## COVER PAGE AND DECLARATION

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**Introduction:**

The dedication and skill of our highly trained manufacturing crew and engineers are crucial to the company's success. The process results in products that live up to the expectations of our customers.

The main goals of manufacturing and product stewardship are to educate employees and lessen any negative impacts on the environment and public safety throughout use and disposal.

Big Green Tractor, a maker of tractors, is one of Indonesia's most well-known companies. Given the significant growth decline Big Green Tractor has had over the last several years, our efforts to streamline processes are imperative.

Big Green's long-term viability and profitability rely on reassessing production tactics in order to boost productivity while reducing waste. Ergonomic handling techniques and automated diagnostic testing apparatus are used on a unique assembly line that seeks to provide the greatest degree of quality and dependability.

The job of the site operations manager is to oversee the chemical industry's highest standards of reliability and quality, which are backed by wash and robotic paint systems, ergonomic handling systems, computerized diagnostic testing equipment, and environmental experts.

In order to address the problems and challenges that are now in place, this article will provide a number of solutions, such as methods to concentrate on cost-effective manufacturing processes and different techniques and tactics to lessen production errors.

This article also discusses industry regulations for the disposal of chemical waste and environmentally friendly production methods.

## Operational industrial streamline procedural guide for Big Green Tractor

### Cost-efficient manufacturing process

there are two methods for determining how cost-effective a project is.

Because there is no upper limit on the amount of money that may be saved, firms are free to continuously increase their productivity.

Businesses analyses cost-efficiency by carefully observing the ratio of product generated to costs. This is how to accomplish something or do something better while saving money.

As a business expands and changes, making cost-effective choices becomes even more important to its success.

Given the recent halt in growth, Big Green Tractor is working to increase its efficiency and simplify its procedures. We will thus need a procedure. High-tech components or those requiring greater manufacturing precisions may be imported from more developed nations in order to better generate value, such as by sharing certain firms. We provide space for novel ideas and developments by raising the value of components like electrohydraulic valves and fuel injectors.

A must a skilled accountant has been employed by Big Green Tractor to assist us in creating two lists: one detailing all the expenses associated with the project or choice and the other stating all the advantages, direct costs, and indirect costs that are associated. The two lists will then be quantitatively compared to see whether the advantages exceed the disadvantages.

Strictly concentrating on cost savings is incorrect. Cost-effectiveness must be integrated into the

company's core principles. It will be easier to provide value for our customers if we are aware of the costs associated with our strategy and operations.

Increase sales and profits while using fewer resources.

**Manufacturing Automation:**

By employing machines to do the work that would otherwise need to be done by humans, automation helps. An electromechanical system like Big Green Tractor's may be configured to do many activities, such as manufacturing and assembly lines. Production capacity may be increased while expenses are cut to improve efficiency. Manufacturers may be better able to predict lead times and deliver more accurate timetables if they have access to real-time data. The need for replacement or repair of equipment may also be determined by monitoring its performance.

**Renewable energy:**

Electricity is the main energy source utilized in the manufacturing of parts and assemblies. Increases in power prices have an effect on both the economy and the environment. By using renewable energy, companies may reduce the strain on their power infrastructures. Long-term renewable energy sources may be advantageous to the leading tractor firms in a variety of ways. Tractor firms may improve their standing with consumers by using sustainable energy sources and taking the initiative to lead the industry**.**

**Cloud Technology:**

Cloud computing is the process of storing and sending data to and from distant computers through the internet. It is now possible to reform both corporate structures and the production process thanks to new technology. Manufacturers may now add their innovation and flexibility

to supply chain business models thanks to the cloud. The great majority of industrial organizations are quickly moving their data storage, analytics, and intelligence to the cloud. Product development, workforce training, data analytics, and product research, design, and development are all impacted by cloud computing. The manufacturing process at GREEN TRACTOR will be aided by cloud computing, which will also enable them to manage their business more strategically.

How they are made, assembled, and used by clients.

