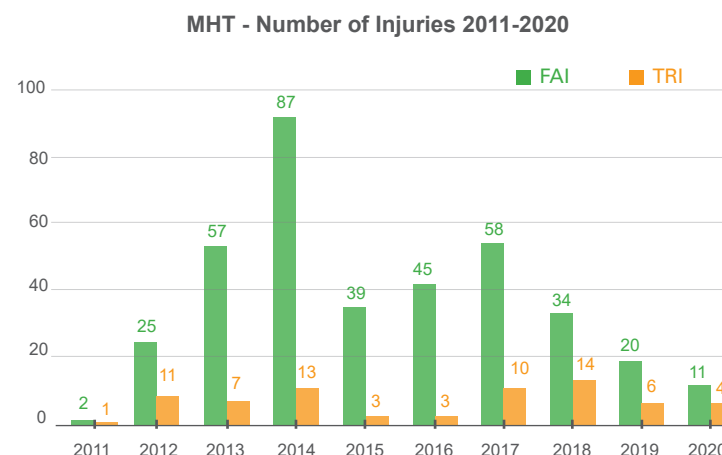
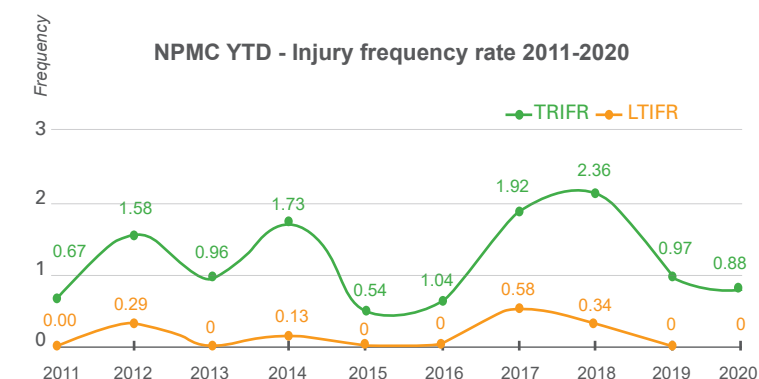
At MHT we conducted both scheduled and ad-hoc safety audits throughout the year. The audits covered all areas under the company's control, including contractors' workshops and their areas of activities. Each audit is carried out with a management representative to be present. The selected area under audit is thoroughly inspected and an action list is generated. The action list includes a timeline for appropriate completion with an escalation protocol to ensure actions are completed in a timely manner.

A Lost Time Injury Rate (LTIFR) is defined as an occurrence that resulted in a fatality, permanent disability or time lost from work of one shift or more. The frequency rate is determined by the number of occurrences per 1,000,000 man-hours worked.

Total Recordable Injuries Frequency Rate (TRIFR) includes fatalities, LTI and Injuries that required restricted work activities or medical treatment. The frequency rate is determined by the number of occurrences per 1,000,000 man-hours worked. The TRIFR does not include First Aid Injuries.

Zero LTI in 2020

Our Total Recordable Injuries (TRI comprising a combined tally of LTI, RWI and MTI) reduced in 2020 to 2 injuries compared to 2019 with record of 4 TRI and LTI free. This factor can be attributed to a paradigm shift in safety reporting in which workers report all incidents that help identify and address future incidents of a similar nature. This exceptional safety performance is due to the establishment of a prominent safety culture that has been constantly promoted to our employees and contractors.

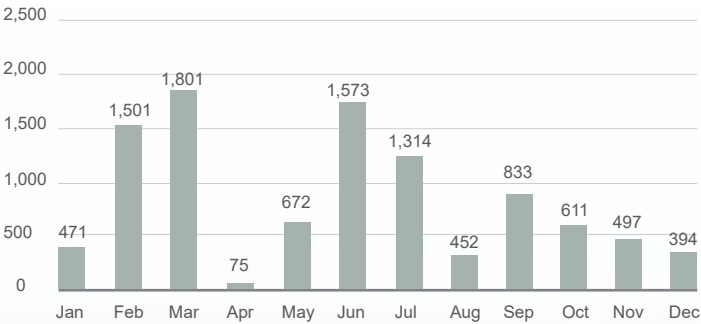


Enhancing Safety Culture

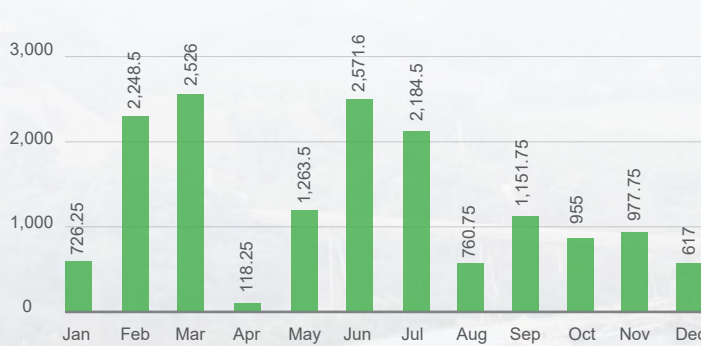
In mining and processing industries, communication mechanisms are critical for engaging staff in safety activities, gaining cooperation and support, and for the adherence to a positive safety culture.

In particular, safety communication is one of the key priorities in distributing valuable safety information to all employees and contractors as well as for obtaining a high level of safety compliance. Throughout the year a total of 26 fundamental safety messages have been communicated to all employees and contractors. These safety alerts were readily available in soft copies and as well as displayed on notice boards and the company’s intranet site. The alerts cover latest health notices, notifications of occurred incidents or general safety topics.

Number of attendees - 2020



Safety training hours - 2020



Safety Training

Our safety team continued to provide various safety-related training programs covering hazardous material management, chemical induction, Safe Work Isolation Procedure System (SWIPS) and actions, risk training, hearing protection, working at height, professional driving training...

Further safety training conducted over the course of the year included Fire first responder for 39 persons who are working in all areas and departments. Them was trained in professional firefighting & rescue skills. After 15,921 training hours with 8 topics, they got good skills and can help the ERT in real incident prevention. The number of persons that attended safety-related training programs was 10,201 persons that underwent 15,921 hours of training during 2020.

The “Take 5” Safety Pre-Start Tool and Task Observation

MHT strongly believes in schooling employees with the correct safety habits - not only to be used at work but likewise to help them carry this mindset throughout daily activities at work and especially at home.

The ‘Take 5’ safety pre-task activity tool check continues to be well received and utilized by the entire workforce. This safety concept activity teaches employees and contractors on how to identify potential hazards associated with the tasks they are about to undertake, and how to identify and minimize the hazards prior to commencing the task. This year, there were 546,475 Take 5’s performed and increase 350% compared with 2019.

Furthermore, Task Observations was introduced as a tool that allowed persons to observe work activities undertaken by a person or group of persons and to monitor and record the methodology of activity capturing good work practices and to discuss these practices with the person or teams that was doing the work. Opportunities for improvement or safety hazards identified during the observation are likewise discussed. Regular work analysis enables identification of repeated substandard acts and good practices and as well as improving conditions. There were 8,085 TO’s performed in 2020 and increase 38% compared with 2019.

Delveloping Training Materials & Conducting Community Trainings

To bring into play our long tradition of working closely with our communities and promoting their health and well-being, HSE team are mobilized to implement an extraordinary range of campaigns at provincial level to disseminate basic safety knowledge and raise awareness of the community.

In 2020, with a wide range of practical safety topics in life such as Food safety; Electric safety and Basic First Aid skills for victim with electric shock; Drowning prevention and First Aid skills for drowning victims, MHT’s HS&E Department conducted seven training courses for 170 women and about 5,000 students in the local community and local schools adjacent to the Nui Phao project. This public awareness training contributes to increase the reputation of MHT and spreads safety culture to the surrounding residential community to better the life quality for not only the company and its employees but also for the local community.

Emergency response

In terms of emergency response, our ERT members at our operational sites continue to collaborate with the Provincial Fire Department of Thai Nguyen in conducting fire drills. The ERT received training on hazardous materials management, vehicle extraction, confined place rescue, high-angle rescue and flood disaster management. To ensure adequate emergency coverage on the sites, a fire truck with two rescue and water trucks, provisioned with rescue equipment such as the jaws of life, lifting bags, various rescue gear, hazardous material equipment and an equipped ambulance are always available.

In 2020, 16 internal drills were conducted that covered activities on fire, chemical, persons rescue and evacuation. Three combination drills with site contractors and various government agencies such as DOIT and Thai Nguyen Fire Police.

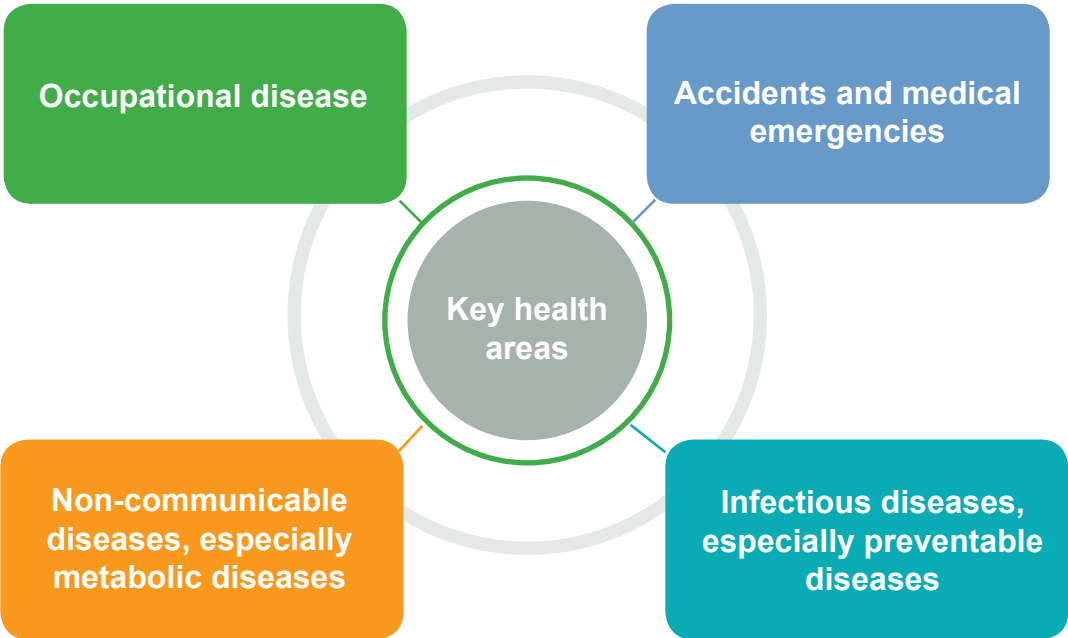
Additional emergency response support was given to the surrounding community during private road accidents and community house fires.

HEALTH

Human Capital, A Driving Force for Sustainable Economic Growth

At MHT we follow the motto: People are the most valuable assets of the business, possessing healthy and talented human resources is the valuable investment and is the key to sustainable business development. In capturing this approach, we provide an overall, robust health assessment program, to all of our people.

This program centers around four key health areas:



The company provides a kaleidoscope of comprehensive community-based, workplace and family health care programs aligned with national health programs, towards long-term health care solutions.

The solutions focused on prevention, minimizing health risks; taking health education knowledge and timely handling as specific solutions. The ultimate health policies are to protect human resources and attract talents through the aspect of health care as a significant medical benefit.

Solutions for Each Specific Risk Area

Occupational disease

- Pre-work and periodic health surveillance is undertaken including comprehensive occupational health examinations in accordance with national occupational health programs.
- Carry out scheduled occupational surveillance twice a year as well as ad-hoc occupational surveillance at all our operations, using best industrial monitoring practices and working closely with professional government agencies.
- Mandatory training for occupational health protection is conducted to every worker before entering the working environment, supported by further training on occupational health throughout the year.
- Health trends and solutions to prevent occupational health risks are regularly reviewed and communicated to the worker and preventative measures put in place to reduce the likelihood of exposure.

Annual checkup

In 2020, the clinic reviewed and gave medical consultation to 1,526 NPMC and 438 MTC employees. The annual health check report is the basis to set up healthcare programs to deal with emerging health problems.



Doctor carrying out health checks at the MHT Medical Center in Vietnam



Occupational Hygiene

At our site operations, our Occupational Hygienist, in collaboration with a certified government agency; the National Institute of Occupational and Environmental Health (NIEOH) and Institute of Environment Science and Public Health (IESH) regularly perform monitoring and conduct high standard occupational hygiene training programs. This year there were extensive surveillance workplace samples taken and several monitoring programs conducted in support of our drive to ensure a healthy environment for our workforce. Activities included:

- Total of occupational workplace samples taken: 3,101.
- Working environment measurement throughout the operational and administrative areas.
- Ergonomic psychological measurement program investigation conducted and assisted by NIEOH and IESH.
- Personal noise monitoring.
- Monthly occupational hygiene inspections in our plant areas.
- Regular noise and nuisance mapping and set-up baseline data for operation.
- Food hygiene and safety inspection of company and vendor kitchens.
- OH training for employees such as hearing protection, smoking pipe awareness.
- Our Occupational Hygienist worked in collaboration with the Human Resources department to identify and categorize arduous, hazardous and dangerous work areas in our operations.



MHT's first-aid training course for local teachers and students (Vietnam)

Medical Training

In 2020, a total of 206 employees were provided with an advanced First Aid Training (FAT) certificate under the auspices of the American Heart Association. These certified FAT courses covered principles of First Aid, Cardiopulmonary Resuscitation (CPR), Hemorrhage, Fractures, Drowning, Electric shock and Burns management.

Additional medical training was rolled out covering:

- 1,006 employees and contractors were provided training on hearing protection.
- 358 employees and contractors were trained smoking pipe awareness.
- 6 courses community trainings
- 4 local school on two topics of First Aid for Electric Shock and First Aid for drowning.

Our Clinic

A medical center was constructed in the first half of 2019. In 2020, the company continued to build up infrastructure and purchase medical equipment to well equip for the medical center operations as well as provide good first aid and consultancy services to MHT employees and contractors. Some initiatives of ongoing improvement to the clinic operation will be taken such as Covid-19 vaccination for all employees and upskill for doctors, etc.

MHT currently has 11 medical staff members, composed of four doctors who hold both General Practitioner (GP) and specialist degrees, one nurse, four physical assistants (Paramedics), one administrator and one occupational hygienist.

The medical clinic provides 24-hour support and mans 365 days a year.

Our medical doctors attended and completed several courses throughout the year such as trainers for occupational safety and hygiene training, Ear Nose and Throat course. A comprehensive succession planning program helps develop our medical personnel and keep them abreast of changes in medical legislation and procedures as well as maintain a high level of skill.

The following training was conducted with our medical staff over the year:

- 1 doctor commenced studies in Ear Nose and Throat (ENT) Specialist - Level One.
- 2 doctors and 1 occupational hygienist attended and graduated in a certificate of trainers for occupational safety and hygiene training.
- 1 occupational hygienist is studying in a master's degree in public health.
- Medical staff, in collaboration with the Emergency Response Team (ERT), conducted weekly and monthly internal training on chemical management, rescue equipment familiarization and regular physical drill exercises on various emergency scenarios.



Drill exercises on various emergency scenarios

Injury and Medical Emergencies

- Our site medical facilities are manned by doctors, nurses and paramedics that are internationally trained to provide emergency medical care during an emergency
- Our site services are manned 24/7 throughout the year and extend emergency medical care services to the surrounding community
- Our dedicated Emergency Response Team and medical staff, regularly participate in emergency drills and undergo robust fitness training
- The site medical facilities are registered with national medical ministries and conform to the standards as set out by the relative government Department of Health
- The medical facilities are well equipped to manage routine and emergency health care and the medical staff are certified to operate specialized medical equipment
- All site health care facilities are equipped with emergency rescue vehicles, fire trucks and ambulances

Our emergency personnel work in collaboration with surrounding government and community medical facilities to provide rapid and effective emergency care.



A free medical check-up and health advice program of MHT for local people

Prevention of Covid-19 Infection

To proactively prevent acute respiratory diseases caused by novel coronavirus (Covid-19), our Clinic together with HR, security and environment representatives proactively came up with a number of measures to prevent and control Covid-19 pandemic such as:



Proactive circulation of detailed guidelines on the measures for prevention and control of Covid-19 infection



Body temperature scanning for staff and frequent reminder to wear masks properly prior to entrance



Sending regular updates on disease situations and guidelines on how to wash hands and wear masks properly from the main gate to the office



Hand sanitizers are fully placed at key locations from the office



All the vehicles, equipment and machines are sprayed with disinfectant Chloramine B, Disinfectant spray is conducted frequently at the office



Set up an area for F2 cases' temporary quarantine at site and another area for F2 cases' quarantine at hotels including medical care



Thousands of medical masks and antibacterial fabric masks provided for employees on the mine site



An online health declaration and transparency commitment form was also introduced for travel requests



All the vehicles, equipment and machines are sprayed with anti-epidemic disinfection

SAFETY AT H.C. STARCK

Maintain Zero Harm to Working Environment

The safety and health of all employees, both those employed by the company and external companies on the factory premises, is a top priority for H.C. Starck Tungsten Powders. This is also documented by the certification of the Goslar and Ganzhou sites according to ISO 45001 “Management Systems for Safety and Health at Work”; the Sarnia site is pursuing the goals of a Toxic Reduction Plan.

In 2020, the SARS-Cov-2 pandemic was a dominant theme. Numerous measures were decided and implemented to avoid a loss of performance. These included mobile working, increased use of virtual meetings, special protection for high-risk patients and staggered working hours to reduce contact. From an incidence value of 30, daily SARS Cov-2 meetings were held between management, site management and the operating board in order to be able to react immediately to current developments.

Addictive substances such as alcohol or other mind-altering drugs endanger both your own safety and that of your colleagues. To counter these dangers, the working group addiction has developed a guideline on addiction as part of the company health management system. This has been made available to managers and provides recommendations for identifying addiction problems and for further action.

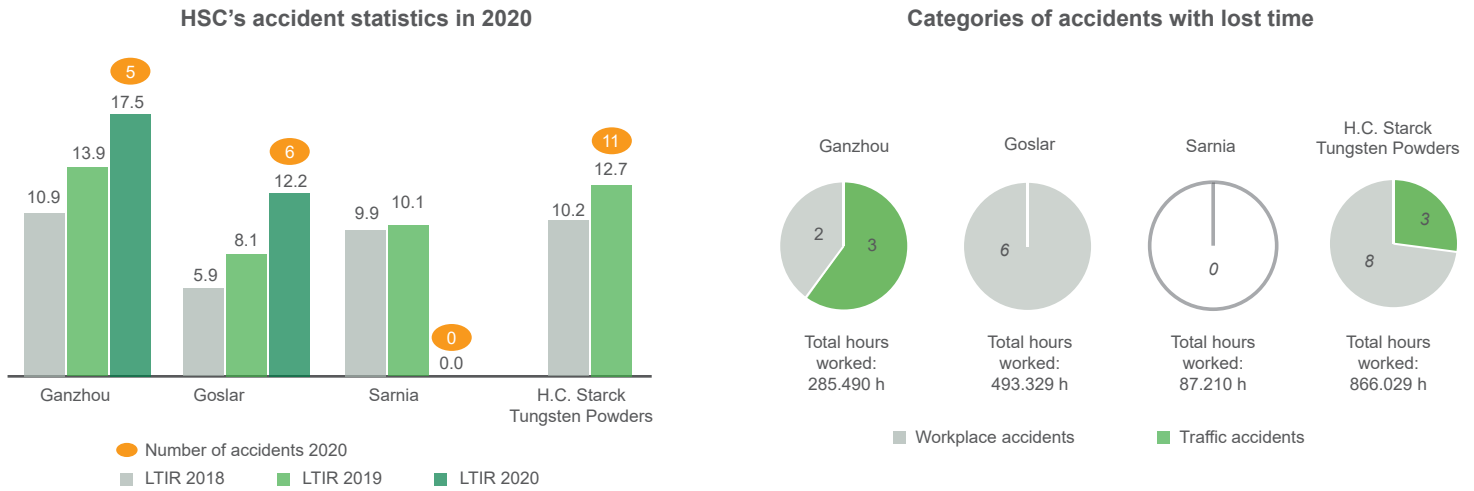
In order to achieve the “zero accidents” target set in the company’s objectives, both accidents and near-hits are handled according to a defined process and the incidents, together with the resulting measures and lessons learned, are presented at the monthly management meetings. A further publication takes place on the information screens. A further component of the monthly reporting is also the reported safety deficiencies, which are discussed in the companies at the daily morning meeting.

At the Goslar site, H.C. Starck Tungsten GmbH works closely with the specialist department for occupational safety in the Metallurgical Park, which also provides the officers for occupational safety.

- Inspections and safety tours are carried out (2019: 19 / 2020: 14**), which are supplemented by regular tours of the company’s safety officers;
- To determine and assess the concentrations of hazardous substances in the air in working areas, work area analyses / control measurements are carried out in accordance with the Technical Rules for Hazardous Substances 402 (TRGS 402) (2019: 7 / 2020: 7). In a few areas, limit values were found to have been exceeded, requiring measures to be taken and also formed the basis for the procurement of blower respiratory protection;
- The committee meetings for occupational safety (2019: 4 / 2020: 4), with the security officers (2019: 7 / 2020: 6**), and with the foremen (2019: 2 / 2020: 1**) are held;
- First Aid training is offered (2019: 36 participants / 2020: 52), whereby H.C. Starck Tungsten GmbH already clearly exceeds the required minimum of 10% of all employees to be trained as first aiders;
- Further safety training courses organized by the trade association BGRCI (2019: 19 courses / 2020: 8**);
- Radiation protection;
- Training for driving cranes and ground conveyors;
- 5S;
- Lean Six Sigma;
- Energy;
- Labelling of dangerous goods;
- Training on management systems and ISO standards.

**_ partly lower numbers in 2020 due to the Sars CoV2 pandemic

In addition to the security training courses offered online, some of which are required by law, the “Days of Security” (2019: 4 / 2020: 4, participants: all employees of Operations and Site Management) are held annually with extensive instruction and information. One component is the fire drills (for all employees), which are flanked by unannounced evacuation drills (2019: 3 / 2020: 2), 2 PMG-trainings (for 2019 / 2020 each for lone work) or the handling of personal protective equipment (PSE). For PSE, H.C. Starck Tungsten has invested 241,888 € in 2019 and 317,778 € in 2020, among other things in new Airstream helmets that prevent CRM dust from being inhaled in the breathable air. The helmets replace FPR3 masks, which created resistance when exhaled, making it more difficult to work.



Total recordable cases per month

	YTD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total hours wored	Total recoreed-able cases	Days away from worked
Ganzhou	5	1	0	1	1	1	0	0	1	0	0	0	0	24,510	0	0
Goslar	6	1	0	0	0	0	1	2	0	0	0	2	0	36,960	0	24*
Sarnia	0	0	0	0	0	0	0	0	0	0	0	0	0	7,168	0	0
H.C. Stark Tungsten Powders	11	2	0	1	1	1	1	2	1	0	0	2	0	68,638	0	24

Fatal Accidents	Incidents: 0
Accidents with lost time incl, notifiable accidents on business trips or accidents on the way to work and back	Incidents: 11
Criminal actions such as theft, fraud, threats etc.	Incidents: 0
Release of substances and/ or emissions of any kind, which may present a risk to Human health and/ or the environment inside and outside H.C. Stark Tungsten Powders sites, e.g. fire	Incidents: 1
Physical damage probably greater than 50 TEUR	Incidents: 0
Local media reactions	Incidents: 0
Others	Incidents: 5

Ensuring a Secured Plant

Working on chemical industry plants is associated with specific risks. In addition to the described measures and training for H.C. Starck’s employees, we also feel responsibility for the safety of employees of external companies who work on our behalf. In addition to an initial safety briefing by plant security when entering the premises, employees of external companies must complete and pass a tungsten-specific safety training course before starting work at H.C. Starck.

We have implemented a system of coordinators, H.C. Starck’s engineers who are responsible for the execution of work by third parties and discuss the risks with them on site. The coordinators are the contact persons for the contractors and also carry out inspections of equipment brought in by the contractors, as required. The coordinator is responsible for the safety of “his” construction site.

The plant area in Goslar is fenced in and monitored 24/7 by factory security via CCTV and regular inspection tours. Visitors and external companies are registered in advance by the receiver / requester at H.C. Starck and must identify themselves at the access control. Vehicles belonging to outside companies are weighed at the entrance and exit to and from the factory premises, bag checks (also for H.C. Starck’s employees) are carried out at random. PSE will be made available to visitors by plant security if required. Private cars and bicycles are not allowed on the entire fenced-in factory premises, parking spaces are located outside.

Fire Prevention

Goslar Plant

To combat fires and chemical accidents, a plant fire department with two full-time firefighters and volunteer firefighters from the plants is available 24/7 in Goslar. Regular training with the fire departments surrounding the plant ensures smooth cooperation between the fire departments in the event of major damage. The plant fire department can be called in from outside if necessary due to their experience in fighting chemical accidents.

Responders performed a total of 368 response hours in 2020, of which approximately 60 hours were performed by the On-call service alone.

In addition, 125 clearances and 472 fire alarm shutdowns were performed for the companies in the MPO. This corresponds to approximately 300 working hours.

	2019	2020
Fire operations	2	5
False alarms (fire alarm system)	14	11
Technical assistance	23	22
Other missions (On-call service)	39	38
Total	78	76



Drill of emergency response to fire at Goslar

Ganzhou Plant

The new employees should be training by 3 levels safety education before start to work, do the comprehensive emergency drill and the drill of special equipment, fire inspection etc. once each year; and do the scene emergency disposal twice each year; and do the safety checking per month and have the quarter safety meeting etc. Above safety activity must follow the law.

In order to strengthen and improve the emergency rescue capabilities for our team, we invited the firefighters from government to give us a profession training every year.



Comprehensive emergency drill



Emergency rescue



How to use the extinguisher

HEALTH

Ensuring A Healthy Workforce

Our employees enjoy a working environment in which they stay healthy and in which they are actively involved in the improvement of safety and health at workplaces. In the suggestion improvement system, there is an own category for safety improvement; reported safety deficiencies are handled with the highest priority.

In addition to the trained first responders (the relevant training is repeated by the first responders every two years), there is a first-aid service at the Goslar site that can be reached on site 24/7. In addition to providing first aid to injured persons and the associated documentation, the medical service is also responsible for cleaning protective masks.

Pre-and post-care examinations are carried out by the company doctor, as are consultations (e.g. before business trips abroad) and vaccinations. In 2019, a total of 1,505 hours of care was provided by the safety specialists and the company doctor (actuarially required: at least 1,494 hours). To ensure specific medical care for our employees - e.g. after accidents - in the surrounding hospitals, the doctors there are trained by the company doctor.

In 2020, HSCS Tungsten GmbH participated in the “Those who do more will be rewarded” bonus program of the employers’ liability insurance association. There, investments in safety-relevant technology are rewarded by the employers’ liability insurance association. For the purchase of a total of 13 Airstream helmets, HCS received a bonus of € 1,000.

The long-term preservation of the health of our employees is the task of the company health management (CHM). The CHM is run by the Health Circle, which is made up of various specialist departments, with the advice of a health manager, and is available to all employees free of charge.

The plant maintains annual site specific full day training days on. ERT, new equipment, safety, op’s. The training days can include off-site training provided by IEC, on-site training by an external provider and internal exercises to stimulate various scenarios. Additionally, the company financially supports the employees to further their education. With that H.C. Starck rises to the challenge of having a well-educated workforce by supporting continuous education through tuition reimbursement for approved relevant courses. This program helps attract and retain employees who are interested in advancing their education, skills, and careers.

Topics of the CHM included as below:

- Monthly training with electrical muscle stimulation
- Weekly in-house yoga classes
- Courses for progressive muscle relaxation
- A pedometer challenge with 133 employees
- Action day “screen workstation”
- Non-smoker coaching
- Monthly health coaching
- Team cooking courses
- Flu vaccinations
- Skin cancer screening
- Annual check-up for all employee

Pedometer Challenge

In 2020, several teams participated in a step counter challenge. This fun fitness initiative, which supports team spirit, is generally held with worldwide participation; however, due to Corona, this year it was only held between teams from the companies operating in the Metallurgiepark Oker (residents: all former divisions of the H.C. Starck Group, Goslar). A total of 19 teams started the competition at the end of July this year. With a total of 120,462,085 steps, they completed around 2.4 circumnavigations of the earth. This year’s winner was the Tungsten team “Die Schwarze Macht II”, which was symbolically celebrated at the end of October with medals and a challenge cup.

In addition to the Pedometer Challenge, the company health management includes many other offers such as yoga classes, massages, ergonomics support, the “mobile break”, fruit baskets, etc.

Medical Precautions

The requirements for health precautions and protective measures are high in Germany. There are many compulsory measures that must be observed within the framework of occupational health and safety. In addition, Tungsten offers its staff support in the areas of addiction prevention, nutritional counselling, stress management and - against the background of the development of the average age in the workforce - also additional health precautions such as flu vaccination or a targeted health check-up to determine the individual risk of heart attack or stroke. Occupational health care is provided by an experienced team of doctors on site in the company doctor’s office, supported by various company paramedics. The company doctor is also on hand to provide advice and support when it comes to fitness tests and workplace assessments, as well as advisory services on the current topic of corona prevention and protective measures.

Due to the fact that an increased number of employees in the office areas are working remotely as a result of Corona, we have developed an online training course together with the works council as a further measure in the sense of health management, which should help as a small guide in this new work situation.

Training Measures

Continuous development and success in our business requires motivated and well-trained employee with safety. All employees were therefore offered training courses on various safety topics. The number of the different trainings can be seen in the following table.

2019	Training scheduled	Number attended	Health, Safety & First Aid Training scheduled	Number attended	2020	Training scheduled	Number attended	Health, Safety & First Aid Training scheduled	Number attended
HCS in total	6,245	6,242 (100%)	544	544 (100%)	HCS in total	9,129	9,012 (99%)	316	316 (100%)
Goslar	6,120	6,120 (100%)	202	202 (100%)	Goslar	8,311	8,198 (99%)	90	90 (100%)
Sarnia	20	17 (85%)	54	54 (100%)	Sarnia	25	21 (84%)	19*	19 (100%)
Ganzhou	105	105 (100%)	288	288 (100%)	Ganzhou	793**	793 (100%)	207**	207 (100%)

* Partly lower numbers due to the SARS Covid-19 pandemic
** Originally planned for 2020: 592 trainings and 127 first aid or additional H&S trainings. This number was adjusted during the year.



- Obtain the certification of MTC AFFF system by Ministry of Police.
- Achieve LTIFR of 0.00 by the end of 2021.
- Align contractor STD’s to MHT STD’s and implement a compliance targetting 70% adherence by end 2021.
- Continue with CHESS general meetings and audits.
- Conduct ERT rescue exercises with 16 internal and 3 external drills engaged with the regulators.
- Continue spreading MHT’s safety culture to surrounding community to increase the company’s reputation throug public awareness trainings.
- Provide additional occupational workplace monitoring on areas of high risk and nuisances.
- Proactively and continuously measures for prevention and control of Covid-19 infection.
- Trade Association Certification “Safe with a System”.
- Application for Occupational Safety Award.
- 4 Days of Safety.
- Further education and training of safety officers.
- Maintain and expend the Pedometer challenge globally.



Sustainability Environment

The year 2020 marked the 10 year anniversary of MHT and the 100 year anniversary of H. C. Starck’s tungsten business. During these years both businesses have celebrated many successes and faced many challenges.MHT always respects the guideline “environmental protection is a key factor for sustainable development”. At all of our operations, in Viet-nam, Germany, Canada or China, Germany, Canada and Chi-na, environmental protection is always closely linked with sustainable business. With continuous investment and efforts in environmental protection, MHT was honored to be in the Top 50 Sustainable Development Enterprises in 2020. This is the third consecutive year that MHT has been honored as a sustainable development champion in Vietnam.



As the global economy grows, the use of resources is increasing, the world faces the gradual depletion of natural resources and the consequences of environmental pollution. At MHT, we believe that sustainable development is always the top concern in the development strategy, it is the mission of the business to contribute to the stable and sustainable development for the social community, both increasing brand value and corporate culture. MHT’s development quality is sustainable development.

WATER AND WASTEWATER MANAGEMENT

Water is a common resource of the community and access to clean water is a fundamental right of each person. Therefore, the sustainable exploitation and management of water resources is essential. At MHT, the efficient use of water resources to avoid loss and increasing water reuse has always been a top priority.

At MHT, the water sources for production activities include: surface water, ground water, deionized water, water from suppliers and recycled water. In 2020, the total water volume used of MHT is 12,136 million liters (compared to 12,482 million liters in 2019).



A part of MHT waste water treatment plant in Vietnam

Year	2013	2014	2015	2016	2017	2018	2019	2020
Total water volume used (million liters)	5,383	12,528	12,586	10,977	11,472	13,482	12,482	12,136
NPMC and MTC	5,383	12,528	12,586	10,977	11,472	11,520	10,683	10,231
Surface water	516	1,332	1,416	1,259	1,268	2,393	2,576	2,517
Ground water for domestic	87	84	93	48	32	37	36	31
Ground water for production	114	718	644	281	493	98		
Recycled water	4,666	10,394	10,433	9,389	9,680	8,992	8,071	7,682
- Water form OTC		2,708	3,040	2,597	2,327	2,951	2,574	2,163
- Water from STC		7,521	7,043	6,497	6,755	5,603	4,613	4,415
- Water from Pit Transfer Pond (PTP)		165	350	295	69	414	275	443
- Recycled water from WWTP					529			
- Recycled water from DP2						24		
- Recycled water from Cut-off trench							609	662
Goslar, Sarnia, Ganzhou					1,612	1,962	1,799	1,906
Surface water					1,492	1,820	1,648	1,742
Water from suppliers					114	134	142	157
Deionized water					6	8	8	7

Surface Water

The surface water source for MHT’s production facilities in Vietnam (NPMC, MTC) is from the Cong River. Whilst the supply to the HCS factories of Goslar, Sarnia and Ganzhou is from local rivers. This useage is licensed by the local state agency according to the regulations of each host country. In 2020, MHT used 4,259 million liters of surface water (2,517 million liters for NPMC and MTC, 1742 million liters for HCS’s factories), accounting for 35.1% of total water volume used of all factories.

Ground Water and Other Sources

Nui Phao Company exploits groundwater at the borehole symbol GK-03 for contractor’s domestic purposes. In 2020, NPMC has exploited 31 million liters of groundwater, only 0.3% of total water volume used of MHT.

The Goslar, Sarnia and Ganzhou factories, in addition to local supply water, use this water in the form of steam and deionized water to supply specific tungsten production stages. In 2020, HCS has used 164 million liters of water accounting for 1.4% of MHT’s total water volume used.



Cong river – water resource supply to NPMC processing plant

Recycled Water for Production

Applying circular economy will help businesses reduce production costs, increase competitiveness and lead to opportunities for sustainable development. Recognizing this issue since project inception, MHT is always actively seeking to optimize the use of recycled water sources.

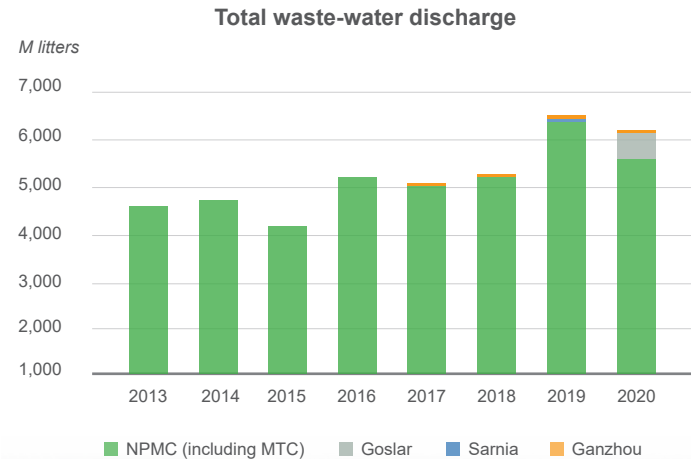
At the Nui Phao processing plant, the wastewater from the processing plant along with the oxide and sulfide tailings are pumped to OTC and STC for separate storage. Wastewater at OTC and STC is then recycled back to the Nui Phao processing plant for reuse, or pumped for treatment at the wastewater treatment plant (WWTP) before discharge into Thuy Tinh stream. Water from the mining operations is also recycled to Nui Phao processing plant, or to the WWTP for treatment and release. In 2020, the total recycled water volume pumped to NPMC is 7,682 million liters, accounting for 75% of NPMC’s total water volume used (compared to 76% in 2019), representing 63.3% of MHT’s total water volume used.

