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Strategy for Green Economy in Steel Industry: A Case Study of Tata Steel

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Abstract:

Steel has had a major influence on our lives, the cars we drive, the buildings we work in, the residential homes in which we live and numerous other aspects in between. Steel is used in our electricity-power-line towers, natural-gas pipelines, machine tools, military weapons-the list is limitless. Steel plays important role in protecting our families by safeguarding our residences, making our daily lives convenient, its benefits are undoubtedly clear .Steel is by far the most important, multi-functional and most adaptable of materials. The development of mankind would have been impossible without steel. The mainstay of developed economies was laid on the strength and inherent makes use of of steel. A Green Economy can be pointed as substitute eco friendly vision for growth and development; one which can produce growth and improvements in mankind lives in ways consistent with sustainable development. A Green Economy endorses a three-way bottom line: sustaining and advancing economic, environmental and social well-being.in this paper we discuss green economy strategies used in tata steel company .

Key words: ***green economy, environmental and social well being, steel industry***

Preface:

Steel has had a major influence on our lives, the cars we drive, the buildings we work in, the residential homes in which we live and numerous other aspects in between. Steel is used in our electricity-power towers, natural gas pipelines, machine tools, military weapons the list is limitless. Steel plays important role in protecting our families by safeguarding our residences, making our daily lives convenient, its benefits are undoubtedly clear .Steel is by far the most important, multi-functional and most adaptable of materials. The development of mankind would have been impossible without steel. The mainstay of developed economies was laid on the strength and inherent makes use of of steel. A Green Economy can be pointed as substitute eco friendly vision for growth and development; one which can produce growth and improvements in mankind lives in ways consistent with sustainable development. A Green Economy endorses a three-way bottom line: sustaining and advancing economic, environmental and social well-being The existing economic growth model is focused on increasing GDP above all other objectives. While this system has improved incomes and reduced poverty for hundreds of millions, it comes with substantial and essentially irreversible social, environmental and economic costs. The consistency of poverty and degradation of the ecosystem are generally traced to a string of market and institutional failures that make the existing economic model far less effective than it otherwise would be in advancing sustainable development goals. These market and institutional failures are well known to economists, but little progress has been made to address them. For instance, there are not sufficient mechanisms to ensure that polluters pay the full cost of their pollution. There are "missing markets" – meaning that markets do not methodically account for the inherent value of services provided by nature, like water filtration or coastal protection. A "market economy" alone cannot provide public goods, like efficient electricity grids, sanitation or public transport. And economic policy is often shaped by those who has power, with strong vested interests, and rarely captures the voice and perspectives of those most at risk.

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Review of Literature:

The concept of a green economy was firstly mentioned by the famous economist Pearce, who suggested that the environment and economy necessarily interact (Pearce, 1989). UNEP gives a clear definition of a green economy in the report: a green economy is one that concentrates on human and natural factors, and also can create high-salary jobs (UNEP, 2007). In 2011 UNEP enriches the meaning of 'green' to refer to an economy that is not only efficient but also fair, ensuring a just transition to an economy that is lowcarbon, resource efficient, and socially inclusive. (UNEP, 2011)

A green economy has an inner relationship with a clean energy policy, and has a more politically applied focus (UNEP). The real value of environmental services and the real costs to the environment are included in national policies (Fulai, Sheng, et al. 2011). The first sector of the green economy is renewable energy (Karl Burkart, 2009). The development of new energy depends on policy (Guo, 2011). So, a green economy needs the support of public policy.

A green economy has the character of public goods. In a green economy, growth in income and employment should be driven by both public and private investment (UNEP, 2011). Greening the economy has great potential to stimulate growth globally (UNEP, 2011). Renewable energy can be a driver for employment (Apergis N, Payne JE, 2010).

The definition of a green job varies from person to person, but all agree that green jobs are jobs linked to the environment and clean energy. Some believes that green jobs can be defined as jobs that involve protecting wildlife or ecosystems, reducing pollution or waste, or reducing energy usage and lowering *Yeyanran Ge and Qiang Zhi / Energy Procedia 88 (2016) 257 – 264* 259 carbon emissions, as well as jobs in industries and sectors that produce environmentally beneficial goods and services (UNEP, 2008). Some conclude that green jobs are created directly through activities that benefit the environment (Borel-saladin J M, et al., 2012).