**Reduction in material cost:**

The second biggest expenditure for a manufacturing business, after cutting labor expenses, is often the wages provided to factory employees. I hope that labor cost reduction won't result in wage employees losing their jobs, but we can increase their productivity by developing their skills. To learn new skills, existing employees should have access to a training coder. As a result, attempts are being made to cut down on the number of procedures needed to complete a product. Reduce the time required to complete each step of the process as well.

The reasonableness of lowering the cost of the materials is one justification. Big Green Tractor may be able to reduce the cost of raw materials in a variety of ways, for as by negotiating with several suppliers and comparing them side by side, as in a procurement process. Big Green Tractor Company could be aware of these guidelines. The only way to reverse the current trend of falling growth is to constantly evaluate what we are doing.

Purchasing in bulk helps lower input prices for goods like aluminum, steel, and microchips when market values fluctuate greatly over short time periods.

**B.Plans to minimize defects throughout the manufacturing process**

Heavy-duty tractor production involves a variety of inputs, including machinery, externally

obtained parts, and raw materials. Different products' quality might vary greatly.

There are two ways to cut down on mistakes. Prior to the commencement of the manufacturing process, issues must first be resolved. Another approach is also available to reduce production-related mistakes. If your product has a lot of problems, it might cost you money and ruin your reputation.

Since the manufacturing process must be stopped in order to remedy the product flaws, this will take some time.

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The standards of craftsmanship and flaws unique to their line of work are among the subjects covered in employee education. Examining labor guidelines, production equipment, environmental controls, and defining standards for acceptable input output. It is possible to conclude that not all of the procedures used to create tractors can be automated. There are fewer mistakes made as a result of training and growth.

This accreditation gives us greater confidence in the supplier's ability to produce and manage quality. Audits of the supplies made available by suppliers and vendors may help to reduce the number of mistakes made during the building of the Big Green Tractor. Replacement parts and other materials may be tested using this technique. Find out whether there will be any issues if purchased supplies are used to operate tractors after they have been sold.

- using computer modelling and IT services to find and correct product defects early in the manufacturing process.

One strategy to prevent future manufacturing problems is to include manufacturing engineers in the product design process. The business could benefit from time and money savings from this.

-choosing whether to outsource or carry out production-related jobs domestically. It is sometimes

required to implement a new manufacturing method in order to improve product quality and reduce flaws.

-Taking care of and replacing obsolete machinery and equipment that constantly needs maintenance.

Make sure you never give up trying to eliminate product flaws since you could become used to some of them.

Working together might significantly reduce mistakes, and regular communication between engineers and designers could increase output. It's easy to see how techniques like organizing meetings and inspecting produced tractors may be quite helpful in spotting and resolving problems as they occur.

It is essential to create a system that monitors the modifications and ensures that the rate of product failures remains below a certain level. - \s-

Performance may be enhanced by identifying and implementing solutions to problems. For instance, employing technologies like Six Sigma, ISO 9000, Total Quality Management, and the 5 "S" Methodology, manufacturers may lower the number of mistakes in their manufacturing process.

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Create a brainstorming group to come up with answers and embrace the viewpoint that all options should be considered before creating a strategy to eliminate product faults throughout the manufacturing process.

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Keep track of all production alterations and the results to properly evaluate the strategy.

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If you want to create a high-quality product, you must collaborate with vendors that use premium materials and components. But often, these problems aren't discovered until after the product has been made and is being subjected to quality control checks. Prioritizing QC checks is crucial since defects are an inevitable part of large production. A specialized division must be established to ensure the manufacturing of high-quality tractors. Tractors may be inspected by a human or a robot.

SOPs and standards must be adhered to for the company's production process to function properly.

**C. Use of 21st century tools to create a greener process**

Indonesia's expanding informal sector over the last 10 years has had a negative impact on the environment and resource sustainability of the Asia-Pacific region.

A Green Industry is now being built by the Indonesian Ministry of Industry. The Green Industry Authorization Committee (GIAC) and the Green Industry Certification Body (GICB) (GIAC). A green industry certificate and authorization to use the green industry emblem will be provided to industrial enterprises who meet the GIS assessment requirements.

**The Process Mass Intensity Calculator (PMI)**

reduces the quantity of raw resources needed in production. This equipment is very effective at calculating the amount of material needed to complete the task when producing goods in production zones.

