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Introduction

EcoNovaTech, an engineering company focused on growing sustainable technologies faces challenges in leadership and their executive team have requested a strategic management report to highlight strategic issues within the company.

1 – Strategic Management Issues

EcoNovaTech faces the issue of the market being competitive in the sense of the green sector of technology becoming highly competitive, as many companies around the world are being driven to focus on renewable green technology and sustainability. To expand globally, EcoNovaTech first need to identify their competition and identify what advantages they have to become more renowned than its competition. Its competitors may include Siemens and TEKEVER. TEKEVER is partnering with other companies around the globe which gives them an advantage (TEKEVER, n.d.). EcoNovaTech should consider doing the same thing.

EcoNovaTech faces competitive pressures from global companies entering the green and sustainable market. The company must continue to invest in its R&D department to give them more leverage and focus on innovation. Companies like Siemens for example are already recognised globally and have established supply chains and a good number of financial resources. Due to these, it can give companies like this a leverage over EcoNovaTech, because as a medium sized company, it will have less resources to be able to create a product that that's more cost effective than its competitors.

Globalisation offers EcoNovaTech growth capabilities however it also exposes challenges to the company. The company needs to ensure their international supplies comply with eco-friendly practices, which does add complexity, but its reputation will be maintained. As the company specialises in solar power, wind turbines, sustainable machinery and recycling solutions, the company needs to ensure these products are designed for long-term sustainability.

Mission, Vision and Goals:

EcoNovaTech's mission can align with strategic direction in the context of sustainability and growth by defining the purpose of the company. The case study states that "*EcoNovaTech Engineering is committed to providing cutting-edge sustainable technology solutions to reduce carbon footprints, enhance energy efficiency, and create long-term value for customers, employees, and the planet.*" This aligns with the company's goal to carbon neutral by 2030.

The company's goal "*to be a global leader in sustainable engineering, driving innovation for a greener future*" aligns with its goal in sustainability and growth in order to expand into Europe and North America and also investing £10 million in R&D in 2023 to develop zero-emission machinery and advanced recycling technologies.

Their other goals, such as reducing supply chain emissions by 40% by 2028, developing eco-friendly machinery and renewable energy products and reducing waste also align with sustainability and growth.

The SWOT analysis below assesses EcoNovaTech's internal and external environment:

Table 1 - SWOT Analysis

Strengths	Weaknesses	Opportunities	Threats
• Prime focus on stability • £60 million in revenue with an annual 12% growth rate • Increased demand for renewable energy • £10 million invested in R&D • Prime focus on sustainable technologies	• Underdeveloped leadership • Lack of workforce diversity • Highly dependent on UK market	• Global expansion • Rise in demand for renewable technologies • Government support for renewable and sustainable technologies • Partnership opportunities	• Increasing competition in the green sector • Global supply chain disruptions • Economic uncertainty • Technological disruptions (advancements in technology by other companies)

2 – Legal Requirements and Ethical Considerations

There are legal regulations that may affect EcoNovaTech. These include health and safety, Intellectual property rights, product liability and contract management:

Health and Safety – the company needs to acknowledge and comply with the UK Health and Safety at Work Act to ensure employees and work practices are made safe. The company must also consider the health and safety practices for countries they look to expand into ensuring work that is done in these countries have ethical and robust health and safety control.

Intellectual Property Rights – This is important, especially for the company's R&D investments, which need to be safeguarded in order to protect their technology and renewable energy systems. Patents should be considered to prevent competitors from replacing their innovations. Purolite, a company that focuses on creating resin has patented their jetting process to protect their operations from being copied (Purolite, n.d.).

Product Liability – Liabilities can arise from defects, such as, design defects, manufacturing defects and marketing defects. EcoNovaTech must ensure their products meet the relevant certification requirements 1987 Consumer Protection Act (CPA) and the 2005 General Product Safety Regulations (GPSR) (Pinsent Masons, 2023).

Contract Management – Supply chain contractor management is essential to minimising risks with delays and quality issues. As EcoNovaTech has a variety of clients, when the company expands into new markets, effective customer contract management with customers will ensure an efficient supply chain process and risks are managed. (Townsend, 2022) talks more in depth about the importance of contract management.