Moreover, green jobs are jobs linked with energy conservation or increasing the supply of renewable or clean energy sources (Konopnicki, 2009). If we consider the wider impact of green growth policies, green jobs including direct, indirect and induced jobs. The concept of green collar jobs to some extent is similar to green jobs, and green collar jobs are jobs created by firms and organizations that aim to improve the environmental quality (UNEP, Pinderhughes, 2006). It should be noted that the influence of green jobs is debated (Morriss, Andrew P. et al.,Pollin 2009.

The employment effect includes direct effects, indirect effects and induced effects, which is similar to the classification of green jobs (Pollin R, 2009). Moreover, employment can also be divided into gross employment and net employment. Gross employment is the sum of direct and indirect employment (Cetin M Erican N, 2011). Net employment considers the traditional job loss from the green economy, for there are potentially negative or displacement effects of the green economy (Borel-Saladin J M,Turok I N,2012).

Many scholars find that the green economy has a positive impact on employment. It creates jobs and enhances social equity (UNEP, 2011). Renewable energy is a driver of employment, increases the demand for labor and results in the net creation of jobs (Engel, Ditlev, et al., 2009). Moreover, a low carbon economy may influence the employment structure, and also improve the scale of low carbon economy (Liu, 2011). A green economy has also been found to have a negative effect on employment, however, as the quantity of employment may reduce. The creation of one green job may destroy another job (Green K P., 2011). Mandated subsidies for renewable generation will necessarily reduce economic wellbeing (Lesser J A., 2010).

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In some developing countries, the green economy has a positive effect on employment. In 2011, the potential strategies for ensuring that green jobs are decent jobs using the case of wind power plants (Chan C K C, Lam M C, 2012). Turkey also finds that the green economy has a positive effect on employment. Solar energy technology's creation of direct employment and the primary source of energy demand have important employment effects on economics (Cetin M Erican N, 2011). Africa's Green Jobs report IDC points out that, in the short-term, the total net employment potential is 98,000 jobs, and the long-term employment potential is 462,567 jobs (IDC, 2011). Green economic activity appears to generate more local jobs than fossil-fuel-based industries in South Africa, so policy involvement in greening the economy is needed (Pollin Robert et al., 2009)

In some developed countries, the positive employment effect of the green economy appears. In America, the clean energy policy on employment is significantly positive, and net job gains rose to about 660,000 jobs in 2010 (Barrett, James P, et al. 2002). The American Recovery and Reinvestment Act and American Clean Energy and Security Act show the attitude of the federal government. The expansion in clean-energy investments can generate a net increase of about 1.7 million jobs (Pollin, Robert, et al.,

2009). All non-fossil fuel technologies create more jobs per unit energy than coal and natural gas (Wei M, Patadia Sand Kammen D M, 2008). The renewable energy sector generates more jobs per unit of energy delivered than the fossil fuel-based sector (Engel, Ditlev, and Daniel M. Kammen, 2009). People with disabilities in the US can have employment opportunities as well (BruyÃ¨re S, Filiberto D, 2013). A substantial number of new jobs will be created and will be needed to support nuclear industry growth (Kenley C R, Klingler R D, et al., 2009).

In Canada, growth in the renewable sectors and energy efficiency in the Revolution scenario led to a net gain in jobs (Rutovitz, Jay and Alison Atherton, 2009). In Ontario, a green investment agenda can offer the potential to create jobs within the 50,000 range, as anticipated by the government (Pollin R, Garrett-Peltier H, 2009). In the UN, capacity growth in renewable energy with very strong growth in wind energy and biomass (Rutovitz, Jay and Alison Atherton, 2009). In Japan, the Prime Minister ordered the Environmental Minister to draft a Green New Deal including funds for green job creation. Japan's National Parks Program has a green worker program that has created green jobs (The Spanish Electricity System Preliminary Report, 2011).

What's more, the European Union's renewable energy policies are among the most progressive in the world. EU estimates indicate that there are currently 150,000 direct jobs in wind energy in the EU, half of the entire renewable energy industry (UNEP, 2011). The renewable energy sector is a very important one in terms of employment and value added (Ragwitz M, Schade W, Breitschopf B, et al., 2009).

