MASAN
HIGH-TECH MATERIALS

Sustainability
REPORT 2020

MASAN
HIGH-TECH MATERIALS

CONTENT

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 eth 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

MASAN HIGH-TECH MATERIALS

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).

GENERAL 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.

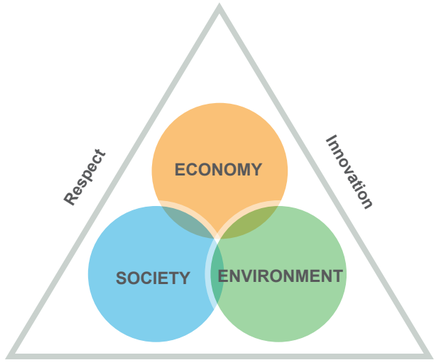
VISION

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

2017

- 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.

2019

- 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

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.

NPMC Processing plant in Vietnam

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.

2020

- In February, MOIT's official approval of the Nui Phao Project's basic mine design was obtained.

Mining Engineer is working with basic mine design

- 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.
- 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.

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 (WCl6 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 (CaF_2)

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 (AlF_3) 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 (NF_3) 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.

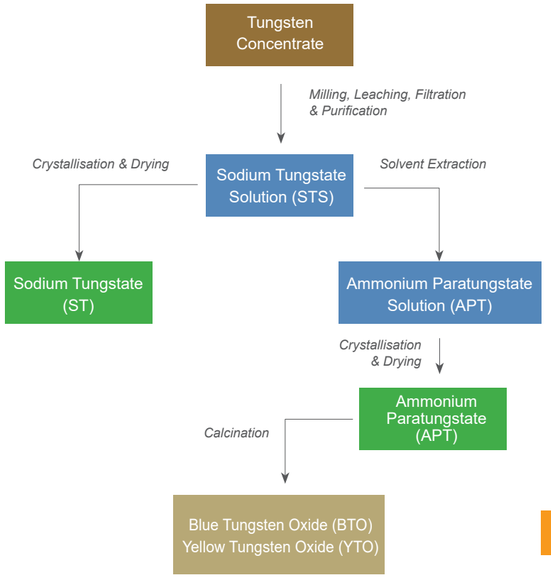
APPLICATION

Tungsten Production

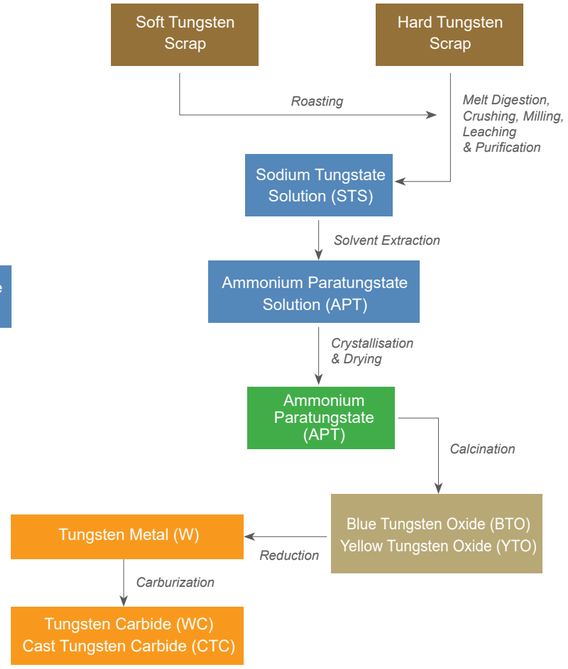
The following is a brief description of the current tungsten production of Masan High-Tech Materials. The MTC plant is designed to process the total amount of NPMC tungsten concentrate, along with tungsten concentrates and tungsten bearing materials purchased from third parties, into high grade Ammonium 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:

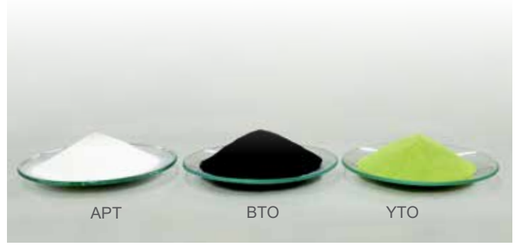
Temperature and pressure of the slurry are increased to drive the conversion of calcium tungstate (Tungsten Ore Concentrate) into sodium tungstate.

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 list[1], 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 lead[2]. 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

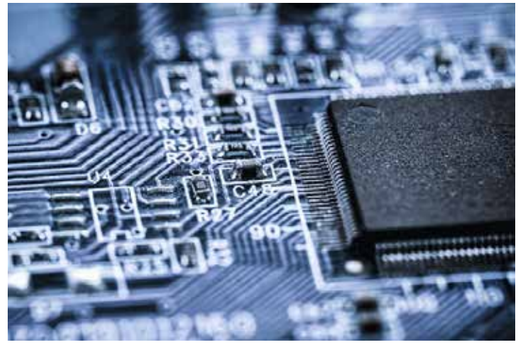
Bismuth has been known since Ancient times, although it was often confused with lead and tin, which share some of its physical properties.

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

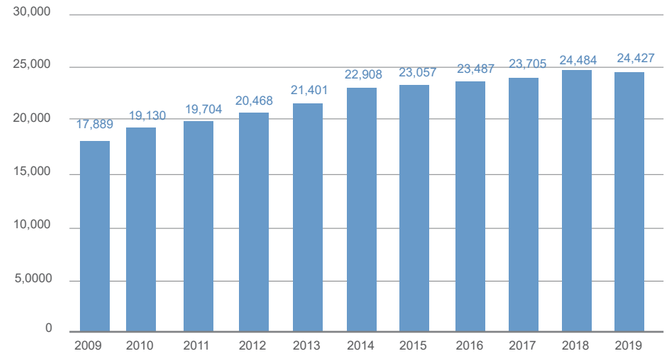
Due to the nature of being a soft, malleable and ductile metal with very high thermal and electrical conductivity, copper is used to many different industries, details could be found in the table below:

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:

Refined copper usage worldwide from 2009 to 2019

(in 1,000 metric tons)



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:

7%

Industrial machinery and equipment

19%

Transportation equipment

10%

Consumer and general products

21%

Electric and electronic products

43%

Building construction

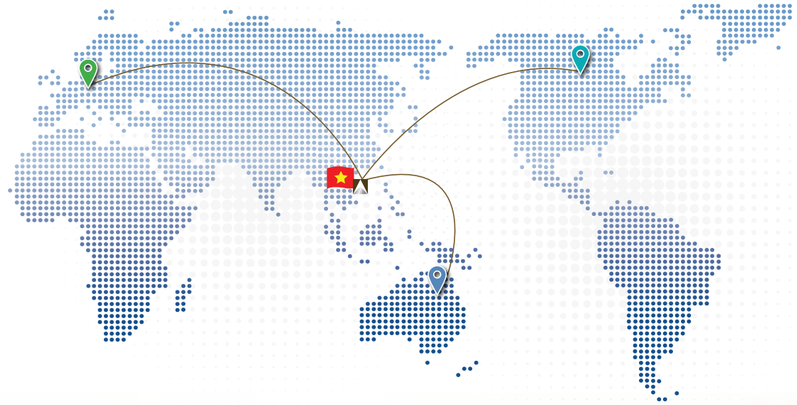
MARKET

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

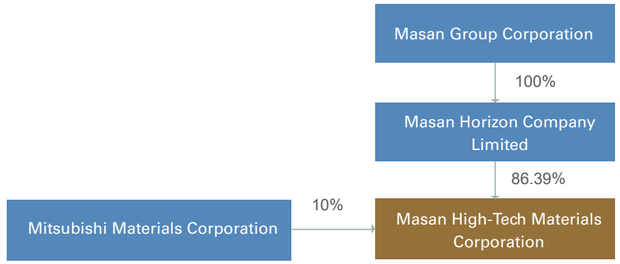
The list of shareholders holding at least 5% of the Charter Capital of the Company as of December 31, 2020 is as follows:

	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.

DEVELOPMENT STRATEGIES

Sustainability at MHT

Development Objectives

Social Development Objectives

‘’Go Global” Execution Strategy

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.

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.

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 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.

SUSTAINABILITY PERFORMANCE REPORT

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 cooperation. 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.


Masan Resources
Health & Safety Policy
Vision


Masan Resources
Environment Policy
Vision


Masan Resources
Community Engagement Policy
Vision

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 CHESS (Community, Health, Environment, Safety & Sustainability) in 2020 have been strengthened in all the areas. The implementation of 3 key measures of CHESS: 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 CHESS activities to enhance the values of safety and environmental sanitation for their employees and contractors.
- Implementing the CHESS 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.

CHESS COMMITTEE

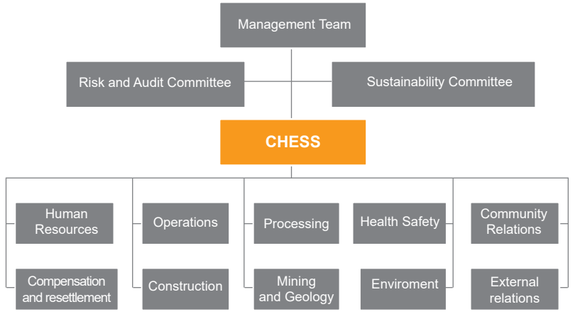
Since its establishment in 2018, CHESS has been effectively engaged across departments and divisions in the Company and its subsidiaries in order to implement the sustainability initiatives as well as to provide further oversight and strategic guidance.

The transfer of 2nd tenure of CHESS 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, CHESS (term 2020-2022) has actively organized the communication activities, monitored and assessed the performance of CHESS 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 CHESS 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.

CHESS 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.



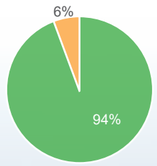
CHESS ACTIVITIES

In 2020, the focus was on providing CHESS 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 CHESS requirements, then instruct other co-workers. The main training activities for CHESS representatives in 2020 included:

CHESS training

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

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



2021 FOCUS

In 2021, the CHESS 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 CHESS 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.

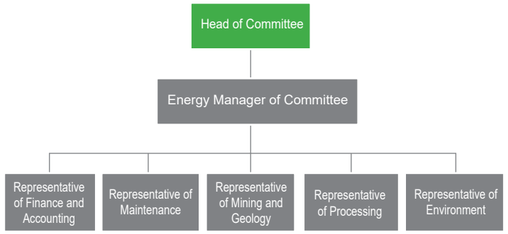
In 2020, the Energy Management Committee has issued an energy policy to manage energy effectively and sustainably through the application of science and high technology to production activities. The energy policy reflects the Company's commitment to achieving improvements in energy efficiency, commitment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

a) Ensure effective implementation, maintenance and improvement of the EnMS.
b) Implementing and maintaining action plans that result in continuous improvement of energy-related performance
c) establishing criteria and procedures necessary to ensure effective operation and management of the EnMS, such as:
d) Promoting awareness of the EnMS and energy goals across divisions
e) Delegation of tasks
f) 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:

a) Operations (Technical Services, Production)
b) Maintenance
c) Process Control Technology
d) Engineering
e) Procurement
f) Technology & Innovation
g) Controlling
h) Site Management
i) Quality Management
j) Supply Chain Management
k) 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

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.

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

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 alterative 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.

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 intermediatory 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

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 oxidisation 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 signficant 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 treament 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 CO_2 emissions but also deliver substantial costs savings to the business. Some of the key areas of innovation in energy efficiency are discussed below:

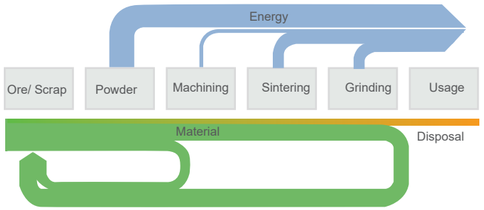
- **Implementation of Membrane Technology in the AMT Production Process**

  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.

Energy and material flow analysis



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 CO_2 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.

Sustainability
Mining & Raw Materials

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

- **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**

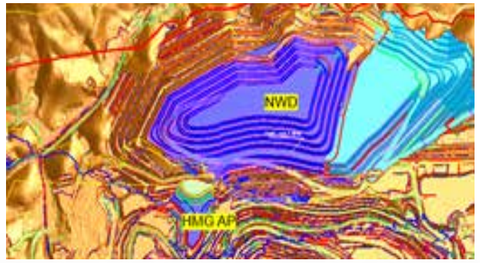
  The northern Waste Dump stability is reviewed using prism monitoring. The location of the Northern waste dump is a fair distance from local community buildings. The dump has been designed inside Nui Phao compensated area.