(IET, 2024) also discusses ethical issues that relate to EcoNovaTech.

There are also ethical dilemmas relating to engineering operations. They are as follows:

Leadership and Team Management – The company has seen a quick growth, but its leadership is underdeveloped. If managers fail to promote inclusivity or support their teams, it can result in workplace inequalities and violate the company's commitment to inclusivity, which will hence affect engineering operations.

Corporate Social Responsibility (CSR) – The 3 P's can be analysed to understand EcoNovaTech's commitment to CSR and its ethical dilemmas.

People – The company shows they have commitment to positively impacting society by "*engaging in local community projects, invests in clean energy educational programs, and sponsors local environmental activities*". Due to expanding across different countries, the attention to engage with local communities can be less prioritised.

Profit – Due to the competitive market, the company could face an issue of compromising its environmental standards to save costs, such as using cheaper less eco-friendly materials, which could violate the company's commitment to sustainability but have increased profit.

Planet – EcoNovaTech has a goal to be carbon neutral by 2030. An ethical dilemma that relates to this is the company's suppliers. Countries with less environmental regulations may not adhere to environmental practices which can impact EcoNovaTech's sustainability goal. Choosing different suppliers could result in delays but will ensure sustainability goals are met.

(Mallaby, 2023) discusses the 3Ps of CSR more in depth which EcoNovaTech can consider.

3 - Total Quality Management (TQM) and Lean Management

TQM:

In terms of engineering operations, TQM provides a systematic approach to the quality of products, process and services across an organisation. TQM focuses on various principles. They are as follows:

The Customer - The goal is to meet customer expectations by delivering high quality products consistently and understanding the customer needs and expectations, along with managing customer relationships.

Employee Commitment - TQM also ensures every employee from top managers to frontline workers play a role in quality improvement.

Process Approach - TQM also provides a process approach to ensure correct steps are taken to ensure production deadlines are met consistently by measuring activities to find room for improvement, using visual action plans for employees to see and act on and using process flow charts to delegate tasks to specific employees.

Continual Improvement - TQM also promotes continual improvement, such as searching for methods to improve processes and providing training sessions for employees.

Data Driven Decision Making – This involves using data to drive decisions for the better, which includes ensuring data is accurate and reliable, provide this data to stakeholders and using reliable methods to gather the data.

(Lucidchart, 2024)

Lean:

Lean manufacturing was first introduced by Toyota in order to eliminate waste and operate more efficiently. Lean manufacturing aims to maximise value for the customer by minimising nonvalue added activities and is centred around improving efficiency, reducing costs and enhancing workflow. Some of these principles are:

Just In Time (JIT) – This involves manufacturing products as per demand instead of using forecasts to predict sales.

Flow – Lean aims to improve the flow by reducing delays and minimising interruptions.

Value – Lean defines value from the customer's perspective which includes any activity or product feature that directly benefits the customer.

(Gomez, 2019)

How EcoNovaTech can apply TQM and lean improve efficiency and reduce waste:

EcoNovaTech has identified supplier variability and lead times, which means that JIT manufacturing could be applied by ensuring raw materials are available as required without overstocking, which will reduce inventory costs.

Work can be standardised by documenting best methods for manufacturing which will ensure tasks are completed efficiently and consistently.

Due to supply chain disruptions, EcoNovaTech should apply lean principles to build stronger supplier relationships by closely collaborating with suppliers.

The company should also invest in its employees with lean and TQM for its workforce, especially as they are experiencing leadership problems. This will help encourage employees to identify inefficiencies in its processes.

Methods such as Statistical Process Control and Pareto Analysis can be implemented to identify the most significant sources of inefficiencies and defects, such as focusing on the top 20% of suppliers contributing to 80% quality issues and delays can help reduce supply chain issues.

4 – Quality and Lean Improvement Tools

There are various tools that EcoNovaTech can use to improve and monitor their quality and operational performance. One of these tools is Statistical Process Control (SPC). This involves using instrumentation and machinery to measure product data in order to provide continuous quality improvement. Performance can be monitored live, and an engineer or operator can trend the data to monitor its performance and make decisions based on this to improve the quality of the product (Quality-One, n.d.).