At our HCS facility in Sarnia, Canada, the team are implementing a process to improve the operation of the CTC water filter press. Once completed it is expected that wastewater will be reduced by some 200% which could lead to annualized savings of CAD\$100,000.

The above-mentioned successful water recirculation and reuse will be the driving force for MHT to apply more “cyclic solutions” to its sustainable development strategy.

Wastewater Discharge Quality and Quantity

MHT’s factories are all granted licenses to discharge wastewater into water sources according to the regulations of the host country or have contractual agreements with a fully functional third party (industrial zone management board) to treat wastewater before discharging into the environment.



Environmental technicians take water samples in waste water dam of MHT in Vietnam

In 2020, the total wastewater volume discharged is 6,202 million liters, a decrease of 2.4% compared to 2019. In which, the total wastewater volume discharged from NPMC (including MTC) accounts for 91% of the total wastewater volume of MHT. Wastewater is treated and monitored to meet local Government standards before being discharged into the environment.



Wastewater treatment plant at NPMC

Efforts to Control wastewater quality at Nui Phao mine

At Nui Phao mine, 2020 was a challenging year for wastewater management and treatment after receiving a new wastewater discharge license issued by the Ministry of Natural Resources and Environment (MONRE) with tightened standards and requirements. Therefore, controlling and optimizing wastewater treatment is an important task, requiring the coordination of many departments of the NPMC.

Wastewater sources (production wastewater, withdraw from open-pit) are collected by NPMC and treated at WWTP before being discharged into the environment through Discharge Point No.2 (DP2). In addition, the run-off and seepage from potentially polluted locations are also collected and treated at WWTP by NPMC prior to discharge back into the environment.

The NPMC WWTP has a capacity of 36,000 m3/day using modern treatment technology comprised of 03 main stages: (i) biological treatment to remove organic matter; (ii) a chemical and physical treatment to remove some metals and fluorine; (iii) removal of sediment and some ions and natural cleaning with plants.

Rainwater run-off is divided into two categories by NPMC: (i) Rainwater run-off at the production area is collected into the wastewater pond, then pumped for treatment at WWTP, then discharged into the environment through DP2; (ii) Rainwater on the surface of the waste dump is collected into the sedimentation pond to settle suspended sediment, then discharged into the environment through DP3.

The automatic wastewater monitoring stations provide continuous monitoring data, along with daily quality monitoring analyzed on-site by SGS Vietnam has helped NPMC effectively control wastewater discharge quality. If contaminant concentration trend data shows signs of increasing, the automatic wastewater monitoring station will initiate alarms and, the environmental department quickly notifies the WWTP operator to check and adjust the treatment process physical.

NPMC has installed a recirculating pump system at the end of TSF-SP pond, in case the water at DP2 exceeds the standard to be returned to the WWTP for treatment until the discharge standard is achieved.



Discharge point No.3 (DP3)

Collection & Treatment of Potentially Polluted Water Sources

In addition to the efficient use of resources, the practise of not exceeding the load-bearing threshold of the ecosystem, the control and minimization of emission sources are also extremely important in environmental sustainable development. Therefore, all site water sources with potential pollution risks are strictly controlled by MHT, measures to collect and treat before being discharged into the environment.

Since the end of 2015, Nui Phao has started to store low grade ore in the southern waste dump and this material will continue to be used for mineral recovery valuable assets in the future. The seepage source from this area has many potential pollution risks. So, collection and treating it is essential.

NPMC has constructed a seepage collection sump and pumping system to allow for treatment at WWTP before being discharged into the environment through DP2.

At our HCS Goslar facility groundwater is managed to the plan agreed with authorities that “No contaminated groundwater leaves the factory premises.” This means that groundwater is extracted from the wells specified in the plan and then treated using a combination of activated carbon and ion exchangers prior to being discharged.

At each of our operations in Germany, Canada, and China the captured water flows are managed through 3rd party contractors’ facilities to ensure compliance with local regulations, and the operating permits of each facility. Due to contractual arrangements with these 3rd party service providers we are limited as to what operational information we are able to share directly. We are pleased to state that our Management teams in each location, live locally, and are comfortable with the compliance activities of both our operations and those of our local service providers.

In the scope of water / wastewater, HCS in Germany has closed a service contract with Chemitas. The permit for direct discharge of rainwater and wastewater via the Central Wastewater Treatment Plant is held by Chemitas. For indirect discharge into the sewerage system, there is a contract between HCS Tungsten GmbH, HCS Infrastructure GmbH and Chemitas, which performs the operator duties. An official exemption from the indirect discharge permit is currently being prepared. The amount of wastewater is not measured directly, but calculated by the purchase of fresh water and chemicals.



Emergency pumps at TSF-SP pond



The seepage collection sump from mineralized waste stockpile

GROUND WASTE MATERIALS MANAGEMENT

Mining activities create a large amount of waste soil and rock include that is classified by the potential chemical characterization: clean, non-acid forming (low sulphur), acid forming (high sulphur) or contaminated (high arsenic concentration). NPMC has separate management plans established to manage each type compliantly and maximize the amount of reused and reduced pressure load on the waste dump.

Renewable Materials

Clean waste soil and rock are used as construction materials for internal mine works (TSF wall-dam construction, road repairs, leveling, ...), the remaining material is disposed into dedicated waste dumps. In 2020, NPMC has reused 987,051 m3 of clean waste soil and rock to construct TSF wall-dam and other civil projects.

Non-Renewable Materials

In Vietnam Clean waste that cannot be reused is disposed into dedicated waste dumps, waste with potential to create acid (contaminated soil and rock or with high sulphur concentration) is stored in the submerged state at least 02m in STC) to prevent oxidation creating acid. In 2020, NPMC’s mining activities created 4,950,229 m3 of waste soil and rock, of which 4,299,603 m3 of clean waste soil and rock and 650,626 m3 of soil and rock with high sulfide concentration.



NPMC Open pit in Vietnam

At our HCS sites, which are well established manufacturing sites with less frequent site disturbance, the issue of renewable and non-renewable materials is much more limited, but is still managed by local regulations as and when ground activities occur.

Waste materials	2013	2014	2015	2016	2017	2018	2019	2020
Renewable materials (m³)	4,548,698	4,548,698	2,346,040	3,205,405	1,116,968	1,177,317	1,319,299	987,051
Waste rock for construction of TSF wall-dam	2,127,551	2,127,551	1,942,208	2,246,162	948,806	924,832	1,135,775	482,233
Soil for TSF dam construction	2,230,538	2,230,538	302,515	555,702	96,261	198,305	111,552	112,675
Waste soil and rock for other civil projects	190,609	190,609	101,317	403,541	71,901	54,180	71,972	392,143
Non-renewable materials (m3)	0	1,245,979	3,817,756	3,444,986	4,594,286	4,768,241	4,813,180	3,963,178
Waste disposed into the waste dump	141,711	141,711	1,203,342	2,675,276	3,696,926	3,896,736	3,821,551	3,312,552
High sulfide waste dumping in STC	1,104,268	1,104,268	2,614,414	769,710	897,360	871,505	991,629	650,626

NPMC - OTC Tailing - Potential Raw Material Source for Cement Production



Ore tail at the NPMC OTC tailing dam (Vietnam)

When natural resources are depleted, waste becomes a valuable resource that people can recycle and reuse. In recent time, implementing the policy of encouraging the reuse, recycling, and treatment of waste to save resources and minimize environmental pollution, Nui Phao Company has cooperated with other companies in need to research, evaluate and trial the OTC tailing. In 2020, NPMC also transferred nearly 7,700 tons of OTC tailing to DRET contractor for mineral processing for cement production.

A few of Vietnam’s biggest cement manufacturing companies and corporations (Vietnam Cement Corporation (VICEM) and The Vissai Cement Group) have surveyed, sampled, and trial researched the use of NPMC’s OTC tailing as input materials for cement production.

With a large volume of arising (1.7 - 2.1 million tons/year), if the OTC tailing recycling project is successful, this will be an extremely abundant source of raw materials for cement producers, contributing to reducing pressure on the environment, saving management costs.

WASTE MANAGEMENT

The manufacturing economy typically begins with the extraction of resources, production, consumption, and ultimately disposal. The circular economy moves toward recovery and regeneration or resources to produce other products. This helps to utilize previously considered waste materials, instead of the cost of exploiting new resources and the cost of waste treatment. The application of recirculating economic models in waste management at MHT through the 3R approach (recycling, reuse, and reduction) has also brought many positive results.

In 2020, total of waste volume is 5,152 tons (compared to 4,966 tons in 2019).

Year	2013	2014	2015	2016	2017	2018	2019	2020
Total of waste volume (tons)	716	1,285	998	1,845	3,318	4,926	4,966	5,152
Recycling rate total				37%	65%	51%	54%	45%
NPMC and MTC	716	1285	998	1,845	1,860	2,893	2,911	3,878
Non-hazardous waste	669	662	567	766	637	1,349	725	502
Hazardous waste	47	624	431	397	383	562	1,185	1,945
Recycled waste	0	0	0	683	840	983	1,001	1,431
Recycling rate				37%	45%	34%	34%	37%
Waste materials								
Renewable materials (m³)	4,548,698	4,548,698	2,346,040	3,205,405	1,116,968	1,177,317	1,319,299	987,051
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High sulfide waste dumping in STC	1,104,268	1,104,268	2,614,414	769,710	897,360	871,505	991,629	650,626
Goslar, Sarnia, Ganzhou				1,457	2,032	2,056	1,274	1,457
Non-hazardous waste				55	124	85	85	55
Hazardous waste				98	387	269	296	98
Recycled waste				1,304	1,521	1,703	893	1,304
Recycling rate				90%	75%	83%	70%	90%

HCS - A global leader in tungsten recycling

Estimates of the recycling rate in the tungsten industry at 25-30%, and that these rates vary greatly in different parts of the globe between 15 - 50%. HCS covers a large part of its raw material requirements in Goslar by recycling tungsten-containing scrap, which is both purchased in the market and received from our customers as part of dedicated recycling or conversion programs. As a result, the recycling rate in our raw material purchasing has been steadily increasing and was >75% in 2020.

In all HCS factories, the manufacturing by-products are usually very rich in valuable materials (especially metals) and can in turn be recycled as raw materials by ourselves or other companies. As a result, most of the production waste is recycled, reducing treatment cost, and protecting the environment.



MHT Beat Plastic Pollution

According to the United Nations statistics in 2018, the world consumes 1 million plastic bottles every minute and generates 300 million tons of plastic waste each year, equal to the weight of the entire world population.

Facing the global plastic pollution, the United Nations launched the program “Beat Plastic Pollution” in 2018, to propagate and urge the community to reduce the use of plastic products once to protect the environment and public health. There are more than 80 countries (Japan, Canada, India, Panama, New Zealand ...) in the world that have banned or minimized restrictions on single-use plastic items.

Vietnam ranks 4th in the world for plastic waste emissions into the ocean (accounting for 6% worldwide) according to the announcement of the MONRE in 2018. Faced with the urgent problem of plastic waste, the Vietnamese government is implementing many powerful solutions to strive to not use disposable plastic by 2025. Since 2018, many ministries, agencies, schools, and businesses have actively participated in the movement of beat plastic pollution, do not use disposable plastic products, reuse, recycle plastic products...

To limit plastic emissions, first of all, priority must be given to limiting input plastic products, using natural and environmentally friendly products, both during daily life and production. Therefore, NPMC has propagated and supported for employees as well as local communities to voluntarily change their behavior and habits in all activities.

In addition to promoting training to change behavior and habits of using plastic products, MHT also has many practical activities to beat plastic pollution from 2018 to now, such as: using biodegradable easily bags, replacing disposable plastic water bottles with stainless steel bottles, paper cups, and glass cups...

After persistent implementation, until now, the restriction on the use of single-use plastic bottles has initially given positive results and gradually become the culture of the Company... Company is also spreading the beat plastic pollution movement to the community.



Using glass cups instead of plastic cups



Training for employees, contractors about the “Beat plastic pollution” movement



Personal stainless steel water bottle - a corporate gift for the employees and contractors during Covid-19 time



ENERGY CONSUMPTION

Following the goal of efficient energy consumption from previous years, in 2020, MHT continues to promote energy saving solutions. In particular, HCS's factories are all certified compliant with ISO 50001 - energy management - and thus can demonstrate commitment to continuous improvement of energy-related performance. To carry out the tasks arising from the standard, MHT has appointed an energy management system officer and installed an energy team since 2019. From the energy assessment, facilities with significant energy use have been identified, and are then prioritized for energy-related performance improvement. The main energy-specific projects / measures across MHT are listed below:

- Operated the crushing plant during off-peak hours to reduce both peak load on the power generation network and overall power consumed by NPMC. This directly contributed towards a reduction in greenhouse emissions associated with generating power during peak hours;
- Optimised the performance of NPMC & MTC processing plants through implementation of automated process control loops utilising our state-of-the-art process control network;

- Continuously upgrade lighting to more energy efficient, longer life LED light fittings in all area of operations globally;
- Installed automatic on/off control of the NPMC plant lighting depending on levels of darkness, with lighting only being utilised as required to meet legislative requirements for workplace safety;
- Modifications to furnaces globally (e.g. insulation, stand-by mode, processes, automation and optimization of production volume);
- Modification of HCS Goslar pipelines to improve overall heating efficiency;
- Steam saving through better piping insulation in HCS Goslar.
- Converting HCS Goslar water purification to less energy intensive reverse osmosis process
- At HCS Sarnia the installation of high efficiency screens achieved a 50% increase in throughput when coupled with automation of boat filling system. These changes stabilized the process, improved product quality, increased yield, and reduced rework. The team are now determining the energy savings.

In 2020, total energy consumption was 1,617,936 GJ (decrease compared to 1,689,641 GJ in 2019), equivalent to 149,234 tons of CO₂:

Year	2013	2014	2015	2016	2017	2018	2019	2020
Total of Energy Consumption (GJ)	1,075,249	849,487	871,434	981,500	1,447,192	1,803,354	1,689,641	1,617,936
NPMC (including MTC)	1,075,249	849,487	871,434	981,500	1,104,792	1,425,562	1,325,990	1,287,484
Petrol	13,750	5,213	2,794	929	2,288	2,238	2,412	1,835
Diesel	864,708	423,794	322,980	306,817	391,612	475,166	439,631	392,779
Coal						250,205	159,855	158,636
Electric Power	196,790	420,480	545,659	673,754	710,892	697,953	724,092	734,235
Goslar, Sarnia, Ganzhou					342,400	377,792	363,652	330,452
Natural gas					188,518	213,625	186,735	161,543
Fuel oil					19,212	22,420	19,020	17,282
Diesel					884	1,006	1,010	1,044
Electric Power					133,787	140,740	156,887	150,583

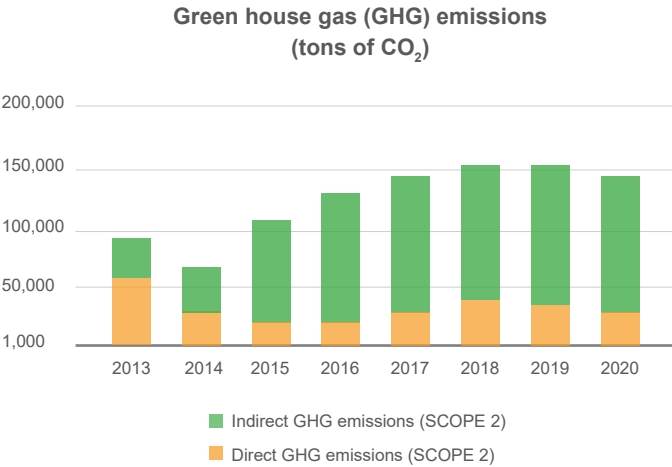
GREENHOUSE GAS (GHG) EMISSION

Direct GHG Emissions (SCOPE 1)

Our direct GHG emissions are generated by the petrol, natural gas, diesel and fuel oil consumed by vehicles, equipment and back-up generators. In 2020, we emitted 31,105 tons of CO₂, decrease compared to 4,923 tons of CO₂ in 2019.

Indirect GHG Emissions (SCOPE 2)

In 2020, we emitted 118,129 tons of CO₂, slightly increase compared to 117,171 tons of CO₂ 7,044 tons of CO₂ in 2019.



Year	2013	2014	2015	2016	2017	2018	2019	2020
Total of GHG emission volume (tons of CO ₂)	95,302	68,618	109,617	128,500	147,146	152,700	153,215	149,234
Total of direct GHG emissions (SCOPE 1)	64,362	31,435	23,873	22,627	32,112	39,303	36,044	31,105
Total of indirect GHG emissions (SCOPE 2)	30,940	37,183	85,744	105,873	115,034	113,397	117,171	118,129
NPMC (including MTC)	95,302	68,618	109,617	128,500	140,577	145,445	146,678	144,014
Direct GHG emissions (SCOPE 1)	64,362	31,435	23,873	22,627	28,868	35,769	32,895	28,637
Indirect GHG emissions (SCOPE 2)	30,940	37,183	85,744	105,873	111,709	109,676	113,783	115,377
Goslar, Sarnia, Ganzhou					6,570	7,255	6,537	5,220
Direct GHG emissions (SCOPE 1)					3,244	3,534	3,149	2,469
Indirect GHG emissions (SCOPE 2)					3,325	3,721	3,388	2,752

ENVIRONMENT TRANSPARENCY

Environmental Monitoring

Environmental monitoring is an indispensable important activity, determining the effectiveness of environmental protection activities. This is a tool for environmental quality and pollution control, and is an important link in environmental impact assessments.

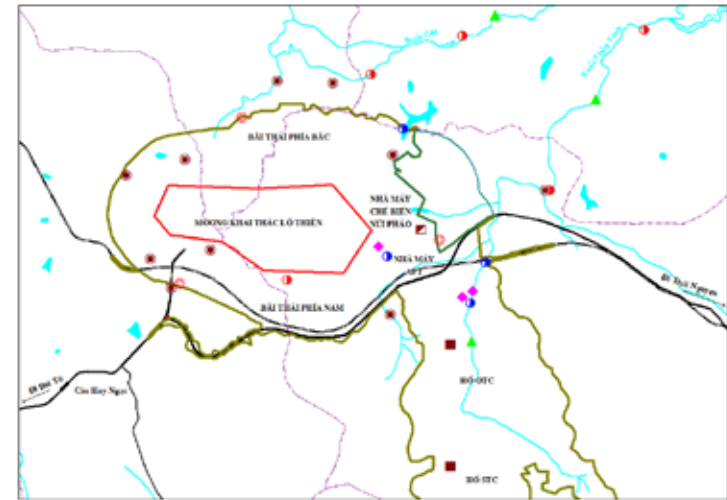
At HCS's Goslar, Samia and Ganzhou factories, wastewater monitoring and/or dust precipitation (deposition) are routinely carried out on a monthly basis. Wastewater is monitored online in centralized wastewater treatment plants. In addition, the responsible water supervisory authority also regularly monitors the control for monitoring. In 2020, the authority took 38 samples to monitor the discharge limits.

The dust precipitation (deposition) is determined according to the "Bergerhoff method" in accordance with TA-Luft and VDI 2119. A network of 13 measuring points for dust precipitation and dust constituents (dust, As, Pb, Cd, Ni and Th) is operated. Sampling and analysis were carried out on a monthly basis, i.e. each value is to be considered as the mean deposition over approximately one month divided by the days on which the collector was on site. The limits refer to the averaging over the year in $\mu\text{g}/\text{m}^2\cdot\text{d}$.

For monitoring the immission situation, Chemitas operates a total of 16 measuring points to monitor the situation at the entire Goslar site (MPO) and to intervene if necessary if anomalies or exceedances should be detected, as the official measurements are not published promptly.

Of these, 9 are located on the MPO site and 7 off-site in the immediate vicinity. The limit values (annual mean values) according to TA-Luft (4.5.1 TA-Luft 2002) apply to all assessment areas that are located outside the plant premises (MPO). Sampling and analysis are carried out on a monthly cycle (monthly averages).

At the Nui Phao mine, the environmental monitoring program is implemented in accordance with the adjusted environmental monitoring program that approved by MONRE. The periodic monitoring of environmental components (ambient air, emission gas, ground water, surface water, wastewater, and hazardous waste identification) is done by the functional monitoring laboratory. In addition, NPMC also carries out daily monitoring at the wastewater treatment facilities and wastewater discharge points for analysis at the SGS Vietnam laboratory to quickly and strictly internal control.

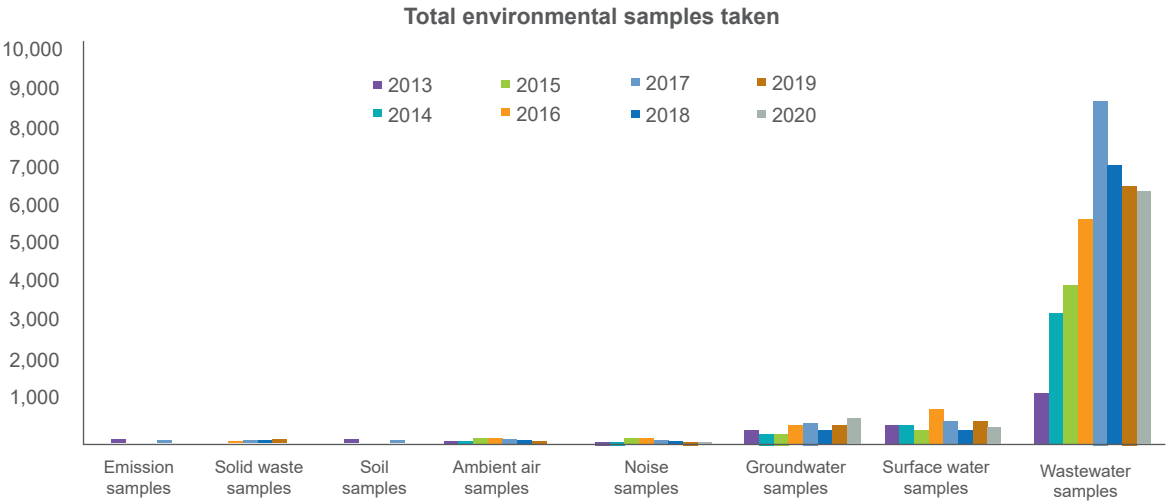


Environmental Monitoring Stations Network



Wastewater monitoring at DP2, NPMC

In 2020, NPMC has taken 8,079 environmental samples, including: 533 surface water samples, 676 ground water samples, 6,596 wastewater samples, 111 solid waste samples, 35 soil and sediment samples, 26 environmental samples ambient air, 74 emission gas samples and 28 noise measurements in 24 hours.



Besides traditional monitoring, NPMC also operates automatic monitoring stations: 04 automatic vibration monitoring stations to control vibration during blasting; 03 automatic wastewater monitoring stations at DP2, DP3 and WWTP; 01 automatic gas monitoring station in the area of Hamlet 4, Ha Thuong commune nearby NPMC's processing plant; Automatic water level monitoring at ground water wells/bores being exploited.

The monitoring stations are currently operating stably, the data of automatic gas and wastewater monitoring stations is continuously transmitted to the data receiving center of the Department of Natural Resources and Environment (DONRE) according to regulations.



Automatic wastewater monitoring station at NPMC

ENVIRONMENTAL REHABILITATION

Reporting and Information Transparency

In 2020, within Vietnam MHT submitted a total of 19 reports, 15 annual environmental reports, 2 reports on waste management, 2 reports of monitoring results of automatic monitoring stations and a number of other reports according to requirements of the host water authority.

In addition within Vietnam, in order to provide timely information on the implementation plan of the recommendations of MONRE (according to the 2017 inspection conclusions), in 2020, NPMC submitted 04 updated quarterly reports on the implementation progress to VEA, DONRE and Ha Thuong DPC.

Through two periodic inspections of the Ministry of Natural Resources and Environment in 2020, the NPMC's efforts for environmental protection have been recognized and appreciated.

In Germany, HCS submitted a total of 15 reports to the various Federal and State Ministries covering; Hazardous waste, emissions, inspections, and accidents. A further 7 reports are required on a 3 or 4 year cycle as per the applicable regulations again covering emissions, waste or inspections.

Reports submitted by the H.C. Starck Tungsten GmbH in Goslar:

- §31 BImSchG; 6 reports / year
- PRTR report; 1 report / year
- Report of the Emission Protection and Major Accidents Officer 1 report / year
- Emission declaration according to 11. BImSchV / every 4 years; last report for 2016, next for 2020
- §52a BImSchG, 5 IED inspections and report / year
- §16 Störfallverordnung, 1 inspection / year
- 6 measurement reports according to §28 BImSchG for 16 emission sources / every 3 years

In 2020, NPMC rehabilitated an area of 7ha at the slopes of waste dumps, buffer zones and other disturbed areas of mining and operations by using a variety of plants and materials to increase the efficiency of environmental rehabilitation and restoration works. A total of 17,710 Acacia trees were planted, 338 kg of grass seeds sown, and 18,178 kg of fertilizer were used for the planting and maintenance of trees planted previously. Up until the end of 2020, NPMC had rehabilitated a total of 63.85ha, making an important contribution to environmental protection works in the mining activities.



Planting trees on the slopes of waste dump

Research on the Ability of Grass to improve wastewater quality

In 2020, NPMC continued to maintain and improve the Floating Wetland model for improving treatment efficiency and improving wastewater quality.

To supplement the effectiveness of our WWTP, in early 2020, NPMC commenced research to evaluate the ability of Umbrella grass to absorb heavy metals in wastewater. The experiment was performed using the wastewater from the Nui Phao mine, and the surface water environment outside the mine area to provide control results. The research period was from January to December 2020 with 06 stages of samples analysis. According to initial analysis and assessment results, heavy metals accumulate the most in the roots, then stems and leaves, the highest accumulation time is when the grass reaches 3 months of age, this is also period of fastest growth and biomass accumulation.

Initial research results has confirmed that heavy metals mainly accumulate in the roots, and to evaluate the extent of absorption, further research will be necessary. The research results will help NPMC to have appropriate management measures when harvesting biomass, and at the same time consider replicating the treatment model if the metal absorption capacity of Umbrella grass is efficient.



Umbrella grass rafts used for experiments



Continue the Energy Crops Planting Program at Nui Phao Mine

Following the results from stage 1, in 2020, NPMC continues to coordinate with UFU (Institute for Independent Environmental Affairs – Germany) to implement Climate Protection Project (CPEP) stage 2 (from 2020 to 2022) with the aim of: (i) Resilience research, land reclamation in areas where energy crops were planted in stage 1; (ii) Calculate the biomass of Acacia after harvest in 2022.

Energy crops planting will help improve and restore the mining environment during and after mining. The use of energy tree biomass to produce biofuels to replace fossil energy sources in the future will contribute to reducing the greenhouse effect - against climate change. Strengthening collaborative research will be the right direction that NPMC takes to find the optimal solutions to protect the environment in the future.



Soil samples taken from the areas where energy crops are grown

Continue with Operational Model “Goldfish and Tilapia Growth in Water Discharge”

In 2019, NPMC developed a showcase initiative for demonstrating the good quality of the water discharge by constructing “Goldfish and Tilapia growth in water discharge” model. This is a real-time visible demonstration of the good quality of water discharge for both aquatic life and vegetation, to the local community and all stakeholders.

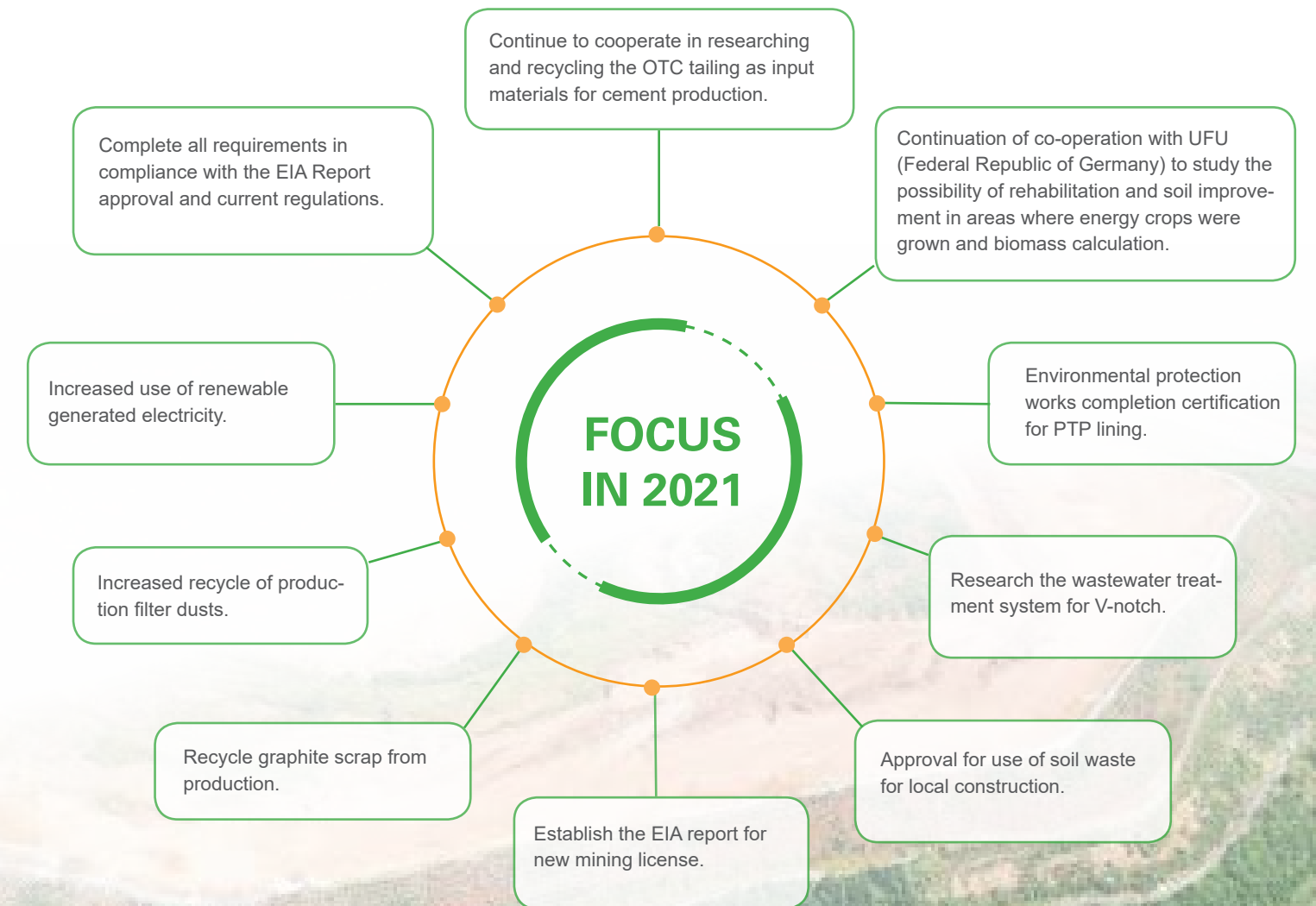
In 2020, NPMC took samples to analyze the metal concentration in fish that growth in 03 areas: DP2, DP3 and Cong river raw water reservoir (control sample). The analysis results showed that fish samples growth at the DP2, DP3 accumulate less metal than fish growth in the Cong river raw water reservoir. This result help demonstrate that the quality of NPMC’s wastewater at the agreed discharge points consistently meets the standards, in compliance with the current environmental regulations.



Fish swimming in the Company's water discharge

Remediation Plan

The company H.C. Starck GmbH is obliged to remediate the contaminated site. The remediation is carried out in accordance with a remediation plan declared to be binding under the remediation goal “No contaminated groundwater leaves the factory premises.” For this purpose, the extraction and treatment of groundwater by means of activated carbon and ion exchangers takes place from the wells specified in the remediation plan.



Sustainability Community

2020 HIGHLIGHTS

Economic Restoration Fund

- VND 2.36 billion contribution into 12 community development projects;
- Total 48 households accessed loan from this fund;
- 95% of 48 household improved their own household economic conditions.

Humanitarian and charity activities

- Free 250 Tet gifts for poor households equivalent to VND 130 Million;
- Bicycle, scholarship and gifts donation to 70 disadvantaged students totaling VND 80 Million;
- VND 600 million support in joining hands with Communities to fight against the Covid-19 pandemic.

Community Health, Water and Sanitation

- Free clean-water supply program to 101 households with VND 500 Million;
- 10 training courses of public awareness on waste and energy saving for 3000 pupils;
- Free medical examination for 100 vulnerable people.

Micro-Livelihood Model for vulnerable people groups

- 11 vulnerable women as single moms with disadvantaged circumstances accessed model of livestock raising and cattle breeding – 100% of chicken developing well;
- Organized 14 training courses and 01 study tour for 899 households for building capacity (farming, manufacturing and processing of VietGap tea, organic tea and fruit-tree; beekeeping etc.).

Community Transparency

- 845 visitors from the Government agencies, local & international experts, Universities, newspaper agencies, local authorities and others;
- 107 meetings and consultations with 1,306 participants;
- 1,156 information items published with 112 contents;
- 213 visitors to the Information Center and 59 written complaints resolved.

Support for infrastructure development to community

- Provided VND 10 Million to upgrade irrigation channel.

ECONOMIC RECOVERY FUND

In 2020, MTH worked with the Dai Tu district Social Policy Bank, trust associations of Ha Thuong, Hung Son town, Phuc Linh, Tan Linh and Cat Ne communes to verify 48 households eligible to access to the loan capital to implement the household economic development models, typically: cattle and poultry farming, fruit-tree cultivation, tea newly planting and sustainable cultivation, etc., with total amount of VND 2.36 billion.

The household Nguyen Van Sinh sesiding in Cau Thanh 2 residential group, Hung Son town

Residing in Cau Thanh 2 residential group, Hung Son town and having a child with disabilities, Mr. Nguyen Van Sinh is one of the project-affected households with disadvantaged conditions. Between 2015 and 2017, Sinh received a VND50 million loan from the Economic Recovery Fund of MHT and invested in the chicken production, mainly construction of the coop and buying chicks with the initial scale of 300m² and 500 chicks to collect eggs. Currently, there are over 2,000 chickens with an area of 1,200m² helping him increase the average income from VND4-5

million to over VND10 million per month. While raising chickens, Sinh and his family have learned from other models to improve his farming practice, especially poultry disease prevention. Besides, his family has invested further in the pig production and vegetables and flowers growing model to utilize various poultry wastes and develop a sustainable household economy. Thanks to preferential interest rate, his family can feel peace of mind to develop the chicken raising model and improve their life quality.



Vegetable farm of local people



Poultry farming to collect eggs of local people

The household Doan Thi Thuy residing in Xuan Dai residential group, Hung Son town

The household Doan Thi Thuy residing in Xuan Dai residential group, Hung Son town, is one of the typical beneficiaries from MHT's policy on joining hands in the model development of key economic sectors in the region. Her family is a near-poor household, accessible to VND50 million loan to invest into the vegetable growing model, mainly buying fertilizer, seedling for an area of 0.216 ha. Thanks to the vegetable growing model, her family income has increased from average VND4-5 million to VND10 million per month. With benefits of lower interest rate and short-term fund of the vegetable growing model, it helps her family income improve and children feel peace of mind during learning. Moreover, her family continued buying earth-moving machinery to improve the production efficiency.



Safe vegetable cultivation of local people

The household Mr. Tran Van Tan residing in hamlet 14, Tan Linh commune

Tan's family was the near-poor household with 5 members. He also has an older mother and two school-age children. In 2018, his family also borrowed VND 50 million from MHT Economic Recovery Fund to invest into 0,1 ha of F1 hybrid tea cultivation. As of 2020, this tea variety is 1.5 times higher in production and 20% higher in prices than the old one. With his hard work, diligence, the life of his family is changing and escaped poverty. His income has increased from VND 7.5 million up to VN10 million per month. "I want to express our sincere thanks to MHT for making favorable conditions my family to the low interest loan during our difficult time so that we can develop the economy and bring up my children. My eldest son has fulfilled his military service and the second child is studying at high school." said Mr. Tan.



VietGAP tea farming model of local people

AGRICULTURAL EXTENSION

VietGAP Tea

One VietGAP tea cooperative group of 42 households with an area of 5ha was established in Hop Thanh residential group, Hung Son town with the support of Nui Phao Mining in the technical training and economical tea irrigation system totaling more than VND 50 million (70% funded by the Company, 30% counterpart capital from the people per ha).

