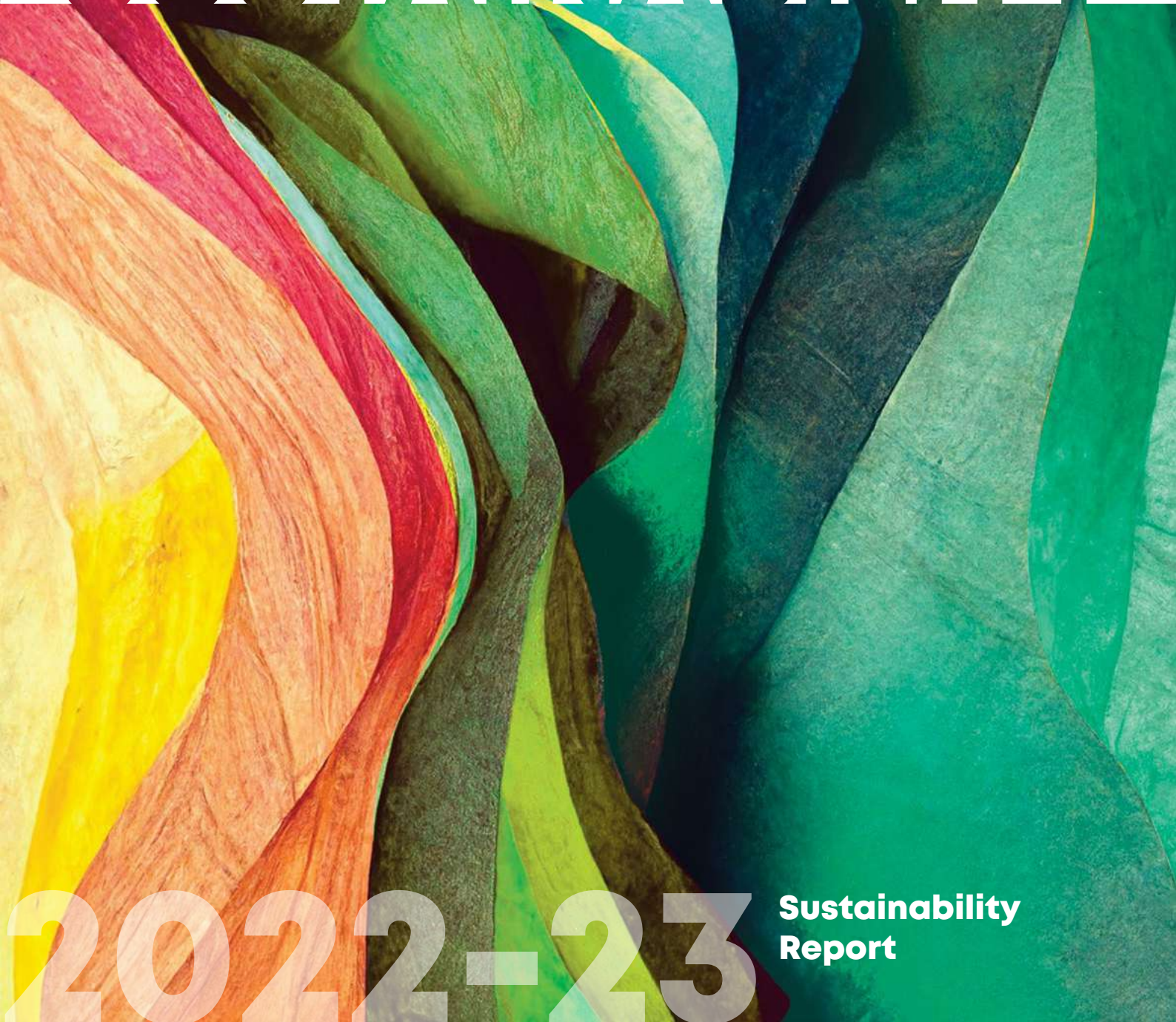


*Technology for*

**SUSTAINABILITY**



2022-23

**Sustainability  
Report**

**c. Use of magnetic resonator in furnace operation**

When a fluid or gas passes through a strong external magnetic field, the magnetic moment of the molecular clusters occurs, which is called magnetic resonance. Magnetic resonance polarizes the fuel. Polarized fuel is expected to react readily with air which improves the area of contact between air and fuel. This enhances the combustion efficiency leading to reduction in energy consumption. Magnetic resonators were installed in locations wherever possible. Energy savings of around 1,020 GJ/Annum was achieved leading to an emission reduction of 56.5 tCO<sub>2</sub>e.

**d. Conversion of cooling medium in air compressors**

Medium of cooling used in the air compressors has a direct impact on the energy consumed. Water-cooled compressors have a higher heat dissipation capacity as water has a higher thermal conductivity than air and hence, it can absorb and carry away heat more efficiently. Air compressors cooled by water can handle higher capacity and larger loads than air-cooled compressors. The efficient heat transfer properties of water enable the compressor to maintain lower operating temperatures, allowing it to work continuously. Air-cooled compressors were converted into water-cooled compressors wherever possible. Energy savings of around 384 MWh/Annum was achieved due to this project thereby leading to an emission reduction of 303.8 tCO<sub>2</sub>e.

**e. VFD installation in pump of cooling tower**

Variable Frequency Drive (VFD) is a device used to control the speed of an electrically-driven motor. It adjusts the frequency and voltage of the electrical power supplied to the motor. Frequency and voltage adjustment leads to precise control of the motor speed leading to reduction in the energy consumption. Significant reduction in energy consumption is achieved due to the use of VFDs. Implementation of VFDs were taken up wherever possible. Energy savings of around 294 MWh/Annum was achieved due to this project thereby leading to an emission reduction of 232.3 tCO<sub>2</sub>e.

**f. Controller in compressor operation**

Controller refers to a device that monitors and regulates the performance of a compressor. The controller's primary function is to maintain the compressor's operation within specified parameters to ensure efficient and safe operation. In forging shop, a common controller got installed for six compressors and preference of compressors was set in controller based on the efficiency or performance of the compressors. This controller switches on/off compressors according to the set preference. Use of controller eliminated the problems such as overheating, breakdown and pressure fluctuations. The expected energy saving due to this implementation is around 62 MWh/Annum thereby leading to a reduction in emission to the extent of 49 tCO<sub>2</sub>e.

**g. Skin coating in furnace for heat loss reduction**

Heat loss in furnace includes the leakage to surroundings. Application of refractory protective coating over the furnace wall reduces skin temperature resulting into the reduction of this heat loss. Refractory skin coating also improves the thermal shock resistance, emissivity of refractory lining, reduces the fuel consumption and increases the life of refractory lining. This enhances the furnace efficiency and reduces the downtime. We have provided the skin coating in furnaces and achieved an energy savings to the extent of 28.5 MWh / Annum and emission reduction of 22.5 tCO<sub>2</sub>e.