- **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**

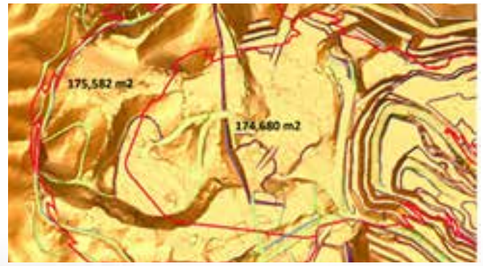
  In planning for our future waste placement, we understand the impact of disturbance we have in our mining license, thus developing plans to engage environment and community to support us in preparing the areas to be cleared or compensated ahead of time. The waste dump management plan allows us to have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

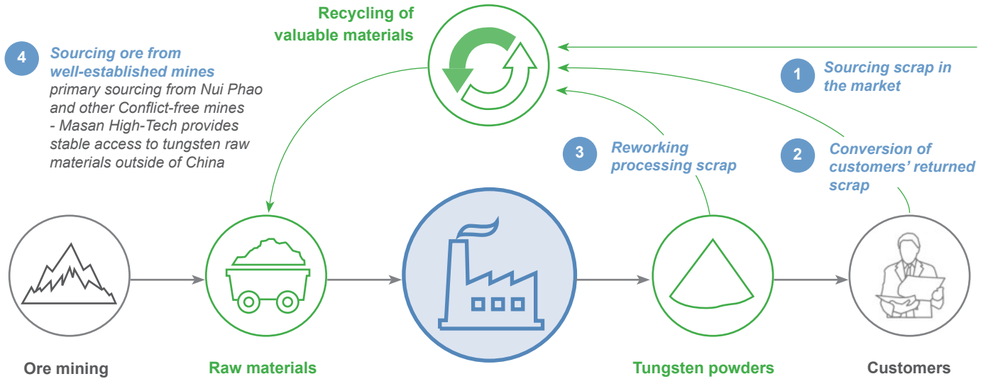
Before starting new business with a supplier, there is a detailed check by the procurement and the legal department to confirm that this potential supplier fulfils all legal requirements and the requirements of the RSCM process. This check is repeated on a regularly basis during the whole time of the 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

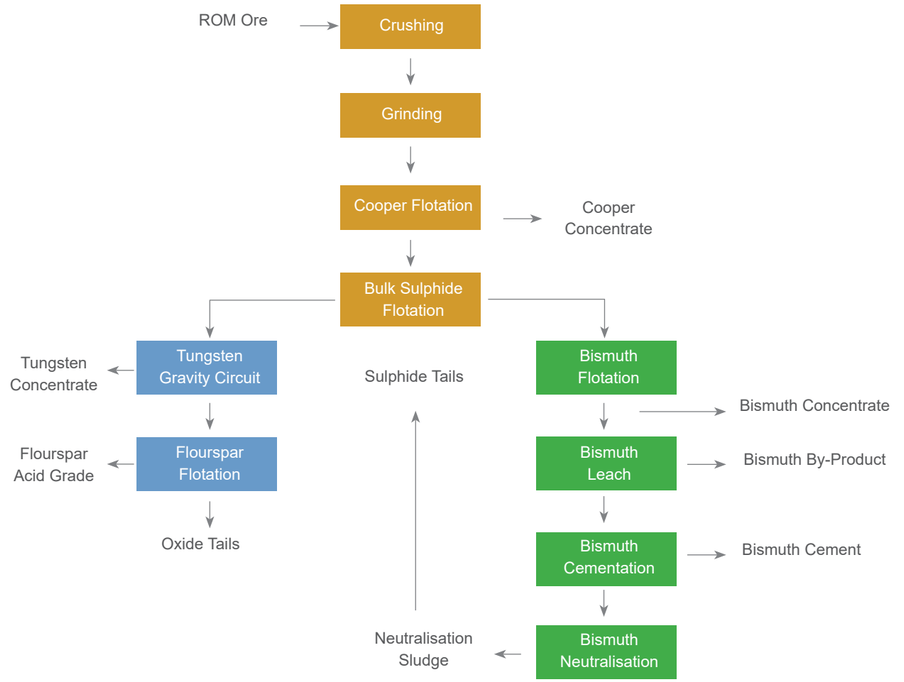


Sustainability Processing

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

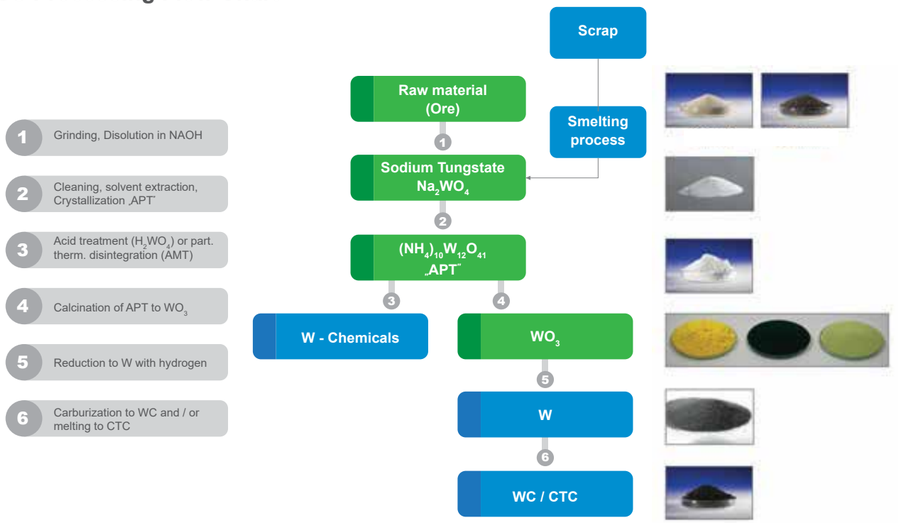
(feed grade 40.2%)

94.4%

target

(feed grade 35.9%)

MTC/HCS Processing Flow Chart



Integration of H.C. Starck Global Tungsten Business

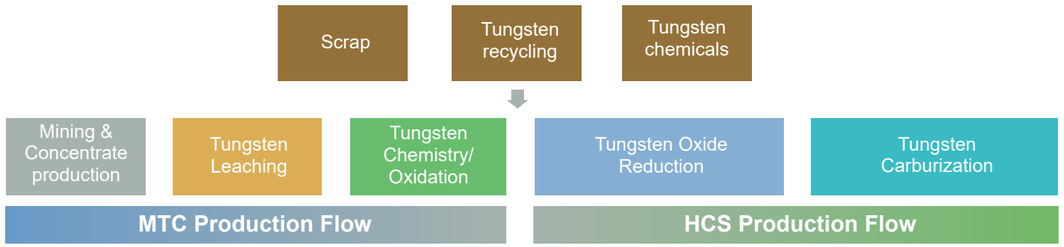
In 2019, Masan Tungsten Limited Liability Company (MTC), a wholly owned subsidiary of MHT, completed the purchase the tungsten business of H.C. Starck Group GmbH. Activities during 2020 involved the first successful stages of the integration of these globally separated business units. Despite the challenges 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 Cananda – 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.

