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## A Study on Green Manufacturing

Piyush Yadav<sup>1</sup>, Prateek Meena<sup>2</sup>, Prashant Patidar<sup>3</sup>, Dharmendra Kumar<sup>4</sup>

UG Student, Dept. of EE, Poornima college of Engineering, Jaipur, Rajasthan, India<sup>1,2,3</sup>

Assistant professor, Dept. of EE, Poornima college of Engineering, Jaipur, Rajasthan, India<sup>4</sup>

**ABSTRACT:** The demand for greening of business practices has reached a tipping point. Each day we come across a new development, a corporate commitment, a technological breakthrough, a new partnership addressing environmental challenges, or a new finding from various agencies, labs or research groups about the progress being made. Amid the multitude developments there is progress, but it's not always obvious or straightforward. Organizations are getting cleaner and more efficient, but only incrementally. Many of the gains are offset by the ever-growing economy. The greenhouse gas (GHG) emissions per dollar of economic activity may be dropping but the growing economy means that these emissions are largely unchanged. Moreover, there does exist a huge gap in the controls and measures which have been built in developed economies against those in developing economies. Mining and Metal Industry contributes to approximately 4-5% of the total world GHG emissions. Technological advancements in the industry over the past 25 years have enabled substantial reductions in CO<sub>2</sub> emissions. Work is continuously on to build technologies that would radically reduce emissions and take the organizations to lower levels of GHG output. The main objective of the green manufacturing is to save the environment and to reduce the cost of the product.

**KEY WORDS:** Green manufacturing, Energy efficiency.

### I. INTRODUCTION

In this global world environment, resources and population are major problems. Environment is crucial one with and change in climate at any point leads to the imbalance of the earth. The ISO has proposed the new quality management system for products and even for Environment management system. The main aim is to minimize the environmental damage due to industries. There is a need of new manufacturing process i.e. Green Manufacturing which is suitable a sustainable development strategic X.C.Tan., et.al (.2002). The cost of energy and resources are constantly increasing due to rising demand and limited supply. Furthermore, price trends can hardly be forecasted, so companies aim to successfully produce with in large price ranges of energy and resources. One strategy to accommodate price fluctuations consists of passing mark ups to the customer. However, a price mark-up may require that improvements be made to the product. Alternatively, stable prices may be facilitated with increased production efficiency, which can be achieved by reducing resource consumption and improving the organization of the manufacturing system Nancy Diaz-Elsayed., et.al. (2013). This paper main objective is to bringing the attention of the manufacturer who are manufacturing the product with the mass production. We have seen that a lot of energy is using day by day and lots of waste is available, the waste are hazardous and can lead the human being to a termination point. Toxic hazards are really crucial for human being.

### II. APPROACH TO GREEN MANUFACTURING

There is no denying of the fact that a greener company, with greener products and services, is more desirable to a growing segment of consumers and business customers. Because of the prominence of global warming concerns, going green has become part of any Corporate Social Responsibility (CSR) agenda to enhance customer and public perception. Some companies are led by "true believers" who simply want to do the right thing for the environment. To give prominence to the greening need, regulators in European Union (EU), United States (US), and elsewhere are aggressively monitoring this aspect of metal products and its related operations. This focuses on toxic materials used in building computing gear, disposal of electronic equipment, and emissions of CO<sub>2</sub> and other greenhouse gases caused by energy / power consumption and other sources. Organizations have started believing that greening is



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not cost but it is a way of doing sustainable business – and this systematic thought has the potential to offer substantial cost reduction and in the process enhance the company's competitive advantage. Global mining and metal production has been growing for the last 50 years. The steel industry, in particular, has grown to a production level of 1440 million mt in 2008 from a level of 200 million mt in 1950.

The future growth in demand for steel will be driven mainly by the needs of the developing world which implies that the steel industry must continue to grow world wide by 3-5% and by 8-10% in China, India and Russia to satisfy these needs. The same logic also applies to other metal industries. But with this growth comes the increase in significant amount of GHG emissions. Unlike IT industries, metal industries do not have significant spend on datacenters, but their manufacturing process itself emits huge amount of GHG emissions. According to the Intergovernmental Panel on Climate Change (IPCC), the steel industry accounts for between 4-5% of total world greenhouse gas emissions. On average, 1.7 tons of carbon dioxide are emitted for every tons of steel produced. Another important aspect of metal industry is that approximately 90% of the emissions in the steel industry comes from Iron Making and about 60 - 70% of the emission in Aluminum industry comes from smelting operations, whereas the same from IT equipment's is negligible.