The experience and empirical study mainly focus on Spain. The country has a different situation. In 2008, researchers find that the use of renewable energies offers the opportunity to diminish energy dependence, reduce the emission of CO2 and create new employment (Moreno B, 2008) while in 2009 more jobs were destroyed than were initially intended to be created (Alvarez G C, Jara R M, Julian J R, 2009). Up until 2011, Green programs in Spain destroyed 2.2 jobs for every green job created (Green K P,2011) and each green megawatt installed destroys 5.28 jobs on average elsewhere in the economy (Alvarez G C, Jara R M, et al., 2009). Two-thirds of the 110,500 green jobs created were in the fields of construction and installation, 25% were in administration, and 10% were in maintenance and operations (The Spanish Electricity System Preliminary Report, 2011). The green economy led to a negative effect on employment that also appears in other countries.

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Europe's experience reveals that the policies on the green economy are terribly economically counterproductive (Lesser J A, 2010). Rising energy costs loses jobs (Rose, A.Z., and Wei, 2006).

The green economy leads to other employment effects: the employment effect caused by the green economy changes according to the policy or the country in different periods may experience different effects. Mitigation policies caused a total of 44,000 net job losses. However, as the share of renewable energy that has indirect employment impacts increased, the policies from 2006 to 2010 actually resulted in 472,000 net job gains (Cai, 2011).

The high cost of the green economy: the green economy may generate green jobs and the employment effect, while only considering the quantity of jobs, but failing to include the cost is not totally correct. Green jobs are often not economically viable (Furchtgott-Roth D.2012). Green jobs lead to high cost in
many countries; one green job cost in Italy could create almost five jobs. Denmark has the highest electricity prices in the European Union (Green K P, 2011). In Spain, $860,000 was spent on each green job (Lesser, 2010). U.S. green job initiatives result in a higher cost of energy to businesses (Kenley C R, et al., 2009). The idea that government "investment" in green jobs helps America's economy is not necessarily true (Environmental Audit Committee, 2010). Longer-term costs are difficult to quantify with uncertainties in their magnitude (Engel, Ditlev, et al., 2009)

Need for the Study:

The tata steel had adopted strategies for Green Economy development policies to promote Social and ecological transformation which is must for environmental and social well-being So, this study has made an attempt to provide effectiveness and activities of sustainable Green Economy development in Tata steel

Objective:

The main objective of this paper is to study the existing sustainable Green Economy development policies in Tata steel.

Methodology:

This paper mainly based on secondary data. The articles which are published in the area of in Green Economy development in steel industry have collected for the study and from website of Tata steel

Tata Steel's Vision strikes a balance between economic value as well as ecological and societal value by aspiring to be "a Global Benchmark in Value Creation and Corporate Citizenship". It guides the Company in its race to excel in all areas of sustainability.

In the initial years, Tata Steel's CSR interventions were more as a 'provider' to society where the community was given support for its overall needs, both for sustenance and development. Gradually, the shift in approach led to Tata Steel being an 'enabler' focusing on building community capacity through training programmes; focusing on providing technical support rather than giving aid. At present, CSR interventions of Tata Steel focus on 'sustainable development' to enhance the quality of life of people.

Tata Steel's approach to business has evolved from the concept that the wealth created must be continuously returned to society. The responsibility of combining the three elements of society - social, environmental, and economic - is of utmost importance to the way of life at Tata Steel. Today, Tata Steel's CSR activities in India encompass the Company's Steel Works, Iron ore mines and collieries, reaching out to the city of Jamshedpur, its peri-urban areas and over 800 villages in the states of Jharkhand, Odisha and Chhattisgarh. Community involvement is a characteristic of all Tata Steel Group companies around the world. It can take the form of financial support, provision of materials and the involvement of time, skills and enthusiasm of employees. The Group contributes to a very wide range

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of social, cultural, educational, sporting, charitable and emergency assistance programmes.

The Company works in partnership with the Government, national and international development organisations, local NGOs and the community to ensure sustainable development. The Corporate Services Division delivers these responsibilities through several institutionalised bodies:

Green Products:

Tata Steel understands that Steel is one of the central pillars of a green economy, in which economic growth and environmental responsibility are mutually dependent.

Recycling is especially important in a green economy because it conserves valuable resources. Steel in itself is 100% recyclable. Once produced, its life-cycle is potentially endless. A patron of environment sustainability and conservation, Tata Steel ensures its products and processes are environment friendly. The Company offers innovative product solutions using carbon efficient technologies and processes that are in line with the Company's vision of making the planet greener. Towards this vision, Tata Steel continuously supports its customers in proper usage and disposal of finished goods.