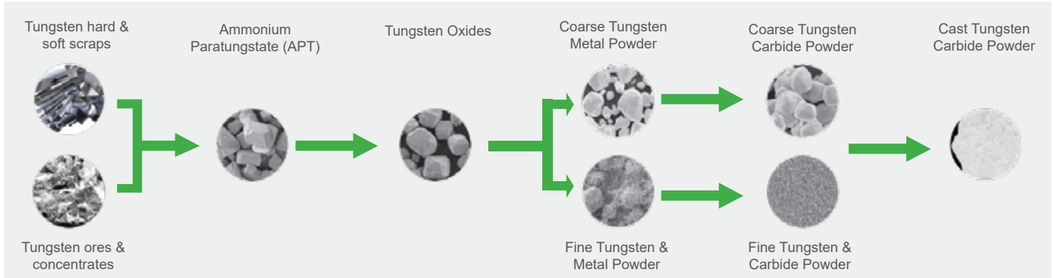
R&D Expert of HCS Technology & Innovation Global checking new tungsten products

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.

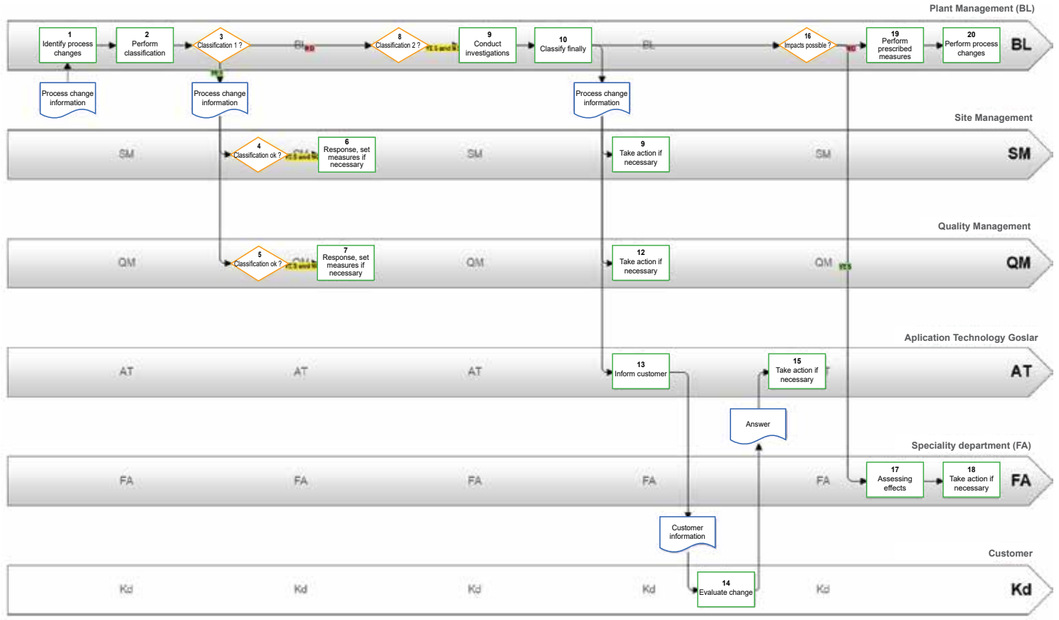
Tungsten carbide is the most important tungsten compound in terms of volume. Depending on customer specification, we offer a product range covering nano/ ultrafine powders to very coarse powders. The exceptionally hard and resistant tungsten carbide is the material of choice for production of cutting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

Tungsten Powder	Typical Applications & Marrkets		End Industries
Tungssten Carbide **Tungsten Metal** Tanta & Niobium Carbides	• Inserts • Round tools • Micro Tools • Wear parts • Drilling heads • Mining tips	**Cutting Tools & Wear Parts**	Automotive
Cast Tungsten Carbide **Tungsten Metal**	• Fixed cutter drill bits • Roller cone drill bits • Shaped charges	**Oil & Gas Exploration Tools**	Energy
Tungsten Metal **Tungsten Carbide**	• Lighting • Contacts • Shielding • Weights • Sputtering targets	**Heavy Metal & Mill Products**	Aerospace Electronics Chemical Industry
Tungsten Chemicals, incl. APT, AMT, WO_3 H_2WO_4	**Catalysts for:** • Refinery processes • NOx reduction • Oxidation • Hydro generation	**Chemical End-Uses**	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 Sarnia 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 pressingss

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.

UMWELT INNOVATIONS PROGRAMM

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 CO_2 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.

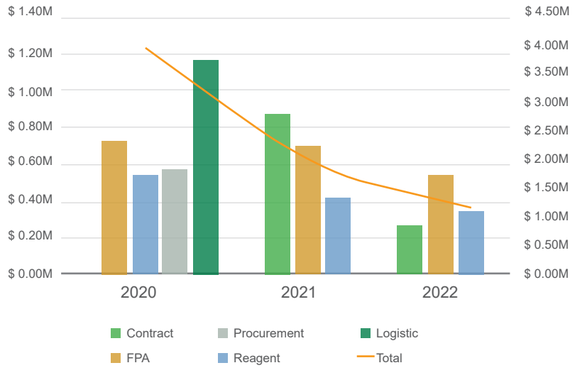
The essential supply of reagents to manufacturing too was at risk, however SCM maintained higher inventory levels anticipating delays during TET. The high inventory levels of reagents helped to keep the show running during the initial wave of emergency stops that were applied the worldwide transportation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

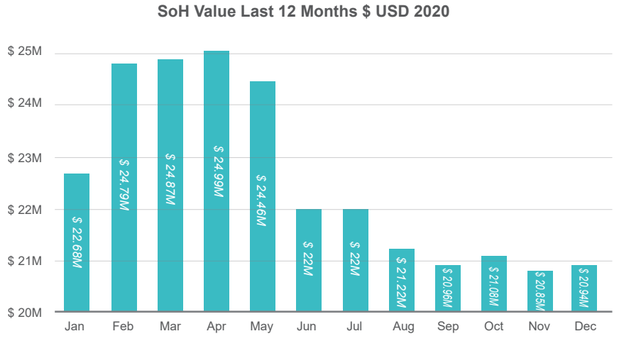
While dealing with the unprecedented situation supply department during the year has delivered a staggering performance and has achieved all its KPI's.