EcoNovaTech focuses on high quality and sustainable engineering. The SPC tool would be an effective choice for the company to use in order to improve their quality and operational performance. To implement SPC, EcoNovaTech should do the following:

Implement Data Collection tools – Data logging tools can be used to extract data from machinery and automated systems which can be used on charts. Technologists, engineers or operators will then be able to monitor system data and make decisions on where to improve quality.

Train Employees – Quality teams would require training to be able to interpret control charts and make decisions based on this. They would also require training on how to set the charts up. Engineers would need to be trained on getting data to the control chart. For example, getting the data from a sensor eventually to the data logger.

Statistical process charts should be used to monitor defects. Over three months, EcoNovaTech recorded defect rates in batches from a key supplier. The SPC chart below shows the defect rates per batch:

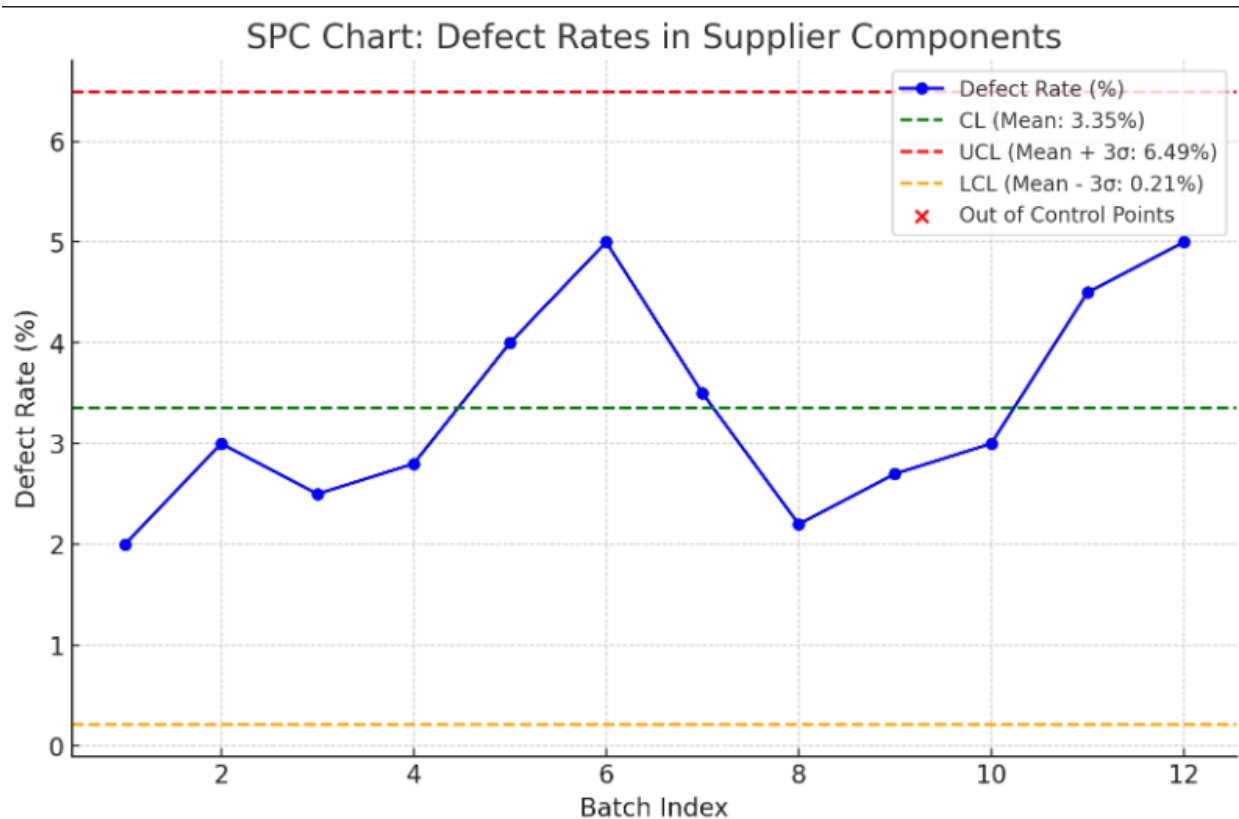


Figure 1 - Statistical Process Chart

The following have been calculated from the SPC chart above:

Central Line (CL): 3.35% (mean defect rate).