### III. GREEN MANUFACTURING

In today's world the e-waste the major issue, green technology is the application of one or more of environmental science, green chemistry, environmental monitoring and electronic devices to monitor, model and conserve the natural environment and resources, and to curb the negative impacts of human involvement. The term is also used to describe sustainable energy generation technologies such as photovoltaics, wind turbines, bioreactors, Biofiltration, Bioremediation, Desalination etc. We don't always have time, or take time, to learn more, read fine print, decipher complex ingredients, and seek alternatives. The word "natural" has become an over-used and inaccurately-used BUZZWORD in today's marketing; it's practically lost all value.

#### 1. Environmental Management Tools

The environmental management tools include. Mass balance i.e. consideration of input and outputs of a process and to determine its effectiveness and wastage. Full cost accounting is related with the costs of materials, energy, labour, waste disposal and other sundry item cost. Product life cycle is also an important part of these tools less the life cycle less is the environment loss.

The systematically engineering process of a product consists of three stages: (1) conceptual, preliminary and detail design,

(2) Production construction and

(3) Operational use and system support Blanchard and Fabrycky, (1997).

In the development of this study, the relevant cost functions are derived in sequence with a point view of systematical engineering process. Imposing extended producer responsibility on manufacturers is a means to achieve a critical leverage point between environment and business benefits. Manufacturers have the unique ability to facilitate product recovery and remanufacturing by designing their products for easier disassembly and reuse of component. Through the product life-cycle value design, the suitable materials are selected and those decisions (such as employing easily recyclable materials and avoiding the unusual materials, components and hazardous materials) can reduce the negative impacts on environment Fishbein, (2000); Toffel, (2002).

#### 2. Sustainable Manufacturing

The concept of sustainability emerged from a series of meetings and reports in the 1970s and 1980s, and was largely motivated by environmental incidents and disasters as well as fears about chemical contamination and resource depletion. The phrase sustainable manufacturing is sometimes used carelessly to describe the actions related to characterizing and reducing the environmental impacts of manufacturing. Sustainability, however, implies a great deal more than the simple act of analyzing and modifying the environmental performance of manufacturing processes and systems In spite of this caveat, this interpretation is likely to be maintained. A system might be thought of as unsustainable when society consumes resources and produces wastes at a rate that exceeds nature's ability to transform industry and society wastes into environmental nutrients and resources. Strictly speaking, sustainability can only be



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discussed in the context of a closed system. Manufacturing subsystems coexist alongside human, ecological, and natural subsystems. Therefore, sustainable manufacturing is a philosophy that cannot be considered independent of broader environmental and socioeconomic systems David A. Dornfeld. et.al. (2013). Sustainable Manufacturing Fundamentals Manufacturing is a business function, and, as such, engineers are well versed in establishing the economic value of engineering solutions for manufacturing. Measuring environmental and social performance presents a more challenging engineering and business task. Sustainability-related impacts result from operations and activities that manufacturing processes and systems employ to convert input materials and energy into marketable products. Material and energy are necessary inputs of manufacturing processes and systems; wastes and emissions, which are generally classified as outputs, are, in turn, inputs to other industrial and natural systems, where their impact is felt socially, environmentally, and economically.

### 3. Sustainable Green operations

Sustainable green operations as an innovative environmental management approach, GO serves to ensure the quality and environmental compliance of electronics manufacturers' inputs (e.g., electronics components and metals) and outputs (e.g., finished products, carbon emission, waste) Zhu et.al. (2008). GO emphasizes product-and process-oriented environmental practices to balance and improve financial performance as well as pollution reduction. Product-oriented environmental practice of GO, also referred to as product stewardship, is concerned with reducing environmental burden with less use of hazardous and nonrenewable materials in products development, considering the environmental impact in product design, packaging, and material used Snir, (2001). Specifically, it promotes recycling and reuse of product components with eco-design, and us in green cycle parts and packaging Lamming and Hampson, (1996); Reinhardt, (1998). Product stewardship of electronics manufacturers considers the environmental impact of products and their packaging from raw materials acquisition to end-of-life product disposal Dechant and Altman, (1994). Such practice is geared towards reducing the environmental damage arising from all product-related parts and components Christina W.Y.Wong.,et.al. (2012).

## IV. SUMMARY AND OUTLOOK

This paper discussed about the green manufacturing, the paper try to impart the attention of the researcher to use green manufacturing i.e. green technology for the environmental development. The paper described the use of green manufacturing its application and even the methods of green manufacturing. The sustainable energy is the better option for our daily and industrial uses the application of sustainable energy even for manufacturing. The green operations GO also mentioned in the paper which explained the environmental management concept and its tools. The green supply chain is very useful tools as it improves green image and competitive advantage; it increases the performance in industry. Future collaborative research efforts will focus on including a broader variety of quantifiable green strategies within the factory, e.g., lighting, HVAC, or pressurized air consumption, and identifying a means of involving fixed costs in the decision-making process.

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