Organic Tea

The organic tea farming model was selected and implemented in Hamlet 10, Tan Linh commune in the period of 2019 - 2022. In early years, the Company has provided the training, capital goods, equipment such as 2 multi-purpose tillers of over VND 30 million for the cooperative group.

Safe Vegetable

With the advantages of the wells to water the safe vegetables in the previous years, in 2020, Nui Phao Mining continues providing additional 5 wells for Hung Son safe vegetable cooperative with its funding of VND 10 million.

Micro-economic Model

Support the micro-economic model in Ha Thuong commune and Hung Son town: 11 poor women are beneficiaries from this model with the support of VND 33 million to carry out the egg-laying model.

Capacity Building Training

No.	Content of training / study visit	No. of courses	Number of participants
1	Training on beekeeping technique & winterization	1	67
2	Training on organic tea cultivation technique	7	400
3	Training on organic vegetable cultivation for Hung Son vegetable cooperative	1	72
4	Training on how to plant and care for the organic citrus trees	2	120
5	Training on VietGAP tea cultivation	2	130
6	Training on composting technique for organic tea cultivation	1	70
7	Study tours to the tea cultivation model in Tan Cuong commune, Thai Nguyen province	1	40
	Total	15	899

RECRUITMENT SUPPORT AND CAPACITY BUILDING FOR LOCAL BUSINESS

- Coordinate with HRD to hire 10 local people to work at MHT.
- The safety is the top priority at the Company, so all the entities/ contractors/-supporting businesses must comply with the safety regulations. Nui Phao Company has always attached great importance to training on fire and explosion prevention & OHS. In 2020, the Company has conducted training courses on OHS & fire and explosion prevention for more than 100 employees of Anh Duong Packaging Company this year.



CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES

- World Environment Day: Coordinate with Environment Department to conduct propaganda at 4 schools with raise public awareness on waste classification to clean up the world; This propaganda attracted total 1,520 participants including pupils, students and teachers/lecturers.
- The World Cleanup Day was integrated into Vietnamese Women's Day:
 - » Coordinate with HSE Department to conduct the communication on domestic food hygiene for Tan Linh commune for 120 households; organize the talk shows on household electrical safety; drowning safety and preventive measures for over 2000 teachers/pupils.
 - » Coordinate with Environment Department to conduct the communication sessions on beating plastic pollution for about 80 women at Tan Linh commune.
- Side by side with Vietnam Fatherland Front of Thai Nguyen province in the prevention and control of Covid-19 pandemic by funding: VND500 million. Furthermore, Company has also contributed VND70 million to the local agencies: (Dai Tu district: VND30 million; Ha Thuong commune: VND10 million; Hung Son commune: VND10 million; and VND5 million for each commune of Tan Linh, Phuc Linh, Cu Van and Tan Thai). Give the 300 bottles of Lifebuoy 500ml hand sanitizer to the poor households in 4 project-affected communes.



Mr. Vo Tien Dung - Director of External Relations, Environment, and Community gave donation to Thai Nguyen Provincial People's Committee



Presenting needy pupils with bicycles in the national action month for children

- The Mid-Autumn Festival gifts Giving program to children in the project area: To implement the Corporate social responsibility activities, especially promote solidarity and care to the children, MHT funded VND23 million for the local authority to organize the Mid-Autumn Festival for thousands of children.
- Participate in and give gifts to the surrounding villages celebrating the Great National Unity Festival with total amount of VND7 million.
- Coordinate with Thai Nguyen Department of Industry and Trade to give bicycles to the children on the occasion of Action Month for Children (20 bicycles worth VND24 million). MHT awarded scholarship to the disadvantaged students with the total amount of VND 50 million.
- Loan capital: In 2020, provide clean water for 386 people of 101 households in hamlets 2 and 6, Ha Thuong commune, totaling VND505 million.





2020 COMMUNITY ACHIEVEMENTS

- 

Maintain and **expand VietGAP tea area** of **5**ha in Hung Son town.
- 

Continue to support and monitor the **10**ha **organic tea project** in Tan Linh commune (2019-2021)
- 

Expand micro livelihood models for **11** most disadvantaged/ vulnerable households.
- 

Further **improve the performance and capacity** of over **100** local supply groups and companies
- 

Actively participate in **charitable and social activities** in Dai Tu district and Thai Nguyen province

 - Support in the fight against Covid-19 (VND **600** million)
 - Blood donation program at MHT (total **199** blood units donated),
 - Central Vietnam flood relief appeal with a total amount of VND **209,552,000**, etc.

COMMUNITY TRANSPARENCY

At Masan High-Tech Materials, the transparency mechanism has always been maintained, improved and developed in order to exchange two-way information between Company and the stakeholders, particularly the local communities. Therefore, the community-related activities are conducted in a transparent manner in the spirit of cooperation and result-oriented development in 2020 as below:

- 

1,156 information items published with **112** contents
- 

107 meetings, field inspection and community consultation with **1,306** participants
- 

213 visitors to the Information Center
- 

65 written complaints resolved

Diversified Information Disclosure Channels

At MHT, a variety of channels to disseminate information were deployed with the aims of giving people the information they need to participate in an informed manner. Stakeholders, particularly project-affected communities are provided and exchanged with two-way communication through channels such as Public Consultation and Disclosure Plan (PCDP), complaint and grievance mechanism, information corners in the community, meetings, dialogues, survey, mine site visits, information center, company's quarterly and annual publication. The channels also enabled us to gain valuable insights into what we do well and where we need to improve.



Community Information Corner

PCDP - An Approachable Communication Channel for Communities

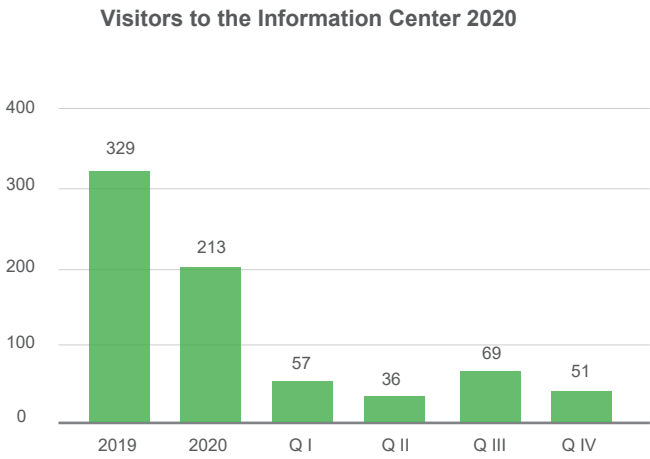
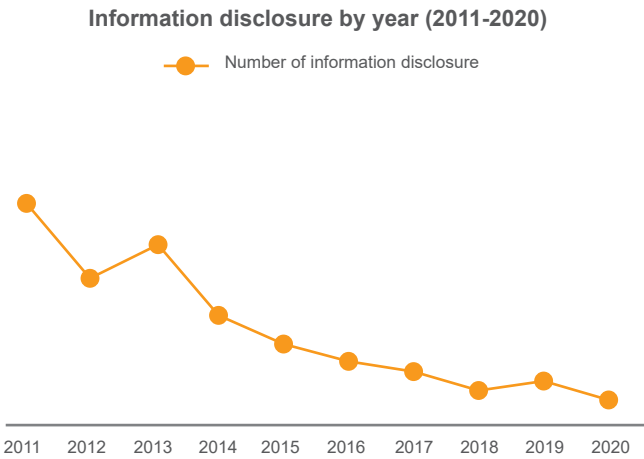
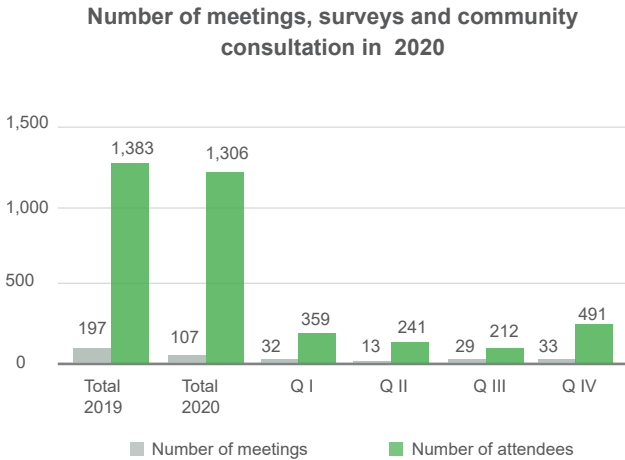
In 2020, the Public Consultation and Disclosure Plan (PCDP) continued to prove itself an effective two-way communication between the Company and stakeholders, particularly local communities. The community relation team proactively engaged with internal and external stakeholders to maximize information accessibility opportunities for local people and timely address their concerns. Due to the impacts of Covid-19 pandemic, some public consultation and information disclosure activities were restricted and continued to be conducted in the coming year.

In 2020, there were 1,129 information items published with 107 contents and 203 visitors to the Information Center. There are numerous channels for local communities to access to the information of the Company, of which the Information Center is remained easy-to-approach channels for community as they can make a phone call or walk in to talk about compensation and relocation inquiries, environmental impact concern or just to get accurate and update information about employment, casual job opportunities and other issues.



Local people came to find out information in the MHT Information Centre in Vietnam

In 2020, the community relation team conducted 107 meetings, surveys and community consultation with 1306 participants. This is outcome of the community consultation, field investigation with a view of needs assessment of infrastructure improvement, economic development, environmental sanitation, health care for the surrounding communities. Such meetings, field investigation also help the Company further understand the needs and concerns from community to provide the warning measures to mitigate the environmental impacts and timely resolve their concerns.



Complaint and Grievance Resolution

MHT in Vietnam

During the 2020, we received 65 written complaints and all cases were forwarded, connected to relevant departments/team within the company as well as required involvement of local authorities to address the concerns. In order to reduce the complaint and grievance from community, the community relation team seek to proactively engage with relevant internal departments to regularly inspect the areas of the Project and surrounding communities to timely provide measures to minimize the impacts. The consultation is also strengthened with the involvement of community to address their concerns or queries in a timely manner. However, during the year, there were several repeated cases which required involvement of local authorities and regulators at all levels to address. Those exist previous years, including concerns on environmental impact raised by villagers in hamlet 6 of Ha Thuong commune and relocation and compensation request raised by people in hamlets 2, 3 and 4 of Ha Thuong commune. These concerns have the potential to impact communities and develop into far-reaching stakeholder opposition to our activities if not handled properly. Thus, the Company seek to proactively engage with internal departments and governmental functional agencies to address these concerns in a timely manner.

Complaints and grievance 2018 - 2020



H.C. Starck in Germany

Since the Goslar site borders on an area with mixed development (residential areas and industrial plants), the neighbors are just as relevant stakeholders of H.C. Starck Tungsten GmbH as its own employees or employees of other companies on the site of the Metallurgical Park Oker (MPO). In 2019, a total of 18 nuisances due to noise, odors or clouds of smoke/steam were reported by residents from the neighborhood and by employees on the plant premises, which were attributable to the production of H.C. Starck Tungsten GmbH. All occurrences were investigated and appropriate measures were taken if necessary. So this number could be reduced in 2020 to 7 nuisances / complaints. The two locations Sarnia and Ganzhou are located in purely industrial areas. In both cases there were no complaints from neighbors or other third parties.

For the 2019 reporting period, a total of 4 environmental incidents are to be reported for H.C. Starck Tungsten GmbH:

- March 2019: Complaint about an odour nuisance caused by H₂S: the conversion of the causing filter press was carried out during maintenance in December 2019.
- June 2019: Emission of gaseous aerosols in the form of a bluish cloud: replacement of the corresponding filters as a preventive measure Installation of cameras, as smoke formation cannot be detected by measuring probes.
- August 2019: Complaint about noise pollution caused by night-time production: repeated instruction to keep windows and gates closed even at high temperatures.
- September 2019: Discharge of molten sodium tungstate. The cause was a defective melting tank. In order to avoid such defects in the future, the wall thickness of the melting tanks is now checked before they are used.

For the 2020 reporting period, a total of 4 environmental incidents are to be reported for H.C. Starck Tungsten GmbH:

- March 2020: Complaint about a smoke leak: the cause was the fire of a filter on a furnace due to a leak.
- June 2020: Due to an oil/oxygen mixture that was incorrect for a short time, incomplete combustion occurred in a furnace, resulting in smoke.

HCS COMMUNITY DEVELOPMENT

In Goslar, Germany

H.C. Starck Tungsten GmbH, as an important and well-known company in the region, is aware of its social responsibility, but also competes with other companies on the labour market for skilled workers.

To get young people interested in chemistry at an early age, we use our own equipment to support chemistry lessons at schools during the so-called "discovery days", invite school classes and student groups to the plant and sponsor the Chemistry Olympics at a university. We actively participate in the so-called "Future Days", where schoolchildren can spend a day getting a taste of business areas.

We support schools with donations in kind. For example, protective glasses for chemistry lessons.

The close proximity of the Goslar site means that we bear a special responsibility for our neighbours. We have developed an emergency management system which, in addition to averting danger, places particular emphasis on providing comprehensive and transparent information to those affected. Information material on how to act in the event of an emergency and contact addresses have been distributed. We are pleased to invite all interested parties, but especially relatives and neighbours, to an open day on the plant premises so that they can find out about our work on site. We also invite people who feel disturbed by noise or odours from HCS production to explain the causes and present our measures to prevent further nuisance.

As part of our health management program, we sponsored the 2018 Goslar Old Town Run, a well-known sporting event in which we also participated with our own teams of runners. Due to the SARS-CoV-2 pandemic, many of the community activities could not be carried out in 2020. However, we will resume them as soon as the infection situation allows it.

During the pandemic, HCS supported doctors and physiotherapists with well over 1,000 FPR-2 masks, which were urgently needed. As seniors represent a special risk group, a senior citizen's residence was provided with masks and protective goggles to prevent infection.



Site manager Juliane Saupe with chemistry teacher Gabriele Klein and school principal Martin Ehrenberg



Welcome gift: Goslar physician spokesman Dr. Jens Suckstorff accepts the masks from H.C. Starck site manager Juliane Saupe

In Sarnia, Canada

Below are the several projects and activities H.C. Starck in Sarnia supported and/or sponsored in the city and the region in 2020.

Christmas Food Drive - onsite for Inn of Good Shepherd:

The Inn of the Good Shepherd is a local charity that provides food, clothing and shelter to the working poor, the unemployed and the homeless. Employees donating food and cash receive draw tickets for an opportunity to win prizes which are sponsored by both companies. The company with the highest fundraising total per employee wins the coveted Golden Can trophy. This is a joint fundraising event between TODA Advance Materials and HC Starck. In total, around 300 food items and \$2400 were donated in the past two years.

Santa Clause Parade Sponsor:

The Kinsmen is a local charity that hosts the Santa Claus Parade every year. The parade typically consists of 40 floats and a number of large marching bands. This a major event that is attended by thousands of people from Sarnia and surrounding areas. This showcases the involvement of the company in local community events. HC Starck is a major sponsor of the float Santa Clause rides on, which gets the most attention during the parade, thereby maximizing the company's exposure in the community.

Celebration of Lights:

Set-up of annual light display in central community park. The Celebration of Lights is a spectacular display in which the Sarnia-Lambton county is set aglow under a blanket of illuminated lights. This event is set-up each year and attracts thousands of people from Sarnia and the surrounding areas. Ongoing sponsorship of the event and set up of our own display to enhance the company's profile as an active and engaged participant in community events.

Little League Sponsorships (Hockey and Baseball):

Employees are given the opportunity to the apply to HC Starck for sponsorship to benefit their local team or club. The name of the company becomes more widely known in the community, both as a sponsor of local sporting activities and a potential employer. This also provides an opportunity to under privilege children to participate in competitive sports.

“Adopt- a-Family” Christmas Gifts at the Inn of the Good Shepherd: Adopt-a-Family is a project where local businesses, families, churches, service clubs and individuals are paired with a family that cannot afford to provide their children with Christmas gifts. The children provide a “wish-list” for Santa and receive their gifts on Christmas morning. We provide employees with an opportunity to be actively involved in supporting a local charity and under privilege children.

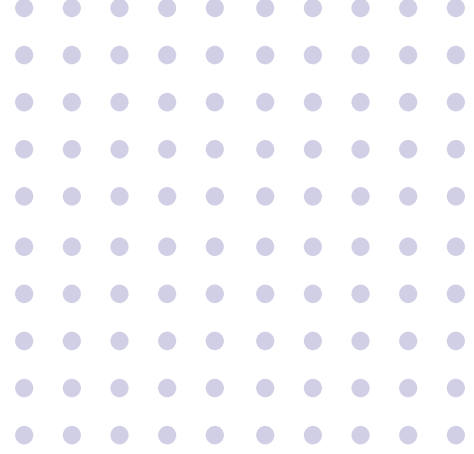


Christmas Food Drive



Celebration of the lights





FINANCE REPORT



Finance Overview
Statement of the Board of Management
Independent Auditor's Report
Consolidated Balance Sheet
Consolidated Statements of Income
Consolidated Statements of Cash Flows
Notes to The Consolidated Financial Statements

FINANCE OVERVIEW

Despite the significant impact of Covid-19, Masan High-Tech Materials Corporation (“Company” or “MHT”) (formerly Masan Resources Corporation) net business revenue for 2020 was VND7,291 billion, a significant increase of VND2,585 billion in comparison with previous year, mainly resulting from the acquisition of H.C Starck Holding (Germany) (“HCS”) during the year. In June 2020, MTC, a subsidiary of the Company, successfully acquired 100% equity interest in HCS, a global manufacturer of tungsten metal powders and carbides (midstream tungsten products). Such transaction resulted in HCS also becoming a subsidiary of MHT.

In October 2020, the Company signed an agreement with Mitsubishi Materials Corporation (“MMC”) to issue 109,915,542 of the Company ordinary shares with the result that MMC now holds 10% of the Company’s equity interest. The proceeds from new shares issuance transactions was used for enhancing financial capability, expanding operation scale and increased competitiveness, helping to form a basis for the sustainable development, safety and efficiency of the Company.

MHT has continued to maintain the salaries, bonuses to the employees, fulfill its tax obligations and fee payment responsibilities to the state and provincial budget which amounted to VND1,478 billion for 2020.

In order to become sustainable, the mining and processing industry must find ways to ensure its long-term economic benefits. For MHT, our strategy is made possible with a stable and long-term business model, underpinned by our successful NPMC and MTC operations – a leading tungsten mine and factories in Vietnam, and successful acquisition of HCS. This allows us to reach to global market. Our role as a raw commodity producer, continues to let us take advantage of the benefits of a secure, long-term and low-cost supply chain solution, giving us a competitive advantage over other industrial product platforms. We have achieved a net revenue of VND7,291 billion for MHT over the year 2020, which is an increase of 55% compared to 2019. Accordingly, the Company delivered an attributable net profit of VND39 billion in 2020, which represents a 89% decrease over the same period last year.

Highlights of MHT Achievements in 2020

Net revenue increased by

55%

Tungsten equivalent product increased by

68%

Copper production increased by

13%

Tax contributions increase

21%

CORPORATE INFORMATION

Enterprise Registration Certificate No.	0309966889	27 April 2010	The Company's Enterprise Registration Certificate has been amended several times, the most recent of which was dated 14 December 2020. The Certificate and its amendments were issued by the Department of Planning and Investment of Ho Chi Minh City. The first Business Registration Certificate No. 0309966889 was issued on 27 April 2010.
Investment Certificate No.	41122000131	2 August 2013	The Investment Certificate was issued by the People's Committee of Ho Chi Minh City to the Company to implement the investment of "Ma San Resources Corporation" which has a term of 10 years from the date of the Investment Certificate.
Board of Directors	Mr. Danny Le	Chairman	
	Mr. Nguyen Thieu Nam	First Vice Chairman	
	Mr. Nguyen Van Thang	Member	
	Mr. Craig Richard Bradshaw	Member	
Board of Management	Mr. Craig Richard Bradshaw	General Director	
	Mr. Stuart James Wells	Chief Financial Officer	
Registered Office	Suite 802, 8 th Floor, Central Plaza Building No. 17 Le Duan, Ben Nghe Ward, District 1 Ho Chi Minh City Vietnam		
Auditor	KPMG Limited Vietnam		

STATEMENT OF THE BOARD OF MANAGEMENT

The Board of Management of Masan High-Tech Materials Corporation (formerly known as Masan Resources Corporation) ("the Company") presents this statement and the accompanying consolidated financial statements of the Company and its subsidiaries (collectively referred to as "the Group") as of and for the year ended 31 December 2020.

The Board of Management is responsible for the preparation and presentation of the consolidated financial statements in accordance with Vietnamese Accounting Standards, the Vietnamese Accounting System for enterprises and the relevant statutory requirements applicable to financial reporting. In the opinion of the Board of Management:

(a) the consolidated financial statements set out on pages 174 to 237 give a true and fair view of the consolidated financial position of the Group as at 31 December 2020, and of their consolidated results of operations and consolidated cash flows for the year then ended in accordance with Vietnamese Accounting Standards, the Vietnamese Accounting System for enterprises and the relevant statutory requirements applicable to financial reporting; and

(b) at the date of this statement, there are no reasons to believe that the Group will not be able to pay its debts as and when they fall due.

The Board of Management has, on the date of this statement, authorized these consolidated financial statements for issue.

On behalf of the Board of Management



Craig Richard Bradshaw
General Director

Ho Chi Minh City, 5 March 2021

INDEPENDENT AUDITOR'S REPORT

To the Shareholders

Masan High-Tech Materials Corporation (formerly known as Masan Resources Corporation)

We have audited the accompanying consolidated financial statements of Masan High-Tech Materials Corporation (formerly known as Masan Resources Corporation) ("the Company") and its subsidiaries (collectively referred to as "the Group"), which comprise the consolidated balance sheets as at 31 December 2020, the related consolidated statements of income and cash flows for the year then ended and the explanatory notes thereto which were authorised for issue by the Company's Board of Management on 5 March 2021, as set out on pages 181 to 237.

Management's Responsibility

The Company's Board of Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with Vietnamese Accounting Standards, the Vietnamese Accounting System for enterprises and the relevant statutory requirements applicable to financial reporting, and for such internal control as the Board of Management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with Vietnamese Standards on Auditing. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Company's preparation and fair presentation of the financial statements 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. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the Company's Board of Management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Auditor's Opinion

In our opinion, the consolidated financial statements give a true and fair view, in all material respects, of the consolidated financial position of the Group as at 31 December 2020 and of their consolidated results of operations and their consolidated cash flows for the year then ended in accordance with Vietnamese Accounting Standards, the Vietnamese Accounting System for enterprises and the relevant statutory requirements applicable to financial reporting.

KPMG Limited
Vietnam
Audit Report No.: 20-02-00097-21-1



Dam Xuan Lam
Practicing Auditor Registration
Certificate No.: 0861-2018-007-1
Deputy General Director
Hanoi, 5 March 2021



Phan Mỹ Linh
Practicing Auditor Registration
Certificate No.: 3064-2019-007-1

CONSOLIDATED BALANCE SHEET

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated balance sheet as at 31 December 2020

Form B 01 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	31/12/2020 VND'000	1/1/2020 VND'000
ASSETS				
Current assets (100 = 110 + 120 + 130 + 140 + 150)	100		9,756,298,985	7,581,595,985
Cash and cash equivalents	110	6	761,930,286	1,723,204,606
Cash	111		705,930,286	941,446,956
Cash equivalents	112		56,000,000	781,757,650
Short-term financial investments	120	7	-	5,900,000
Held-to-maturity investments	123		-	5,900,000
Accounts receivable - short-term	130		2,771,124,731	1,735,574,636
Accounts receivable from customers	131	8	1,166,693,898	280,413,823
Prepayments to suppliers	132		139,861,845	204,604,439
Loan receivables	135	9	1,143,479,452	1,000,000,000
Other receivables	136	10	321,089,536	250,556,374
Inventories	140	11	4,880,128,480	3,139,024,753
Inventories	141		4,969,141,648	3,139,024,753
Allowance for inventories	149		(89,013,168)	-
Other current assets	150		1,343,115,488	977,891,990
Short-term prepaid expenses	151		56,241,220	41,186,774
Deductible value added tax	152		1,286,793,842	936,705,216
Taxes and others receivable from				
State Treasury	153		80,426	-

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated balance sheet as at 31 December 2020 (continued)

Form B 01 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	31/12/2020 VND'000	1/1/2020 VND'000
Long term assets (200 = 210 + 220 + 240 + 250 + 260)	200		30,352,548,829	22,193,123,896
Accounts receivable – long-term	210		1,298,310,451	1,303,868,898
Other long-term receivables	216	10	1,298,310,451	1,303,868,898
Fixed assets	220		23,784,752,467	16,568,909,156
Tangible fixed assets	221	12	19,826,833,068	16,103,772,445
<i>Cost</i>	222		30,478,383,425	21,906,539,480
<i>Accumulated depreciation</i>	223		(10,651,550,357)	(5,802,767,035)
Finance lease tangible fixed assets	224		-	-
<i>Cost</i>	225		67,300,000	67,300,000
<i>Accumulated depreciation</i>	226		(67,300,000)	(67,300,000)
Intangible fixed assets	227	13	3,957,919,399	465,136,711
<i>Cost</i>	228		4,693,664,166	696,680,717
<i>Accumulated amortisation</i>	229		(735,744,767)	(231,544,006)
Long-term work in progress	240		1,467,480,229	1,694,487,259
Construction in progress	242	14	1,467,480,229	1,694,487,259
Long-term financial investments	250	7	202,627,868	-
Investments in associates, joint ventures	252		195,227,868	-
Held-to-maturity investments	255		7,400,000	-
Other long-term assets	260		3,599,377,814	2,625,858,583
Long-term prepaid expenses	261	15	2,905,894,138	2,625,858,583
Deferred tax assets	262	21(a)	693,483,676	-
TOTAL ASSETS (270 = 100 + 200)	270		40,108,847,814	29,774,719,881

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated balance sheet as at 31 December 2020 (continued)

Form B 01 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	31/12/2020 VND'000	1/1/2020 VND'000
RESOURCES				
LIABILITIES (300 = 310 + 330)	300		26,029,306,779	17,304,897,615
Current liabilities	310		7,508,154,152	11,219,362,163
Accounts payable to suppliers	311		952,963,298	324,870,571
Advances from customers	312	16	955,735,222	1,105,603,346
Taxes payable to State Treasury	313	17	162,676,781	199,721,483
Payables to employees	314		16,064,491	6,220
Accrued expenses	315	18	944,647,799	704,901,206
Other short-term payables	319	19	306,683,463	1,126,975,596
Short-term borrowings, bonds	320	20(a)	4,162,866,240	7,757,283,741
Provisions – short-term	321		6,516,858	-
Long-term liabilities	330		18,521,152,627	6,085,535,452
Other long-term payables	337	19	500,170	-
Long-term borrowings and bonds	338	20(b)	9,220,442,520	4,969,653,657
Deferred tax liabilities	341	21(a)	1,842,833,535	586,978,688
Provisions – long-term	342	22	7,457,376,402	528,903,107

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated balance sheet as at 31 December 2020 (continued)

Form B 01 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	31/12/2020 VND'000	1/1/2020 VND'000
EQUITY (400 = 410)	400		14,079,541,035	12,469,822,266
Equity	410	23	14,079,541,035	12,469,822,266
Share capital	411	24	10,991,554,200	9,892,398,780
- Ordinary shares with voting rights	411a		10,991,554,200	9,892,398,780
Share premium	412	24	1,098,259,892	145,709,384
Other capital	414		(295,683,347)	(295,683,347)
Foreign exchange differences	417		(189,058,584)	-
Other equity funds	420		(358,967,342)	-
Retained profits after tax	421		2,766,593,412	2,727,397,449
- Retained profits brought forward	421a		2,727,397,449	2,375,003,634
- Retained profit for the current year	421b		39,195,963	352,393,815
Non-controlling interest	429		66,842,804	-
TOTAL RESOURCES (440 = 300 + 400)	440		40,108,847,814	29,774,719,881

5 March 2021

Prepared by:

Nguyen Thi Thanh Mai
Chief Accountant

Reviewed by:

Stuart James Wells
Chief Financial Officer

Approved by:

Craig Richard Bradshaw
General Director

The accompanying notes are an integral part of these consolidated financial statements

CONSOLIDATED STATEMENT OF INCOME

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated statement of income for the year ended 31 December 2020

Form B 02 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	2020 VND'000	2019 VND'000
Revenue from sales of goods and provision of services	01		7,365,774,085	4,706,129,858
Revenue deductions	02		74,593,427	
Net revenue (10 = 01 - 02)	10	26	7,291,180,658	4,706,129,858
Cost of sales	11		7,113,222,006	3,971,145,298
Gross profit (20 = 01 - 11)	20		177,958,652	734,984,560
Financial income	21	27	646,482,348	931,680,260
Financial expenses	22	28	1,652,967,999	1,290,661,189
Share of loss in associates	24		(29,488,203)	
Selling expenses	25		226,224,066	104,782,370
General and administration expenses	26		282,149,068	142,007,143
Net operating (loss)/profit (30 = 20 + 21 - 22 + 24 - 25 - 26)	30		(1,366,388,336)	129,214,118
Other income	31	29	1,328,986,068	1,230,029,410
Other expenses	32	30	58,808,571	893,457,185
Results of other activities (40 = 31 - 32)	40		1,270,177,497	336,572,225

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated statement of income for the year ended 31 December 2020 (continued)

Form B 02 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	2020 VND'000	2019 VND'000
Accounting (loss)/profit before tax (50 = 30 + 40)	50		(96,210,839)	465,786,343
Income tax expense – current	51	31	20,654,658	138,562,148
Income tax benefits – deferred	52	31	(168,656,455)	(25,169,620)
Net profit after tax (60 = 50 - 51 - 52)	60		51,790,958	352,393,815
Net profit attributable to:				
Equity holders of the Company	61		39,195,963	352,393,815
Non-controlling interest	62		12,594,995	-
Earnings per share			VND	VND
Basic earnings per share	70	32	39	356

5 March 2021

Prepared by:

Nguyen Thi Thanh Mai
Chief Accountant

Reviewed by:

Stuart James Wells
Chief Financial Officer

Approved by:

Craig Richard Bradshaw
General Director

The accompanying notes are an integral part of these consolidated financial statements

CONSOLIDATED STATEMENT OF CASH FLOWS

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated statement of cash flows for the year ended 31 December 2020
(Indirect method)

Form B 03 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	2020 VND'000	2019 VND'000
CASH FLOWS FROM OPERATING ACTIVITIES				
(Loss)/profit before tax	01		(96,210,839)	465,786,343
Adjustments for				
Depreciation and amortisation	02		1,557,239,244	1,206,383,561
Negative goodwill on acquisition of a subsidiary	02	29	(1,298,081,205)	-
Allowances and provisions	03		160,371,671	39,749,622
Exchange losses/(gains) arising from revaluation of monetary items	04		2,888,194	(6,976,590)
Profits from investing activities	05		(22,087,236)	(40,014,585)
Interest expense and borrowing fees	06	28	1,278,848,458	1,161,519,606
Operating profit/(loss) before changes in working capital	08		1,582,968,287	2,826,447,957
Change in receivables and other assets	09		(216,175,072)	487,538,695
Change in inventories	10		(145,583,894)	(1,493,010,616)
Change in payables and other liabilities	11		(573,206,231)	773,365,144
Change in prepaid expenses	12		(209,068,012)	4,220,162
			438,935,078	2,598,561,342
Interest paid	14		(1,248,770,678)	(1,127,738,800)
Income tax paid	15		(154,592,206)	(39,142,971)
Net cash flows from operating activities	20		(964,427,806)	1,431,679,571

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated statement of cash flows for the year ended 31 December 2020
(Indirect method - continued)

Form B 03 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	2020 VND'000	2019 VND'000
CASH FLOWS FROM INVESTING ACTIVITIES				
Payments for additions to fixed assets and other long-term assets	21		(1,474,237,254)	(888,223,637)
Compensation to finalize previously constructed fixed assets	21		-	984,161,905
Proceeds from disposals of fixed assets and other long-term assets	22		12,765,546	977,273
Payments for term deposit and granting loans to other parties	23		(1,931,153,425)	(1,000,000,000)
Term deposits received and receipts from collecting loans	24		1,787,321,421	-
Payments for acquisition of non-controlling interest	25		-	(8,525,794)
Receipt of interest	27		34,978,354	37,731,636
Acquisition of subsidiary, net of cash acquired	25	5	(1,053,739,472)	-
Net cash flows from investing activities	30		(2,624,064,830)	(873,878,617)
CASH FLOWS FROM FINANCING ACTIVITIES				
Proceeds from equity issued	31		2,094,330,737	-
Proceeds from borrowings and bonds	33		13,350,232,314	7,908,523,055
Payments to settle loan principals and bond issuance related costs	34		(12,814,978,565)	(7,206,551,527)
Net cash flows from financing activities	40		2,629,584,486	701,971,528

The accompanying notes are an integral part of these consolidated financial statements

Masan High-Tech Materials Corporation and its subsidiaries
Consolidated statement of cash flows for the year ended 31 December 2020
(Indirect method - continued)

Form B 03 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

	Code	Note	2020 VND'000	2019 VND'000
Net cash flows during the year (50 = 20 + 30 + 40)	50		(958,908,150)	1,259,772,482
Cash and cash equivalents at the beginning of the year	60		1,723,204,606	467,220,260
Effect of exchange rate fluctuation on cash and cash equivalents	61		(2,366,170)	(3,788,136)
Cash and cash equivalents at the end of the year (70 = 50 + 60 + 61)	70	6	761,930,286	1,723,204,606

5 March 2021

Prepared by:

Nguyen Thi Thanh Mai
Chief Accountant

Reviewed by:

Stuart James Wells
Chief Financial Officer

Approved by:

Craig Richard Bradshaw
General Director

The accompanying notes are an integral part of these consolidated financial statements

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

These notes form an integral part of and should be read in conjunction with the accompanying consolidated financial statements.

1. Reporting entity

(a) Ownership structure

Masan High-Tech Materials Corporation (formerly known as Masan Resources Corporation) (“the Company” or “MHT”) is incorporated as a joint stock company in Vietnam. In 2020, the Company changed its name from Masan Resources Corporation to Masan High-Tech Materials Corporation and successfully registered the change in its Enterprise Registration Certificate dated 6 August 2020. The consolidated financial statements comprise the Company and its subsidiaries (collectively referred to as “the Group”).

(b) Principal activities

The principal activity of the Company is investment holding.
The principal activities of the subsidiaries and associate are described as follows:

Subsidiaries:			Percentage of economic interests at	
Name	Address	Principal activity	31/12/2020	1/1/2020
Direct subsidiary				
Masan Thai Nguyen Resources Company Limited (“MRTN”)	(i) Ho Chi Minh City	Investment holding	100%	100%
Indirect subsidiaries				
Thai Nguyen Trading and Investment Company Ltd (“TNTI”)	(i) Ho Chi Minh City	Investment holding	100%	100%
Nui Phao Mining Company Limited (“NPM”)	(i) Thai Nguyen Province	Exploring and processing mineral (*)	100%	100%
Masan Tungsten Limited Liability Company (“MTC”)	(i) Thai Nguyen Province	Deep processing of nonferrous metals and precious metals (Tungsten)	100%	100%
H.C. Starck Holding (Germany) GmbH (“HCS”)	(i) Goslar, Germany	Investment holding	100%	-
ChemiLytics Beteiligungs GmbH	(ii) Goslar, Germany	Investment holding	100%	-
H.C. Starck GmbH	(ii) Goslar, Germany	Investment holding	100%	-
Chemische Fabriken Oker und Branschweig AG	(ii) Goslar, Germany	Producing chemicals utilized in the manufacturing of paper and additives for the absorptive materials industry	100%	-

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020

Form B 09 – DN/HN
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			Percentage of economic interests at	
Name	Address	Principal activity	31/12/2020	1/1/2020
H.C. Starck Infrastructure GmbH & Co. KG	(ii) Munich, Germany	Deep processing of nonferrous metals and precious metals (Tungsten)	100%	-
ChemiLytics GmbH & Co. KG	(ii) Goslar, Germany	Chemical analysis and physical measurement data	100%	-
H.C. Starck Tungsten GmbH	(ii) Munich, Germany	Deep processing of nonferrous metals and precious metals (Tungsten)	100%	-
H.C. Starck Nonferrous Metals Trading (Shanghai)Co. Ltd.	(ii) Shanghai, PRC	Trading and distribution	100%	-
H.C. Starck Canada Inc.	(ii) Sarnia, Ontario, Canada	Deep processing of nonferrous metals and precious metals (Tungsten)	100%	-
H.C. Starck Tungsten GKCo., Ltd.	(ii) Tokyo, Japan	Trading and distribution	100%	-
H.C. Starck Tungsten LLC	(ii) Newton, USA	Trading and distribution	100%	-
H.C. Starck Jiangwu Tungsten Specialities (Ganzhou) Co., Ltd.	(ii) Ganzhou, China	Deep processing of nonferrous metals and precious metals (Tungsten)	60%	-

Associates			Percentage of economic interests at	
Name	Address	Principal activity	31/12/2020	1/1/2020
Indirect associates				
Jiangwu H.C. Starck Tungsten Products Co., Ltd.	(ii) Ganzhou, China	Deep processing of nonferrous metals and precious metals (Tungsten)	30%	-

(i) HCS is a newly acquired subsidiary of MTC (see Note 5). MTC is a subsidiary of NPM. TNTI and NPM are subsidiaries of MRTN. MRTN is a subsidiary of the Company.