Few of the recent initiatives by Tata Steel in this direction include:

Galvano: Tata Steel's zero spangled galvanized products (Galvano) are coated in a lead-free coating which is eco-friendly. Trivalent Chrome passivation is also offered as per the customer's requirements.

Nest-in housing solution:

The Nest-in housing solution by Tata Steel is made of cold rolled high strength steel sections and is an excellent building solution which does not pollute the environment like cement & brick in the conventional RCC. It does not require any welding, cranes or usage of water, therefore making the construction pollution free and environment friendly

The Nest-In Bio-toilet:

This is an integrated solution, commercialised in FY 13, made up of a Bio-toilet system and Nest-In super structure. The bio-toilet system is developed under license from DRDO. The Bio digester disposes human waste in 100% eco-friendly manner and generates colourless, odourless water and inflammable gas.

ReadyBuild Cut & Bend rebar (CAB) products:

To its retail consumers, the Company offers ready to use Cut-And-Bend rebars to eliminate difficult and labour intensive task at site. This initiative helps in reducing GHG emission due to reduction in scrap.

Fe600:

Marketing of 40mm Rebar, Fe600 rebar has resulted in reduction in specific steel usage compared to 32mm rebar & Fe415 / 500 grades of rebar. This also leads to a reduction in GHG emission.

Fe500/Fe550D:

The consumption of Fe 500 is 15% lower than Fe 415 rebar, resulting in reduction of overall steel consumption in the infrastructure sector. This effectively reduces GHG emission and conserves natural resources.

Super Ductile Rebars:

Super ductile - earthquake resistant rebars ensure safety even during a major earthquake. New Corrosion Resistant Steel (CRS) rebar developed by the Company have higher corrosion resistance quality.

LCWR:

Tata Steel's superior quality Low Carbon Wire Rods have helped customers to shift from the "Acid Pickling" process before wire drawing to only "Mechanical De-scaling". By using this improved product, customers are able to save approximately Rs.800/ t.

High Strength C-Mn 440 Steel:

Development of this product has helped in light-weighting of cars, leading to low carbon usage in lifetime of vehicle and also increasing the fuel efficiency

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to a great extent. This also helps in localisation of the grade for the Automotive OEMs.

VAVE (Value Analysis / Value Engineering) Programme:

Based on its expertise on automotive steels, Tata Steel (R&D, Technology Group, Operation Managers and Sales Manager) works with Customer teams to generate ideas on steel usage in a vehicle with an aim to reduce cost and weight of the vehicle. These ideas not only reduce cost but also reduce GHG emissions through the life cycle of the vehicle.

Replacing wood as packaging materials:

Tata Steel has completely replaced wood by recyclable and reusable EPS saddles for stuffing export containers. This is the first time an Indian Steel maker has used recyclable material for stuffing containers. This move has resulted in savings of 50 m (linea) of timber per container. It has also increased the efficiency by increasing the container floor area, allowing for a significant savings in freight costs

In addition to the above initiatives, Tata Steel has also installed a Rain Water Harvesting System (RWHS) with zero discharge facility at the Faridabad stockyard.

Similar system is also being planned at Chennai, Kanpur and Ludhiana stockyards. At the same time, by using transparent sheet in the roof, Faridabad stockyard has reduced the electricity consumption by 80%. Similar plans are also there for Chennai and Kanpur stockyards. Also, Tata Steel has used Fly Ash Bricks instead of fire clay bricks for new constructions at the stockyards as the former are environment friendly.

Biodiversity

Biodiversity is the coexistence of a variety of living organisms including exotic species of plants, animals and aquatic life on earth. It is so complex that despite centuries of continuous discovery, most of our planet's biodiversity is yet unexplored. This is of great concern when we consider that a total of 17,291 species are known to face the threat of extinction due to irresponsible human activities. Already more than 1.5 million species are believed to have become extinct due to several abiotic factors, especially human influences on the environment. With this loss, we are losing prospects for future valuable discoveries in the spheres of food, fiber, fuel, bio-inspired innovation, and much more.

To protect the environment and maintain biodiversity, it is very important to assess what causes loss of biodiversity and then adopt measures that conserve as well as enhance balance in our ecosystem. Some of the main factors that affect biodiversity are –

Degradation and destruction of natural habitats:

A primary cause for the loss of biodiversity, this is the consequence of clearance of native vegetation for agriculture, housing, timber and industry.