- 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.

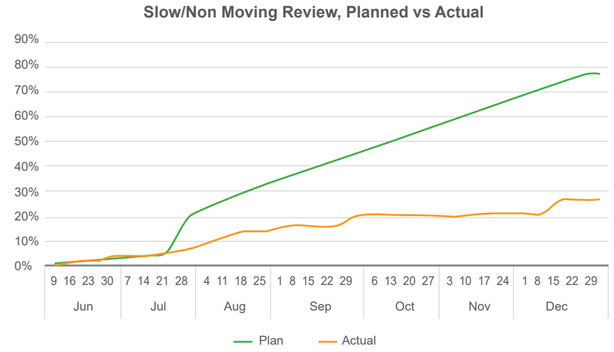
From Raw Material & Inventory Planning (RMIP) to Distribution Management (DM) and Production Planning (PP) – processes were made more sustainable at each of these parts of the supply chain.

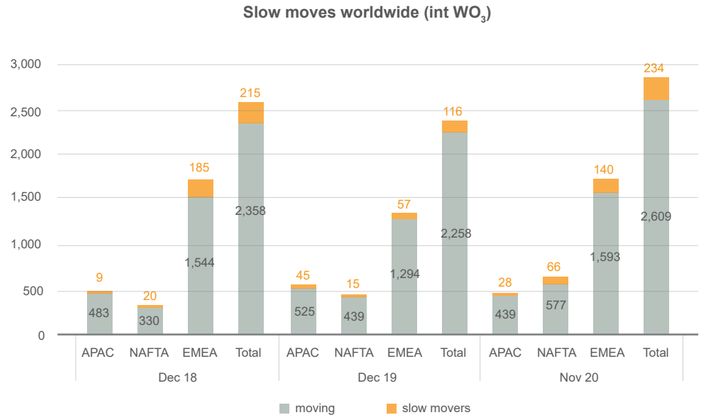
RMIP plans requirements of raw materials, i.e., scraps as well as intermediates considering technical capabilities, inflow from customers, inventory targets and lead times. Managing inventories is one of the core tasks. At H.C. Starck Tungsten, inventory levels are optimised inventory to ensure continuous 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 CO_2 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 Sarnia.

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.

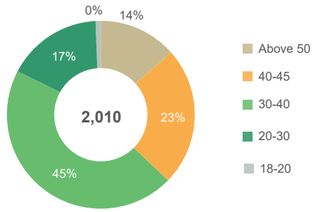
Year	2016	2017	2018	2019	2020
Total number of employees of MHT globally	1,343	1,363	1,403	1,403	2,010

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

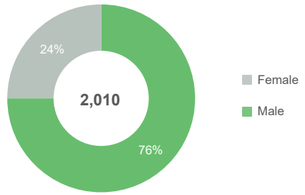
By Age

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%.



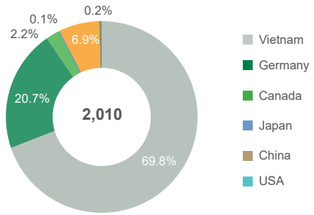
By Gender

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.



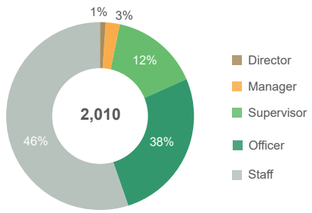
By Countries

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

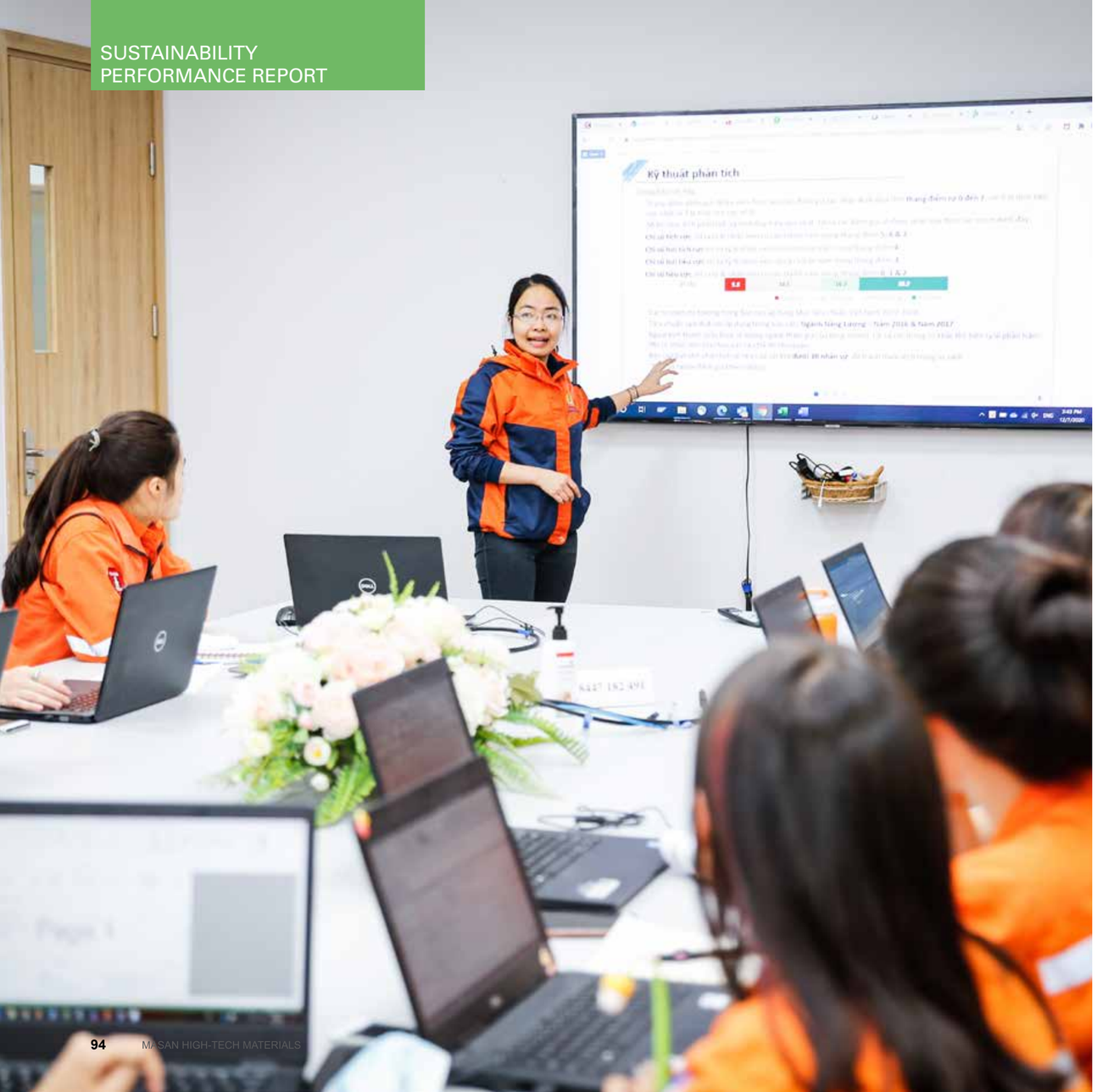
Year	2016	2017	2018	2019	2020
Employee number in totality	1,343	1,363	1,403	1,403	1,403
- NPMC	1,027	1,072	1,150	1,157	1,096
- MTC	316	291	253	246	307
Of which					
- Vietnamese employees	1,236	1,261	1,303	1,309	1,329
- Expats	107	102	100	94	74
Average income (VND million per month) for Vietnamese employees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