(ii) These entities are direct and indirect subsidiaries and associate of HCS.

(*) NPM’s principal activities are to explore, exploit, mine and process tungsten, fluorite, bismuth, copper under the “Nui Phao Mining Project” in Ha Thuong Commune, Dai Tu District in Thai Nguyen Province for export and domestic sales. The “Nui Phao Mining Project” is under Investment Certificate No. 17121000026 which expires on 2 February 2034.

(**) HCS is a leading manufacturer of high-tech tungsten metal powders and carbides (midstream tungsten products). HCS has production hubs in Europe, North America, and China serving customers across the globe. HCS and its subsidiaries mainly specialize in the development, manufacture and sale of high-performance powders based on the technology of metal tungsten and its compounds, tailored to individual customer needs.

The percentage of economic interests represents the effective percentage of economic interests of the Company both directly and indirectly in the subsidiaries. As at 31 December 2020, the Group had 2,028 employees (1/1/2020: 1,403 employees).

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
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2. Basis of preparation

(a) Statement of compliance

The consolidated financial statements have been prepared in accordance with Vietnamese Accounting Standards, the Vietnamese Accounting System for enterprises and the relevant statutory requirements applicable to financial reporting.

(b) Basis of measurement

The consolidated financial statements, except for the consolidated statement of cash flows, are prepared on the accrual basis using the historical cost concept. The consolidated statement of cash flows is prepared using the indirect method.

(c) Annual accounting period

The annual accounting period of the Company and its subsidiaries are from 1 January to 31 December.

(d) Accounting and presentation currency

The Group's accounting currency is Vietnam Dong ("VND"), which is also the currency used for financial statement presentation purpose. All amounts have been rounded to the nearest thousand ("VND'000"), unless otherwise indicated.

3. Summary of significant accounting policies

The following significant accounting policies have been adopted by the Group in the preparation of these consolidated financial statements.

(a) Basis of consolidation

(i) Business combinations

Business combinations are accounted for using the purchase method as at the acquisition date, which is the date on which control is transferred to the Group. Control exists when the Group has the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities. In assessing control, the Group takes into consideration the potential voting rights that currently are exercisable.

Under the purchase method, the assets and liabilities of the acquired entity are consolidated using their fair values. Cost of a business combination (cost of the acquisition) is the aggregate amount of the fair values, at the date of exchange, of assets given, liabilities incurred or assumed, and equity instruments issued by the acquirer in the acquisition in exchange for control

of the acquiree and any costs directly attributable to the business combination. Identifiable assets acquired, identifiable liabilities and contingent liabilities assumed in a business combination are recognised at fair value at the acquisition date.

Any goodwill that arises representing the excess of the cost of the acquisition over the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities of the acquiree is recognised in consolidated balance sheet, then amortised through to the consolidated statement of income. When the excess is negative (gain from bargain purchase), it is recognised in the consolidated statement of income for the current year after a reassessment has been performed to ensure that the measurement of identifiable assets acquired, liabilities and contingent liabilities assumed and the cost of the business combination appropriately reflects consideration of all available information as of the acquisition date.

If the initial accounting for a business combination is incomplete by the end of the reporting period in which the combination occurs as the result of fair values of acquiree's identifiable assets, liabilities or contingent liabilities or the cost of the combination being only provisionally determined, the Group shall account for such business combination at provisional amounts. During twelve months from the acquisition date (i.e. the measurement period), the Group shall retrospectively adjust the provisional amounts recognised at the acquisition date.

Transaction costs, other than those associated with the issue of debt or equity securities, that the Group incurred in connection with business combinations included any costs directly attributable to the combination, such as professional fees paid to accountants, legal advisers, valuers and other consultants to effect the combination. Transaction costs are capitalised into the cost of business combination. General administrative costs and other costs that cannot be directly attributed to the particular combination being accounted for are not included in the cost of the combination; they are recognised as an expense when incurred.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Group. Control exists when the Group has the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities. In assessing control, potential voting rights that currently

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

are exercisable are taken into account. The financial statements of subsidiaries are included in the consolidated financial statements from the date that control commences until the date that control ceases.

(iii) Non-controlling interests

Non-controlling interests ("NCI") are measured by their proportionate economic interest in the acquiree's identifiable net assets at date of acquisition.

Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as transactions with owners. In accordance with Circular No. 202/2014/TT-BTC issued by the Ministry of Finance providing guidance on preparation and presentation of consolidated financial statements ("Circular 202") which was applied prospectively from 1 January 2015, the difference between the change in the Group's share of net assets of the subsidiary and any consideration paid or received is recorded directly in retained profits under equity.

(iv) Associates (equity accounted investees)

Associates are those entities in which the Group has significant influence, but not control, over the financial and operating policies. Significant influence is presumed to exist when the Group holds between 20 and 50 percent of the voting power. Associates are accounted for using the equity method (equity accounted investees). They are initially recognised at cost, which includes transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Group's share of the income and expenses of the equity accounted investees, after adjustments to align the accounting policies with those of the Group, from the date that significant influence commences until the date that significant influence ceases. The carrying amount of investments in equity accounted investees is also adjusted for the alterations in the investor's proportionate interest in the investees arising from changes in the investee's equity that have not been included in the income statement (such as revaluation of fixed assets, or foreign exchange translation differences, etc.).

When the Group's share of losses exceeds its interest in an equity accounted investee, the carrying amount of that interest (including any long-term investments) is reduced to nil and the recognition of further losses is discontinued except to the extent that the Group has an obligation or has made payments on behalf of the investee.

(v) Transactions eliminated on consolidation

Intra-group transactions, balances, and any unrealised income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. However, foreign currency difference arising on intra-group monetary items, whether short-term or long-term are recorded in the consolidated statement of income. Unrealised gains and losses arising from transactions with equity accounted investees are eliminated against the investment to the extent of the Group's interest in the investee.

(vi) Goodwill

Goodwill arises on the acquisition of subsidiary. Goodwill is measured at cost less accumulated amortisation. Cost of goodwill represents the excess of the cost of the acquisition over the Group's interest in the net fair value of the identifiable assets, liabilities and contingent liabilities of the acquiree in exchange for control of the acquire, plus any costs directly attributable to the acquisition.

When the excess is negative (gain from bargain purchase), it is recognised immediately in the consolidated statement of income.

(b) Foreign currency

(i) Foreign currency transactions

Transactions in currencies other than VND during the year have been translated into VND at rates approximating actual rates of exchange ruling at the transaction dates.

Monetary assets and liabilities denominated in currencies other than VND are translated into VND at the account transfer buying rate for assets and account transfer selling rate for liabilities at the end of the annual accounting period quoted by the commercial bank where the Company or its subsidiaries most frequently conducts transactions.

All foreign exchange differences are recorded in the consolidated statement of income.

(ii) Foreign operations

For the purpose of presenting the consolidated financial statements, the assets and liabilities of foreign operations are translated to VND as follow:

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
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Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
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- Assets and liabilities including fair value adjustments arising on acquisition, are translated to VND at the account transfer buying rate (for assets) and the account transfer selling rate (for liabilities) at the end of the accounting period quoted by the commercial bank where the Company most frequently conducts transactions;
- Revenues, income, expenses and cash flows of foreign operations are translated to VND at exchange rates at which approximate actual exchange rates ruling on the dates of transactions;
- Retained profits/Accumulated losses, funds and reserves are derived from the translated net profits/movement from which they were appropriated.

Foreign currency differences arising from the translation of foreign operations' financial statements to VND are recognised in the balance sheet under the caption "Foreign exchange differences" in equity. When the foreign currency differences relate to a foreign operation that is consolidated but not wholly owned, accumulated exchange differences arising from translation and attributable to non-controlling interests are allocated to, and recognised as part of, non-controlling interests in the consolidated balance sheet.

(c) Cash and cash equivalents

Cash comprises cash balances and call deposits. Cash equivalents are short-term highly liquid investments that are readily convertible to known amount of cash, are subject to an insignificant risk of changes in value and are held for the purpose of meeting short-term cash commitments rather than for investment or other purposes.

(d) Investments

(i) Held to maturity investments

Held-to-maturity investments are those that the Group's management has the intention and ability to hold until maturity. Held-to-maturity investments include term deposits at bank, bonds and loan receivables held to maturity. These investments are stated at costs less allowance for investments.

(e) Accounts receivable

Accounts receivable from customers and other receivables are stated at cost less allowance for doubtful debts.

(i) Factoring

Depending on market conditions and liquidity requirements, the Group enters into factoring agreements to transfer trade receivables. For factoring transactions, the Group assesses whether trade receivables can be derecognised in their entirety or not, basing on the extent to which it retains the risks and rewards of ownership of the trade receivables.

If the Group:

- transfers substantially all the risks and rewards of ownership of the receivables, the Group derecognises the receivables and recognises separately as asset or liability any rights and obligations created or retained in the transfer;
- retains substantially all the risks and rewards of ownership of the receivables, the Group continues to recognise the receivables;
- neither transfers nor retains substantially all the risks and rewards of ownership of the receivables, the Group determines whether it has retained control. If the Group does not retain control, it derecognises the receivables and recognises separately as assets or liabilities any rights and obligations created or retained in the transfer. If the Group retains control, it continues to recognise the receivables to the extent of its continuing involvement in the receivables.

The extent of continuing involvement in the transferred assets is the extent to which it is exposed to changes in the value of the transferred assets, which is the lower of the carrying amount of assets and the maximum amount of the consideration that the Group could be required to pay ("the guarantee amount").

When the Group continues to recognise an asset to the extent of its continuing involvement, the Group also recognises an associated liability. The associated liability is initially measured at the guarantee amount plus the fair value of the guarantee. Subsequently the initial fair value of the guarantee is recognised in the consolidated income statement on a time proportion basis.

(f) Inventories

Inventories are stated at the lower of cost and net realisable value. Cost is determined on a weighted average basis and includes all costs incurred in bringing the inventories to their present location and condition. Cost in the case of finished goods and work in

progress includes raw materials, direct labour and attributable mining and manufacturing overheads. Net realisable value is the estimated selling price of inventory items, less the estimated costs of completion and direct selling expenses.

The Group applies the perpetual method of accounting for inventories.

(g) Tangible fixed assets

(i) Cost

Upon completion of the mine construction phase, the assets are transferred into "building and structures", "machinery and equipment" or "other mining assets" in tangible fixed assets. Tangible fixed assets are stated at cost less accumulated depreciation. The initial cost of a tangible fixed asset comprises its purchase price or construction cost, including import duties, non-refundable purchase taxes and any directly attributable costs of bringing the asset to its working condition and location for its intended use, and the costs of dismantling and removing the asset and restoring the site on which it is located. Expenditure incurred after tangible fixed assets have been put into operation, such as repairs and maintenance and overhaul costs, is normally charged to the statement of income in the year in which the costs are incurred. In situations where it can be clearly demonstrated that the expenditure has resulted in an increase in the future economic benefits expected to be obtained from the use of tangible fixed assets beyond their originally assessed standard of performance, the expenditure is capitalised as an additional cost of tangible fixed assets.

If the self-constructed tangible assets have been completed and are put into used but their cost is not finalised, their historical cost will be recorded at a temporarily estimated value and they shall be adjusted with the difference after the finalised cost are approved.

Other mining assets comprise mine rehabilitation assets; and fair value of mineral reserves and mineral resources from business combination.

(ii) Depreciation

Machinery and equipment and fair value of mineral reserves from business combination directly related to mining activities

Machinery and equipment and fair value of mineral reserves from business combination which are directly related to the mining

exploitation activities is depreciated on a unit-of-production method calculated using the estimated mineral reserve. Mineral reserves are estimates of the amount of product that can be economically and legally extracted from the Group's mining properties.

Machinery and equipment of a subsidiary directly related to production activities

Machinery and equipment of a subsidiary which are directly related to the deep processing of tungsten products are depreciated over its estimated useful lives on a units of production basis. The estimated total production quantity output which the tangible fixed assets are depreciated on a unit-of-production basis are as follows:

ST plant	171,865 tonnes of tungsten
APT plant	166,990 tonnes of tungsten

Others

Depreciation is computed on a straight-line basis over the estimated useful lives of tangible fixed assets. The estimated useful lives are as follows:

- buildings and structures 5 – 40 years
- machinery and equipment 3 – 20 years
- office equipment 3 – 10 years
- motor vehicles 3 – 25 years
- other mining assets 19 years

Construction asset which are completed and put into use before construction costs being finalised, are stated at provisional cost. On the date the construction costs are finalised and approved, provisional cost shall be adjusted to finalised cost and accumulated depreciation shall not be adjusted. The subsequent depreciation charge is determined as the approved value minus the accumulated depreciation made for the period up to the approval of finalisation of fixed asset divided by the remaining depreciation period of the fixed asset according to relevant regulations.

(h) Intangible fixed assets

(i) Land

Lands comprise those acquired in a legitimate transfer. Lands are stated at cost and are not amortised.

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(ii) Software

Cost of software include:

- Cost of acquisition of new software, which is not an integral part of the related hardware, is capitalised and treated as an intangible asset. Acquired software costs are amortised on a straight-line basis over three (3) to eight (8) years;
- Cost incurred during software development phase when following conditions are met:
 - » Respective costs are attributable directly to the software development stage;
 - » There is well-founded expectation – verifiable by program designs, models, or the like that the Group has intention to complete the development project and use or sell it;
 - » The Group will be able to implement and use the software after its development;
 - » Adequate technical, financial and human resources should be available to complete the software development successfully;
 - » The Group is able to measure expenditures attributable to the software development project reliably.

Developed software are amortised on a straight-line basis over period of up to four (4) years starting from the date on which the respective modules are completed.

(iii) Mining rights

The mining rights are calculated based on the remaining exploitable reserves multiplied with the price as announced by the provincial authorities in accordance with Decree 203/2013/ND/CP dated 28 November 2013 (“Decree 203/2013”) which became effective from 20 January 2014. Cost of mining rights was stated at an amount equal to the present value of mining rights fee and was capitalised and treated as an intangible asset. Amortisation of mining rights is computed on a straight-line basis over the economic life of the mineral reserves.

(iv) Development costs

Expenditure on development activities, whereby research findings are applied to a plan or design for the production of new or substantially improved products and process, is capitalised if the product or process is technically and commercially feasible and

the Group has sufficient resources to complete development. The expenditure capitalised include the costs of materials, direct labour and an appropriate portion of overheads. Other development expenditure, including expenditure on internally generated goodwill and brands, is recognised in the consolidated statement of income as an expense as incurred. Capitalised development costs are stated at cost less accumulated amortisation, which is provided on a straight-line basis over 3 to 16 years.

(v) Brand name

Cost of acquisition of brand name is recognised as an intangible asset.

The fair value of brand name acquired in a business combination is based on the discounted estimated royalty payments that have been avoided as a result of the brand name being owned. The fair value of brand name acquired in a business combination is recognised as an intangible asset and is amortized on a straight-line basis ranging from 20 to 30 years.

(vi) Customer relationship

Customer relationships that are acquired by the Group in the acquisition of subsidiary are capitalised and presented as an intangible fixed asset. The fair value of customer relationships are amortised on a straight-line basis over period of 36 years.

The- fair value of customer relationships acquired in a business combination is determined using the multi-period excess earnings method, whereby the subject assets are valued after deducting a fair return on all other assets that are part of creating the related cash flows.

(vi) Technologies

Technologies that are acquired by the Group in the acquisition of subsidiary are recognised as intangible fixed assets. The allocated values of technologies are amortised on a straight-line basis over their useful lives ranging from 16 to 31 years.

The fair value of technologies acquired in a business combination are determined using the multi-period excess earnings method whereby the subject assets are valued after deducting a fair return on all other assets that are part of creating the related cash flows and/or based on the discounted estimated royalty payments that have been avoided as a result of the technologies being owned.

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(i) Construction in progress

Construction in progress represents mineral assets under development and cost of construction and machinery which have not been fully completed, installed and commissioned. It also comprises land compensation, mineral reserves, mineral resources and related development expenditure. These assets qualify for capitalisation when the mineral reserves to which they relate is proven to be commercially and technically viable. They are capitalised net of proceeds from the sale of commissioning products during the development phase. On completion of construction defined as the time when the assets are brought into the condition of its intended use, all assets are reclassified to tangible fixed assets as either “buildings and structures”, “machinery and equipment” or “other mining assets”; or long-term prepaid expenses as “other mining costs”.

No depreciation is provided for construction in progress during the period of development, construction, installation and commissioning stages.

(j) Long-term prepaid expenses

(i) Prepaid land costs

Prepaid land costs comprise prepaid land lease rentals, including those for which the Group obtained land use rights certificate but are not qualified as intangible fixed assets under Circular No. 45/2013/TT-BTC dated 25 April 2013 of the Ministry of Finance providing guidance on management, use and depreciation of fixed assets, and other costs incurred in conjunction with securing the use of leased land. These costs are recognised in the consolidated statement of income on a straight-line basis over the term of the leases from 35 to 50 years.

(ii) Land compensation costs

Land compensation costs comprise prepaid land lease rentals, compensation, resettlement and other costs incurred in conjunction with securing the use of leased land for its mining activities. These costs are recognised in the consolidated statement of income on a straight-line basis over the term of the lease.

(iii) Other mining costs

Other mining costs comprise:

- Exploration, evaluation and development expenditure (including development stripping); and
- Production stripping (as described below in ‘Deferred stripping costs’).

Deferred stripping costs

In open pit mining operations, it is necessary to remove overburden and other waste materials to access ore body. Stripping costs incurred in the development phase of a mine (development stripping costs) are recorded as part of the cost of construction of the mine. All development stripping expenditure incurred during construction phase are transferred to other mining costs.

The costs of removal of the waste material during a mine’s production phase (production stripping costs) are deferred where they give rise to future benefits:

- It is probable that the future economic benefits will flow to the Group;
- The component of the ore body for which access has been improved can be identified; and
- The costs incurred can be measured reliably.

Production stripping costs are allocated between inventory and long-term prepaid expenses in accordance with the life of mine strip ratio.

The life of mine strip ratio represents the estimated total volume of waste, to the estimated total quantity of economically recoverable ore, over the life of the mine. These costs are recognised as long-term prepaid expenses where the current period actual stripping ratio is higher than the average life of mine strip ratio.

The development and production stripping costs are amortised over the life of the proven and probable reserves of the relevant components on a systematic basis.

(iv) Incremental costs of obtaining a contract

The incremental costs of obtaining a contract are those costs that the Group incurs to obtain a contract with a customer that the Group would not have incurred if the contract had not been obtained. The Group shall capitalize incremental costs of obtaining a contract if such costs meet the following criteria:

- Only the incremental costs incurred as a result of obtaining a contract should be capitalized;
- The cost must be recoverable.

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The recognised asset shall be amortised on a systematic basis match with the transfer of the goods or services to the customer to which the asset relates.

(v) Other prepaid expenses

Other prepaid expenses include service fees which are initially stated at cost and amortised on a straight-line basis over the term of the contracts for services fees.

(k) Accounts payable

Accounts payable to suppliers and other payables are stated at their cost.

(l) Provisions

A provision is recognised if, as a result of a past event, the Group has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability.

(i) Mining rights

In accordance with the Law on Minerals 2010, a subsidiary of the Company has an obligation to pay the government fees for mining rights grant. Mining rights is calculated based on the remaining exploitable reserves and the price to calculate the charge for granting mining rights which is defined under the prices to calculate the resource royalty in accordance with the law on resource royalty at the time of determining the charge for granting mining rights which are:

- Decree 203/2013/ND-CP dated 28 November 2013 (“Decree 203”), Decree 158/2016/ND-CP dated 29 November 2016 (“Decree 158/2016”) and Circular 38/2017/TT-BTNMT dated 16 October 2017 (“Circular 38”) until 15 September 2019; and
- Decree 67/2019/ND-CP dated 31 July 2019 (“Decree 67”) from 15 September 2019.

The prices to calculate the resource royalty is announced by the provincial People's Committee. The conversion method is based on various parameters of the conversion coefficient under guidelines of Circular 38 and/or Decree 67.

(ii) Mine rehabilitation

The mining, extraction and processing activities of the Group normally give rise to obligations for site closure or rehabilitation. Closure and rehabilitation works can include facility decommissioning and dismantling; site and land rehabilitation. The extent of work requires and the associated costs are dependent on the requirements of Ministry of Natural Resources and Environment (“MONRE”) and the Group's environmental policies based on the Environment Impact Report.

Provisions for the cost of each closure and rehabilitation program are recognised at the time that environmental disturbance occurs. When the extent of disturbance increases over the life of an operation, the provision is increased accordingly. Costs included in the provision encompass all closure and rehabilitation activity expected to occur progressively over the life of the operation proportional to the degree of influence on the environment existing at the end of the accounting period.

Where rehabilitation is conducted systematically over the life of the operation, rather than at the time of closure, provision is made for the estimated outstanding continuous rehabilitation work at each reporting dates and the cost is charged to the statement of income. Routine operating costs that may impact the ultimate closure and rehabilitation activities, such as waste material handling conducted as an integral part of a mining or production process, are not included in the provision. Costs arising from unforeseen circumstances, such as the contamination caused by unplanned discharges, are recognised as an expense and liability when the event gives rise to an obligation which is probable and capable of reliable estimation.

The timing of the actual closure and rehabilitation expenditure is dependent on the life of the mine. Closure and rehabilitation provisions are measured at the expected value of future cash flows, discounted to their present value and determined according to the probability of alternative estimates of cash flows occurring for each operation. Significant judgments and estimates are involved in forming expectations of future activities and the amount and timing of the associated cash flows. Those expectations are formed based on existing environmental and regulatory requirements which give rise to a constructive obligation.

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When provisions for closure and rehabilitation are initially recognised, the corresponding cost is capitalised as an asset if the related obligations for closure and rehabilitation are unavoidable to the construction of the asset. The capitalised cost of closure and rehabilitation activities is recognised in other mining assets and depreciated accordingly. The value of the provision is progressively increased over time as the effect of the discounting unwinds, creating an expense recognised in financial expenses.

Closure and rehabilitation provisions will also be adjusted for changes in estimates. These adjustments will be accounted for as a change in the corresponding capitalised cost, except where a reduction in the provision is greater than the under-depreciated capitalised cost of the related assets, in which the capitalised cost is reduced to nil and the remaining adjustment is recognised in the consolidated income statement. Changes to the capitalised cost result in an adjustment to future depreciation. Adjustments to the estimated amount and timing of future closure and rehabilitation cash flows are a normal occurrence in light of the significant judgements and estimates involved.

(iii) Pension liabilities

Pensions are retirement benefits and are classified as either defined contribution plans or defined benefit plans.

Under a defined contribution plan, the Group pays fixed contributions into a separate fund. The amount of an employee's future retirement benefit is only based on the contributions paid and the income earned from the investment. The Group has no legal or constructive obligations to pay further contributions if the fund does not hold sufficient assets to pay all employees the benefits relating to employee service in the current and prior periods. The Group's contributions are to be recognised as expenses in the periods in which they were paid.

Under a defined benefit plan, employees will receive a defined amount of pension benefit on retirement, usually dependent on one or more factors such as age, years of service and compensation. The provision to be recognised for a defined benefit plan is calculated as the present value of the defined benefit obligations at the balance sheet date. The defined benefit obligation is calculated annually by independent actuaries. The present value of the defined benefit obligation is determined by

discounting estimated future cashflow using interest rates of high-quality AA-corporation bonds that are denominated in the currency in which the benefits will be paid, and that have terms to maturity approximation to the terms of the related pension liability. The Group determines the net interest expense on the net defined benefit liability (asset) for the year by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability, taking into account any changes in the net defined benefit liability during the period as a result of contributions. Net interest expense and other expenses related to defined benefit plans are recognised in consolidated statement of income. The remeasurement of defined benefit obligation involves estimation of future cashflow, employee turnover, mortality and future increase in salaries.

Remeasurements of the net defined benefit obligation, which comprise actuarial gains and losses and the relevant deferred tax are recognised in equity under the caption “Other equity funds” in accordance with a ruling from the Ministry of Finance

(m) Bonds issued

At initial recognition, bonds are measured at cost which comprises proceeds from issuance net of issuance costs. Any discount, premium or issuance costs are amortised on a straight-line basis over the term of the bond.

(n) Equity

(i) Ordinary shares

Ordinary share capital is classified as equity. The excess of proceeds contributed over the par value of shares issued is recorded as share premium. Incremental costs directly attributable to the issue of ordinary shares are recognised as a deduction from share premium.

(ii) Preference shares

Mandatorily convertible preference shares are classified as equity. These are entitled to fixed dividends and any discretionary dividends declared to ordinary shareholders and it participates equally in the residual assets on dissolution. The excess of proceeds contributed over the par value of shares issued is recorded as share premium. Incremental costs directly attributable to the preference shares are recognised as a deduction from share premium.

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(iii) Other capital

Equity movements resulting from acquisition or disposal to non-controlling interests and transactions involving equity instruments were recorded in “Other capital” prior to the prospective application of Circular 202 from 1 January 2015 (Note 3(a)(iii)).

(o) Taxation

Income tax on the profit or loss for the year comprises current and deferred tax. Income tax is recognised in the statement of income except to the extent that it relates to items recognised directly to equity, in which case it is recognised in equity.

Current tax is the expected tax payable on the taxable income for the year, using tax rates enacted at the end of the annual accounting period, and any adjustment to tax payable in respect of previous years.

Deferred tax is provided using the balance sheet method, providing for temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. The amount of deferred tax provided is based on the expected manner of realisation or settlement of the carrying amounts of assets and liabilities using tax rates enacted or substantively enacted at end of the annual accounting period. Deferred tax is recognised in the consolidated statement of income except to the extent relating to item recognised directly in equity.

A deferred tax asset is recognised only to the extent that it is probable that future taxable profits will be available against which the temporary difference can be utilised. Deferred tax assets are reduced to the extent that it is no longer probable that the related tax benefit will be realised.

(p) Revenue

(i) Goods sold

Revenue from the sale of goods is recognised in the consolidated statement of income when significant risks and rewards of ownership have been transferred to the buyer. No revenue is recognised if there are significant uncertainties regarding recovery of the consideration due or the possible return of goods. Revenue on sales of goods is recognised at the net amount after deducting sales discounts.

For sales of minerals, the sales price is usually determined

on a provisional basis at the date of revenue recognition and adjustments to the sales price subsequently occurs based on movements in quoted market or contractual prices up to the date of final pricing. The period between provisional invoicing and final pricing is typically between 30 and 60 days, but in some cases can be as long as 90 to 180 days. Revenue on provisionally priced sales is recognised based on the estimated fair value of the total consideration receivable.

In cases where the terms of the executed contractual sales agreement allow for an adjustment to the sales price based on a survey of the goods by the customer, assay results issued by a third party are preferable, unless customer’s survey is within executed contractual tolerance, then sales recognition is based on the most recently determined product specifications agreed by parties.

(ii) Revenue from tolling business

Tolling process is offered to the Group’s worldwide customers of the metal powder business, in which customers deliver used material or metal scraps to the Group for recycling into finished products i.e. metal powder. Revenue from tolling business is recognised in the consolidated statement of income when the goods have been processed and accepted by the buyer. Revenue from tolling business is measured based on the consideration to which the Group expects to be entitled in the contract, including tolling fee and fair value of materials of which its obtained control. No revenue is recognised if there are significant uncertainties regarding recovery of the consideration due.

(q) Financial income and financial expenses

(i) Financial income

Financial income comprises interest income from deposits and loans and foreign exchange gains. Interest income is recognised as it accrues in the statement of income.

(ii) Financial expenses

Financial expenses comprise interest expenses on borrowings, bonds, facility fees, financing costs, transaction costs and foreign exchange losses.

(r) Leases

(i) Leased assets

Leases in terms of which the Group, as lessee, assumes substantially all the risks and rewards of ownership are classified

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as finance leases. Tangible fixed assets acquired by way of finance leases are stated at an amount equal to the lower of fair value and the present value of the minimum lease payments at inception of the lease, less accumulated depreciation.

Depreciation on finance leased assets is computed on a straight-line basis over the shorter of the lease term and the estimated useful lives of the leased assets unless it is reasonably certain that the Group will obtain ownership by the end of the lease term. The estimated useful lives of finance leased assets are consistent with the useful lives of tangible fixed assets as described in Note 3(g)(ii).

Assets held under other leases are classified as operating leases and are not recognised in the Group’s balance sheet.

(ii) Lease payments

Payments made under operating leases are recognised in the statement of income on a straight-line basis over the term of the lease. Lease incentives received are recognised in the statement of income as an integral part of the total lease expense.

Lease payments made under finance leases are apportioned between the finance expense and the reduction of the outstanding liability. The finance expense is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability.

(s) Borrowing costs

Borrowings costs comprise interest expenses on borrowings, facility fees, financing costs and transaction costs. Borrowing costs are recognised as an expense in the year in which they are incurred, except where the borrowing costs relate to borrowings in respect of the construction of qualifying assets, in which case the borrowing costs incurred during the year of construction are capitalised as part of the cost of the fixed assets concerned.

(t) Earnings per share

The Group presents basic and diluted, if any, earnings per share (“EPS”) for its ordinary shares. Basic EPS is calculated by dividing the profit or loss attributable to the ordinary shareholders of the Company by the weighted average number of ordinary shares outstanding during the year. To determine the profit or loss attributable to ordinary equity holders, profit or loss for the year is allocated to the ordinary shares and participating equity

instruments. This allocation is made in accordance with the rights of the other class of shares to participate in distributions if the entire profit or loss were distributed.

Diluted EPS is determined by adjusting the profit or loss attributable to the ordinary shareholders and the weighted average number of ordinary shares outstanding for the effect of all dilutive potential ordinary shares.

(u) Segment reporting

A segment is a distinguishable component of the Group that is engaged either in providing related products or services (business segment), or in providing products or services within a particular economic environment (geographical segment), which is subject to risks and rewards that are different from those of other segments. The Group’s primary and secondary format for segment reporting is based on business segments and geographical segments respectively.

(v) Related parties

Parties are considered to be related to the Group if one party has the ability, directly or indirectly, to control the other party or to exercise significant influence over the other party in making financial and operating decisions. Parties are also considered to be related if they are subject to common control or common significant influence. Related parties may be individuals or corporate entities and include close family members of any individual considered to be a related party. Related parties that are individuals refer to key management personnel who have authority and responsibility for planning, directing and controlling the activities of the Company, including directors and officers of the Company. Related companies refer to the shareholders and their ultimate parent companies and their subsidiaries and associates.

(w) Comparative information

Comparative information in these consolidated financial statements is presented as corresponding figures. Under this method, comparative information for the prior year is included as an integral part of the current period financial statements and are intended to be read only in relation to the amounts and other disclosures relating to the current year. Accordingly, the comparative information included in these consolidated financial statements is not intended to present the Group’s consolidated financial position, results of operation or cash flows for the prior year.

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4. Segment reporting

(a) Business segments

The Group comprises the following main business segments:

	Copper	Fluorspar	Tungsten	Others	Total
	VND'000	VND'000	VND'000	VND'000	VND'000
From 1/1/2020 to 31/12/2020					
Segment revenue	749,991,344	1,505,652,969	4,985,152,820	50,383,525	7,291,180,658
Segment gross profit/(loss)	(258,933,157)	946,641,059	(429,133,271)	(80,615,979)	177,958,652
Unallocated expenses					(508,373,134)
Financial income					646,482,348
Financial expenses					(1,652,967,999)
Share of loss in associates					(29,488,203)
Results from operating activities					(1,366,388,336)
Other income					1,328,986,068
Other expenses					(58,808,571)
Income tax benefit					148,001,797
Net profit after tax					51,790,958
From 1/1/2019 to 31/12/2019					
Segment revenue	34,116,482	1,696,168,333	2,898,070,934	77,774,109	4,706,129,858
Segment gross profit/(loss)	6,914,560	1,076,441,562	(240,417,870)	(107,953,692)	734,984,560
Unallocated expenses					(246,789,513)
Financial income					931,680,260
Financial expenses					(1,290,661,189)
Results from operating activities					129,214,118
Other income					1,230,029,410
Other expenses					(893,457,185)
Income tax benefit					(113,392,528)
Net profit after tax					352,393,815

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	Copper	Fluorspar	Tungsten	Others	Total
	VND'000	VND'000	VND'000	VND'000	VND'000
As at 31 December 2020					
Segment assets	153,242,533	757,149,316	9,407,654,444	963,525,139	11,281,571,432
Unallocated assets					28,827,276,382
Total assets					40,108,847,814
Total liabilities					26,029,306,779
As at 1 January 2020					
Segment assets	167,025,898	826,106,905	1,874,331,657	1,051,224,444	3,918,688,904
Unallocated assets					25,856,030,977
Total assets					29,774,719,881
Total liabilities					17,304,897,615
From 1/1/2020 to 31/12/2020					
Capital expenditure	-	-	95,552,600	83,095,789	178,648,389
Unallocated capital expenditure					1,295,588,865
Depreciation and amortisation	13,783,364	68,957,589	468,824,448	87,699,306	639,264,707
Unallocated depreciation and amortisation					917,974,537
Unallocated amortization of prepayment					231,291,861
From 1/1/2019 to 31/12/2019					
Capital expenditure	467,834	85,520	155,979,770	35,436,976	191,970,100
Unallocated capital expenditure					696,253,537
Depreciation and amortisation	14,048,610	71,389,313	114,556,457	92,700,766	292,695,146
Unallocated depreciation and amortisation					913,688,415
Unallocated amortisation of prepayment					190,694,275

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(b) Geographical segments

The Group comprises the following geographical segments:

	Vietnam	Belgium	Germany	Japan	USA	Singapore	Others	Total
	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000
From 1/1/2020 to 31/12/2020								
External revenue	100,310,278	2,168,030,828	721,401,110	592,321,521	614,301,694	-	3,094,815,227	7,291,180,658
Segment assets	31,553,724,237	102,805,243	5,706,084,571	215,265,268	318,909,291	-	2,212,059,204	40,108,847,814
Capital expenditure	1,474,237,254	-	-	-	-	-	-	1,474,237,254
From 1/1/2019 to 31/12/2019								
External revenue	65,355,666	1,616,222,115	225,482,636	945,394,214	616,156,308	104,764,762	1,132,754,157	4,706,129,858
Segment assets	29,522,101,450	97,267,774	1,013,850	45,487,936	12,308,133	-	96,540,738	29,774,719,881
Capital expenditure	888,223,637	-	-	-	-	-	-	888,223,637

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5. Business combination

On 9 June 2020 the Group acquired 100% share of H.C. Starck Holding (Germany) GmbH (“HCS”). HCS is a leading manufacturer of high-tech tungsten metal powders and carbides (midstream tungsten products) with 11 subsidiaries operating in Germany, America, Canada, China and Japan.

The acquisition had the following effect on the Group’s assets and liabilities on acquisition date.

