



# STT EMTEC

Sweden, [www.sttemtec.com](http://www.sttemtec.com)

A mature high-tech Swedish manufacturing firm partnered with a major customer/distributor to adapt the SME's flagship technology for application in a new market. This open innovation collaboration gave the struggling company a new lease of life and staved off certain bankruptcy

## Executive Summary

This case is about a mature high-tech manufacturing firm, STT, whose traditional market disappears. To survive the company had to find a new market niche. The market opportunity was identified by a large Swedish customer and distributor. The project involved adapting STT's system for emission control –originally developed for the automotive industry –for applications in shipping. The company was forced to reduce its workforce and all other business except for this new product. The company would not have survived without the project. STT now has an opportunity to grow and has learned to collaborate in further projects.

### CASE N°: SC46

SECTOR: ENGINE TECHNOLOGY

TECH INTENSITY: HIGH-TECH

LIFE CYCLE STAGE: RENEWAL

INNOVATION VECTORS: PRODUCT, CUSTOMERS & MARKETING

01 PARTNERS: LARGE CORPORATION, LEAD CUSTOMERS/USERS

KEYWORDS: Customer collaboration, confidentiality, change in market, new market niche, survival

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- INNOVATION CHALLENGE & MARKET OPPORTUNITIES
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- BUSINESS IMPACT
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# BACKGROUND

The company– Swedish Turbo Technology, STT – was established in 1981 by Ingmar Eriksson as a family business. Over the years their operations focused on systems to enhance emission control and performance. Until the late 1990s, the company had between 5–15 employees, a figure that varied over the years. In the late 1990s, the company developed an innovative product, DNOx, for nitrogen oxide reduction. This changed the focus of the company, and in 2000 it changed its name to STT Emtec and completed an IPO. For a short period, the company had around 50 employees, a figure that today (after changes mainly in the automotive market) has fallen to 20.

STT has always been a technology-driven company and will continue to be so. However, in the future, the company intends to focus more on products where it has an opportunity to grow. It is important for STT to pay more attention to commercialization and revenue, and to some degree lower the costs of R&D and innovation. This means that in the future fewer resources will be spent on innovation, although this will continue to be the company's backbone.

## INNOVATION CHALLENGE & MARKET OPPORTUNITIES

STT Emtec had worked with diesel engine exhausts for applications in the automotive industry (buses, trucks, cars, etc.). Its main markets were in Asia and the US. At the time of the project they experienced a decline in the market. Since the company was not an OEM (manufacturer of the final engine) it found that it was increasingly being squeezed out as the vehicle manufacturers themselves took over more and more of the technology for emission control. They knew that the maritime market for emission control was less developed than the automotive market, and realized that it could represent a new business for them. The project they engaged in involved adapting their system for applications in shipping.

The market opportunity was identified by a large Swedish manufacturer of marine diesel engines. They were involved in some pilot projects with biodiesel, in collaboration with a ferry boat customer. STT wanted to promote itself and acquire the marine diesel manufacturer as a customer.

When the latter's ferry boat customer asked them to include emission control in their agreement, in line with future regulatory requirements, the diesel engine manufacturer contacted STT (who they already knew). They had an urgent need for a supplier and were keen to push the project. When the project was completed STT used the engine manufacturer as its main distributor. Today this role has changed and the company is one of several distributors – "one of a crowd."

## OPEN INNOVATION TRAJECTORY

### Concept development

There were a number of different anti-pollution techniques that could be used for the purpose of the project. There was an important choice to be made and several different concepts were discussed. Finally, the partners selected the SCR (Selective Catalytic Reduction) technology that the company already had experience with. Because of their previous experience and knowledge, this was not a difficult choice.

### The development process, IPR and competition strategy

The diesel engine manufacturer contacted STT when their customer wanted help to clean up their exhaust emissions in line with future legal requirements. In 2009 STT and the manufacturer were awarded a Vinnova grant (national Swedish funding agency for innovation) to "Adapt a system to reduce NOx from automotive to marine applications".

Existing SCR systems on the market for marine applications are typically geared to very large motors and are of an industrial type. The purpose of the project was to develop a SCR system adapted to smaller ships and ships that typically have several diesel engines for propulsion of between 300 and 750 kw in size. For these applications, the existing industrial installations were both space-consuming and expensive. The purpose of the project was therefore to develop SCR systems for such applications based on technology used for vehicles, thus providing a compact and cost-effective system.

The challenge was to take technology from the automotive and truck industry and to adapt it to the marine/ship industry. The truck industry is characterized by mass production and customized modular systems, which is not the case in the

marine sector. In this niche of the sector, all ships are more or less unique. There are, for example, great differences when it comes to installation and proper testing. Scale formation is a typical challenge in the marine sector, something that is not the case in the automotive industry. Developing a product for the marine industry therefore required a genuine development and adaption of the technology.