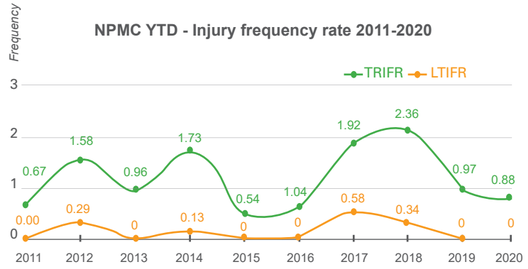
At MHT we conducted both scheduled and ad-hoc safety audits throughout the year. The audits covered all areas under the company's control, including contractors' workshops and their areas of activities. Each audit is carried out with a management representative to be present. The selected area under 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.

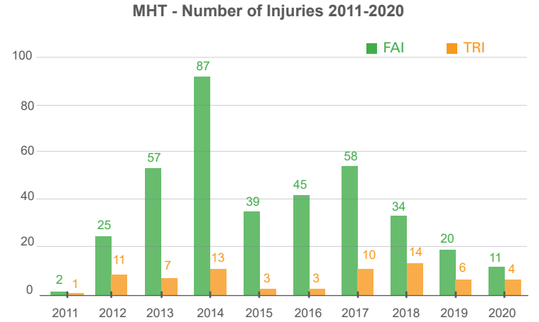
A Lost Time Injury Rate (LTIFR) is defined as an occurrence that resulted in a fatality, permanent disability or time lost from work of one shift or more. The frequency rate is determined by the number of occurrences per 1,000,000 man-hours worked.

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.

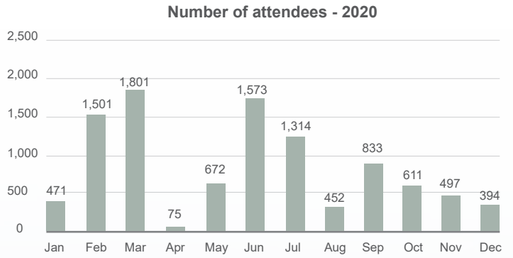




Enhancing Safety Culture

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.



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.

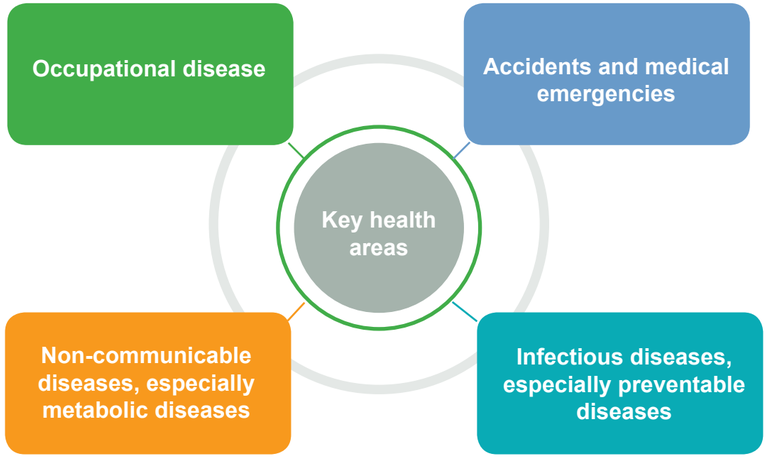
Additional emergency response support was given to the surrounding community during private road accidents and community house fires.

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 ministeries 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 facilties 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.

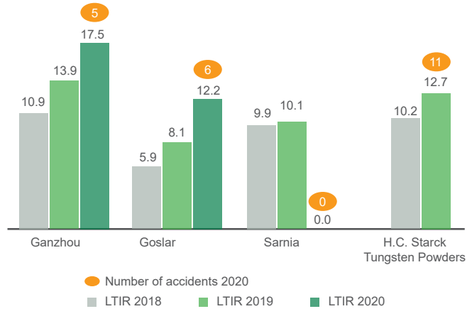
At the Goslar site, H.C. Starck Tungsten GmbH works closely with the specialist department for occupational safety in the Metallurgical Park, which also provides the officers for occupational safety.

- 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.

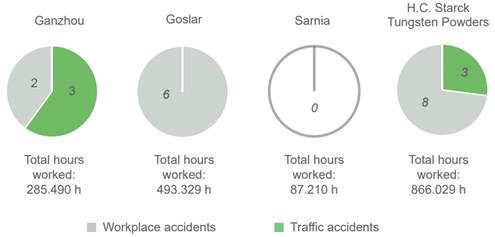
***_ partly lower numbers in 2020 due to the Sars CoV2 pandemic*

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.