	Pre-acquisition carrying amounts VND'000	Fair value adjustments VND'000	Recognised value on acquisition VND'000
Cash and cash equivalents	940,189,999	-	940,189,999
Inventories – net	1,672,825,666	(27,102,920)	1,645,722,746
Other current assets	1,023,150,088	-	1,023,150,088
Tangible fixed assets – net	1,644,135,046	2,426,234,824	4,070,369,870
Intangible fixed assets – net	68,441,660	3,372,981,832	3,441,423,492
Other long-term asset	509,842,300	199,528,207	709,370,507
Current liabilities	(1,346,965,449)	-	(1,346,965,449)
Long-term liabilities	(5,497,091,306)	(1,671,344,182)	(7,168,435,488)
Non-controlling interests	50,670,274	(99,962,179)	(49,291,905)
Total net identifiable assets and liabilities acquired	(934,801,722)	4,200,335,582	3,265,533,860
Negative goodwill (gain from bargain purchase) on business combination (Note 29)			(1,298,081,205)
Total consideration for business combination (i)			1,967,452,655

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Net cash outflow for business combination

Total consideration for business combination (including transaction cost) (i)	1,967,452,655
Receivable for reduction of purchase price (Note 10)	26,476,816
Total consideration paid	1,993,929,471
Cash increase from business combination	(940,189,999)
Net cash outflow	1,053,739,472

From acquisition date to 31 December 2020 the acquired business contributed revenue of VND3,252,671 million and net loss of VND393,467 million to the Group's results, excluding the above gain from bargain purchase.

6. Cash and cash equivalents

	31/12/2020	1/1/2020
	VND'000	VND'000
Cash on hand	229,529	90,493
Cash in banks	696,047,057	941,356,463
Cash in transit	9,653,700	-
Cash equivalents	56,000,000	781,757,650
	761,930,286	1,723,204,606

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7. Investments

(a) Held-to-maturity investments

	31/12/2020	1/1/2020
	VND'000	VND'000
Short-term deposits	-	5,900,000
Long-term deposits	7,400,000	-
Held-to-maturity investments	7,400,000	5,900,000

(b) Investments in associates, joint ventures

The investments in associates, joint-ventures as at 31 December 2020 represent the investment in Jiangwu H.C. Starck Tungsten Products Co. Ltd. – a company incorporated in China as the result of the acquisition of HCS group as described in Note 5. The Group has 30% of interest and voting rights in this entity.

	2020
	VND'000
Opening balance	-
Increases from business combination	213,921,246
Share loss in associates	(29,488,203)
Currency translation differences	10,794,825
Closing balance	195,227,868

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8. Accounts receivable from customers - short-term

Accounts receivable from customers detailed by significant customers

	31/12/2020 VND'000	1/1/2020 VND'000
Third parties		
Tungsten customers	966,871,809	185,752,001
Fluorspar customers	102,016,555	64,831,341
Copper customers	74,769,087	27,744,460
Bismuth customers	23,036,447	1,941,870
Other customers	-	144,151
	1,166,693,898	280,413,823

9. Loans receivables

Loans receivables – short-term represent loans granted to Masan Group Corporation – the ultimate parent company. The loan is unsecured, receivable in 12 months after drawn down dates and earns interest at the rates agreed in the agreements at the transaction dates.

10. Other short-term and long-term receivables

	31/12/2020 VND'000	1/1/2020 VND'000
Short-term receivables		
Receivable for mining rights fee (a)	239,835,807	239,835,807
Interest income	19,197,889	1,833,157
Receivable from reduction of purchase price (c)	26,476,816	-
Others	35,579,024	8,887,410
	321,089,536	250,556,374

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	31/12/2020 VND'000	1/1/2020 VND'000
Long-term receivables		
Land compensation receivable from Thai Nguyen People's Committee (b)	1,234,392,503	1,249,999,696
Deposit paid to Environment Protection Fund (d)	61,310,120	53,306,374
Others	2,607,828	562,828
	1,298,310,451	1,303,868,898

(a) Receivable for mining rights fee ("MRF") represents additional mining rights fee of the Nui Phao Mining Company Ltd ("NPM") – a subsidiary for the year 2018 and 2019 and relevant administrative charges that NPM paid to the authorities based on temporary calculation by the General Department of Geology and Minerals ("GDGM") under the Official Letter No.3724/DCKS-KTDCKS dated 28 December 2018 ("the Official Letter 3724").

NPM does not agree with the amount and basis of the Official Letter 3724 as the management is of the opinion that it is unreasonable and does not comply with current regulations. For example:

- Based on current regulation, the requirement on MRF payment for the year 2018 has to be notified to NPM before 31 December 2017 (NPM received the notification on 28/12/2018); and
- The price used to calculate the charge for granting mining rights (or mining right fee) is based on the prices to calculate the resource royalty. In accordance with regulations of the Government's Decree No. 12/2015/ND-CP dated 12 February 2015 and guidance of the Ministry of Finance's Circular No. 152/2015/TT-BTC dated 2 October 2015 on Royalties, if enterprises extracted natural resources undergo further processing instead of being sold, their price is exclusive of processing cost provided that it must be within the taxable price bracket imposed by the Provincial People's Committee. NPM's products are industrial products, for which the taxable price for resource royalty is determined on the basis of the higher of selling price minus (-) processing cost and the taxable price imposed by the Provincial People's Committee. GDGM did not use the taxable price applied for industrial products, instead they used the taxable price applied for tungsten ore (0.1% < WO3 < 0.3%).

Management believes that it had adequately provided for its liabilities for MRF based on its interpretation of relevant legislation, including regulations on the charge for granting mining rights and regulations on natural resources tax. NPM has made payment for MRF in accordance with Decision 500/QD-BTNMT issued by the Ministry of Natural Resources and Environment ("MONRE") on 4 March 2015. Therefore, the payment made under Official Letter 3724 has been deemed as receivable from advance payment. NPM has sent letters to different levels of authorities to highlight the issues and seek for proper resolutions. The final outcome may be subject to review and investigation by a number of relevant authorities.

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- (b) These represented receivables from State Treasury for the land compensation cost of the Nui Phao Mining Project which was paid to the affected residents at Ha Thuong Commune, Dai Tu District, Thai Nguyen Province. The amount can be netted off against annual land rental fee of future years.
- (c) The amount is receivable from H.C. Starck Group GmbH – the former owner of H.C. Starck Holding (Germany) GmbH under the settlement agreement regarding the joint review process and certain tax claims of seller under the Sales and purchase agreement to acquire HCS (Note 5). After the joint review in December 2020, two parties agreed to make the adjustment to the total purchase price under the SPA.
- (d) NPM is required to deposit for obligation to mine closure and environment rehabilitation obligation to Environment Protection. In accordance with Decision 1536/QD-BTMMT issued by MONRE dated on 20 June 2019, the mine rehabilitation plan requires deposit amount to be increased to VND123,460 million. On this date, the remaining deposit of VND87,692 million are approved for annual instalment over 10 years from 2019. The future deposit instalment will be based on the annual CPI fluctuation in accordance with Circular 38/2015/TT-BTNMT dated 30 June 2015.

11. Inventories

	31/12/2020		1/1/2020	
	Cost VND'000	Allowance VND'000	Cost VND'000	Allowance VND'000
Goods in transit	71,956,654	-	54,194,593	-
Raw materials	956,039,022	-	237,723,007	-
Tools and supplies	686,047,326	(30,721,208)	572,289,604	-
Work in progress	669,042,621	(25,338,147)	139,145,869	-
Finished goods	2,508,689,741	(32,953,813)	1,259,545,121	-
Merchandise inventories	23,320,446	-	739,273,589	-
Goods on consignment	54,045,838	-	136,852,970	-
	4,969,141,648	(89,013,168)	3,139,024,753	-

Included in inventories at 31 December 2020 was VND30,721 million of tools, VND291,208 million of work in progress and VND1,469,146 million of finished goods (1/1/2020: Nil) carried at net realisable value.

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12. Tangible fixed assets

	Buildings and structures VND'000	Machinery and equipment VND'000	Office equipment VND'000	Motor vehicles VND'000	Other mining assets VND'000	Total VND'000
Cost						
Opening balance	4,930,775,651	11,821,423,653	42,227,092	16,186,948	5,095,926,136	21,906,539,480
Increases from business combination	2,636,129,079	4,840,579,656	-	-	-	7,476,708,735
Additions	380	31,603,119	-	-	-	31,603,499
Transfer from construction in progress (Note 14)	200,001,653	647,211,246	706,082	1,104,000	-	849,022,981
Disposals	(19,720,858)	(115,095,369)	-	(807,551)	-	(135,623,778)
Currency translation differences	127,761,931	222,370,577	-	-	-	350,132,508
Closing balance	7,874,947,836	17,448,092,882	42,933,174	16,483,397	5,095,926,136	30,478,383,425
Accumulated depreciation						
Opening balance	1,073,164,994	3,552,372,866	38,295,409	11,603,407	1,127,330,359	5,802,767,035
Increases from business combination	586,645,146	2,819,693,719	-	-	-	3,406,338,865
Charge for the year	346,595,078	846,030,300	1,574,793	2,170,330	212,669,058	1,409,039,559
Disposals	(7,226,526)	(114,095,248)	-	(807,551)	-	(122,129,325)
Currency translation differences	26,263,136	129,271,087	-	-	-	155,534,223
Closing balance	2,025,441,828	7,233,272,724	39,870,202	12,966,186	1,339,999,417	10,651,550,357
Net book value						
Opening balance	3,857,610,657	8,269,050,787	3,931,683	4,583,541	3,968,595,777	16,103,772,445
Closing balance	5,849,506,008	10,214,820,158	3,062,972	3,517,211	3,755,926,719	19,826,833,068

Included in the cost of tangible fixed assets of the Group were assets costing VND73,443 million which were fully depreciated as at 31 December 2020 (1/1/2020: VND49,896 million), but which are still in active use.

At 31 December 2020, tangible fixed assets with carrying value of VND10,832 billion were pledged with banks as security for long-term bonds issued by NPM and the Company (1/1/2020: VND10,977 billion) (Note 20).

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13. Intangible fixed assets

	Land	Software	Mining rights	Development cost	Brand name	Customer Relationship	Technologies	Other intangible fixed assets	Total
	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000
Cost									
Opening balance	-	108,309,899	588,370,818	-	-	-	-	-	696,680,717
Increases from business combination	68,425,536	286,893,361	-	649,265,674	1,062,970,311	218,306,487	1,466,260,807	25,257,122	3,777,379,298
Additions	-	10,836,616	-	-	-	-	-	-	10,836,616
Transfer from construction in progress (Note 14)	-	3,693,341	-	1,404,438	-	-	-	-	5,097,779
Disposal	-	(746,069)	-	-	-	-	-	-	(746,069)
Currency translation differences	3,548,013	15,830,568	-	35,162,425	57,508,550	11,810,762	79,327,269	1,228,238	204,415,825
Closing balance	71,973,549	424,817,716	588,370,818	685,832,537	1,120,478,861	230,117,249	1,545,588,076	26,485,360	4,693,664,166
Accumulated amortisation									
Opening balance	-	73,423,648	158,120,358	-	-	-	-	-	231,544,006
Increases from business combination	-	280,310,256	-	53,616,472	-	-	-	2,029,078	335,955,806
Charge for the year	-	15,692,012	30,550,328	32,445,109	21,758,309	3,696,804	42,975,821	1,081,302	148,199,685
Disposal	-	(746,069)	-	-	-	-	-	-	(746,069)
Currency translation differences	-	15,185,479	-	3,732,808	557,987	94,804	1,102,105	118,156	20,791,339
Closing balance	-	383,865,326	188,670,686	89,794,389	22,316,296	3,791,608	44,077,926	3,228,536	735,744,767
Net book value									
Opening balance	-	34,886,251	430,250,460	-	-	-	-	-	465,136,711
Closing balance	71,973,549	40,952,390	399,700,132	596,038,148	1,098,162,565	226,325,641	1,501,510,150	23,256,824	3,957,919,399

Included in the cost of intangible fixed assets were assets costing VND15,291 million which were fully amortised as at 31 December 2020 (1/1/2020: VND15,291 million), but which are still in use.

At 31 December 2020, intangible fixed assets with carrying value of VND422 billion were pledged with banks as security for long-term bonds issued by NPM and the Company (1/1/2020: VND465 billion) (Note 20).

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14. Construction in progress

	2020 VND'000	2019 VND'000
Opening balance	1,694,487,259	1,429,178,901
Additions during the year	554,779,318	734,397,495
Increases from business combination	112,549,289	-
Transfer to tangible fixed assets (Note 12)	(849,022,981)	(458,284,054)
Transfer to intangible fixed assets (Note 13)	(5,097,779)	(8,402,685)
Transfer to long-term prepaid expenses (Note 15)	(8,934,805)	-
Transfer to short-term prepaid expenses	(37,931,144)	(2,402,398)
Currency translation differences	6,651,072	-
Closing balance	1,467,480,229	1,694,487,259

During the year, borrowing costs capitalised into construction in progress amounted to VND34 billion (2019: VND55 billion).

As at the reporting date, construction in progress of NPM, which mainly represented land compensation, mine and plant development cost and other capitalised costs pertaining to tailing dams, have been pledged with banks as security for long-term bonds issued by NPM (Note 20(b)).

Major constructions in progress were as follows:

	31/12/2020 VND'000	1/1/2020 VND'000
Land compensation	774,195,509	709,194,565
Site clearance, relocation infrastructure and others	209,074,215	196,250,365
Plant, machinery and equipment	151,254,220	608,943,655
Tailing dams	25,288	30,254,309
Other assets	332,930,997	149,844,365
	1,467,480,229	1,694,487,259

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15. Long-term prepaid expenses

	Prepaid land cost and land compensa- tion costs VND'000	Other mining costs VND'000	Incremental costs of obtaining contract (*) VND'000	Others VND'000	Total VND'000
Opening balance	1,006,778,004	1,563,054,219	-	56,026,360	2,625,858,583
Additions	-	130,679,345	186,387,600	169,718,472	486,785,417
Transfer from construction in progress (Note 14)	-	-	-	8,934,805	8,934,805
Transfer from long-term receivables	15,607,194	-	-	-	15,607,194
Amortisation for the year	(74,060,263)	(112,477,373)	(4,413,765)	(40,340,460)	(231,291,861)
Closing balance	948,324,935	1,581,256,191	181,973,835	194,339,177	2,905,894,138

(*) In September 2020, a subsidiary incurred costs to terminate its long-term offtake agreement with an existing customer in order to obtain a more favourable contract with another. This cost is incremental costs of obtaining contract, thus is capitalised and amortised on a systematic basis consistent with the transfer of the goods under new contract with another customer.

16. Advance from customers - short-term

	31/12/2020 VND'000	1/1/2020 VND'000
Third parties		
Advance from sales of Fluorspar product (*)	645,340,981	1,073,439,647
Advance from sales of Bismuth product (*)	103,650,397	278,534
Others	206,743,844	31,885,165
	955,735,222	1,105,603,346

(*) Advance from sales of Fluorspar and Bismuth shall be discharged through monthly instalments through subsequent deliveries. Advance from sales of Fluorspar bears prepayment fee based on agreed term and is guaranteed by the intermediate parent company and the ultimate parent company.

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17. Taxes payable to State Treasury

	1/1/2020 VND'000	Increases from business combination VND'000	Incurred VND'000	Paid/Offset VND'000	Currency translation differences VND'000	31/12/2020 VND'000
Tax payables to Vietnamese State Treasury						
Value added tax	-	-	333,350,890	(333,350,890)	-	-
Import-export tax	-	-	666,641,059	(666,641,059)	-	-
Corporate income tax	134,400,473	-	(3,805,730)	(130,139,941)	-	454,802
Environment protection tax	-	-	28,888,859	(28,888,859)	-	-
Personal income tax	63,044,211	-	139,858,517	(194,121,425)	-	8,781,303
Natural resource tax	-	-	316,951,961	(316,951,961)	-	-
Other taxes	2,276,799	-	24,946,981	(23,360,462)	-	3,863,318
	199,721,483	-	1,506,832,537	(1,693,454,597)	-	13,099,423
Tax payables to foreign tax authorities						
Corporate income tax	-	92,822,622	24,460,388	(24,452,265)	8,514,328	101,345,073
Other taxes	-	89,618,155	-	(46,698,761)	5,312,891	48,232,285
	-	182,440,777	24,460,388	(71,151,026)	13,827,219	149,577,358
	199,721,483	182,440,777	1,531,292,925	(1,764,605,623)	13,827,219	162,676,781

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18. Accrued expenses

	31/12/2020	1/1/2020
	VND'000	VND'000
Operating costs	563,082,117	314,119,079
Accrued interest payable	228,436,211	239,049,922
Accrual for other financing costs	14,691,057	4,181,514
Share issuance fee	42,624,809	-
Consultant fee	42,620,276	983,850
Natural resource taxes and fees	25,766,750	71,039,152
Bonus	15,469,188	59,959,470
Accrual for construction work	10,576,562	14,187,389
Others	1,380,829	1,380,830
	944,647,799	704,901,206

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19. Other short-term and long-term payables

Other payables included the following amounts:

	31/12/2020	1/1/2020
	VND'000	VND'000
Short-term:		
Amounts due to Masan Group Corporation (“MSN”) – the ultimate parent company		
Financial expenses – short-term (a)	244,123,839	1,124,123,839
Amounts due to Masan Horizon Company Limited (“MH”) – the immediate parent company		
Non-trade – short-term (b)	2,511,785	2,511,785
Other payable to other parties		
Payable for termination of off-take agreement with customer	47,056,004	-
Other payables – short-term	12,991,835	339,972
	306,683,463	1,126,975,596
Long-term:		
Other payable to other parties		
Other payables – long-term	500,170	-

(a) Under agreement with MSN – the ultimate parent company, these amounts were unsecured, interest-free.

(a) Amounts due to related parties were unsecured, interest-free and repayable based on agreement between the parties.

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20. Borrowings and bonds

(a) Short-term borrowings and bonds

	1/1/2020	Movements during the year			31/12/2020	
	Carrying amount and amount within repayment capacity	Additions	Payments	Reclassification from long-term borrowings	Unrealised foreign exchange differences	Carrying amount and amount within repayment capacity
	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000
Short-term borrowings	3,188,857,080	8,050,093,685	(8,070,548,253)	-	(3,758,494)	3,164,644,018
Current portion of long-term borrowings (Note20(b))	4,568,426,661	27,312,927	(4,595,739,588)	998,222,222	-	998,222,222
	7,757,283,741	8,077,406,612	(12,666,287,841)	998,222,222	(3,758,494)	4,162,866,240

Terms and conditions of short-term borrowings at respective reporting dates were as follows:

	Currency	31/12/2020 VND'000	1/1/2020 VND'000
Secured bank loan (i)	USD	1,135,396,849	864,314,359
Secured bank loan (i)	VND	-	150,308,000
Secured bank loan (ii)	VND	895,817,351	1,082,810,380
Secured bank loan (ii)	USD	-	15,908,877
Secured bank loan (iii)	USD	333,766,713	164,877,248
Secured bank loan (iii)	VND	286,954,000	504,905,811
Secured bank loan (iv)	VND	190,352,000	150,245,000
Unsecured bank loan (v)	VND	100,589,728	57,915,778
Unsecured bank loan (v)	USD	96,054,387	155,757,627
Secured bank loan (vi)	USD	125,712,990	41,814,000
		3,164,644,018	3,188,857,080

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- (i) The USD and VND denominated loans from a related party bore interest ranging from 3.45% to 4.93% per annum and from 8.70% to 9.52% per annum respectively (1/1/2020: 3.88% - 4.93% and 8.95% - 9.47%). The loan is secured by part of short-term receivables of NPM and 7.19% of the issued shares of the Company held by Masan Horizon Company Limited (“MH”).
- (ii) The loan from a local bank is secured by inventories and part of short-term receivables of NPM. Specific loans drawn down in USD and VND bore interest ranging from 4.5% to 5.5% per annum and from 7.0% to 7.5% per annum, respectively (1/1/2020: 4.5% - 5.5% and 6.8% - 9.5%).
- (iii) Specific loans in USD and VND by MTC – a subsidiary bore interest ranging from 5.1% to 6.1% per annum and from 7.7% to 9.3% per annum, respectively (1/1/2020: 5%-6.3% and 8.3% - 9.6%).
- (iv) Specific loans in VND by NPM – a subsidiary bore interest from 8.4% to 9.6% per annum, respectively (1/1/2020: 6.8%)
The above loans as in a(iii) and a(iv) from a local bank are secured by 10.01% of the issued shares of the Company held by MH.
- (v) The loan from two branches of a foreign bank in Vietnam by MTC – a subsidiary, is unsecured. Specific drawdown in USD and VND bore interest ranging from 3.08% to 4.57% per annum and from 4.7% to 6.8% per annum, respectively (1/1/2020: 4.5% - 4.6% and 6.8%).
- (vi) The USD denominated loan from a foreign bank is secured by part of short-term receivables and all operating bank accounts of MTC opened at the bank. Specific loans drawn down in USD bore interest ranging from 2.22% to 4.3% per annum (1/1/2020: 3.3% - 3.9%).

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(b) Long-term bonds

	31/12/2020	1/1/2020
	VND'000	VND'000
Long-term bonds issued	10,218,664,742	9,538,080,318
Repayable within twelve months (Note 20(a))	(998,222,222)	(4,568,426,661)
Repayable after twelve months	9,220,442,520	4,969,653,657

Terms and conditions of outstanding long-term bonds denominated in VND were as follows:

	Year of maturity	31/12/2020	1/1/2020
		VND'000	VND'000
Secured bond issued	2020	-	3,570,177,119
Secured bond issued	2020	-	998,249,542
Secured bond issued (a)	2023	497,829,434	496,989,214
Secured bond issued (b)	2021	998,222,222	995,555,556
Secured bond issued (c)	2023	1,493,200,000	1,490,800,000
Secured bond issued (d)	2024	497,186,709	496,533,333
Secured bond issued (e)	2022	298,874,684	298,133,333
Secured bond issued (f)	2022	199,202,900	198,711,110
Secured bond issued (g)	2024	497,333,333	496,533,333
Secured bond issued (h)	2022	99,488,774	99,288,889
Secured bond issued (i)	2022	189,028,670	188,648,889
Secured bond issued (j)	2022	209,000,349	208,460,000
Secured bond issued (k)	2023	1,577,600,000	-
Secured bond issued (l)	2023	986,000,000	-
Secured bond issued (m)	2023	689,638,629	-
Secured bond issued (n)	2023	993,333,333	-
Secured bond issued (o)	2023	992,725,705	-
		10,218,664,742	9,538,080,318

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These secured bonds in the consolidated financial statements were reported net of bond arrangement fees.

- (a) The VND denominated bonds issued by NPM with a five-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.25%. The bond proceeds were used by NPM and secured by 4.70% of the issued shares of the Company held by MH.
- (b) The VND denominated bonds issued by the Company with a three-year term bore interest rate of 9.8% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.2%. The bond was secured by certain long term assets of NPM (Note 12, Note 13 and Note 14).
- (c) The VND denominated bonds issued by the Company with a five-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.25%. The bond was secured by 14.09% of issued shares of the Company held by MH and a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (d) The VND denominated bonds issued by NPM with a five-year term bore interest rate of 10.2% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.3%. The bond was secured by 5.06% of issued shares of the Company held by MH.
- (e) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 2.84% of issued shares of the Company held by MH.
- (f) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 1.89% of issued shares of the Company held by MH.
- (g) The VND denominated bonds issued by the Company with a five-year term bore interest rate of 10.2% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.3%. The bond was secured by 5.06% of issued shares of the Company held by MH and a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (h) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 1.22% of issued shares of the Company held by MH.

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- (i) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 2.31% of issued shares of the Company held by MH and a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (j) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 2.48% of issued shares of the Company held by MH.
- (k) The VND denominated bonds issued by NPM with a three-year term bear interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.2%. The bond was guaranteed by Masan Group Corporation – the ultimate parent company and secured by a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (l) The VND denominated bonds issued by NPM with a three-year term bear interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.2%. The bond was guaranteed by Masan Group Corporation – the ultimate parent company and secured by a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (m) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.2%. The bond was guaranteed by Masan Group Corporation – the ultimate parent company and secured by a part of certain long-term assets of NPM (Note 12, Note 13 and Note 14).
- (n) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 12.38% of the issued share of the Company held by MH.
- (o) The VND denominated bonds issued by NPM with a three-year term bore interest rate of 10% per annum for the first twelve months. After the first twelve months, the applicable interest rate per annum will be adjusted every six months and calculated as the average twelve-month saving deposit rate of related reference banks plus 3.1%. The bond was secured by 12.38% of the issued share of the Company held by MH.

These secured bonds were reported net of bond arrangement fees.

The representatives of the bondholders of bonds in all disclosed notes above are Techcom Securities JSC – the ultimate parent company's associate.

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21. Deferred tax assets, liabilities and unrecognised deferred tax assets

(a) Recognised deferred tax assets and liabilities

	Tax rate	31/12/2020 VND'000	1/1/2020 VND'000
Deferred tax assets:			
Remeasurement of provision for pension liabilities	30%	1,281,357,440	-
Fair value adjustment of other asset from business combination (*)	15% - 30%	(520,258,159)	-
Tax losses carry-forwards	30%	187,383,399	-
Accruals and provisions (*)	30%	(275,044,687)	-
Pre-existing relationship - Benefit from contract with NPM	30%	20,045,683	-
Total deferred tax assets		693,483,676	-
Deferred tax liabilities:			
Mineral reserves and mineral resources	15%	552,077,034	583,078,428
Unrealized loss on intra-group transactions	10% - 15%	45,054,074	3,900,260
Newly identified intangible assets from business combination	30%	1,010,890,563	-
Fair value adjustment of other asset from business combination	15% - 30%	162,647,075	-
Accruals and provisions	30%	16,752,855	-
Others	30%	55,411,934	-
Total deferred tax liabilities		1,842,833,535	586,978,688

(*) Deferred tax assets and liabilities includes items mainly arose from HCS and its subsidiaries. These items were presented on a net basis because the subsidiaries have a legally enforceable right to set off current tax assets against current tax liabilities and the deferred tax assets and the deferred tax liabilities relate to income taxes levied by the same taxation authorities on the same taxable entities.

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(b) Movement in temporary differences during the year

	1/1/2020	Increases from business combination (Note 5)	Recognised in consolidated statement of income	Recognised in equity	31/12/2020
	VND'000	VND'000	VND'000	VND'000	VND'000
Mineral reserves and mineral resources	(583,078,428)	-	31,001,394	-	(552,077,034)
Unrealized loss on intra-group transactions	(3,900,260)	-	(41,153,814)	-	(45,054,074)
Pre-existing relationship asset	-	22,384,346	(2,338,663)	-	20,045,683
Remeasurement of provision for pension liabilities (**)	-	1,163,407,482	-	117,949,958	1,281,357,440
Tax losses carry-forwards	-	38,391,743	143,767,487	5,224,169	187,383,399
Accruals and provisions	-	(267,482,770)	2,590,356	(26,905,128)	(291,797,542)
Newly identified intangible from business combination	-	(951,280,572)	26,022,880	(85,632,871)	(1,010,890,563)
Fair value adjustment of other asset from business combination	-	(667,132,172)	25,276,373	(41,049,435)	(682,905,234)
Others	-	(42,865,105)	(16,509,558)	3,962,729	(55,411,934)
	(586,978,688)	(704,577,048)	168,656,455	(26,450,578)	(1,149,349,859)

(**) Deferred tax recognised in equity also included the relevant deferred tax of the remeasurement of the net defined benefit obligation - provision for pensions. As explained in Note 3(l), these amounts are recognised in equity under the caption “Other equity funds” in accordance with a ruling from the Ministry of Finance.

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22. Provisions – long-term

Movements of long-term provisions during the year were as follows:

	Mine rehabilitation	Mining rights	Pensions	Total
	VND'000	VND'000	VND'000	VND'000
Opening balance	99,121,941	429,781,166	-	528,903,107
Increases from business combination	-	-	5,946,290,580	5,946,290,580
Provision made during the year	4,678,557	33,613,058	71,885,161	110,176,776
Remeasurement of provision for pensions (*)	-	-	514,337,973	514,337,973
Provision used during the year	-	(73,145,651)	(142,227,470)	(215,373,121)
Currency translation differences	-	-	573,041,087	573,041,087
Closing balance	103,800,498	390,248,573	6,963,327,331	7,457,376,402

(*) As explained in Note 3(l) , the remeasurement of the net defined benefit obligation - provision for pensions and the relevant deferred tax are recognised in equity under the caption “Other equity funds” in accordance with a ruling from the Ministry of Finance.

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23. Changes in equity

	Share capital	Share pre- mium	Other capital	Foreign exchange differences	Other equity funds	Undistributed profit after tax	Equity attribut- able to equity holders of the Company	Non-controlling interest	Total equity
	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000	VND'000
Balance at 1 January 2019	8,993,091,220	145,709,384	(295,683,347)	-	-	3,282,836,988	12,125,954,245	-	12,125,954,245
Net profit for the year	-	-	-	-	-	352,393,815	352,393,815	-	352,393,815
Bonus share issuance	899,307,560	-	-	-	-	(899,307,560)	-	-	-
Acquisition of NCI	-	-	-	-	-	(8,525,794)	(8,525,794)	-	(8,525,794)
Balance at 1 January 2020	9,892,398,780	145,709,384	(295,683,347)	-	-	2,727,397,449	12,469,822,266	-	12,469,822,266
Net profit for the year	-	-	-	-	-	39,195,963	39,195,963	12,594,995	51,790,958
Increases from business combination (Note 5)	-	-	-	-	-	-	-	49,291,905	49,291,905
New shares issuance	1,099,155,420	995,175,317	-	-	-	-	2,094,330,737	-	2,094,330,737
Transaction fee for new shares issuance	-	(42,624,809)	-	-	-	-	(42,624,809)	-	(42,624,809)
Remeasurement of provision for pensions	-	-	-	-	(358,967,342)	-	(358,967,342)	-	(358,967,342)
Foreign exchange differences	-	-	-	(189,058,584)	-	-	(189,058,584)	4,955,904	(184,102,680)
Balance at 31 December 2020	10,991,554,200	1,098,259,892	(295,683,347)	(189,058,584)	(358,967,342)	2,766,593,412	14,012,698,231	66,842,804	14,079,541,035

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24. Share capital

The Company's authorised and issued share capital comprised:

	31/12/2020		1/1/2020	
	Number of shares	VND'000	Number of shares	VND'000
Authorised share capital	1,099,155,420	10,991,554,200	989,239,878	9,892,398,780
Issued share capital				
Ordinary shares	1,099,155,420	10,991,554,200	989,239,878	9,892,398,780
Shares in circulation				
Ordinary shares	1,099,155,420	10,991,554,200	989,239,878	9,892,398,780
Share premium	-	1,098,259,892	-	145,709,384

All ordinary shares have a par value of VND10,000. Each share is entitled to one vote at meetings of the Company. Shareholders are entitled to receive dividends as declared from time to time. All ordinary shares are ranked equally with regard to the Company's residual assets. In respect of shares bought back by the Company, all rights are suspended until those shares are reissued.

Share premium represents the excess of the proceeds on issuance of shares over the par value.

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Movements in share capital during the year were as follows:

	2020		2019	
	Number of shares	VND'000	Number of shares	VND'000
Balance at the beginning of the year	989,239,878	9,892,398,780	899,309,122	8,993,091,220
Bonus shares issuance during the year	-	-	89,930,756	899,307,560
Ordinary shares issued during the year (*)	109,915,542	1,099,155,420	-	-
Balance at the end of the year	1,099,155,420	10,991,554,200	989,239,878	9,892,398,780

(*) On 26 October 2020, the Company signed share subscription agreement with Mitsubishi Material Corporation (the Investor) to issues 109,915,542 of ordinary shares for the total consideration of VND2,094,330,737,268. In relation to this transaction, the Company also granted a put option to the Investor under which the put option will be exercised in the event that (i) the Company and the Investor (or their affiliate) fail to establish a joint operation of midstream tungsten business within 18 months after the closing date of share issuance or (ii) a change in control in the Company. The put price is at the amount equal to the purchase price in VND less the aggregate of any proceeds received by the Investor from disposing the Company's shares, dividends and compensations received by the Investor, subject to customary adjustment from dilutive events. The deadline to close the put option is 18 months from the date that the Company receives put option notice from the Investor. The exercise of the put option will be subject to approval of Board of Directors, shareholders and Vietnamese regulators.

The share issuance was completed on 24 November 2020 and all expected shares were distributed and all considerations were received. After completion of this transaction, the Investor holds 10% of the Company's equity interest. The proceeds from new shares issuance transactions shall be used for enhanced financial capability, expanded operation scale and increased competitiveness, forming a basic for the sustainable development, safety and efficiency of the Company and/or its subsidiaries throuh capital injection by the Company to its subsidiaries.

25. Off balance sheet items

(a) Lease

The future minimum lease payments under non-cancellable operating leases were:

	31/12/2020 VND'000	1/1/2020 VND'000
Within one year	16,497,931	2,145,000
Within two to five years	16,599,443	-
	33,097,374	2,145,000

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(b) Foreign currencies

	31/12/2020		1/1/2020	
	Original currency	VND'000 equivalent	Original currency	VND'000 equivalent
USD	12,139,880.37	279,035,150	30,746,796	710,558,466
EUR	10,166,623.19	285,438,113	-	-
JPY	149,538,241.00	33,004,585	-	-
CNY	10,586,982.83	36,747,417	-	-
CAD	763,488.94	13,650,419	-	-

(c) Bad debts written off

	31/12/2020 VND'000	1/1/2020 VND'000
Bad debts written off	21,507,965	21,507,965

(d) Capital expenditure commitments

As at 31 December 2020 the Group had the following outstanding capital commitments approved but not provided for in the balance sheet:

	31/12/2020 VND'000	1/1/2020 VND'000
Approved but not contracted	176,985,972	1,040,288
Approved and contracted	85,765,512	14,594,996
	262,751,484	15,635,284

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(e) Final sales pricing adjustment

As disclosed in Note 3(p), the Group had the commitments under sales contract to adjust the sales price of its product sold based on future quoted market price at the London Metal Bulletin (“LMB”) at the agreed final pricing date. The revenue on provisionally priced sales is initially recognised based on the estimated fair value of the total consideration receivable. Such revenue is subject to adjustment at the final pricing date subsequent to balance sheet date.

There is no revenue recognised on a provisional basis as at 31 December 2020 (1/1/2020: VND301 billion).

26. Revenue from sales of goods and provision of services

Total revenue represents the gross value of goods sold and services rendered exclusive of value added tax and export tax.

27. Financial income

	2020 VND'000	2019 VND'000
Call option fee	406,473,000	-
Settlement of past interest expenses from the arbitration settlement	-	809,725,000
Foreign exchange gains	187,623,389	78,308,024
Interest income from deposit and loans	52,304,346	39,037,312
Others	81,613	4,609,924
	646,482,348	931,680,260

28. Financial expenses

	2020 VND'000	2019 VND'000
Interest expense	1,199,925,907	1,079,224,166
Borrowing fees	78,922,551	82,295,440
Foreign exchange losses	230,948,527	54,140,686
Others	143,171,014	75,000,897
	1,652,967,999	1,290,661,189

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29. Other income

	2020 VND'000	2019 VND'000
Gain from bargain purchase from business combination (Note 5)	1,298,081,205	-
Other compensation from the arbitration settlement	-	1,212,834,666
Gain on disposal of fixed assets	12,478,204	9,741,897
Gain on scrap sales	1,462,130	977,273
Other	16,964,529	6,475,574
	1,328,986,068	1,230,029,410

30. Other expenses

	2020 VND'000	2019 VND'000
Tax penalties	9,370,848	32,904,728
Loss from disposal of fixed assets	8,776,981	-
Other expenses from the arbitration settlement	-	522,246,200
Cancellation of past sales of claim	-	256,200,000
Compensation for cancellation of sales of claims	-	74,736,877
Others	40,660,742	7,369,380
	58,808,571	893,457,185

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31. Income tax

(a) Recognised in the consolidated statement of income

	2020 VND'000	2019 VND'000
Current tax expense		
Current year	24,879,988	128,366,030
(Over)/under provision for prior years	(4,225,330)	10,196,118
	20,654,658	138,562,148
Deferred tax benefit		
Origination and reversal of temporary differences	(168,656,455)	(25,169,620)
Income tax (benefit)/expenses	(148,001,797)	113,392,528

(b) Reconciliation of effective tax rate

	2020 VND'000	2019 VND'000
(Loss)/profit before tax	(96,210,839)	465,786,343
Tax at the Company tax rate	(19,242,167)	93,157,269
Non-deductible expenses	7,151,662	21,340,103
Tax incentives	-	(32,286,329)
Effect of different tax rates in subsidiaries	7,635,516	1,762,922
Tax exempt income	(259,616,241)	-
(Over)/under provision for prior years	(4,225,330)	10,196,118
Change in unrecognised deferred tax assets arise from temporary differences	120,294,763	19,222,445
	(148,001,797)	113,392,528

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(c) Applicable tax rates

The Company has an obligation to pay the government corporate income tax at the rate of 20% of taxable profits. The Company's subsidiaries have obligation to pay the government income tax in accordance with the prevailing regulations. The Company's subsidiaries enjoy various tax incentives which provide subsidiaries with further tax exemption and reductions as follow:

- MTC – a subsidiary enjoys income tax incentives applicable for high-tech investment project under Vietnamese current tax regulations.
- NPM – a subsidiary enjoys income tax incentives applicable for mining and processing activities for mineral products other than gold in areas with extremely difficult socio-economic conditions under Vietnamese current tax regulations.