It is essential to assess the greenness of reaction components required for each phase in order to build a complete green-by-design process. It could be possible to reduce hazardous waste and energy usage by buying less material overall. The 21st century has witnessed the emergence of several new technologies and approaches that may help Big Green Tractor in establishing more environmentally friendly operations because of the demand for materials like tractor replacement

parts and other things. Research must be done at every stage of a product's life cycle, and operational management must consider "the planet." Currently, a significant transformation has to be made in both the management of natural resources and business administration in general.

Production that falls under the broad category of "GREEN" is ethical, ecologically conscious, organic, and fair-trade. These ideas were developed for a specific industrial procedure. Businesses that care about the environment and are dedicated to preserving the world's ecosystems and natural resources are proliferating.

Reducing the output needs for energy, pollutants, and trash from the product. Low-emission diesel automobiles and hybrid petrol electric cars are two examples of products that have undergone design modifications and the application of new technologies in order to reduce emissions. In order to do this, they must guarantee that their goods are properly recycled and disposed of when their useful lives have ended. To shorten the time it takes to dismantle a vehicle, manufacturers are altering their products to make them easier to disassemble.

A growing number of companies are using green supply chain management (GSCM) to enhance their environmental performance.

For instance, industrial cohabitation enables the development of an eco-industrial network, which expands synergistic possibilities. For instance, recycling mixed paper, mixed plastic, and organic waste and employing the recovered materials in industrial production may cut CO2 emissions by roughly 69 kt.

The Big Green Tractor is developing a ground-breaking idea and technique for lessening a produced good's energy footprint. The turning process was modelled and optimized to lower the cost of energy**.**

**Reagent guides and solvent selection tools:** Green industrial practices might be implemented

with Big Green Tractor. In order to develop a numerical ranking system, three criteria from each of the three EHS categories are used. Greener solvents provide lower test results.

The net cumulative energy demand (CED) of solvent production may be evaluated by looking at the energy needed to make a solvent and the choices available to recover part of that energy at the end of its life. It could be required to balance the demand for resources or recycle the solvent in order to adhere to energy regulations. The manufacture of a comparable volume of fresh solvent requires more energy than incineration, which also involves the distillation-based cleaning of spent solvent. If the research and development department has access to reagent guides and solvent selection tools, they may assess the toxicity of various chemicals used in the production of tractors, such as paints and acid. You may use the output of this equipment to help you restrict your chemical options by studying it.

**Develop a socially responsible operational guide for the Big Green Tractor for their Pollutants**

Big Green Tractor's strategic managers are in charge of sustaining a variety of industry norms and procedures.

**a. Industrial standards on disposal of chemical waste**:

**Used oil standards**

Generators are now required to follow the basic rules for spent oil storage. Recycling used oil is governed by RCRA regulations. Only tanks and containers in excellent condition without leaks, structural damage, or deterioration should be used to store used oil cans. Both refined crude oil and synthetic oil that has been tainted by physical or chemical impurities must meet

the same requirements. Used oil must be properly marked with the term "Used Oil" on aboveground tanks, containers, and fill pipelines in order to prevent contamination. To move old oil into underground storage tanks, these equipment are all utilized.

errors with used oil or hazardous trash The research claims that Indonesia's government has built a number of landfills where chemicals and other products produced by businesses may be kept and used in the future with just minor adjustments..

- **Monitoring Product Metrics**

The benefits of a multi-media approach to emissions control for environmental management have been shown by the chemical industry (Solomon, 1993). This method has nothing to do with the need to measure emissions using a particular medium. Rather from being used as the finished product, commodity and specialty chemicals are often used as ingredients in other goods. Chemicals that create CO2 are projected to be of major interest to researchers in the future because to the Kyoto Protocol's emphasis on energy usage and possible economic disincentives for continuing to manufacture CO2. The chemical industry monitors environmental performance using energy efficiency. The Big Green Tractor must track and report carbon dioxide (CO2) emissions since they have an immediate impact on energy efficiency.

**Sustainability**

Utilizing sustainable energy sources, recycling garbage, and recycling content are essential. Other process inputs are employed, as well as renewable raw materials that may be recycled after usage.