HSC’s accident statistics in 2020



Categories of accidents with lost time



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.

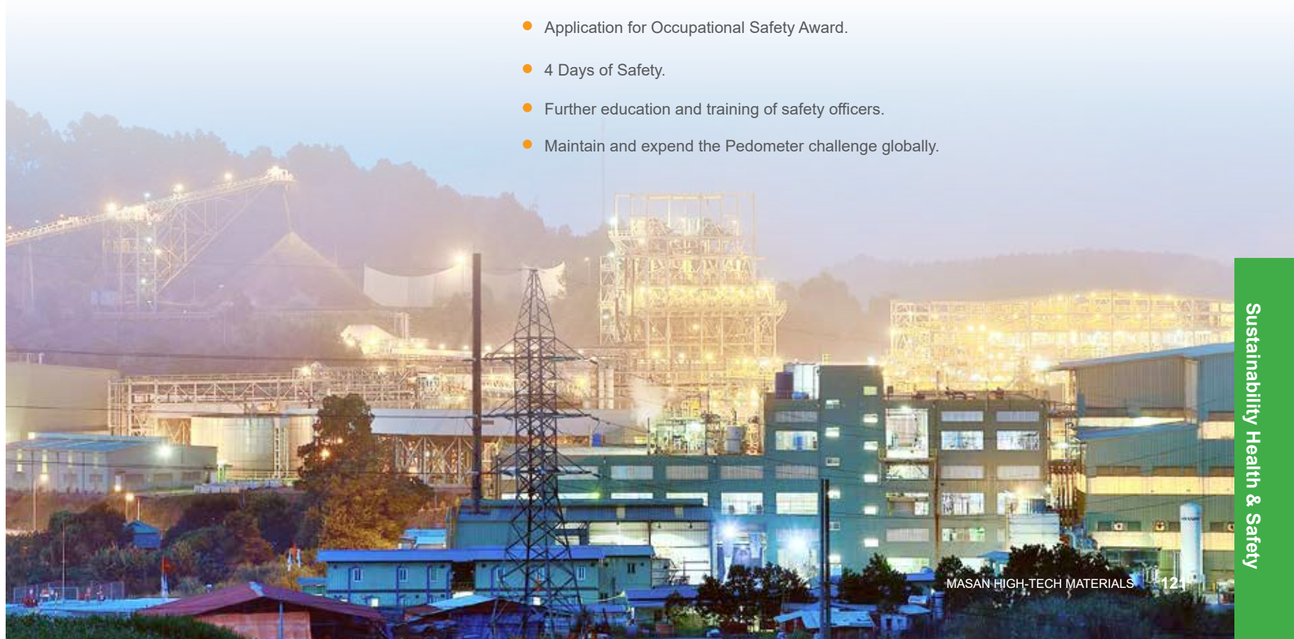
2019	Training scheduled	Number attended	Health, Safety & First Aid Training scheduled	Number attended
HCS in total	6,245	6,242 (100%)	544	544 (100%)
Goslar	6,120	6,120 (100%)	202	202 (100%)
Sarnia	20	17 (85%)	54	54 (100%)
Ganzhou	105	105 (100%)	288	288 (100%)

2020	Training scheduled	Number attended	Health, Safety & First Aid Training scheduled	Number attended
HCS in total	9,129	9,012 (99%)	316	316 (100%)
Goslar	8,311	8,198 (99%)	90	90 (100%)
Sarnia	25	21 (84%)	19*	19 (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.*

FOCUS IN 2021

- 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 surrouding community to increase the company's reputation throgh 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 Vietnam, Germany, Canada or China, Germany, Canada and China, 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 litters)	**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.

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.

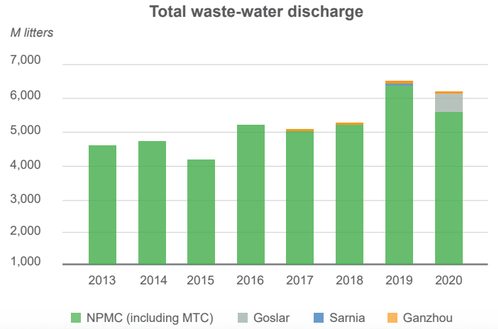
At our HCS facility in Sarnia, Canada, the team are implementing a process to improve the operation of the CTC water filter press. Once completed it is expected that wastewater will be reduced by some 200% which could lead to annualized savings of CAD$100,000.

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.

Cong river – water resource supply to NPMC processing plant

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 contractal 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 standardt o 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 (m^3)	**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 (m^3)	**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 (m^3)	**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
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 CO_2:

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

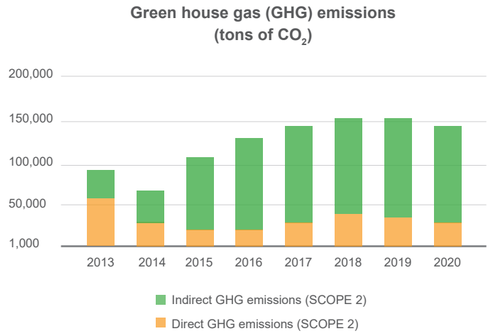
GREENHOUSE GAS (GHG) EMISSION

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 CO_2, slightly increase compared to 117,171 tons of CO_2 7,044 tons of CO_2 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.

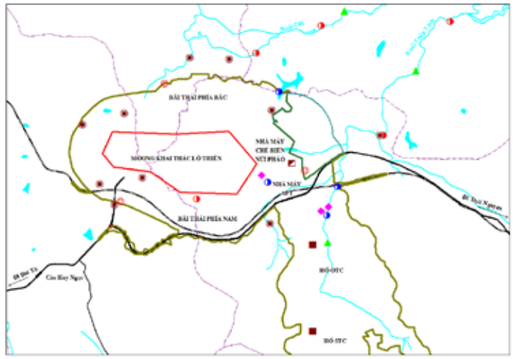
At HCS's Goslar, Sarnia and Ganzhou factories, wastewater monitoring and/or dust precipitation (deposition) are routinely carried out on a monthly basis. Wastewater is monitored online in centralized wastewater treatment plants. In addition, the responsible water supervisory authority also regularly 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 µg/m²*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).