All of the above tax exemption and reduction are not applicable to other income which is taxed at the standard income tax rate applicable to enterprises before any incentives of 20%.

HCS and its subsidiaries are based mainly in Germany, Canada, China.

- Companies based in Germany with legal form of corporation are subject to corporation tax of 15% and are then subject to a surcharge of 5.5% (solidarity surcharge). This results in a total tax rate of 15.825%. These companies are also subject to the Trade tax which is a combination of a uniform tax rate of 3.5% (base rate) multiple with municipal tax rate depending on where the companies' permanent establishment located. The corporate income tax rate are the sum of total rate and the trade tax, which is approximately 30% on average;
- H.C. Starck Jiangwu Tungsten Specialities (Ganzhou), Co., Ltd is subject to corporate income tax of 15% applicable to foreign investment production enterprise and established in Ganzhou, Jiangxi Province of People's Republic of China;
- H.C. Starck Canada Inc. is subject to corporate income tax rate applicable to Canadian enterprise of approximately 25%.

(d) Tax contingencies

The taxation laws and their application in some countries where the Company and its subsidiaries operate were subject to interpretation and may change over time. The final tax position may be subject to review and investigation by a number of authorities, who are enabled by law to impose severe fines, penalties and interest charges. These facts may create tax risks for the Company and its subsidiaries. Management believes that it had adequately provided for tax liabilities based on its interpretation of tax and legislation, including on transfer pricing requirements and computation of corporate income tax and deferred tax liabilities. However, the relevant authorities may have different interpretations.

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

32. Basic earnings per share

The calculation of basic earnings per share for the year ended 31 December 2020 was based on the profit attributable to ordinary shareholders of VND39,196 million (2019: VND352,394 million) and a weighted average number of ordinary shares outstanding of 1,000,651,874 shares (2019: 989,239,878 shares), calculated as follows:

(a) Net profit attributable to shareholders

	2020 VND'000	2019 VND'000
Net profit for the year	51,790,958	352,393,815
Non-controlling interest	(12,594,995)	-
Net profit attributable to ordinary shareholders	39,195,963	352,393,815

(b) Weighted average number of shares

	2020	2019
Issued ordinary shares at the beginning of the year	989,239,878	899,309,122
Effect of bonus shares issued on 18 November 2019	-	89,930,756
Effect of shares issued on 24 November 2020	11,411,996	-
Weighted average number of ordinary shares for the year ended 31 December	1,000,651,874	989,239,878

(c) Diluted earnings per share

The Company has no dilutive potential ordinary shares.

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

33. Significant transactions with related parties

In addition to related party balances and transactions disclosed in other notes to these consolidated financial statements, the Group had the following significant balances and transactions with related parties during the year.

(a) Related party balances

As at and for the year ended 31 December 2020, the Group has current and term deposit accounts at Vietnam Technological and Commercial Joint Stock Bank ("TCB") at normal commercial terms.

As at 31 December 2020, associates of the ultimate parent company and the ultimate parent company held VND161,807 million (1/1/2020: VND319,180 million) and Nil (1/1/2020: VND1,250,000 million) of the issued bonds of the Group respectively.

(b) Related party transactions

Related Party	Nature of transactions	2020 VND'000	2019 VND'000
Ultimate parent company			
Masan Group Corporation ("MSN")	Bond interest	-	120,429,756
	Borrowings received	2,181,000,000	-
	Borrowings repaid	(2,181,000,000)	-
	Interest expense	13,773,529	-
	Loan granted	1,923,753,425	1,000,000,000
	Loan collected	(1,780,273,973)	-
	Interest income from loan granted	46,098,803	-
Ultimate parent company's associate			
TCB and its subsidiaries	Interest expense and borrowing fees	91,904,512	73,109,464
	Borrowings received	38,823,600	1,367,341,337
	Borrowings repaid	1,777,789,296	1,498,587,983
	Bond proceeds received (i)	5,300,138,629	2,000,000,000
	Bond repurchased	1,900,979,224	-
	Bond related fees paid	-	18,550,000

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
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Related Party	Nature of transactions	2020 VND'000	2019 VND'000
Ultimate parent company's subsidiary			
Masan Consumer Corporation	Purchase of goods	1,370,253	1,352,168
	Purchase of services	1,273,609	2,509,043
Masan Horizon Company Limited	Fees paid on behalf by NPM	-	2,050,559
	Cancellation of sales of claims	-	256,200,000
	Compensation for cancellation of sales of claims	-	74,936,877
Key management personnel	Salary, bonus and other benefits (ii)	25,157,139	31,123,186
Board of Directors ("BOD")			
Member of BOD	Purchase of goods from a related company of a member of BOD (iii)	-	725,041,695

(i) The bonds are listed and sold to a broader group of investors pursuant to arrangement agreements.

(ii) No board fees were paid to Board of Directors members for the year ended 31 December 2020 and 31 December 2019.

Included in the remuneration to key management personnel, the actual board fees, salary and bonus for each member of the Company's Board of Directors and the Company's General Director during the year ended 31 December 2020 was as follows:

Name	Position	VND'000
Board of Management		
Mr. Danny Le	Chairman	-
Mr. Nguyen Thieu Nam	First Vice Chairman	-
Mr. Nguyen Van Thang	Member	-
Mr. Craig Richard Bradshaw	Member	-
Board of Directors		
Mr. Craig Richard Bradshaw	General Director (*)	25,157,139

(*) Salary and bonus for the General Director of the Company for the year ended 31 December 2020 and 31 December 2019 are paid out by a subsidiary of the Company.

(iii) In 2018, NPM has sold goods to a related company of a member of Member Council of NPM, also a member of BOD of the Company, and subsequently in 2019, NPM has purchased such goods from such related company. The transaction was approved by the Member Council of NPM on 25 March 2019.

Masan High-Tech Materials Corporation and its subsidiaries
Notes to the consolidated financial statements for the year ended 31 December 2020
(continued)

Form B 09 – DN/HN
(Issued under Circular No. 202/2014/TT-BTC
dated 22 December 2014 of the Ministry of Finance)

34. Comparative information

Comparative information as at 1 January 2020 was derived from the balances and amounts reported in the Company's consolidated financial statements as at and for the year ended 31 December 2019.

5 March 2021

Prepared by:

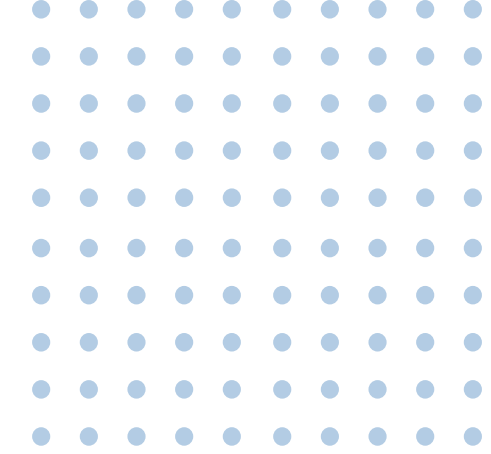
Reviewed by:

Approved by:


Nguyen Thi Thanh Mai
Chief Accountant


Stuart James Wells
Chief Financial Officer


Craig Richard Bradshaw
General Director



GENERAL INFORMATION



Vision & Mission
Company Profile & History
MHT Flagship Assets
Our Products
Shareholders Information

VISION & MISSION



OUR PURPOSE

During Fiscal Year 2020, we delivered the first steps in our corporate strategy and gained overwhelming shareholder approval to rebrand the business. The management have now refined our vision, mission, and values to reflect our diverse and growing number of stakeholders, firmly establish our guiding principles and how they define who we are, who we aspire to be, and how we are going to get there.

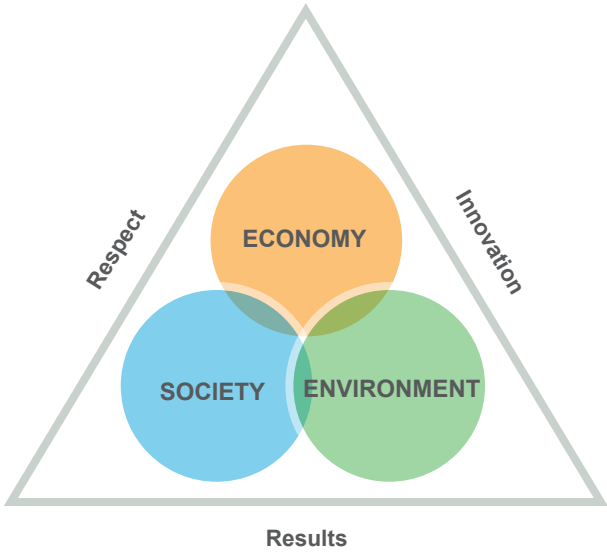
VISION

To be the leading integrated supplier of high-tech advanced materials critical to global innovation.

MISSION

We aim to be the partner of choice to high-tech industries where our products are a key component in evolving and shaping the future of our world. Through the application of our materials, we will create unparalleled solutions to drive innovation and productivity which will deliver superior outcomes for all our partners and stakeholders.

OUR VALUES



- RESPECT**
We believe caring for people, environment and community results in mutually beneficial relationships.
- INNOVATION**
We strive for excellence in everything we do.
- RESULTS**
We are passionate about exceeding expectations.

COMPANY PROFILE

Name of the Company
Công ty Cổ phần Masan High-Tech Materials

English name
Masan High-Tech Materials Corporation

Abbreviated name
Masan High-Tech Materials

Address
Suite 802, 8th Floor, Central Plaza, 17 Le Duan, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam

Telephone +84 28 6256 3862

Fax +84 28 3827 4115

Website www.masanhightechmaterials.com

Enterprise Registration Certificate
No. 0309966889 issued by the Department of Planning and Investment of Ho Chi Minh City on April 27, 2010, amended for the 18th time on December 14, 2020.

Charter Capital VND 10,991,554,200,000

Stock code on HNX-Unlisted Public Company Market (UPCoM):
MSR



COMPANY HISTORY

The Company was established on April 27, 2010 focused on mining and resources extraction activities as part of the Masan Group. Significant events in the Company's business are set out below:



NPMC Open Pit in Vietnam

- Acceleration of project development for the Nui Phao Project.
- In December, the National Mineral Reserves Assessment Council acknowledged the results of the Nui Phao Project's resources and reserve grade conversion.

- In August, the Company received Investment Certificate No. 41122000131 from the People's Committee of Ho Chi Minh City.

- Record production achieved for all four commodities. NHTCM applied for and obtained the Certificate of High Tech issued by Ministry of Science and Technology on April 24.
- Achieved design capacity and successfully commissioned the NHTCM Tungsten Chemical factory. Initiatives in committing for further developing in processing and increasing performance efficiency.
- In September, the Company successfully completed its listing on Hanoi's UPCOM exchange.
- In September, the Company hosted the 28th International Tungsten Association (ITIA) annual meeting, attended by over 120 global delegates.



NPMC Crusher in Vietnam

- Upgrades undertaken on the tungsten circuit have resulted in tungsten recovery increase to 67% with room for further improvement through optimization measures.
- A significant price increase across all commodities of the Company and its subsidiaries coupled with an increased operational efficiency allowed the Company to achieve record results in all aspects of production, revenue and net profit.
- The Company's global brand recognition, underpinned by high quality and reliable products resulted in oversubscribed order book with new customers.
- Commenced procuring third party tungsten raw materials for processing in the NHTCM factory.

- Through MSR's wholly owned subsidiary – MTC, entered into an agreement to purchase the tungsten business of H.C. Starck Group GmbH – a leading manufacturer of high-tech tungsten metal powder and carbides in the world.
- In December 2019, MTC obtained the Decision of Thai Nguyen People's Committee on amendment of the Investment Certificate which registered capacity of ST, APT and BTO/YTO are 1,067 tonnes; 8,278 tonnes; 5,000 tonnes per year respectively depending on the production plan and grade.
- In December 2019, the Ministry of Science and Technology issued "High-Tech Enterprise Certificate" to MTC.



MHT - Hanoi Representative Office

• 2011

- In February, MOIT's official approval of the Nui Phao Project's basic mine design was obtained.

A photograph of a mining engineer wearing a hard hat and safety glasses, pointing at a large map or plan.

Mining Engineer is working with basic mine design

• 2012

- The Nui Phao Project started commercial production of Tungsten Concentrate and Copper Concentrate on March 1, Fluorspar Acid Grade on June 1, and Bismuth Concentrate on September 1.
- Established Nui Phao – H.C. Starck Tungsten Manufacturing LLC ("NHTCM"), a joint venture with H.C. Starck GmbH of Germany to construct and operate an advanced Tungsten Chemical factory in Vietnam.

• 2013

- Successfully held the first AGM after listing on April 22; ranked as premium on the UPCOM Board of the Hanoi Stock Exchange.
- Commercial production of Bismuth Cement started from July 1.
- Continued innovating and investing in upgrading with new processes and technology, cost saving, change in business process, developed engagement and cooperation with NHTCM and has significantly advanced the production volume and revenue of the value-added tungsten chemical products.
- In December, Masan Group, through its wholly owned subsidiaries, successfully completed the tender offer for shares of the Company, thereby providing an exit to Mount Kellett and increasing its ownership in the Company to 93.78%, paving the way for the next round of strategic capital and growth.

• 2014

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• 2015

- Upgrades undertaken on the tungsten circuit have resulted in tungsten recovery increase to 67% with room for further improvement through optimization measures.
- A significant price increase across all commodities of the Company and its subsidiaries coupled with an increased operational efficiency allowed the Company to achieve record results in all aspects of production, revenue and net profit.
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• 2016

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- In December 2019, MTC obtained the Decision of Thai Nguyen People's Committee on amendment of the Investment Certificate which registered capacity of ST, APT and BTO/YTO are 1,067 tonnes; 8,278 tonnes; 5,000 tonnes per year respectively depending on the production plan and grade.
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• 2017

- Through MSR's wholly owned subsidiary – MTC, entered into an agreement to purchase the tungsten business of H.C. Starck Group GmbH – a leading manufacturer of high-tech tungsten metal powder and carbides in the world.
- In December 2019, MTC obtained the Decision of Thai Nguyen People's Committee on amendment of the Investment Certificate which registered capacity of ST, APT and BTO/YTO are 1,067 tonnes; 8,278 tonnes; 5,000 tonnes per year respectively depending on the production plan and grade.
- In December 2019, the Ministry of Science and Technology issued "High-Tech Enterprise Certificate" to MTC.

• 2018

- Acquired H.C. Starck GmbH's 49% stake in NHTCM for total cash consideration of USD29.1 million. Subsequent to acquisition, the name of NHTCM has been changed to Masan Tungsten Limited Liability Company ("MTC").
- Increased the third-party raw material procurement by 300% in order to maximize utilization at the MTC as well as to satisfy the growing demand for tungsten chemical products.
- Company achieved record annual results in all aspects of production, revenue and net profit.

• 2019

- In June, MSR through its wholly owned subsidiary MTC completed the acquisition of H.C. Starck GmbH's global Tungsten business.
- In June, The Company's name was approved to be changed to Masan High-Tech Materials Corporation (MHT) at the Company's Annual General Meeting of Shareholders. This change of company name was officially effective from 6 August 2020 after the Department of Planning and Investment of Ho Chi Minh City issued the Enterprise Registration Certificate amended for the 17th time.
- In December 2020, the Company completed a private placement of shares to Mitsubishi Materials Corporation ("MMC"), making MMC the second largest shareholder owning 10% of the Company's total fully diluted shares.

• 2020

- In June, MSR through its wholly owned subsidiary MTC completed the acquisition of H.C. Starck GmbH's global Tungsten business.
- In June, The Company's name was approved to be changed to Masan High-Tech Materials Corporation (MHT) at the Company's Annual General Meeting of Shareholders. This change of company name was officially effective from 6 August 2020 after the Department of Planning and Investment of Ho Chi Minh City issued the Enterprise Registration Certificate amended for the 17th time.
- In December 2020, the Company completed a private placement of shares to Mitsubishi Materials Corporation ("MMC"), making MMC the second largest shareholder owning 10% of the Company's total fully diluted shares.

A photograph of a large industrial processing plant with multiple large circular storage tanks and conveyor systems.

NPMC Processing plant in Vietnam

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MASAN HIGH-TECH MATERIALS 243

MHT FLAGSHIP ASSETS

Nui Phao Mining Company Ltd (NPMC)

The Nui Phao mine, which is operated by Nui Phao Mining Company Ltd. ("NPMC"), a wholly owned subsidiary of Masan High-Tech Materials, is situated within three communes (Hung Son, Ha Thuong, and Tan Linh) of Dai Tu district in Thai Nguyen province. The site is approximately 80 km from Hanoi and is accessible via highway. Road and rail links connect the mine to the nearest ports of Hai Phong and Quang Ninh province, from which the products can be shipped to international customers. As of 2014, the Nui Phao proven and probable ore reserves are estimated at 66 million tonnes, with an estimated mine life of 20 years.

The major project components are:

- Open pit poly-metallic mine,
- Waste rock disposal facilities,
- Modern mine plant and facilities, including crushing, grinding, thickening, flotation, leaching and gravity recovery facilities,
- A suite of commercial product streams including Tungsten, Copper, Bismuth and Fluorspar concentrates which are either processed into value added products onsite (Tungsten and Bismuth) or sold as high-end commodities,
- A Tailings Storage Facility (TSF) with water and tailings management ponds,
- Buffer zones, relocation sites, haul roads, and mine services.

Products from Nui Phao are shipped to worldwide markets (including well established customer networks) from Quang Ninh Port (in Ha Long City, 197 km to the southeast of the Project site). The port is also used to receive equipment and materials required to run the mine.

NPMC operates at the cutting edge of production of its product suite. Investment in research and development continues to deliver processing, equipment, and chemical improvements. Processing operations are supported by advanced mining and processing management software to maximize recovery and minimize costs and resource loss.



NPMC Crusher in Vietnam

Masan Tungsten Limited Liability Company (MTC)

Masan Tungsten Limited Liability Company, formerly Nui Phao - H.C. Starck Tungsten Chemicals Manufacturing, was established in 2014 as a Joint Venture with H.C. Starck GmbH, a leading worldwide manufacturer of technological metals and one of the biggest companies in the global Tungsten industry. The objective of the company is to connect NPMC's business to the global Tungsten market and enable advanced processing of Vietnam's strategic tungsten resources into higher value tungsten chemicals, thus enabling further value extraction from the Vietnamese strategic resources. In August 2018, NPMC acquired the 49% capital contribution by H.C. Starck GmbH in the Joint Venture. The Joint Venture then changed its name to Masan Tungsten Limited Liability Company. In September 2019, MSR announced the acquisition of H.C. Starck's global Tungsten Division ("HCS"). HCS is a leading manufacturer of midstream tungsten products such as hi-tech Tungsten Metal powders and Carbides. HCS has operating production hubs in Germany, Canada and China serving customers all over the world.

The four main products of the MTC facility used in production of Tungsten and Tungsten Carbides are: APT (Ammonium Paratungstate); BTO (Blue Tungsten Oxide); YTO (Yellow Tungsten Oxide) and ST (Sodium Tungstate).

MTC produces high purity, world-competitive products while operating in Vietnam. This places it among the few tungsten suppliers outside of China who are directly connected to a resource base. The MTC factory has the advantages of secured long term supply source (NPMC) with modern production facilities able to produce high quality products tailored to specific requirements of customers,

- Low conversion costs and preferential tax policies,
- Positive market reputation by affiliation with a technology and skills provider – H.C. Starck has 100 years of experience and is a leading premium supplier of Tungsten,
- Processing technology transfer from H.C. Starck Germany,
- Opportunities for further development of in-country tungsten scrap,
- Sources into high end specific products.

These factors have accelerated the acceptance of a Vietnamese business to the world's Tungsten producer map as well as contributed to improved sales performance.



Metallurgist working in MTC Processing plant in Vietnam

H.C. Starck Tungsten Powders

H.C. Starck Tungsten Powders is a company of the Masan High-Tech Materials Group and is one of the world's leading suppliers of tungsten products with tungsten powder plants in Germany, China, and Canada. With 100 years of experience the company develops, produces, and distributes high-performance powders of tungsten and its compounds. H.C. Starck Tungsten Powders offers the entire range of products along the tungsten powder value chain, processing both primary and secondary raw materials and turning them into high quality, customer-specific tungsten chemicals, metal powders and carbides. They all meet the highest standards of quality and performance.

Highly qualified teams in research & development and in application technology are dedicated to the solutions of tomorrow. Tailor-made solutions with outstanding material properties are developed in close cooperation with customers.

Sustainability is a significant part of the company strategy. A large proportion of used raw materials are obtained through recycling. Security of supply is an important issue in today's world. H.C. Starck Tungsten Powders has access to primary and secondary raw materials and is therefore independent of sources in China, for example.



R&D Expert of HCS Technology & Innovation Global - Tungsten Hydrometallurgy

ChemiLytics

ChemiLytics is a company of the Masan High-Tech Materials Group, and is one of the largest state of the art industrial scale laboratories in Germany for inorganic elemental analysis and powder characterisation. With 70 highly qualified personnel working in teams operating 7 days a week, ChemiLytics offers analytical services in all market segments from the sunset industries of traditional manufacturing through to sunrise industries such as Additive Manufacturing, Aerospace Applications or E-Mobility. Typical samples analyzed include Tungsten ores, Tantalum and Niobium ores, all refractory powders and scrap, Si_3N_4 , battery precursors etc.

ChemiLytics collaborates with customers allowing customization in service provision from traditional samples submissions through to developing individually customized solutions that can allow for the provision of on-line operational control sample analysis through to having the capability to develop specific analytical and technology applications for customers based on ChemiLytics unique service portfolio such as in the electronics industry (WCI6 analysis).



OUR PRODUCTS

Tungsten, Fluorspar, Copper and Bismuth produced at the Nui Phao mine, by Masan High-Tech Materials are the Vietnamese strategic metals that are globally important for many high-tech industries today.

Tungsten (W)

Tungsten is a unique element having the highest melting point of all metals, a density almost twice that of lead, and a hardness close to that of diamond when in tungsten carbide form.

Due to its unique intrinsic properties, tungsten is ideally suited to the needs of all major heavy industries, such as manufacturing, oil & gas, construction, energy, automotive and aviation. Tungsten is also an essential element in the steel industry, where its usage ranges from the production of stainless steel, steel alloys to super alloys.

The tungsten intermediate chemicals manufactured at Masan Tungsten LLC in Thai Nguyen end up in a wide variety of end-use applications. Majority of our customers further process these chemicals into tungsten carbides and tungsten metal powders, which in turn are further processed into a range of downstream products such as cutting tools and mill products.

H.C. Starck Tungsten Powders clearly stands out with its excellent quality and expertise gained over the many years dedicated to the production of tungsten. The intermediate product ammonium paratungstate (APT) is first produced from the raw materials, which is then processed into tungsten metal (W), tungsten carbide (WC) and cast tungsten carbide (CTC). The company also produces tantalum and niobium carbides. State-of-the-art systems and processes as well as experienced employees who are true experts in their specific fields ensure a consistently high level of material quality. Certified quality management and the ceaseless analysis of the products' properties ensure product performance that meets customers' exact needs. Customers can therefore rely on consistent, highest quality products, enabling them to produce high-quality tools while reducing their own process costs.

Fluorspar (CaF₂)

Fluorspar is an industrial mineral from which the element Fluorine is liberated, with two major downstream uses; the production of Hydrofluoric Acid (HF) which is used as a building block for Fluorine Chemicals, and the production of Aluminium Fluoride (AlF₃) which is an important additive for the production of Aluminium by electrolysis. Fluorspar also finds application in various steel and aluminum products, glass and ceramic manufacturing and in the growing nitrogen trifluoride (NF₃) sector. Examples of products containing Fluorine includes household and automotive air conditioners, Teflon products fluoxetine medicines, welding rods, glass and ceramics.



Copper (Cu)

Copper is a soft, malleable and ductile metal and finds wide use industrially due to its exceptional thermal and electrical conductivity. Copper is also relatively inert and corrosion-resistant and has been shown to have antimicrobial properties.

The largest application for copper is in the manufacture of electrical cables and wiring. The construction industry is also a major consumer of copper through electrical systems as well as copper piping in plumbing. Its corrosion resistance as well as its aesthetic appeal have made it popular in roofing, and it is commonly found in the construction of domes, spires and doors. Copper has nutrient qualities and is used as a fungicide in the protection of crops and plants as well as enriching the soil. When copper is mixed with zinc it produces brass, which is also used in a variety of industrial applications.

Bismuth (Bi)

Bismuth is a minor metal with consumer and industrial applications.

For the consumer, bismuth-based chemicals are used in the health and pharmaceutical sector through radiation protection and medicines for treatment of nausea, indigestion and ulcer diseases. Due to its non-toxicity, it has also found use in cosmetics. Industrially, Bismuth is used as a non-toxic pigment in the production of certain paints and in the manufacture of electrical components. Bismuth is also used as a catalyst for vehicular emissions control, as well as in the production low melting point alloys for the reliable work holding devices for heavy machinery such as turbines.

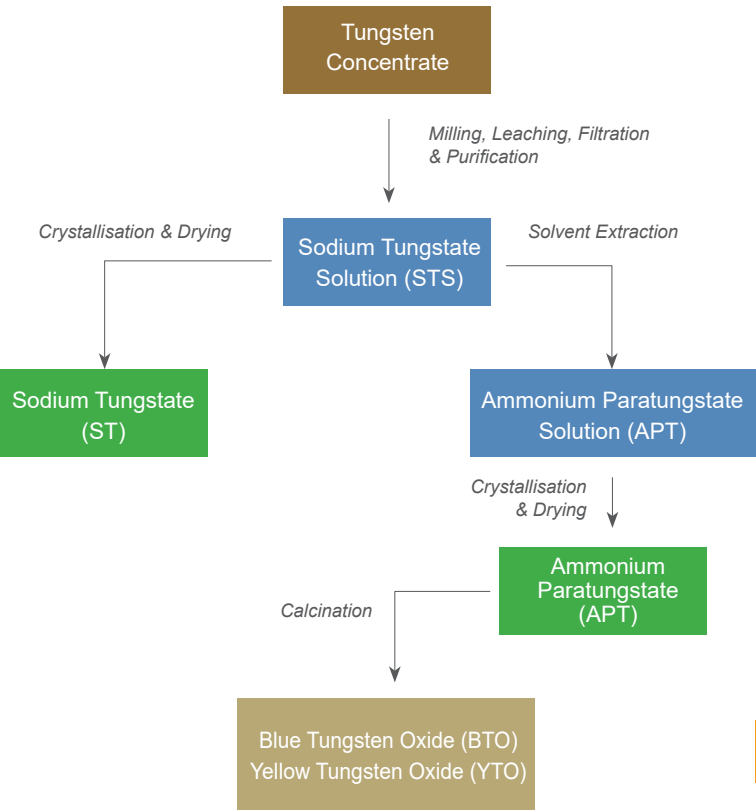
APPLICATION

Tungsten Production

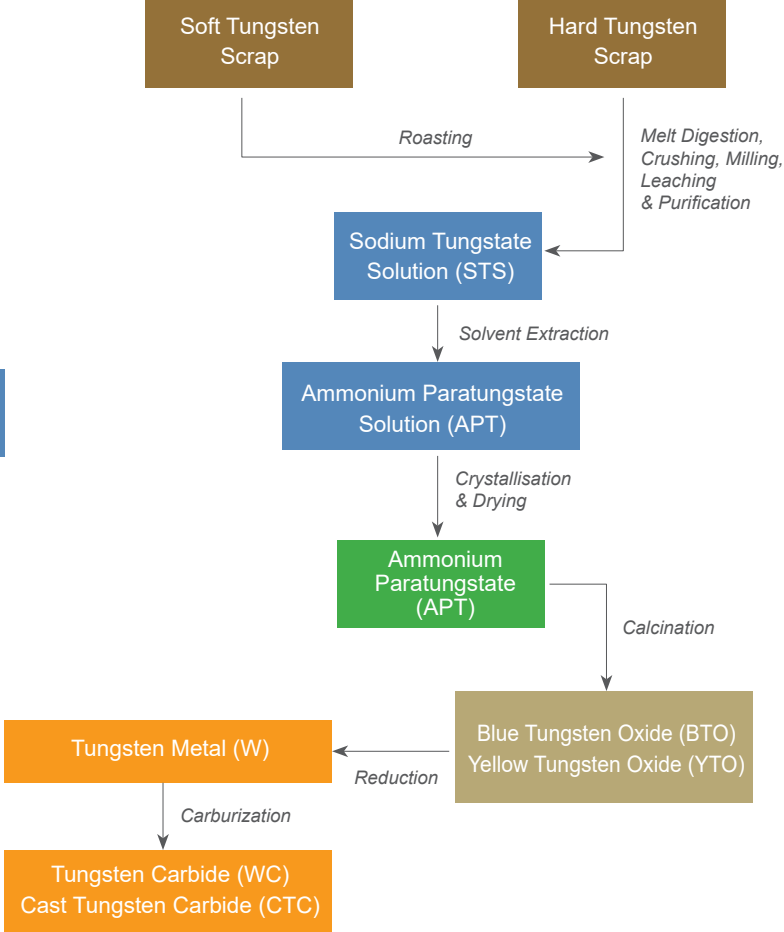
The following is a brief description of the current tungsten production of Masan High-Tech Materials. The MTC plant is designed to process the total amount of NPMC tungsten concentrate, along with tungsten concentrates and tungsten bearing materials purchased from third parties, into high grade Ammonium Paratungstate (APT) via chemical digestion followed by physical and chemical purification and, finally, crystallization. APT which is then packaged for sale or undergoes calcination to produce tungsten oxides included Blue Tungsten Oxides and Yellow Tungsten Oxides for sale.

HCS's production processes include the recycling of tungsten bearing soft and hard scraps as well as the Reduction of Tungsten Oxides to Tungsten Metal, and the Carburization to (Cast) Tungsten Carbides.

MTC process



HCS process



Roasting / Grinding / Leaching:

Ball mills are used to grind and homogenously mix the incoming Tungsten Concentrate in preparation for the steps of Solvent and Extraction.

Salt Melting / Dissolution:

Hard scrap is dissolved in a sodium hydroxide melt under supply of air. Molten sodium tungstate is casted into crucibles and cooled down before being crushed and dissolved in water under formation of a sodium tungstate solution.

Solvent Extraction:

A continuous, closed loop process which transforms the sodium tungstate solution into ammonia tungstate solution, through the use of organic compounds and sedimentation vessels.

Leaching:

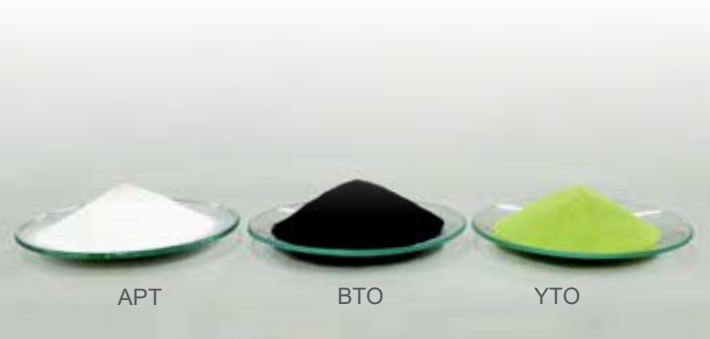
Temperature and pressure of the slurry are increased to drive the conversion of calcium tungstate (Tungsten Ore Concentrate) into sodium tungstate.

Purification:

A continuous technical process to remove the remaining impurities.

APT Crystallization:

A batch process which evaporates excess water and ammonia from the solution to facilitate precipitation of ammonium paratungstate (APT). A dryer is used to ensure low moisture content and that the final product is easy to handle.



MTC products

Calcination to BTO / YTO:

A semi-automated process which converts the APT powder into tungsten oxide powder.

Whilst two grades of oxide are typically produced: Blue Tungsten Oxide (BTO) and Yellow Tungsten Oxide (YTO). There is the ability to customize some characteristics to meet customer specifications.

Blending and Packing:

A process to package the dry APT / BTO / YTO powders into bulk handling format, ready for shipping

Tungsten Application

Tungsten is a strategically important rare metal that is increasingly defined as 'critical', both by those in industry and in government. Its unique physical and chemical properties make it indispensable for general engineering and in traditional heavy industries, having a hardness close to that of diamond, an extremely high melting point (3,422°C) and excellent strength at high temperature. Tungsten together with its compounds is also becoming of growing importance to electronics and display technologies and other high technology applications.

Tungsten is being increasingly used as a material of choice in the design of field emission guns, used in electron microscopes, integrated circuits (ICs), and, due to its high molecular density, as a shielding material from high energy radiation sources. Tungsten is also used in nano-electronic technology for fabrication of nanowires, due to its high surface to volume ratio, with the expected applications as pH (potential of hydrogen) probes and gas sensors.

Tungsten is indispensable in many key industries.



Mechanical engineering and toolmaking

It is impossible to imagine mechanical engineering without high-performance Tungsten Carbide tools. The continuous increase in precision, combined with increased service life, enables users to optimise their manufacturing processes and product performance.



Oil and gas industry

Tungsten finds myriad applications in the extreme environments encountered in O&G. It is used in high-performance drill heads, valves, wear parts, and functional coatings, and in shaped charges that perforate the rock around the well to allow oil and gas to flow out.



Medical technology

Precision components made of tungsten metal are used in modern X-ray diagnostics and therapy. For example, to shield and focus hard X-rays or gamma radiation.



Aerospace

In aviation, tungsten or tungsten alloys are used because of their high density and strength in balance weights, vibration protection parts for loading flaps or for balancing rotor blades.



Chemical industry

In the chemical industry, tungsten is used for many applications, especially in the field of catalysts, such as oxidation catalysts.



Electrical industry

A high thermal load capacity of tungsten-copper materials in combination with very good thermal and electrical conductivities predestine these materials for applications in electrical high-performance switching contacts, as heat sinks in the electrical industry or for use as erosion electrodes.

Tungsten for a Cleaner Environment

Tungsten is the densest chemical element known to be biologically active. Its toxicity is rather low, especially when compared to other metals, however, this is the subject of ongoing studies. In the strive for a cleaner environment, lead has been identified as one of the metals that needs urgent replacement. According to the US Government's Top 100 Hazardous Substances Priority list¹, lead is ranked second. Furthermore, the US Environmental Protection Agency has listed lead as a toxic chemical and have set threshold limits for its concentrations in the air, soil, water and vegetation.

Due to the molecular density similarities between lead and tungsten, tungsten has been proposed as a possible substitution of lead. However, a higher cost and a greater level of machining

difficulty of tungsten have often been cited as big obstacles to its introduction, despite its greater level of recycling compared to lead.

An alternative lie with tungsten polymer composites ^{2,3}. It is a composition of various resins and tungsten powders, which are mixed together to create thermoplastic tungsten, with the final material density matching that of lead². Such a material is easily malleable, has no toxic constituents and it is resistant to corrosion by weather elements. In addition to its easily moldable shapes, thermoplastic tungsten exhibits no harmful effects while handling/processing and can be recycled without any without detrimental effects to the environment, making it a viable alternative to lead. In addition to being a good substitute for lead, tungsten

polymers have also been proposed to replace depleted uranium in certain applications. The mains reasons for this lay in the similarities in the similar densities of depleted uranium and tungsten composites, however, tungsten composites bear no health risks.

The demand for tungsten is set to experience a recovery in 2025 as supply and demand move closer to balance. This, coupled with the dire need for an alternative for lead, is also predicted to increase the cost of tungsten composites, which makes it an attractive investment opportunity.