Global warming or climate change:

The increasing temperature of the Earth's surface due to the rising pollution levels and greenhouse gases affects biodiversity. A rapid change in climate is also known to have a negative impact on ecosystems.

Deforestation or increased felling of trees:

Forests – earth's richest biological areas, are home to a variety of plants, birds, animals and micro-organisms. Deforestation and over-exploitation of jungles is one of the biggest factors that affect biodiversity adversely.

Pollution:

Pollution is one of the primary factors that affect biodiversity, causing environmental imbalances.

Keeping these factors in mind, it is extremely essential for each one of us to play our parts in protecting the environment through eco-friendly practices. This especially applies to companies and large businesses that have the resources and funds to make a difference through responsible industrialisation and environment conservation initiatives. A Green Economy is one of the few alternatives that has the potential to pave the way for a sustainable future for generations to come.

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TATA STEEL APPROACH: Sustainable development and effective management of environmental impacts have become key goals for policy action at global and local levels of all industrial bodies today. Tata Steel has been one of the first companies in India to adopt sustainability as a policy. It is a core value, built on respect for people, desire for growth and respect for the environment. Building further on this vision, Tata Steel is the first Indian company to be a part of the International Integrated Reporting Council (IIRC) – an international initiative towards voluntary communication on how an organisation's strategy, governance, performance and prospects lead to the creation of value over the short, medium and long-term.

As a member of the World Steel Association, the Company's seeks to bring an understanding of sector-specific, local and global sustainability concerns to local and national policy making processes.

Tata Steel is:

- A member of the Steel Manufacturing, Mining and Environment committees of the Confederation of Indian Industries and the Federation of Indian Chambers of Commerce and Industry
- An executive committee member of the Federation of Indian Mineral Industries
- A participant in the World Steel Association Climate Action programme
- An endorser of the United Nations global compact's CEO water mandate

All key sites and operations of Tata Steel involved in mining and manufacturing are certified under EMS ISO 14001, the international environmental management standard.

Plants and Processes

The manufacture of steel involves steps that are potentially hazardous if not executed with due care and attention. The Group's businesses are subject to numerous laws, regulations and contractual commitments relating to health, safety and the environment in the countries in which it operates. Appropriate measures for environment protection are taken by adopting BAT (Best Available Technology) and designing pollution control infrastructure to achieve discharge and emissions within statutory limits. Sustainability issues related to Environment impacts at Jamshedpur and social impacts at all twelve locations were prioritised based on a systematic materiality process.

Tata Steel's efforts at continual improvement of its plants and processes are well recognised. Its processes at the Main Works at Jamshedpur comply with the ISO-14001 standard.

A few environment initiatives at plants:

- To meet environmental standards, dust and other emission levels are monitored for prompt corrective actions to ensure they stay within permissible limits. On initiating the Brownfield steel expansion project to raise production capacity at the Jamshedpur Steel Works, the Company has made large capital investments in Air Pollution Control Equipment (APCE) for new and existing plants.
- A significant investment has been made to ensure Ambient Air Quality monitoring, Effluent treatment, BOTP and Rainwater harvesting at Mines and Steel works.
- A new 8 MGD (2 x 4 MGD) Effluent Treatment Plant is being set up at Jamshedpur Steel Works. It will significantly reduce the water consumption of the Steel Works by converting effluents into service quality water for use in cooling and quenching.
- Increased use of fly-ash bricks instead of fire-clay bricks has enhanced recyclability at stockyards.
- Bio-Diversity assessment and management processes have been introduced at mines with International Union for Conservation of Nature (IUCN).

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- Transparent Fibre-Reinforced Plastic (FRP) sheets are used at the plants to maximize daylight usage.
- LD slag is being used as fluxing agent in cement industry, saving CO2, resources and wastes.
- Coke Dry Quenching (CDQ) is used to enhance waste heat recovery, improve coke quality and reduce dust emissions.
- More than 94 per cent of the Blast Furnace Slag at Tata Steel is Granulated Blast Furnace Slag. It is used as a clinker substitute in slag cement, saving mineral resources.
- No hazardous waste is imported or exported by Tata Steel India. The objective remains reduction of hazardous waste generation wherever possible from the perspective of operational efficiency.
- As part of its commitment to producing energy efficient products Tata Steel invests its best efforts to mitigate GHG emissions through the supply of energy-efficient steel and by-products as well as the solutions proposed for construction material. Tata Steel has achieved a 40 per cent reduction in specific energy consumption in the last 30 years.
- Collaborations have been made with UNGC, CDP, CEO Water mandate, TERI, CII-GBC and MAIT. The Company is also a WSA Climate Action member.