Upper Control Limit (UCL): 6.49% (CL + 3 standard deviations).

Lower Control Limit (LCL): 0.21% (CL - 3 standard deviations).

When analysing the graph, it is evident that that batch 6 and 12 were close to the UCL. From batch 8 onwards, it appears that the defect rate percentage is on a continuous rise, which means action must be taken to lower its percentage. No defect rates fall below the LCL (0.21%). However, the highest defect rates (5%) approach but do not exceed the UCL. To reduce the defect rate, EcoNovaTech can request suppliers to implement shipment inspections, standardise and make more of their production automated.

5 - Sustainability and Supply Chain Management

In terms of sustainability, EcoNovaTech should consider its economic, social and environmental impacts of its operations and implement sustainable solutions.

Environment – As EcoNovaTech has a goal of being carbon neutral by 2030 and the company needs to implement sustainable solutions in order to achieve this goal. The company can increase the use of renewable energy in its operations and invest in renewable systems. Tesla powers their facilities using solar panels and Ikea and Apple run their facilities on 100% renewable energy (Eco Hedge, 2023).

EcoNovaTech should consider using their own solar panels to power their facilities.

Economic - EcoNovaTech's high R&D budget can be used to focus on developing sustainable technologies. Using innovations like high-efficiency solar cells and low-emission machinery, the company can maintain a competitive advantage while also supporting its sustainability mission.

Social – The company must ensure its suppliers adhere to regulations and standards. Auditing suppliers and aligning them with the company's standards will reduce risks to EcoNovaTech's reputation. The company should also continue to be involved with local partnerships. They can provide STEM programs to institutions which can benefit the company's reputation.

EcoNovaTech also has ongoing supply chain issues. There are many that have been identified, which can be seen below:

- Inconsistent supplier quality, contributing to defects, which increases waste, production downtime and rework time.
- High dependence on global suppliers, which exposes the company to geopolitical risks, fluctuations in currency which can lead to material shortages and inflated costs.
- Sustainability challenges, which involves ensuring suppliers align with the company's eco-friendly goals. Unsustainable practices by suppliers could lower EcoNovaTech's credibility with achieving its carbon neutral goal.

There are solutions to these problems which EcoNovaTech should consider in order to reduce their supply chain issues. They are as follows:

- Collaborate with different suppliers, which reduces the reliance on single suppliers. The company should also consider including local suppliers, which reduces global transportation risks.
- Partner with eco-friendly suppliers, which will position EcoNovaTech with a high reputation for environmental practices.
- Implement a Just-In-Time (JIT) system to reduce storage and waste costs to enhance operational efficiency.

6 - Leadership Development and Team Management

Key leadership challenges have also risen due to the company's energy efficient cooling system project which has produced leadership challenges across different teams, this includes:

R&D Team - Dedicated to driving innovation, but progress is slowed by setbacks in testing.

Manufacturing Team - Resisting the adoption of expensive eco-friendly materials due to concerns over profit margins.

Sales Team - Facing challenges in aligning client expectations with delivery schedules.

Leadership Challenge - Poor communication between teams has led to issues, contributing to declining employee morale.

These challenges may have arisen due to lack of team building programs, management training programs and lack of skills development courses.

There are leadership practices that can encourage ethical decision-making and support continuous professional development. They are as follows:

- Establish leadership training to mid-level managers focusing on conflict resolution and critical and strategic thinking. This can empower mid-level managers to take on more responsibilities.
- Implement team building programs across all departments. Such as hosting a company-wide town hall to reinforce the vision of creating a sustainable product. This will improve collaboration and promote team engagement.
- Setting reasonable targets for every team, which will give the employees a deadline to work towards, which will improve performance.

With these suggestions, EcoNovaTech will gain effective leadership, and their R&D team can agree on a cost-effective compromise. Sales will meet delivery estimates with confidence and employee morale will be improved.

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