Environmentally friendly product

1. <https://www.atsdr.cdc.gov/SPL/index.html>
2. <https://www.tungstenheavypowder.com/lead-replacement-sustainability/>
3. <http://tdmfginc.com/portfolio-item/tungsten-polymer>
4. <http://www.tungsten-polymer-radiation-shielding.com/tungsten-polymer-industry-radiation-shielding.html>

Fluorspar Application

Fluorspar is the commercial name for the mineral fluorite, CaF_2 . In its pure form it consists of 51.1% Calcium (Ca) and 48.9% Fluorine (F). In nature however, small amounts of silicon, aluminum and magnesium are usually present due to impurities. Fluorspar is found in a wide range of geological environments; however, it most commonly occurs as vein fillings in rocks that have been subjected to hydrothermal activity [1]. These veins often contain metallic ores which can include sulfides of tin, silver, zinc, copper and other metals.

Commercial fluorspar is graded in accordance to its quality. The grades depend on the content of fluorspar and the associated amounts of impurities (calcite, quartz, Sulphur, arsenic and lead). The grades are:

- Acid grade - contains a minimum of 97% of fluorspar, with the remaining 3% being various impurities
- Ceramic grade – contains 85% - 96% fluorspar, with the remaining 4% - 15% being various impurities
- Metallurgical grade – contains between 60 % and 84% of fluorspar, with the remaining 16% to 40% being various impurities

The grade of fluorspar determines its end-use. Almost two thirds of all fluorspar production is of acid grade and is predominantly used in the production of hydrofluoric acid (HF) [1], while approximately one third of fluorspar is of metallurgical grade and primarily used as a flux in steelmaking and in the production of aluminum. A small amount of fluorspar is of ceramic grade, where it is used in the manufacture of specialty glass, ceramics and enamelware.



Flourspar studied under the microscopes

HF is a highly corrosive acid, capable of dissolving glass and many other materials, primarily oxides. Due to its highly corrosive characteristic, it is used in many industries, such as chemical, mining, refining, glass finishing, silicon chip manufacturing and cleaning. Approximately 60% of global HF production is used in various fluorochemical applications, such as refrigerants, non-stick coatings, medical propellants and an aesthetics, whereas smaller amounts of HF are used in petroleum alkylation [2], and as a pickling agent for metal etching in the electronics industry. Furthermore, HF is also used for cleaning of silicon wafers, glass etching and in the production of polished and frosted glass [2].

[1]. T. Bide, G. Gunn, T. Brown and D. Rayner, "Fluorspar", British Geological Survey (2011), available online at: www.MineralsUK.com.

[2] HF, available online at: https://en.wikipedia.org/wiki/Hydrofluoric_acid

Bismuth Application

Bismuth has been known since Ancient times, although it was often confused with lead and tin, which share some of its physical properties.

Bismuth compounds account for about half for the market for Bismuth products.

Known for its good antibacterial properties, it is used widely in medical applications. It is used to treat diseases like gastritis, peptic ulcers and even gastric cancers. Many over-the-counter stomach settling remedies also include bismuth as the active ingredient, with some bismuth medicinal compounds also used to treat burns, intestinal disorders, and stomach ulcers in humans and animals. Historically, it was also used in the treatment of syphilis.

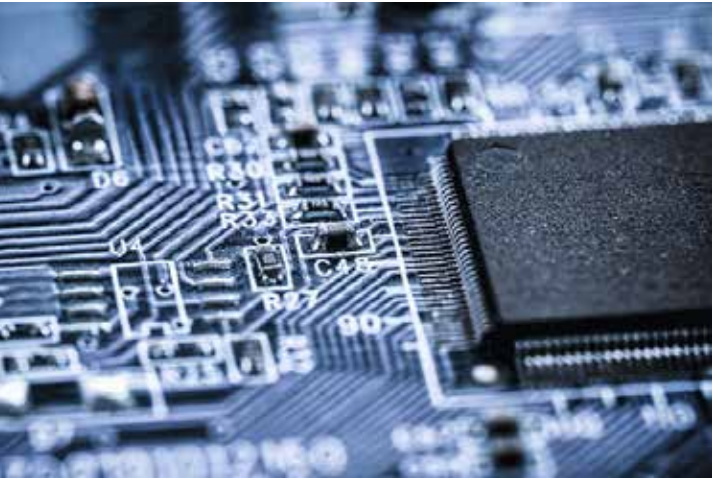
The use of bismuth in cosmetics dates back to ancient Egypt and is today used increasingly as a pigment in paint for eye shadows, hair sprays and nail polishes. Its luster makes it ideal for cosmetics.

The other major use for Bismuth is as an alloying addition in various low melting point alloys, in Steel an Aluminium to improve machining properties, and as a Lead substitute where high density is required. Pigments produced from bismuth are also used in the manufacture of paints and ceramics.

Bismuth for Greener Environment

With an increasing focus on reducing the consumption of lead globally, bismuth alloys have found roles as efficient substitutes. Its low melting point has increased its use in electronics and its low toxicity makes it ideal for use in food processing equipment and copper water pipes. The medical industry has also found it to be a highly effective in X-ray shielding.

In some jurisdictions it is has even been legislated as a replacement for lead shot used in hunting and as sinkers for fishing.

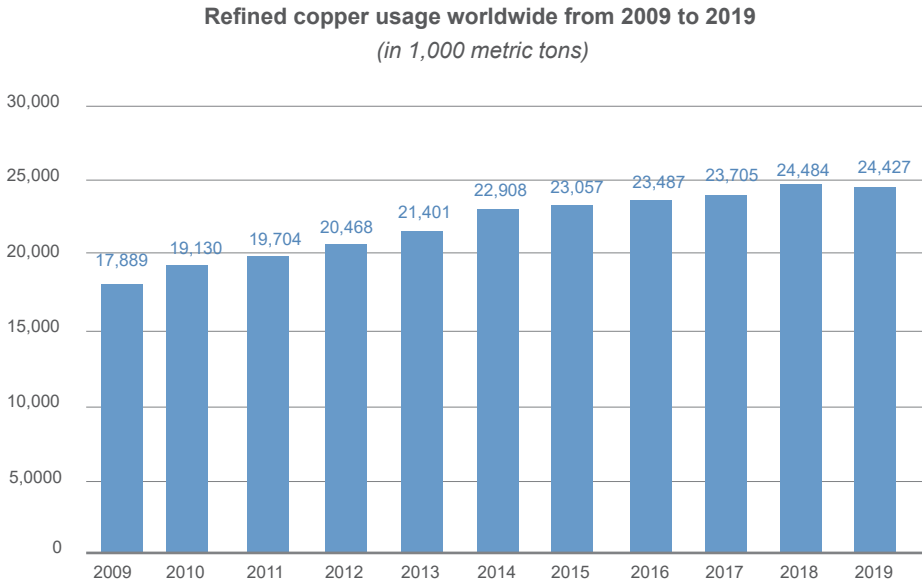


Copper Application

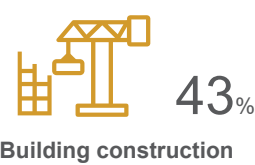
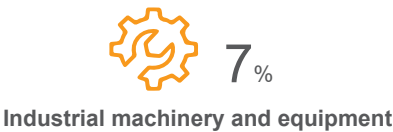
Due to the nature of being a soft, malleable and ductile metal with very high thermal and electrical conductivity, copper is used to many different industries, details could be found in the table below:

Property	Industry/Type of Application
Aesthetics	Architecture, sculpture, jewelry, clocks, cutlery.
Bactericide	Door hardware, marine internal combustion engines, crop treatments.
Biofouling resistance	General, hydraulic and marine engineering, metalworking, aerospace, power generation, shipbuilding, off-shore oil and gas platforms.
Corrosion resistance	Plumbing tubes and fittings, roofing, general and marine engineering, shipbuilding; chemical engineering, industrial processes including pickling, etching and distilling; domestic plumbing, architecture, desalination, textiles, papermaking.
Ease of fabrication	All of the above plus printing.
Electrical conductivity	Electrical power generation, transmission and distribution, communications, resistance welding, electronics.
Environmental friendliness	Essential for health of humans, animals, and crops.
Fungicide	Agriculture, preservation of food and wood.
Low temperature properties	Cryogenics, liquid gas handling, superconductors.
Mechanical strength/ductility	General engineering, marine engineering, defense, aerospace.
Non-magnetic	Instrumentation, geological survey equipment, minesweepers, offshore drilling.
Non-sparking	Mining and other safety tools, oxygen distribution.
Elasticity	Electrical springs and contacts, safety pins, instrument bellows, electronic packaging.
Thermal conductivity	Heat exchangers and air-conditioning/refrigeration equipment, automotive radiators, internal combustion engines, mining.

Global copper usage in 2019 recorded at just over 24mMT, and generally global usage is showing an upward trend when the material is a limited resource, details in the below chart:



In term of usage by industry, copper is mainly used for building construction, Electric and electronic products, and transportation equipment, which account for more than 80% of the market in 2020:



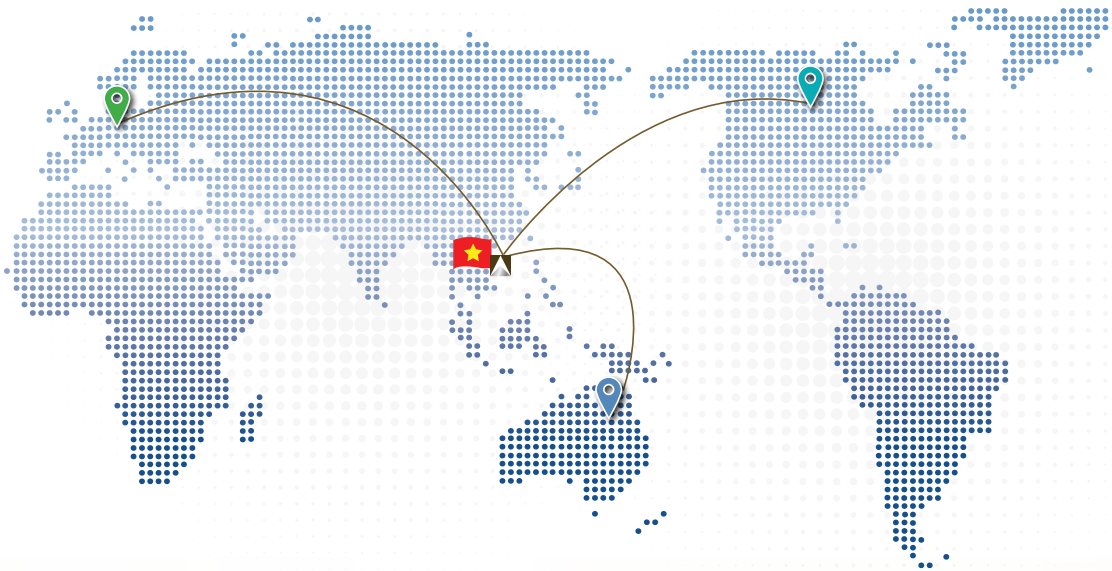
MARKET

A Global Approach

Nui Phao is the first mine in Vietnam to operate in accordance with international standards. That in itself is no small feat, however MHT has no intention of stopping there. We aim to position ourselves in a leadership position and to provide tungsten to the rest of the world.

The mining industry is cyclical and one of its biggest challenges is supply may at some points meet the current demand, however, a more likely scenario is that will inevitably fall into a deficit. We are aware of this, however, given that Vietnam accounts for approximately 40% of the world's supply of tungsten and MHT has successfully acquired H.C. Starck with 100 years of refractory metals expertise and metallurgical excellence, we are confident that MHT will continue to play a key future role in this market.

In 2020, the market for our products while subdued (aligning with the global economy) gave us the opportunity to show our resilience and ability to consistently product high class tungsten materials. The quality of our products is recognized globally, and while we are a preferred supplier to many international consumers of scale, we were also able to find new markets with the improved international coverage. MHT's global brand recognition, is underpinned by high quality, reliable products, and agility to adapt to adversity.



EMEA

- 54.4% Tungsten Chemicals
- 38% Tungsten Powders
- 43% Tungsten Carbides
- 25% Fluorspar

APAC

- 0.3% Tungsten Chemicals
- 52.3% Tungsten Powders
- 44% Tungsten Carbides
- 28% Fluorspar
- 100% Bismuth

NAFTA

- 45.3% Tungsten Chemicals
- 9.7% Tungsten Powders
- 12% Tungsten Carbides
- 100% Copper
- 47% Fluorspar

Market Scale

With the acquisition of H.C. Starck Global Tungsten Division, MHT is a leading manufacturer of midstream tungsten products such as high-tech tungsten metal powders and carbides, integrating HCS's production hubs in Europe, North America, and China serving customers across the globe.

A highly qualified and professional team of experts in R&D, application engineering, coupled with modern automated manufacturing processes ensure its customers benefit from the highest and consistent quality products.

MHT has the intellectual capital to apply innovative product manufacturing such as ultrafine size tungsten compounds. In addition, MHT is now operating a comprehensive, environmentally sound tungsten scrap recycling platform backed by proprietary intellectual property.

The ongoing integration is a strategic step in executing MHT's vision to become a leading vertically integrated high-tech industrial materials platform in the world. MHT's low cost, stable primary supply of ammonium paratungstate (APT), combined with the European scrap recycling platform, will provide MHT a global competitive edge.

This will enable MHT to generate strong and consistent cash flows across price cycles and expand the addressable market by 3.5 times from US\$1.3 billion to US\$4.6 billion.

MHT has become a leading midstream tungsten products supplier across critical industries such as mechanical engineering and tool making, mining, automotive and energy, aviation and the chemical industry. The move into midstream tungsten products is also value enhancing as these products command on average a 30-50 percent premium to APT products.

This has created a global high-tech industrial company in Vietnam of scale, but more importantly, enhance Vietnam's competitive edge in global tungsten market by owning a cutting-edge R&D and technology platform and provide Vietnamese workforce an opportunity to develop engineering skills in the high-tech manufacturing space, as part of the globalization of MHT's business.

We embody the "Vietnam Can Do" spirit, and we are strongly positioned not only to significantly increase shareholder value, but more importantly to enhance social economic value as a global representative of Vietnam.

SHAREHOLDERS INFORMATION

Shareholders Structure

The shareholder structure of the Company as of December 31st, 2020 is as follows:

	Shareholder Structure	12/31/2020			
		Number of Shareholders	Number of Shares held	Value (by par value) (VND)	Shareholding percentage
1	Domestic Shareholder	3,239	983,133,809	9,831,338,090,000	89.44
	Institutional Shareholders	9	950,518,797	9,505,187,970,000	86.48
	Individuals	3,230	32,615,012	326,150,120,000	2.96
2	Foreign Shareholders	37	116,021,611	1,160,216,110,000	10.56
	Institutional Shareholders	1	109,915,542	1,099,155,420,000	10.00
	Individuals	36	6,106,069	61,060,690,000	0.56
Total		3,276	1,099,155,420	10,991,554,200,000	100

Source: List of shareholders of the Company provided by VSD.

List of Shareholders Holding at least 5% of The Charter Capital of The Company

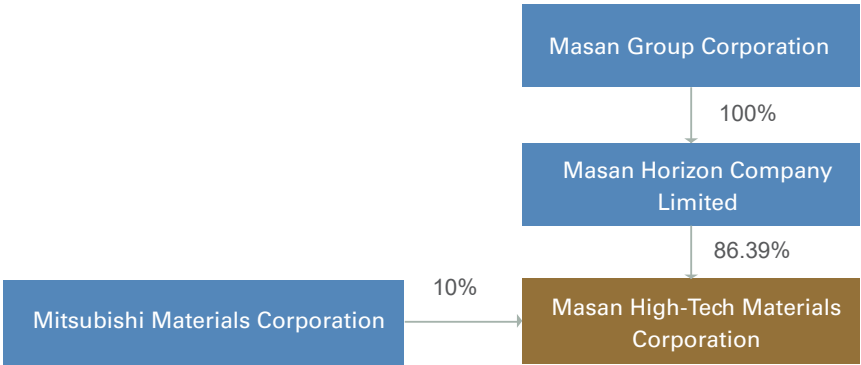
The list of shareholders holding at least 5% of the Charter Capital of the Company as of December 31, 2020 is as follows:

	Shareholder	Number of Shares held	Value (by par value) (VND)	Shareholding percentage
1	Domestic Shareholder			
	Masan Horizon Company Limited	949,597,153	94,959,715,300,000	86,39%
2	Foreign Shareholder			
	Mitsubishi Materials Corporation	109,915,542	1,099,155,420,000	10.00%

Source: List of shareholders of the Company provided by VSD.

Major Shareholders - Investors

Ownership Structure of Masan High-Tech Materials as of December 31, 2020.



Institutional Shareholders

Domestic Shareholder

Masan Group Corporation (the controlling shareholder through its wholly owned subsidiary, via Masan Horizon)

Masan Group Corporation (“Masan” or the “Company”) believes in doing well by doing good. The Company’s mission is to provide better products and services to the 90 million people of Vietnam, so that they can pay less for their daily basic needs. Masan aims to achieve this by driving productivity with technological innovations, trusted brands, and focusing on fewer but bigger opportunities that impact the most lives.

Masan Group’s member companies and associates are industry leaders in branded food and beverages, branded meat, value-added chemical processing, and financial services, altogether representing segments of Vietnam’s economy that are experiencing the most transformational growth.

The CrownX

The CrownX is a consumer-retail platform that currently consolidates Masan’s interests in MCH and VCM. The company was established with the vision to become a “Point of Life” platform in order to provide more products and services to Vietnamese consumers online and offline.

MasanConsumerHoldings

MasanConsumerHoldings was established to be the Group’s primary platform to further invest in branded food and beverage opportunities and related sectors. Its core holdings include Masan Consumer and Masan Brewery.

MasanConsumerHoldings is one of Vietnam’s largest local diversified FMCG companies. The company manufactures and distributes a range of food and beverage products, including soya sauce, fish sauce, seasoning, chili sauce, instant noodles, instant congee, instant coffee, instant cereals, bottled beverages, processed meat, and beer. MasanConsumerHoldings has grown its product portfolio and domestic distribution channels to establish a leading position in Vietnam’s branded consumer food and beverage market. Its key brands include CHIN-SU, Nam Ngu, Tam Thai Tu, Omachi, Kokomi, Komi, Heo Cao

Boi, Ponnie, Vinacafé, Wake-up, Wake-up 247, Compact, Vinh Hao, Quang Hanh, Vivant, Faith, Red Ruby and Su Tu Trang. With the recent acquisition of NET, Masan Consumer is now also present in the home and personal care space.

VCM/VinCommerce

VinCommerce is the largest modern retail platform in Vietnam with more than 123 supermarkets (VinMart) and 2,231 mini-marts VinMart+ (as at the end of 2020). VinCommerce, via VinEco, also owns 14 high-tech farms VinEco which provide products of international quality standards. Via the VinID app, VinCommerce is a pioneer in terms of omni-channel strategy with access to 8.7 million customers.

VinCommerce has continuously achieved prestigious domestic and international awards, such as Top 10 most prestigious retailers in Vietnam in 2017, 2018, 2019, 2020; Asian Green Retailers 2019; and Asian Responsible Business 2019.

Masan MEATLife

Masan MEATLife is Vietnam’s one of the largest fully-integrated (“Feed-Farm-Food” business model) branded meat platform, focused on driving productivity in Vietnam’s animal protein industry and ultimately directly serving consumers with traceable, quality and affordable meat products, a USD10.2 billion opportunity.

From its origin as a leading animal feed company, where today its “Bio-zeem” feed brand is a market leader known for its productivity, Masan MEATLife (formerly known as Masan Nutri-Science) has since transformed into a branded consumer meat business, being the first in Vietnam to launch chilled meat products using European processing technology and standards under the “MEATDeli” brand.

Masan High-Tech Materials

Masan High-Tech Materials (formerly Masan Resources) is one of the largest private sector mineral resource and chemical processing companies in Vietnam, currently operating the world-class Nui Phao

polymetallic project in Northern Vietnam. Nui Phao is the largest Tungsten mine in the world and the industry’s first new Tungsten project to be commissioned in over a decade. Masan High-Tech Materials is also a globally significant producer of Fluorspar and Bismuth. Masan High-Tech Materials’ objective is to show the world that a Vietnamese company can lead the transformation of the global Tungsten market and is strategically exploring opportunities and discussions to become a further integrated downstream Tungsten business of global scale. This will enable MHT to deliver a consistent and strong financial profile across commodity cycles.

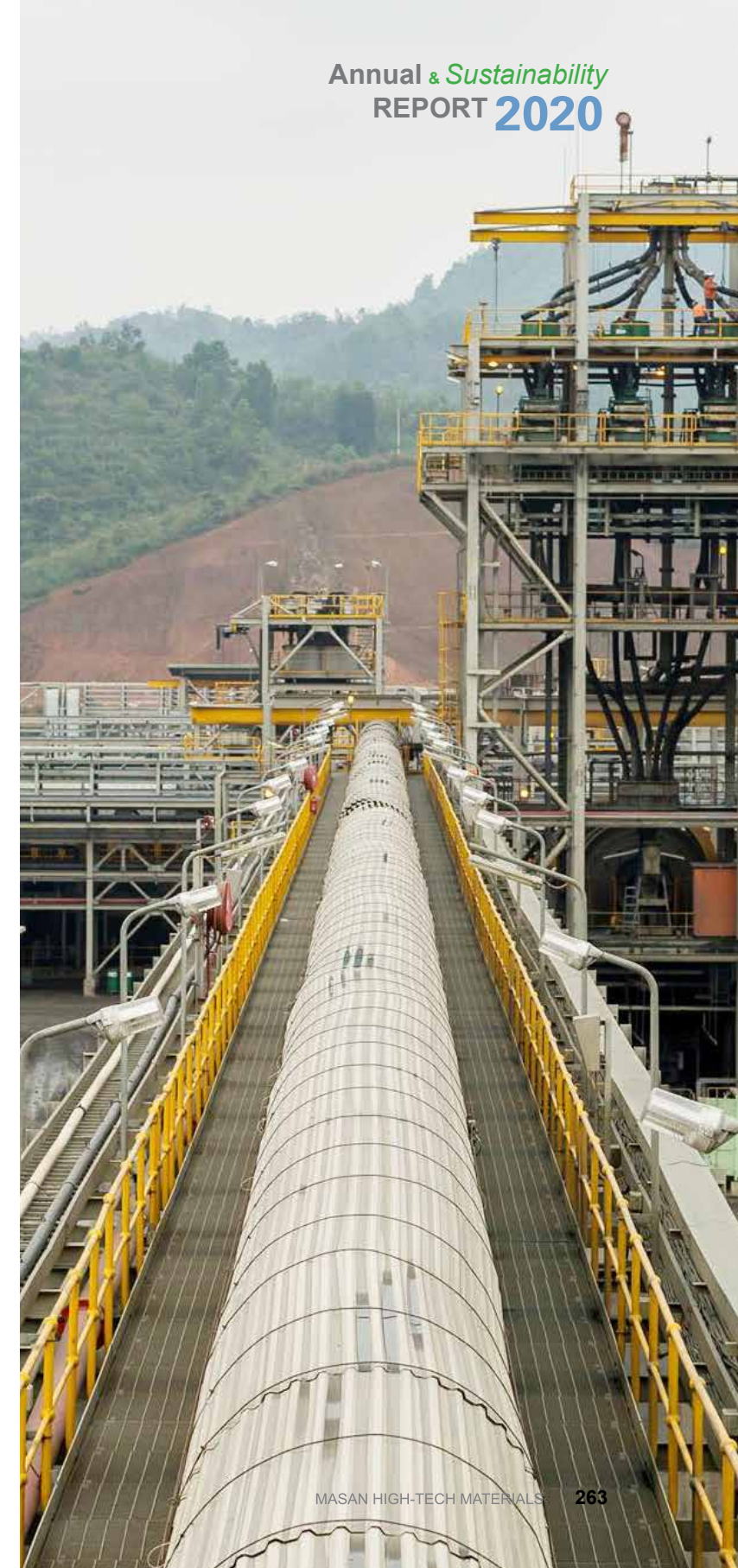
Techcombank

Techcombank is currently one of the largest joint stock commercial banks in Vietnam in terms of total operating income, assets, loans, deposits, customers and distribution network. It has built industry-leading franchises in retail deposits, SME and retail lending through its consumer-centric ecosystem approach. In over 26 years since its establishment, it has developed a diversified range of financial products and services to cater to the financial needs of Vietnam’s emerging consumer class and budding private enterprises.

Foreign Shareholder

Mitsubishi Materials Corporation (MMC)

Mitsubishi Materials Corporation holds 109,915,542 ordinary shares (equivalent to 10.00% of the total shares in circulation). Mitsubishi Materials Group is an “integrated materials manufacturer” meeting customers’ needs by providing such basic materials as copper and cement, mechanical parts, electronic materials and components used in automobiles, home appliances as well as the tools used to make them. Besides, MMC is also involved in recycling and energy business. It is one of the core companies of Mitsubishi Group in Japan.





GROUP STRUCTURE



MHT Structure
Organisation Chart
Management Structure

MHT STRUCTURE

Holding Company

Masan High-Tech Materials Corporation (MHT)

Name of the Company

Masan High-Tech Materials Corporation

Address

Suite 802, 8th Floor, Central Plaza, 17 Le Duan, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam

Telephone +84 28 6256 3862

Fax +84 28 3827 4115

Website www.masanhightechmaterials.com

Enterprise Registration Certificate

No. 0309966889 issued by the Department of Planning and Investment of Ho Chi Minh City on April 27, 2010, as amended for the 16th time on May 20, 2019

Charter Capital VND 10,991,554,200,000

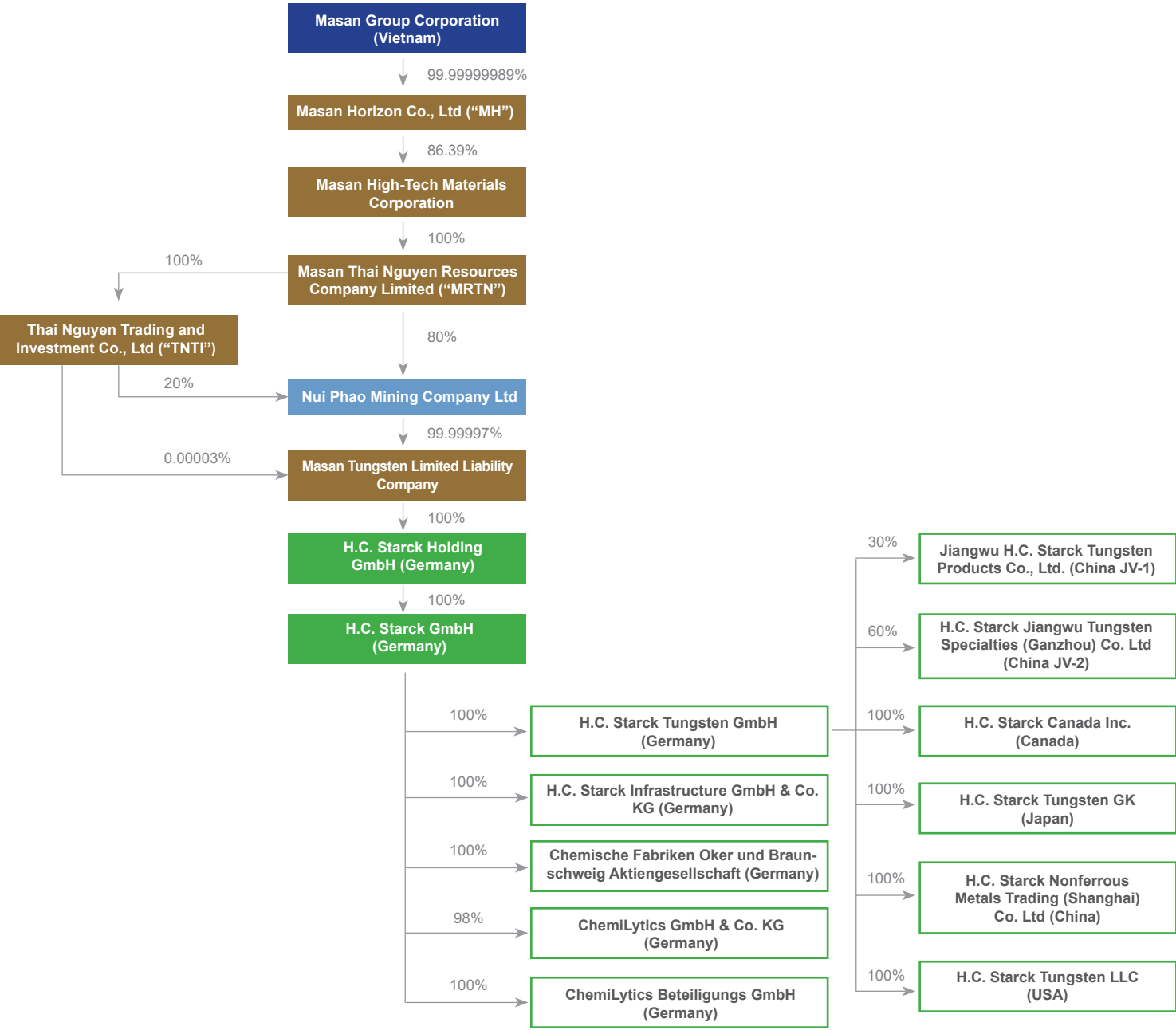
Contributed capital in Company VND 10,991,554,200,000

Major business sectors

- Market research and public surveys (details: market research); and
- Management consultancy (details: investment and management consulting services, excluding financial services).

Organization structure

The corporate structure of MHT is set out in the diagram below:



Consolidated Subsidiaries

MASAN THAI NGUYEN RESOURCES COMPANY LIMITED (MRTN)

Name of the Company	Masan Thai Nguyen Resources Company Limited
Address	Suite 802, 8 th Floor, Central Plaza, 17 Le Duan, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam
Telephone	+84 28 6256 3862
Fax	+84 28 3827 4115
Enterprise Registration Certificate	No. 0309960069 issued by the Department of Planning and Investment of Ho Chi Minh City on May 7, 2010, and amended for the 8 th time on December 14, 2020
Charter Capital	VND 12,156,476,389,152
Contributed capital in Company	VND 12,156,476,389,152
Capital contribution ratio of the Company	100% of charter capital

Major business sectors

- Market research and public survey (details: market research); and
- Management consultancy (details: investment and management consulting services, excluding financial services).

THAI NGUYEN TRADING AND INVESTMENT COMPANY LIMITED (TNTI)

Name of the Company	Thai Nguyen Trading and Investment Company Limited
Address	Suite 802, 8 th Floor, Central Plaza, 17 Le Duan, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam
Telephone	+84 28 6256 3862
Fax	+84 28 3827 4115
Enterprise Registration Certificate	No. 0310352925 issued by the Department of Planning and Investment of Ho Chi Minh City on October 15, 2010, and amended for the 7 th time on December 14, 2020
Charter Capital	VND 2,158,702,686,000
Contributed capital in Company	VND 2,158,702,686,000
Capital contribution ratio of the Company	100% of charter capital

Major business sectors

- Management consultancy (details: investment and management consulting services, excluding financial and accounting consulting services);
- Advertising;
- Market research and public surveys (details: market research);
- Extraction of precious and rare minerals (not operating at the head office);
- Extraction of non-ferrous metals (not operating at the head office);
- Trade promotion; and
- Financial support services, not classified (details: investment consulting services, excluding legal, financial and accounting consulting services).

NUI PHAO MINING COMPANY LTD (NPMC)

Name of the Company	Nui Phao Mining Company Ltd
Address	Hamlet 2, Ha Thuong Commune, Dai Tu District, Thai Nguyen Province, Vietnam
Telephone	+84 24 37182490
Fax	+84 24 37182491
Enterprise Registration Certificate	No. 4600864513 issued by the Department of Planning and Investment of Thai Nguyen Province on July 5, 2010, and amended for the 12 th time on December 10, 2020
Charter Capital	VND 10,792,915,155,000
Contributed capital in Company	VND 10,792,915,155,000
Capital contribution ratio of the Company	100% of charter capital

Major business sectors

- Extraction of precious metal ores (exploitation, processing of tungsten, fluorspar, bismuth, copper and gold);
- Extraction of other, non- ferrous containing ore;
- Architecture and related technical consulting (geological and water resource exploration (mineral exploration);
- Assistance service activities for mining of other, not mentioned above, ores;
- Production of precious metal ores;
- Sale of the metals and metal ores (excluding sale and purchase of gold bars);
- Management consultancy;
- Other special office assistance; and
- Import and export of the products traded by the Company.

MASAN TUNGSTEN LIMITED LIABILITY COMPANY (MTC)

Name of the Company	Masan Tungsten Limited Liability Company
Address	Hamlet 2, Ha Thuong Commune, Dai Tu District, Thai Nguyen Province, Vietnam
Telephone	+84 24 73075588
Fax	+84 24 37182491
Enterprise Registration Certificate	No. 4601163743 issued by the People's Committee of Thai Nguyen province on January 15, 2014, amended for the 9 th time on December 10, 2020
Charter Capital	VND 3,289,086,725,777
Contributed capital in Company	VND 3,289,086,725,777
Capital contribution ratio of the Company	100% of charter capital

Major business sectors

Manufacture of non-ferrous metals and rare metals (processing tungsten for export or domestic trade).

