**Team ID: G4**

**Green Guardians**

**Team Member Name Year Major**

Arnab Sarkar 2023 MBA

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**Advisor(s):**  Prof Kuruvilla Joseph Pandikattu SJ

**Topic Title:** "The lightweight with a heavy punch!" – Tata Steel, reignited with Hydrogen

**Audience:** Executive Board Members of Tata Steel, Jamshedpur, India

**Sustainable Development Goals**

### SDG9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

### SDG13: Take urgent action to combat climate change and its impacts

### SDG12: Ensure sustainable consumption and production patterns

**Executive Summary**

As one of the most critical engineering and construction materials, steel is one of the core pillars of our society. However, the steel industry is among the three biggest producers of carbon dioxide globally, which calls for an immediate reduction of its carbon footprint. In a developing country like India, the magnitude of this problem is staggering. The Tata Plant we are studying emitted 19,646,580 tons of CO2 in FY-21. Almost every ton of steel produced in 2021 emitted, on average, 1.85 tons of CO2. Recent studies estimate that the global steel industry may find approximately 14% of steel companies’ potential value is at risk if they cannot decrease their environmental impact. Further, the changing trend of customer requirements is leading to a growing demand for carbon-friendly steel products. Hence, decarbonization should be the top priority for Steel Plant to remain economically competitive.

So we recommend the green Hydrogen-based DRI and scrap in combination with EAFs, a technically proven production method that enables nearly emission-free and high-purity steel production. The process substitutes fossil fuels in the DRI production stage with Hydrogen produced with renewable energy. We foresee the decline in the price of green Hydrogen driven by falling costs of electrolytes and cheap renewable energy due to the economy of scale, learning rate, and improved efficiency. The transition can be enabled by availing sustainable investment by environmentally responsible business development through UN PRI. Thus, our solution will significantly improve the triple bottom line of the Steel Plant while creating a sustainable competitive advantage and a Win-Win situation for all the stakeholders. Going further, this will lead to a Domino effect on the nation's steel industry, with the Tata Steel Plant being the pioneer in offering financially viable and ethically sound solutions.