Before recycling a particular chemical, the government may need to issue special authorization based on the recycling requirements and processes. The health and safety of

workers and contractors within the organization are also in danger if rigorous requirements are not followed. The Big Green Tractor, maybe

Anything involving the environmentally friendly disposal of used chemicals. Big Green Tractor may save money on future purchases of the same chemicals if recycling processes are implemented.

. **b. Green alternatives to traditional manufacturing process.**

Big Green Tractor provides environmentally friendly substitutes for traditional industrial practices. In the tractor sector, the usage of bio plastics is expanding. Composites made of synthetic and natural fibers the strength of polymers and plastics may be increased by the use of composite mixing. The composite material "fibre glass," which combines glass fibre with a polymer, is the most well-known. Bio-composites are plastics or polymers that include sustainable fibers in their composition.

Measurement and Analysis of Biodegradable Materials Biodegradation of Plastics Bio-PA, or polyamides from biological sources, are thermoplastic polymers with a number of advantageous physical and chemical characteristics that are employed in engineering. Utilizing biodegradable materials throughout the manufacturing process may be a priority for Big Green Tractor.

- Split Examples of EGTs include products and services that deal with energy, water, the environment, and pollution. Use seawater desalination as an alternative supply of water for industry. Geothermal, wind, and solar energy are examples of sources of green energy. Due to worldwide government initiatives, Indonesia presently has an excess of green energy. The company's production facility can utilize renewable energy sources more efficiently as a result.
- HVAC these systems are used to purify the air within buildings so that it is safe for people to breathe while also cooling and heating homes and offices. HVAC,

Which Big Green Tractor might improve the production process? Alternative form: Circulating or renewing the air in a particular place is what HVAC entails. This allows you to regulate the temperature and humidity levels and improve the quality of the air within your home. This includes getting rid of dampness and other irritants like smoke and smells. In order to account for unforeseen changes in process pressure, fluid characteristics, waste, or byproducts, improvements to production facilities are made. Productivity and profitability may be increased by integrating technical advancements into business strategy and preserving technological alignment with industrial processes. The manufacturing facility may be changed as a result of integrated enterprise resource planning (ERP) technology, allowing Big Green Tractor to reduce emissions by using less energy.

**Conclusion:**

Modern manufacturing organizations have been compelled to embrace new, cutting-edge production models by more intense competition. Businesses nowadays are compelled to provide more ecologically friendly goods. Decisions must be taken at the stages of design, manufacturing, and supply chain management in order to adopt green industrial processes.

Flexibility and long-term viability are often used by the business sector nowadays as success indicators.

According to LASHERAS, "What may be taken from the transmission network for consumption at a certain time and place depends on how much energy is being produced, transmitted, and used concurrently at the various nodes of that network. The network as a whole is affected by energy consumption or integration, which may alter the system's ability to meet the needs of its many locations."

Operations research at BIG GREEN TRACTOR relies heavily on sustainability analysis due to the complexity, difficulty, and risk involved in decision-making. Choosing the proper course of action might have a significant influence on the profitability and competitiveness of the company. Big Green Tractor is attempting to streamline operations and reduce operating costs.

As a result of the introduction of basic environmental rules in 1988, several companies have developed a corporate culture of environmental protection. In order to improve the use of current measurements in production, industrial operations have worked hard to integrate metrics into decision-making. BIG GREEN TRACTORS prioritizes reducing production errors.

Manufacturing flaws may be decreased in a number of ways.

Continuous development could result from identifying and fixing issues as soon as is viable and as near to the original location as is feasible.

We may make use of these and other technologies to help Big Green Tractor implement more environmentally friendly practices, including measuring product metrics, sustainability, and recycling, utilizing techniques like KAIZEN, LEAN, Six Sigma, and QFD. Purchasing energy-efficient equipment, electrifying, and lowering carbon dioxide emissions are just a few of the CSR initiatives included in this report. Additionally, a number of industry regulations and standards might be considered. An industrial energy auditor or a strategic energy manager may give you a tour of the site and point out potential areas for energy savings. As a result, the Big Green Tractor group may research alternatives for green production.

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