H.C. STARCK HOLDING (GERMANY) GmbH	
Registered Number: HRB 200744	Business sectors
Registered Office: Im Schleeke 78-91, 38642 Goslar, Germany	Pure holding company, no operating business.
Date and place of incorporation: April 23, 2007, Goslar, Germany	
Charter capital: EUR 25,000	
Ownership: Masan Tungsten Limited Liability Company	
Directors: Craig Richard Bradshaw, Stephan Broske, Dr. Hady Seyeda (Managing Director)	
Accounting reference date: 31 December	
Tel: +49 5321 751-0	

H.C. STARCK GmbH	
Registered Number: HRB 200743	Business sectors
Registered Office: Im Schleeke 78-91, 38642 Goslar, Germany	Pure holding company, no operating business.
Date and place of incorporation: April 20, 2007, Goslar, Germany	
Charter capital: EUR 10,000,000	
Ownership: H.C. Starck Holding (Germany) GmbH	
Directors: Craig Richard Bradshaw, Stephan Broske, Dr. Hady Seyeda (Managing Director)	
Accounting reference date: 31 December	
Tel: +49 5321 751-0	

H.C. STARCK TUNGSTEN GmbH	
Registered Number: HRB 222201	Business sectors
Registered Office: Landsberger Str. 98, 80339 Munich, Germany	Headquarter of HCS Tungsten Powders and the largest of the Powders' sites.
Date and place of incorporation: November 26, 2015, Munich, Germany	Functioning as base for the senior management.
Charter capital: EUR 26,000	Full tungsten powders value chain covered on-site with a special focus on recycling.
Ownership: H.C. Starck GmbH	In-house technology for raw material processing (incl. recycling) and production of tungsten chemicals, tungsten metal, tungsten carbide and tantalum / niobium carbide powders.
Directors: Dominic Heaton, Stephan Broske, Dr. Hady Seyeda (Managing Director)	Technical competence hub including R&D center and technical engineering.
Accounting reference date: December 31	Long-term deep relationship with local and national government.
Tel: +49 5321 751-0	

H.C. STARCK INFRASTRUCTURE GmbH & Co. KG GmbH	
Registered Number: HRA 104613	Business sectors
Registered Office: Landsberger Str. 98, 80339 Munich, Germany	Landowner in Goslar, lessor of certain buildings on site, owner of the H.C. Starck brand, licensor.
Date and place of incorporation: November 26, 2015, Munich, Germany	
Charter capital: EUR 26,000	
Ownership: General partner: H.C. Starck Tungsten GmbH Limited partner: H.C. Starck GmbH	
Directors: General partner: H.C. Starck Tungsten GmbH	
Accounting reference date: December 31	

JIANGWU H.C. STARCK TUNGSTEN PRODUCTS CO., LTD.	
Registered Number: 360700520012039	Business sectors
Registered Office: Shuixi Nonferrous and Metallurgical Industrial Base, Zhanggong District, Ganzhou, Jiangxi Province, PRC	Production of ammonium paratungstate and tungsten oxide products.
Date and place of incorporation: November 27, 2012, Ganzhou, PRC	Sale of ammonium paratungstate and tungsten oxide products.
Charter capital: RMB 95,355,000	Architecute and related technical consulting.
Ownership: H.C. Starck Tungsten GmbH (30%) Jiangxi Tungsten Industry Co., Ltd. (70%)	Production and sale of chemical products (except dangerous goods).
Directors: Dr. Hady Seyeda, Yi Zhang (Board of Directors)	
Accounting reference date: December 31	
Tel: +86 18870105188	

H.C. STARCK JIANGWU TUNGSTEN SPECIALITIES (GANZHOU) CO. LTD.		
Registered Number: 360700520011685	Business sectors	
Registered Office: Shuixi Nonferrous and Metallurgical Industrial Base, Zhanggong District, Ganzhou, Jiangxi Province, PRC	• production of tungsten metal powder and tungsten carbide powder.	
Date and place of incorporation: July 31, 2012, Ganzhou, PRC	• sale of tungsten metal powder and tungsten carbide powder	
Charter capital: RMB 149,625,000	• research and development of tungsten metal powder and tungsten carbide powder	
Ownership: H.C. Starck Tungsten GmbH (60%) Jiangxi Tungsten Industry Co., Ltd. (40%)	• Import and export of products traded by company, and	
Directors: Dr. Hady Seyeda, Yi Zhang, Nanqiu Wen (Board of Directors)	• Other value-added service to customer	
Accounting reference date: December 31		
Tel: +86 797 5162518		

H.C. STARCK NONFERROUS METALS TRADING (SHANGHAI) CO. LTD.		
Registered Number: 12000002201811140011	Business sectors	
Registered Office: Room 301, 69 Yonghong Road, Minhang District, Shanghai, PRC	• Sales, customer service, application supporting, marketing consultancy, finance and management consultancy	
Date and place of incorporation: November 14, 2018, Shanghai, PRC	• Other special office assistance, not mentioned above	
Charter capital: RMB 4,000,000		
Ownership: H.C. Starck Tungsten GmbH		
Directors: Stephan Broske (Legal Representative)		
Accounting reference date: December 31		
Tel: +86 21 6025 1106		

H.C. STARCK CANADA INC.		
Registered Number: 4358201	Business sectors	
Registered Office: 933 Vidal Street South, P.O. Box 3098, Sarnia, Ontario, N7T 8H8, Canada	• Manufacturing Chemicals	
Date and place of incorporation: May 18, 2006, Sarnia, Canada	• Producing Tungsten Metal Powders, Tungsten Carbide Powders and Cast Tungsten Carbide Powder	
Charter capital: [●]		
Ownership: H.C. Starck Tungsten GmbH		
Directors: Stephan Broske, Ryan Bender		
Accounting reference date: December 31		
Tel: +1 519-346-4300		

H.C. STARCK TUNGSTEN GK		
Registered Number: 0100-03-027237	Business sectors	
Registered Office: 2-20, Kaigan 1-chome, Minato-ku, Tokyo Japan	• Import, export, and sales of rare metals and chemical compounds such as tungsten, and cobalt, etc.; and	
Date and place of incorporation: March 26, 2018, Tokyo, Japan	• Any other business incidental to or relating to the foregoing such as scrap recovery of cemented carbides, heavy metals, etc.	
Charter capital: JPY 650,000		
Ownership: H.C. Starck Tungsten GmbH		
Directors: Stephan Broske, Tadashi Iba (Operating Officers)		
Accounting reference date: December 31		
Tel: +81-3-6721-8050		

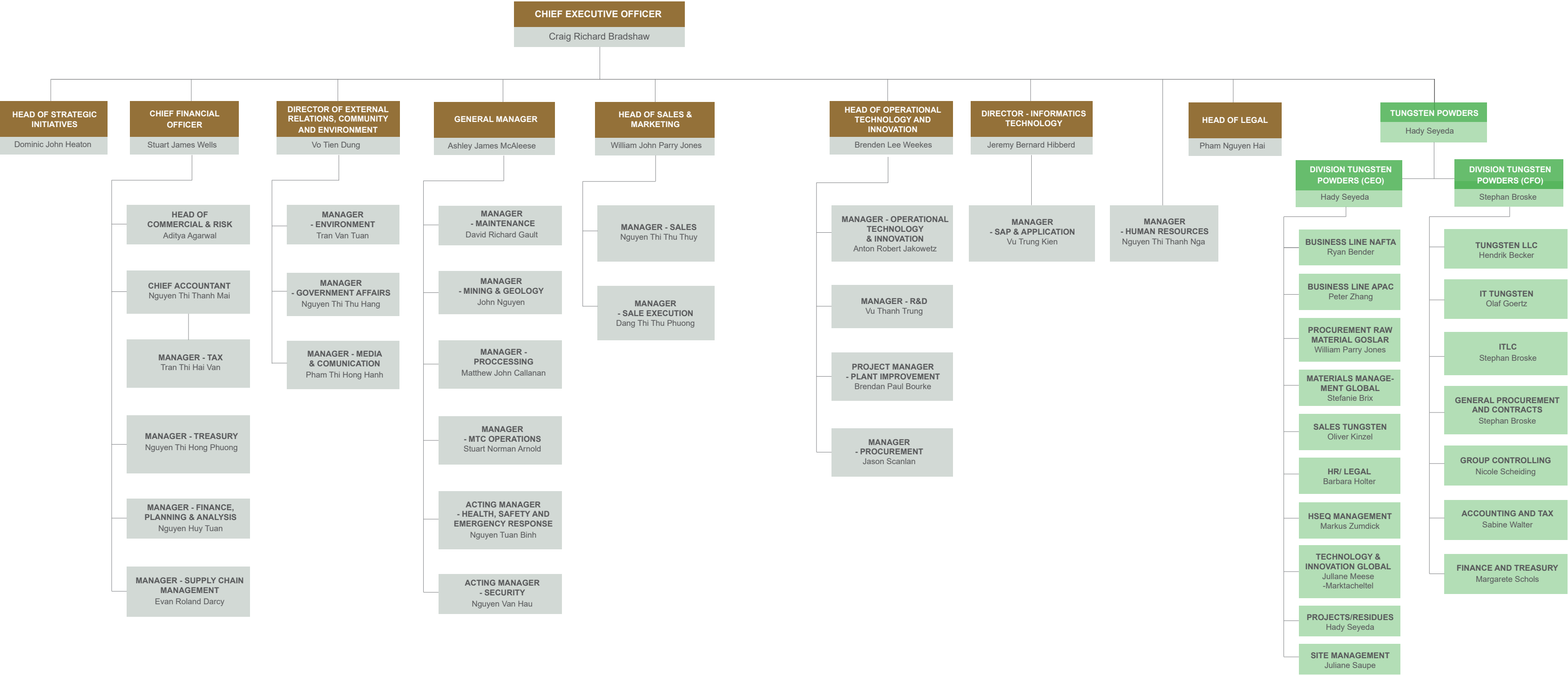
H.C. STARCK TUNGSTEN LLC		
Registered Number:	7609450	Business sectors
Registered Office:	45 Industrial Place, Newton, MA 02461, USA	Sale of metals and metal ores;
Date and place of incorporation:	September 19, 2019, Newton, USA	Import and export of the products by the Company
Charter capital:	[•]	
Ownership:	H.C. Starck Tungsten GmbH	
Directors:	Hendrik Becker (President)	
Accounting reference date:	December 31	
Tel:	+1 339-293-0990	

CHEMILYTICS BETEILIGUNGS GmbH		
Registered Number:	HRB 207566	Business sectors
Registered Office:	Im Schleeke 78 - 91, 38642 Goslar, Germany	Pure holding company, no operating business.
Date and place of incorporation:	December 27, 2018, Goslar, Germany	
Charter capital:	EUR 25,000	
Ownership:	H.C. Starck Holding (Germany) GmbH	
Directors:	Dr. Sascha Janosch (Managing Director)	
Accounting reference date:	December 31	
Tel:	+49 5321 751 51515	

CHEMISCHE FABRIKEN OKER UND BRAUNSCHWEIG AKTIENGESELLSCHAFT		
Registered Number:	HRB 110008	Business sectors
Registered Office:	Im Schleeke 78 - 91, 38642 Goslar, Germany	Landowner in Goslar, lessor of certain buildings on site.
Date and place of incorporation:	February 14, 2006, Goslar, Germany	
Charter capital:	EUR 205,000	
Ownership:	H.C. Starck GmbH	
Directors:	Juliane Saupe (Management board)	
	Dr. Hady Seyeda (Chairman of Supervisory Board)	
	Stephan Broske (Member of Supervisory Board)	
	Raoul Wilhelmus (Member of Supervisory Board)	
Accounting reference date:	December 31	
Tel:	+49 5321 751-0	

CHEMILYTICS GmbH & Co. KG		
Registered Number:	HRA 202206	Business sectors
Registered Office:	Im Schleeke 78 - 91, 38642 Goslar, Germany	Industry-leading high-throughput laboratory with broad expertise across all relevant industries e.g. metal, chemistry, ceramic and battery
Date and place of incorporation:	October 10, 2018, Goslar, Germany	Laboratory for full range of inorganic elemental analytics and powder characterization
Charter capital:	EUR 10,000	Typical samples include tungsten ores, Ta&Nb ores, all refractory powders and scrap, Si3N4, wastewater etc.
Ownership:	General partner: H.C. Starck GmbH (98%)	Consulting for analytical problems of our customers
Limited partner:	ChemiLytics Beteiligungs GmbH (2%)	Operating up to 7 days a week
Directors:	General partner: H.C. Starck GmbH	DAkkS accredited since 2013
Accounting reference date:	December 31	
Tel:	+49 5321 751 51515	

ORGANISATION CHART



MANAGEMENT STRUCTURE

MHT General Meeting of Shareholders

The General Meeting of Shareholders is the supreme authoritative body of the Company. The annual General Meeting of Shareholders shall be organized once a year. The annual General Meeting of Shareholders shall be convened within 4 months from the end of the financial year, or as may be extended, but not beyond 6 months as from the end of the fiscal year, to the extent permitted by the business registration authority and at the request of the Board of Directors.

MHT Board of Directors

The Board of Directors is responsible for the overall management and direction of the Company. The Board of Directors typically meets when required, but at least every quarter, to review and monitor the Company’s financial position and operations.

The current Board of Directors comprises four (4) members. The term of the Board of Directors is five years. The term of each member of the Board of Directors shall not exceed five years, with a possibility of re-election at the end of the term. The Board of Directors may elect, dismiss or remove the Chairman of the Board of Directors.

List of members of the Board of Directors

The current members of the current Board of Directors are as follows:

Name	Position in the Company	Executive/ non-executive member	Date of appointment
Mr. Danny Le	Chairman of the Board of Directors	Non-executive member	19/04/2019
Mr. Nguyen Thieu Nam	First Vice Chairman of the Board of Directors	Non-executive member	18/02/2013
Dr. Nguyen Dang Quang*	Member of the Board of Directors	Non-executive member	18/02/2013
Mr. Nguyen Van Thang	Member of the Board of Directors	Non-executive member	22/04/2016
Mr. Craig Richard Bradshaw	Member of the Board of Directors	Executive member	19/04/2019

Dr. Nguyen Dang Quang submitted his resignation to the Board of Directors on December 13, 2019, which was passed in the Annual General Meeting of Shareholders 2020 on 29/06/2020.

MHT Management Team

Mr. Craig Richard Bradshaw
General Director



Mr. Craig Richard Bradshaw has over 26 years’ experience in the mining business, spanning mining and processing operations, logistics, and sales and marketing in Australia, Thailand and Lao PDR. Mr. Bradshaw was previously Senior Commercial Manager for Lang Xang Minerals Ltd Sepon Mine. He has also previously served as the Country General Manager for Thailand for Toll, Australia’s largest fully integrated logistics service provider. Prior to this Mr Bradshaw worked in management roles for Mount Isa Mines Limited (“MIM”) and Xstrata.

Mr. Stuart James Wells
Chief Financial Officer



Mr. Stuart James Wells has more than 24 years of financial experience across a range of sectors with 17 years spent in the natural resources industry working across Tungsten, Gold, Nickel, Alumina, Metallurgical Coal and Oil & Gas for both operational and greenfield projects working in Australia, Indonesia, United Kingdom and now Vietnam. Prior to joining NPMC, he was the Finance Manager for PT Agincourt Resources which owns the Martabe Gold Mine in Sumatra, Indonesia and prior to that spent 4.5 years as the Head of Finance for BHPs MetCoal project (IndoMet Coal) in Indonesia. He is a member of CPA Australia.

Ms. Nguyen Thi Thanh Mai
Chief Accountant



Ms. Nguyen Thi Thanh Mai is a Bachelor of Accounting at National Economics University and holds an Auditor Certificate issued by the Ministry of Finance. She has more than 10 years of experience in auditing at Arthur Andersen Vietnam Limited Company and KPMG Limited. Prior to joining MSR, she was the Chief Accountant in charge of accounting, finance and tax at Ban Phuc Nickel Mines Limited Liability Company for 12 years.

NPMC Management Structure

The rights and obligations of the Members’ Council, the Chairman and the General Director are regulated by the charter of NPMC. According to the charter of NPMC, the Members’ Council is the highest decision-making body of NPMC.

The Members’ Council is responsible for the management of the businesses and for the appointment of principal senior management of NPMC. Chairman of the Members’ Council is elected by the Members’ Council. The term of office of the Chairman is five years and can be re-elected without any limit.

Mr. Nguyen Thieu Nam
Chairman



Mr. Nguyen Van Thang
Deputy Chairman



Mr. Danny Le
Member



Mr. Craig Richard Bradshaw
Member



List of the members of the Members’ Council of NPMC

Name	Position in the Company	Date of appointment
Mr. Nguyen Thieu Nam	Chairman of the Members’ Council of NPMC	19/04/2019
Mr. Nguyen Van Thang	Vice Chairman of the Members’ Council of NPMC	09/11/2010
Mr. Danny Le	Member of the Members’ Council of NPMC	19/04/2019
Mr. Craig Richard Bradshaw	Member of the Members’ Council of NPMC	19/04/2019

NPMC Management Team

Mr. Craig Richard Bradshaw
General Director



Mr. Craig Richard Bradshaw has over 26 years' experience in the mining business, spanning mining and processing operations, logistics, and sales and marketing in Australia, Thailand and Lao PDR. Mr. Bradshaw was previously Senior Commercial Manager for Lang Xang Minerals Ltd Sepon Mine. He has also previously served as the Country General Manager for Thailand for Toll, Australia's largest fully integrated logistics service provider. Prior to this Mr Bradshaw worked in management roles for Mount Isa Mines Limited (“MIM”) and Xstrata.

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Mr. Dominic Heaton
Head of Strategic Initiatives



Mr. Dominic holds a Bachelor of Science from James Cook University, Townsville, Australia and a Post Graduate Diploma in Mineral Processing Technology from La Trobe University, Australia. He has also completed an Advanced Management Program with the Mt Eliza arm of the Melbourne Business School. Mr. Dominic is the member of Australian Institute of Mining & Metallurgy and Australian Institute of Company Directors. Over the course of more than 27 year career in the mining industry, Mr. Dominic has managed projects in remote areas of Australia, Papua New Guinea, Indonesia, and Lao PDR. Prior to joining Masan High-Tech Materials, he served a variety of management roles at Aurora Gold/Oxiana/OZ Minerals/MM Group, working as General Manager of Sepon Gold, Laos and General Manager of Operations of Martabe, Indonesia.

Mr. Vo Tien Dung
Director - External Relations,
Environment & Community



Mr. Vo Tien Dung has 20 years' experience in mining industry, of which 07 years working in the management and operation role of various mining projects in Vietnam. In addition, Mr. Dung also has work experience in the International Investment Fund for the natural resources projects. Mr. Dung holds a PhD in Geology and Mineral Resources Engineering, Master's degree in Geology from Hanoi University of Mining and Geology and a Master of Science in Environmental Assessment and Management at University of Salford, Manchester, UK. Prior to joining NPMC, he was General Director of Viet Minerals Mining Processing Joint Stock Company (VMPCo) and previously as Deputy General Director of Bao Lai Investment JSC (BLG). He is now Vice Chairman of Vietnam Association of Geological and Mineral Enterprises, and the member of the Executive Board of the Union of Geological Sciences of Vietnam.

Mr. Ashley James McAleese
General Manager



Mr. Ashley James McAleese is a qualified Minerals Processing Engineer with more than 18 years of operational experience across a range of commodities that include Copper, Gold, Silver, Zinc and Lead on both operating and greenfield projects working in Australia, Indonesia, Papua New Guinea and now Vietnam. Prior to joining NPMC, he was the Operations Manager for PT Batutua Tembaga Raya which owns the Wetar Copper Project on Wetar island, Indonesia and prior to that was Operations Manager for PT Natarang Mining in Indonesia. He is a member of Australasian Institute of Mining & Metallurgy.

Mr. Brenden Lee Weekes
Head of Operational Technology and
Innovation



Mr. Brenden Lee Weekes a qualified Chemical Engineer, has more than 21 years of extensive experience in the design, commissioning and operation of processing facilities in the natural resources industry throughout the world including Australia, Laos, Spain, New Caledonia and now Vietnam. He has the ability to lead multi-disciplinary teams to develop innovative solutions and optimise complex mineral and metal processing facilities working across Tungsten, Fluorite, Bismuth, Copper, Nickel and Gold. Prior to joining NPMC he was the Process Manager for MMG Limited at their Sepon Copper and Gold Operation in Laos.

Mr. Jeremy Bernard Hibberd
Director - Informatics Technology



Mr. Jeremy Bernard Hibberd is a Senior Information Technology Leader with wide-ranging experience leading strategic and transformational IT programs and having strong technical and people leadership skills developed over 24 years' managing IT services across a number of sectors internationally. Prior to joining Masan High-Tech Materials he was the Senior IT Operations Manager for Queensland Rail, and has extensive experience in the Mining sector as the Global IT Operations Manager for Zinifex, OZ Minerals and MMG.

Mr. William John Parry - Jones
Head of Sales and Marketing



Mr. William John Parry-Jones has more 10 years of experience in the minerals and metals industry with a particular focus on the sales and marketing of tungsten products. Prior to joining NPMC, he worked as a commodities trader for Amalgamated Metal Corporation, where he developed extensive knowledge of international commerce and strong global connections in the upstream technology metals industry. He holds a Bachelor's degree in the field of Materials Engineering, and a Master of Science in the field of Aerospace Composites from Imperial College London, UK.

MTC Management Structure

According to the Charter of MTC, the organizational structure of MTC consists of the Members’ Council and the General Director. The Members’ Council is the supreme decision-making body of MTC and consists of a maximum of four (04) representatives appointed by NPMC and TNTI, of which up to three (03) representatives are to be appointed by NPMC and one (01) representative is to be appointed by TNTI.

The Members’ Council is responsible for the management of the businesses and the appointment of principal senior management of MTC. The Members’ Council has one Chairman who is nominated by NPMC and elected by the Members’ Council. The term of office of the Chairman is five years and can be re-elected without any limit.

Mr. Nguyen Van Thang
Chairman of the Members’ Council



Mr. Nguyen Thieu Nam
Member of the Members’ Council



Mr. Craig Richard Bradshaw
Member of the Members’ Council



MTC Management Team

Mr. Craig Richard Bradshaw
General Director



Mr. Craig Richard Bradshaw has over 26 years’ experience in the mining business, spanning mining and processing operations, logistics, and sales and marketing in Australia, Thailand and Lao PDR. Mr. Bradshaw was previously Senior Commercial Manager for Lang Xang Minerals Ltd Sepon Mine. He has also previously served as the Country General Manager for Thailand for Toll, Australia’s largest fully integrated logistics service provider. Prior to this Mr Bradshaw worked in management roles for Mount Isa Mines Limited (“MIM”) and Xstrata.

Mr. Stuart James Wells
Chief Financial Officer



Mr. Stuart James Wells has more than 24 years of financial experience across a range of sectors with 17 years spent in the natural resources industry working across Tungsten, Gold, Nickel, Alumina, Metallurgical Coal and Oil & Gas for both operational and greenfield projects working in Australia, Indonesia, United Kingdom and now Vietnam. Prior to joining NPMC, he was the Finance Manager for PT Agincourt Resources which owns the Martabe Gold Mine in Sumatra, Indonesia and prior to that spent 4.5 years as the Head of Finance for BHPs MetCoal project (IndoMet Coal) in Indonesia. He is a member of CPA Australia.

Mirek Banackowski
MTC Operations Manager



Mr. Miroslaw Banackowski has more than 31 years’ experience in the mining and processing business including commissioning, design and construction, operations, metallurgy, Technical and Engineering in Australia, Laos, New Caledonia. Before joining Masan High-Tech Materials, Mr Miroslaw has worked with MMG, Vale, Scott Dalley Francks, Minara Resources (Glencore International), Energy Resources of Australia - Ranger Mine (North Limited), and Pasminco Metals EZ – Hobart (North Limited). He holds a bachelor’s degree of Applied Science in Metallurgy from South Australian Institute of Technology.

MHT Supervisory Board

Ms. Doan Thi My Duyen
Head of the Supervisory Board



Ms. Doan Thi My Duyen is the head of the Supervisory Board of MHT, and the Chief Accountant of MSN. At MSN, she is in charge of reporting on financial conditions and announcement and management of the financial matters. Prior to joining Masan Group, she was with KPMG Limited, Vietnam. She holds an MBA in Accounting from the University of Economics of Ho Chi Minh City, Vietnam and is a member of the Association of Chartered Certified Accountants (ACCA).

Mr. Nguyen Quynh Lam
Member of the Supervisory Board



Mr. Nguyen Quynh Lam is a member of the Supervisory Board of MHT, and the head of the Supervisory Board of both MSN and MSC. He joined Masan Group in 2001 and has held various senior financial positions in Masan Group companies. He holds a BSc in Mining Economics.

Ms. Pham Quynh Nga
Member of the Supervisory Board



Ms. Pham Quynh Nga is a member of the Supervisory Board of MHT, MSN and ANCO. She joined the Masan Group in 2015 and is holding a Senior Accountant position. Prior to joining the Masan Group, she worked for KPMG Limited (Vietnam). She is a Certified Public Accountant (CPA) of Australia.

Sustainability Committee

No.	Members of Sustainability Committee	Position	Day becoming/no longer member of the Sustainability Committee	Number of attendances	Percentage	Reasons for absence
1	Mr. Dominic John Heaton	Committee Chairman	22/04/2016	2/2	100%	
2	Mr. Nguyen Van Thang	Member	23/06/2017	1/2	50%	
3	Mr. Craig Richard Bradshaw	Member	23/06/2017	2/2	100%	
4	Mr. Tran Phuong Bac	Member	23/06/2017	1/2	50%	
5	Mr. Vo Tien Dung	Member	14/01/2020	1/2	50%	

Risk & Audit Committee

No.	Members of Risk & Audit Committee	Position	Day becoming/no longer member of the Risk & Audit committee	Number of attendances	Percentage	Reasons for absence
1	Mr. Craig Richard Bradshaw	Committee Chairman	21/09/2017	2/2	100%	
2	Mr. Dominic John Heaton	Member	21/09/2017	2/2	100%	
3	Mr. Morgan Carroll	Member	21/09/2017	2/2	100%	
4	Mr. Tran Phuong Bac	Member	21/09/2017	1/2	50%	
5	Mr. Pham Nguyen Hai	Member	21/09/2017	2/2	100%	



HCS Management Team

Mr. Hady Seyeda
H.C. Starck Tungsten Powders CEO



Mr. Hady Seyeda has had over 20 years of work experience in the refractory and technology metals industry, specializing in Tungsten, Tantalum and Niobium. Hady holds interest in three patents and co-authored 12 publications.

He holds a PhD in Inorganic Chemistry and has worked for HCS since 1998 in various key functions including: Vice President Corporate Strategy, Vice President Operations & Site Manager Goslar, MD China.

In 2016, he was appointed as a Chief Operating Officer (COO), responsible for worldwide Operations, R+D, SCM and HSEQ. In 2018 he became Chief Executive Officer (CEO) of H.C. Starck Tungsten GmbH and is now CEO of H.C. Starck GmbH, H.C. Starck Holding GmbH & H.C. Starck Infrastructure GmbH, Goslar.

Mr. Stephan Broske
H.C. Starck Tungsten Powders CFO



Mr. Stephan Broske has over 25 years' financial experience across a range of sectors like banking, logistics and chemicals with 14 years spent at H.C. Starck starting as Head of Corporate Finance before becoming the CFO of the Tungsten business.

Previously, he worked as Financial Risk Manager for Cognis Special Chemicals, a Henkel carve out, and Deutsche Post DHL Group. He started his career at HypoVereinsbank /UniCredit as Corporate Sales Manager for Forex & Money Market.

Mr. Broske is a CFA charterholder. He earned the right to use the Chartered Financial Analyst® designation.



Mr. Peter Zhang
General Manager
H.C. Starck APAC

Mr. Peter Zhang has more than 23 years' experience of powder business in Asia. As senior management group member for Höganäs Asia Pacific, he led China to become the most successful subsidiary for Höganäs Group. Previously, he worked as President for Wagner Industry Solutions China. Mr. Zhang is skilled at creating and sharing value on the whole value chain as well as building strong local team to drive sustainable growth and profitability for foreign companies in China and the Asia region.



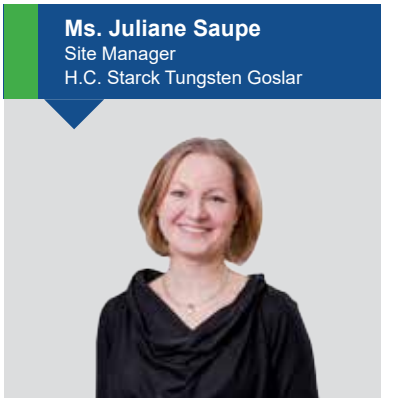
Ms. Juliane Meese-Marktscheffel
Director Technology & Innovation Global

Ms. Juliane Meese-Marktscheffel has over 25 years of experience in global innovation and technology management in the chemical industry. As graduated chemist and certified business chemist her main innovation focus areas are on R&D strategy and development of superior product portfolios. Her international record refers to the set-up of diverse joint ventures including commissioning and ramp-up of new powder productions at sites in Canada and Japan in the battery material business and for strategic Tungsten powders/chemicals in China and Vietnam. She started her professional career within the rare earth element chemistry followed by more than 10 years in the cathode materials development of secondary batteries zooming in on Nickel/Cobalt based Lithium ion/polymer batteries for electromobility. Scientific emphasis meanwhile is across the value chains of the refractory metals, in particular Tungsten. She is a member of the Scholarship Foundation of the German Nation as well as of the Alexander-von-Humboldt Foundation of Germany.



Mr. Ryan Bender
Site Manager / Managing Director
H.C. Starck Canada

Mr. Ryan Bender has more than 20 years of management experience in the Manufacturing Industry. He has been with H.C. Starck Canada for 10 years, holding several progressive positions before taking over management of the Sarnia Site in January 2019. When not making Tungsten, Ryan works part time as a firefighter and is a certified Emergency Medical Responder.



Ms. Juliane Saupe
Site Manager
H.C. Starck Tungsten Goslar

Ms. Juliane Saupe has over 13 years' experience in the chemical industry, process development and optimization, Lean management, sustainability and health management. After graduating from the Technical University of Berlin as chemical engineer, she started working as a R&D project manager at H.C. Starck in 2007. Later, she switched to plant management and has now been the site manager of our location in Goslar since 2019.



DEVELOPMENT STRATEGIES



Sustainability at MHT

Development Objectives

Social Development Objectives

"Go Global" Execution Strategy



H.C. Starck Tungsten Powders Factory in Goslar, Germany



H.C. Starck Tungsten Powders Factory in Sarnia, Canada



H.C. Starck Tungsten Powders Factory in GanZhou, China



Tsukuba Plant of Mitsubishi Materials Corporation in Japan,
a Strategy Partner of Masan High-Tech Materials



Sustainability at MHT

Our position on Sustainability remains a matter of public record, and one which we welcome dialogue on. Our delivery of the commitments made enables our people to understand our common approach, our values, how we measure success and the basis for our decision-making.

Within MHT policy is set at a global level, recognizing the requirement to act at a local level. Sustainability is about managing our risks, reducing our adverse environmental, social, economic and cultural impacts, while supporting and sustaining the industries, communities, and environments in which we operate.

Development Objectives

MHT’s vision is to become the global leader and partner of choice, as the high-tech materials industry continues to shape the future of our world. Through the application of innovative, quality assured and sustainable products and processes we will create unparalleled solutions in advanced and strategic materials and superior outcomes for all our stakeholders.

We delivered the first step of this vision in June 2020 in closing the acquisition of the H.C. Starck (HCS) global tungsten business, the HCS brand, and the ChemiLytics business.

Through the acquisition of the HCS global sales and distribution network importantly strengthens our commitment to working

We also believe MHT’s sustainability needs to include consideration of global issues such as pandemic management, climate change, supporting and respecting human rights, advocating for social change by supporting the rights of peoples within conflict zones and responsible sourcing initiatives so that end customers have a clear choice available to them on the products and brands they accept.

Across MHT we are determined to make a positive difference.

together with our customers to continuously support developing specific product efficiencies and emergent industry initiatives.

In November 2020 we welcomed Mitsubishi Materials Corporation as a substantial shareholder, with both an equity infusion used to help repair our balance sheet and an MoU signed for greater technical collaboration.

In 2021 we are looking to continue the integration of the business units to optimize performance whilst we look to deliver on our vision.

Social Development Objectives

We delivered on our commitment to promote the circular economy. We HCS is the global leader in the recycling of both hard and soft tungsten scrap. Each year HCS’s operations recycle a similar amount of tungsten to the annual tungsten production of the Nui Phao mine.

Our plans for 2020 were focused on four key areas:

- Ensure our industrial chemical products remain the leading products in the eyes of our customers; ensure strong cost effectiveness in the market; Continuous work to enhance our people, processes and systems, to support the changing needs of industrial customers;

- Promote the circular economy through the adoption of “Reduce, Reuse & Recycle” philosophy;
- Safeguard the ecosystems of our people, our environment, our stakeholders; and
- Ensure superior financial results on a long-term sustainable basis.

On review we can say that we delivered well on all items.

MHT products maintained market leadership across our indicators; customer complaints, customer ratings, and our ability to maintain pricing advantage against like products demonstrated our delivery on this.

Whilst we did have some incidents across our workplaces in 2020 our trailing indicators further explained later in the report all showed continued strong performance globally.

“Go Global” Execution Strategy

Now truly global our execution strategy for building our business remains focused around three key areas:

Local knowledge with global considerations and understanding to facilitate project execution and asset optimization.

Masan High-Tech Materials knows that a strong local understanding of the local sensitivities of community and customer concerns are critical for successful and sustainable business. We have demonstrated this both in Vietnam for the last 10 years and across the HCS sites over the last 100 years by working proactively with our local communities and global customers base via our local and international management team.

Use our ability to access and optimize capital and cash flows to acquire and develop quality assets.

On identification of value accretive scalable assets, Masan High-Tech Materials has demonstrated the ability to access internal and external capital to acquire, develop and stabilize assets to build sustainable long-term shareholder value another excellent example of this area. We delivered on this in 2020 through engaging with MMC to have them inject equity and sign an MoU for technical advancement.

Masan High-Tech Materials remains hedged against commodity price fluctuations through the diversification of its portfolio of metals, minerals and revenue currencies.

The HCS acquisition has further decreased tungsten revenue volatility via an expanded product range and through the processing of scraps sourced globally neither of which are index priced.

CAUTIONARY NOTE REGARDING FORWARD LOOKING STATEMENTS

This communication contains information that may constitute “forward-looking statements”. Generally, the words “believe”, “expect”, “intend”, “aim”, “estimate”, “anticipate”, “project”, “will” and similar expressions identify forward-looking statements, which generally are not historical in nature. However, the absence of these words or similar expressions does not mean that a statement is not forward-looking. All statements that address operating performance, events or developments that we expect or anticipate will occur in the future – including statements relating to volume growth, share of sales and earnings per share growth, and statements expressing general views about future operating results – are forward-looking statements.

Management believes that these forward-looking statements are reasonable as and when made. However, caution should be taken not to place undue reliance on any such forward-looking statements because such statements speak only as of the date when made. Masan High-Tech Materials Corporation undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. In addition, forward-looking statements are subject to certain risks and uncertainties that could cause audited results to differ materially from our company’s historical experience and our present expectations or projections. These risks include commodity pricing risks and the prices we obtain for our Tungsten, Copper, Fluorspar and Bismuth are determined by, or linked to, prices in world markets, which have historically been subject to substantial volatility. Fluctuations in commodity prices can occur due to price shifts reflecting underlying global economic and geopolitical factors, industry demand, increased supply due to the development of new productive resources, technological change, product substitution and national tariffs. Volatility in global economic growth has the potential to adversely impact future demand and prices for commodities. This has the potential to negatively impact future earnings and cash flows. These risks and uncertainties include, but are not limited to, those described elsewhere in this report and those described from time to time in our future reports filed with the Hanoi Stock Exchange.

This communication is not for distribution in the United States. This communication and the information contained herein is not an offer of securities for sale in the United States. Securities may not be offered or sold in the United States absent registration pursuant to the U.S. Securities Act of 1933, as amended, or an exemption from registration. Any public offering of securities to be made in the United States will be made by means of a prospectus that may be obtained from the issuer or selling security holder and that will contain detailed information about the company and management, as well as financial statements.

ABBREVIATIONS/ DEFINITIONS

APT Plant	Tungsten Chemicals Processing Plant of Masan Tungsten LLC
ACCA	Association of Chartered Certified Accountants
AGM	Annual General Meeting
ANCO	Argo Nutrition International Joint Stock Company
APEC	Asia-Pacific Economic Cooperation
APT	Ammonium Paratungstate
BImSchG	Bundesimmissionsschutzgesetz (Federal Emission Control Act)
BOD	The Board of Directors of the Company
BOJ	Bank of Japan
BTO	Blue Tungsten oxide
C&R	Compensation and Resettlement
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CHESS	Community, Health, Environment, Safety and Sustainability committee
Company	Masan High-Tech Materials/Masan High-Tech Materials Corporation and its subsidiaries
CSI	Corporate Sustainability Index
CSR	Corporate social responsibility
DP2	Discharge Point 2
DP3	Discharge Point 3
EBITDA	Earnings before Interest, Taxes, Depreciation and Amortization
EC	Electro-chromic
EIA	Environmental Impact Assessment
ENV	Environment
ERD	Economic Restoration Development
E-PRTR	European Pollutant Release and Transfer Register
FY	Financial Year
GDP	Gross Domestic Product

H.C. Starck or HCS	H.C. Starck Tungsten Powders
HNX	The Hanoi Stock Exchange
HRD	Human Resources Department
HSD	Hill Side Dyke
HR	Human Resources
HSS	Health, Safety and Security Department
IC	Integrated Circuit
IED	Industrial Emissions Directive
IT	Information technology
ITIA	The International Tungsten Industry Association
ITRB	Independent Tailings Review Board
Law on Enterprises	Law on Enterprises No. 68/2014/QH13 dated November 26, 2014 of the National Assembly of the Socialist Republic of Vietnam
LCD	Liquid Crystal Display
LTI	Lost-Time-Injury
LTIFR	Lost Time Injury Frequency Rate
MAINT	Maintenance
Masan Group	MSN and its subsidiaries
Masan Resources or MSR	Masan Resources Corporation
M&A	Mergers and Acquisitions
M&G	Mining & Geology
Masan Horizon or MH	Masan Horizon Company Limited
MCH	Masan Consumer Corporation
MHT	Masan High-Tech Materials Corporation
MNSMML	Masan Nutri-Science CorporationMasan MEATLife Corporation
MONRE	Ministry of Natural Resources and Environment
MRTN	Masan Thai Nguyen Resources Company Limited
MSN	Masan Group Corporation

MTC	Masan Tungsten Limited Liability Company
mtu	1mtu = 10kg
NHTCM	Nui Phao - H.C. Starck Tungsten Chemicals Manufacturing
NPAT	Net Profit After Tax
NPMC	Nui Phao Mining Company Ltd
PCDP	Public consultation and information disclosure program
PROC	Processing
R&D	Research & Development
RMI	Responsible Minerals Initiative
S&M	Sales and Marketing
SCM	Supply chain management
TNTI	Thai Nguyen Trading and Investment Company Limited
TRIFR	Total Recordable Injuries Frequency Rate
TSF	Tailing
TSF	Tailings Storage Facility
USD or US\$ or \$	the official currency of United States of America
VAS	Vietnamese Accounting Standards
VAT	Value-added tax
VBCSD	Vietnam Business Council for Sustainable Development
VND	The official currency of Vietnam
VNR	Vietnam Report Corporation
YTO	Yellow Tungsten Oxide



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