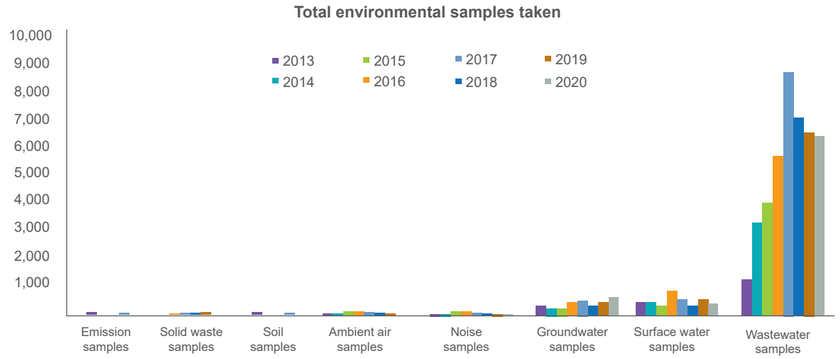
At the Nui Phao mine, the environmental monitoring program is implemented in accordance with the adjusted environmental monitoring program that approved by MONRE. The periodic monitoring of environmental components (ambient air, emission gas, ground water, surface water, wastewater, and hazardous waste 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

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

ENVIRONMENTAL REHABILITATION

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.

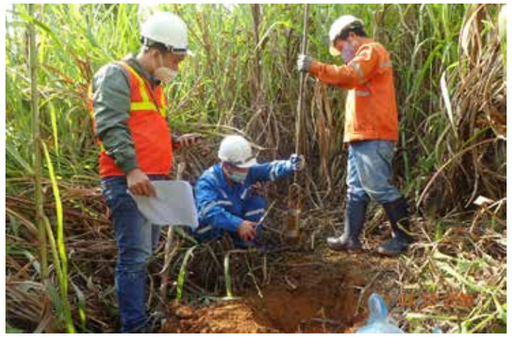
Initial research results has confirmed that heavy metals mainly accumulate in the roots, and to evaluate the extent of absorption, further research will be necessary. The research results will help NPMC to have appropriate management measures when harvesting biomass, and at the same time consider replicating 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 castle 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.).

Support for infrastructure development to community

- Provided VND 10 Million to upgrade irrigation channel.

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.

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 300m^2 and 500 chicks to collect eggs. Currently, there are over 2,000 chickens with an area of 1,200m^2 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'spolicy 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 5ha in Hung Son town.

Continue to support and monitor the 10ha **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

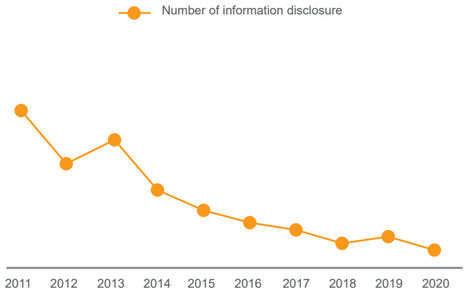
PCDP - An Approachable Communication Channel for Communities

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.

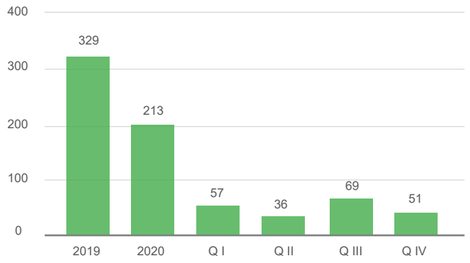
In 2020, there were 1,129 information items published with 107 contents and 203 visitors to the Information Center. There are numerous channels for local communities to access to the information of the Company, of which the Information Center is remained easy-to-approach channels for community as they 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

Information disclosure by year (2011-2020)

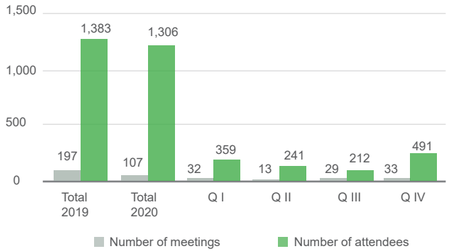


Visitors to the Information Center 2020



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.

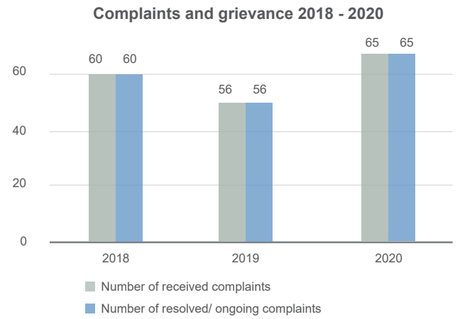
Number of meetings, surveys and community consultation in 2020



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.



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. Howsever, 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

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.

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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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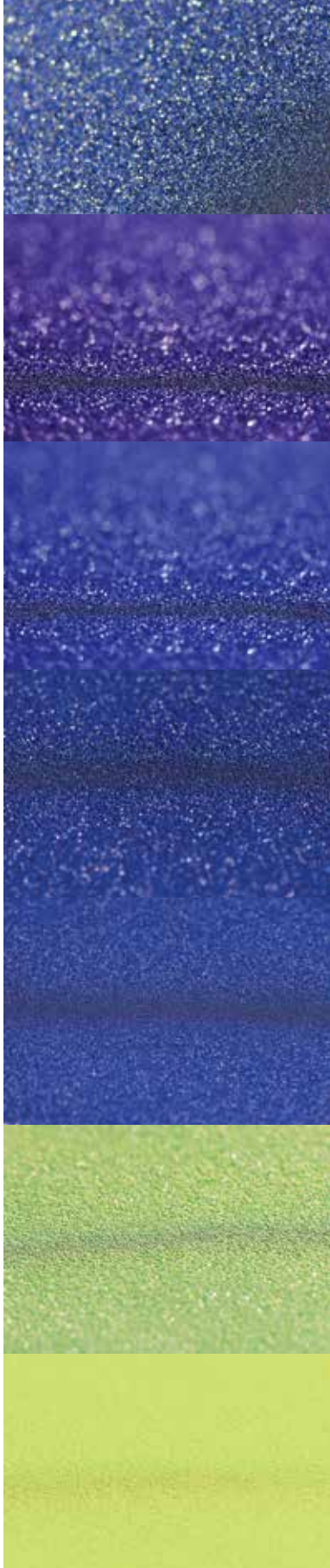
GO GLOBAL
Customer Solutions Focus



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