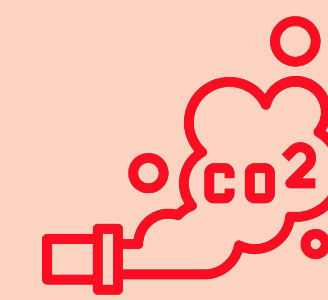




Changes in supply

Scarcity and tightening of trade borders mean access to raw materials, energy, and water can pose a serious challenge for the metal producers of tomorrow



Emissions

With global pressure to lower CO2 emissions, all organizations must adapt to changing environmental standards - especially industries with large impacts on the environment.



Competition for talent

An increasingly digitalised world means new skillsets are required from employees. Companies need to invest in development of smart factories and sustainable products and processes in order to attract talented employees.



Changes in demand

Rapid urbanisation will be a defining trend in terms of consumption, affecting not only infrastructure but also trends in consumer habits and culture.

How will the future metals plant succeed?

90%

Scrap metal as primary source of production

Due to trends of protectionism, raw material scarcity in regions like Europe will require companies to adjust their operations to use resources available. Furthermore, scrap metal production methods produce significantly less carbon dioxide emissions when comparing to traditional manufacturing methods

10%

Iron ore from mines

Not all steel companies will have transitioned from iron ore pellets. With scrap a primary source for raw materials, raw iron ore pellets processed with environmentally-friendly and sustainable methods will be a necessity to cover for inadequacies in scrap resources.

Autonomous material transportation and production

Scrap metals and iron ore pellets will be transported utilising autonomous vehicles such as trucks, sea freight, and rail. The logistics operations will be managed semi-autonomously, as logistics managers will have the ability to supervise and control transport fleets from control rooms onsite.

Within the plant...

Digitalisation and data-integration

With rapid digitalisation in the metals industry, the organisation must be able to manage a vast amount of data collected throughout the entire production process and ecosystem surrounding the plant. Integrating collaborative data management into the metals production cycle is imperative in managing production cycles, shipments, resource management, and maintenance of equipment and machinery in order to develop a streamlined production process.

Automation

Due to the exponential improvements in automation and the vast amounts of data collected, human interaction to these processes is mainly limited to maintenance, process development and attention to special, unpredicted situations.

Sustainable energy sources

In principle, steelmaking will have similar processes in place in the year 2040 as it has today, with the utilisation of more efficient and powerful electric arc furnaces. A key difference in the process will be the energy input for the furnace, as renewable energy will be the primary source of energy by the year 2040, especially in regions such as Europe.

The urbanisation of plant operations

With exponential urbanisation and the increasing propensity for communities to adopt circular systems into urban areas, actors the metals industry will have seized the opportunity to build manufacturing facilities near urban areas

Hydrogen-based steel production

The introduction of hydrogen-based steel production will be a major breakthrough in developing CO2-free steel production. The process radically changes the reduction process as it replaces the use of coke from coal to hydrogen gas - resulting in an offset of water instead of carbon dioxide.

Digitally-driven employees

With the development and installations of wireless technologies in 5G, processes can be controlled remotely and supervised in real time.

Smart materials

This means that the new trackability of smart materials will enable metal manufacturers to follow their products even after the sell, enabling them to more efficiently initiate recycling of a high percentage of their manufactured material

smart materials will be able to communicate their attributes directly to the machinery in the supplying plant, as well as in the processing steps of the customer. This enables a lean production set-up, requiring less manual configurations. In turn, the data generated during the processing can be utilized to further optimize production processes on a continuous basis.

Predictive maintenance using artificial intelligence

Onsite or offsite, maintenance can be assisted digitally from start to finish. For example, employees can receive real time assistance and guidance employing augmented reality and digitally connected tools. It can also be scheduled according to the production schedules onsite, reducing lag time and delays. Data collected on processes will be used for improvements automatically.

The sales process

Secondary production

The progress of automated processes in the metals industry will also take an impact on the sales process. Metal plants will operate solely on made to order basis, utilizing automated order processes enabled through interconnected ERP systems. Machine learning enabled demand forecast will speed up the reaction time of metal plants significantly.

End consumer

By saving and generating data, smart materials will simplify the after-sales process, as the customer can receive all needed data directly from their purchased products.

With adaptations to accommodate recycling and reuse, manufacturing companies are able to benefit from community-wide recycling efforts for their operations