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This first project (additional projects followed later) was completed in 2010 and the diesel engine manufacturer introduced the SCR technology in its marine engines. In a press release at the time, it said, "The system uses Selective Catalytic Reduction (SCR) technology and is intended for passenger ferries in city harbours and on river waterways, government vessels like pilot and patrol boats, workboats and harbor tugs and other applications where emission demands are stringent. The marine SCR system can be fitted to all of our marine diesels and provides up to a 90% reduction of NOx emissions.

The launch of the marine SCR product was a direct result of STT Emtec's knowledge of NOx reduction technologies in the automotive sector which was tailored to the specific needs of coastal workboats, ships and offshore vessels. The system comprises a sophisticated control system, a urea tank, a urea pump with an injection module as well as a catalyst. The system was extensively tested on board a passenger ferry which operates in the Archipelago of Stockholm, one of Sweden's most beautiful, but also most populated and sensitive coastal areas. The complete SCR system was sold and serviced through authorized marine centers and distributors of the diesel engine manufacturer.

After 2010, STT continued to develop the concept, which has also changed over time. Much focus was put on how to bring down the cost of the customized products. To reduce costs for marine applications, it is necessary to use components that are mass produced, which mostly means for applications other than the marine sector. The first product which was manufactured as a result of the project was a system based on purchased components. Today STT uses to a large extent its own self-developed components in the product/system. A number of requirement specifications have also changed in the meantime.

The competition has much to do with niche markets. There is a great risk that manufacturers of marine engines will want to develop their own products in the future (just like what happened in the automotive industry). For example, in this open innovation project with the diesel engine manufacturer, STT found that their partner was very interested in getting information and learning more about STT's solutions. However, the large company was guarded when it came to protecting its own knowledge and was very confidential.

The risk that engine manufacturers will develop their own products is a great challenge for STT who really has to work hard to build strong relationships with them in order to create a long-term presence in market. If this fails, the company might not survive.

## **Commercialization and follow-up**

STT designs and produces everything themselves, but they buy components from both local and European suppliers (e.g. catalysts from Finland and electronics from Bosch). The collaboration with the Finnish catalyst company in particular has existed for a long time and the companies know each other well. These are important partnerships, although today they are more like traditional customer-supplier relationships with more standardized components.

The company had to let go of personnel. This was mainly caused by the changes in the automotive industry where STT's market disappeared. STT has had to abandon all other business activities except for the marine applications and some consulting. Today all activities are linked to the marine engine sector (products and consulting); without this new market niche the company would not have survived.

The marketing strategy of the company also underwent changes. Previously, STT worked on a global scale with partners and resellers. Earlier, the most important markets were in Asia, Malaysia, South Korea, Japan and North America. With the new business, the company's markets are to be found in northern Europe, especially Sweden and Norway. Because of this the company focuses more on direct marketing rather than having a number of distributors. For example, their partner diesel engine manufacturer used to be an important distributor, but now the sales volumes of this new product are too small.

Subsequently, STT also applied for additional funding for follow-up projects from the government agency Vin nova. This example demonstrates how important it is for STT to participate in and monitor what is happening in different research areas.

## BUSINESS IMPACT

One of the benefits of this project was that it has triggered other new ideas. STT has filed a number of new patent applications. Historically STT used to patent more than they do today, but now the company does not really have the resources, either to seek, maintain or protect patents.

This collaboration demonstrates how important it is for STT to participate in projects and monitor what is happening in different research areas. STT has started to participate in other open innovation projects, both with universities and other companies.

Had STT not participated in this project, the company would hardly have existed today. In terms of sales, the project represents about SEK 10 million (approximately €1 million). The goal, however, is to grow considerably more. It is estimated that STT can double in size. However, this opportunity will probably only exist until 2020/2021, after which it is more likely that engine manufacturers will have developed their own products. There are currently many regulatory changes going on in the sector.

## LESSONS LEARNED

This case is about a mature high-tech manufacturing firm, STT, whose traditional market disappears. To survive the company had to find a new market niche. The market opportunity was identified by a large Swedish customer and distributor. The project was about adapting STT's system for emission control, which was originally developed for the automotive industry, for applications in shipping.

STT experienced that their large collaboration partner was eager to obtain information from STT, but that they themselves were very confidential and unwilling to share. There is a potential risk that large customers like this want to integrate the component into their own products in future.

The company had to reduce its number of employees and all other business lines except for this new product. The company would not have survived without the project. STT now has an opportunity to grow and has learned to collaborate in further projects.

### Main lessons learned:

1. This case demonstrates how a mature SME manages to survive with the help of an open innovation project
2. The large collaboration customer in this project was eager to learn from the SME, but acted confidential and was unwilling to share their own information.
3. The case also demonstrates that the lessons from a successful open innovation project encouraged the SME to participate in future collaborative projects, both with other firms as well as public research organizations.