Responsible Mining

Sustainable and responsible mining is fundamental to the ethos of Tata Steel. The Company operates ore mines, quarries and collieries in the eastern states of Jharkhand and Odisha and all key mining sites are certified under EMS ISO 14001, the international environmental management standard.

Scientific mining and conservation of minerals:

Tata Steel has adopted advanced scientific mining technologies to ensure conservation of minerals. Innovative ore beneficiation and extraction techniques are used to ensure minimum waste. At OMQ – Joda, the Company has set up a computerised Central Mine Planning Cell since 1989, with the facilities of Surpac Mine Planning Software, Total Station survey instrument and other ancillary facilities, such as, installation of Coupled Plasma Analyser Units and GPS based Truck Dispatch Systems. The Sukinda Chromite Mine in Odisha is the first mine in the world to be certified under Quality Management System (SA 8000) and is also certified under Environment Management System (ISO 14001:2004) apart from a host of other standards and certifications.

Protection of water resources at mines:

Mining operations across the Iron mines are restricted above the ground water table to ensure that there is no intersection of the ground water table. No natural watercourse or water resources are obstructed due to the Company's mining operations where they exist. Experts from IIT, Kharagpur monitor ground water quality at the iron ore mines every quarter and the results are submitted to Ministry of Environment and Forests, Government of India and respective State Pollution Control Boards twice a year. Besides, Tata Steel also conserves water through zero wastewater discharge from colliers, implementation of Scientific Rainwater Harvesting Systems and artificial recharge of ground water.

Minimising biodiversity impacts:

No national park, wild life sanctuaries, elephant corridor and tiger reserves exist within a 10 kilometre radius of the core zone around Tata Steel's operational locations. The Company pursues voluntary initiatives to assess and mitigate potential impacts of mining on sensitive ecosystems and is looking to collaborate with IUCN (International Union for Conservation of Nature) to explore the possibility of working on biodiversity.

Restoration of mined out land:

Tata Steel ensures a green world around its mines through reclamation of mined land. The mines have taken a pioneering role in preventing soil erosion and stabilizing the dump slope faster through advanced

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methods of land reclamation. The Company has built several lush green botanical parks and zoological gardens that house exotic species of flora and fauna.

Towards A Green Economy

Steel is one of the central pillars of a green economy, in which economic growth and environmental responsibility are mutually dependent.

Steel products form the building blocks for achieving health & safety excellence in a wide range of end applications. Tata Steel therefore considers itself responsible for the performance of its steel in these end applications and works closely with its customers to improve product design and ensure structural integrity. Tata Steel's Technology Roadmap has interpreted product responsibility and quality to include the entire lifecycle of its products, mandating the development of safe product designs, efficient use of resources as well as deployment of eco-friendly technologies and processes.

Steel is 100% recyclable, which means it can be reclaimed into the same material with the same quality again and again. Once steel is produced, its life-cycle is potentially endless. Recycling is especially important in a green economy because it conserves valuable resources.

Tata Steel ensures that the technologies and processes used to manufacture products must optimise resources and be carbon efficient. The Company's Total Quality Management processes are aimed at continuously monitoring the safety and efficiency of its products through their lifecycle. While every process of Tata Steel from mining to manufacturing is reviewed under the Total Quality Management process, each product must undergo extremely stringent Technical Delivery Conditions, mandatory standards of customers aside from the applicable BIS standards.

Tata Steel believes its products are part of the solution to climate change, as steel has inherent environmental advantages, such as being durable, adaptable, reusable and recyclable. The completion of the 9.7 MTPA brownfield project has put Tata Steel firmly on its path to meeting its goals of adding new eco-efficient products to its portfolio while using fewer natural resources, less energy and less water per tonne of steel produced.

Conclusion:

Tata steel is implementing green economy policies by applying strategic features like green products,biodiversity,responsible mining and forwarding towards green economy and maintaining economic growth and enivronmental responsibility.

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