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Sweden: Volvo Penta, case study

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About

Case study name:

[The greening of industries in the EU](#)

Country:

Sweden

Organisation Size:

500+

Sectors:

Shipbuilding

Volvo Penta is the Swedish manufacturer of engines and power systems for industrial and marine applications. Its new inboard propulsion system (IPS), allowing up to 30% lower fuel consumption and 30% lower CO2 emissions, helped the company maintain a more or less stable number of jobs during the global financial crisis. This practice had an effect (by being highly technologically advanced) on the skills development of at least 100 of its 1400 employees (7.1%). The company collaborates with Swedish universities by taking interns and participating in joint research work to manage green change. The case study was carried out between October 2011 and March 2012.

Introduction

[Volvo Penta](#) is one of the world's leading suppliers of engines and complete power systems for marine and industrial applications, as well as stern drive and inboard drive systems. The origins of the company can be traced back to 1907, when the former foundry developed its famous first marine engine, called B1. The company has its offices in Gothenburg and manufacturing operations in various locations in Sweden, China, and the US. Volvo Penta employs about 1400 people (1100 of them white-collar, including 300 employees in the product development team) and 300 blue-collar workers).

The green business practice selected is the development of an [inboard propulsion system \(IPS\)](#) that allows up to 30% lower fuel consumption and 30% lower CO2 emissions, among other benefits. This invention is unique among other companies producing marine propulsion solutions, first because it uses a different alignment of propellers, and secondly through its extensive use of electronics for control. Both of these features contribute significantly to the lower energy consumption. The new product has had such a positive influence on the company's employment levels that it has mitigated the negative impact of the economic and financial downturn on demand for Volvo Penta's production. Impact on job quality has only been felt in skills development – the new skills mostly related to electronics that have been needed by the product developers. The product development department of the company also had to help the sales department adjust its working practices.

Drivers and motivations

While Volvo Penta sees environmental protection as one of its core values, the motivation to introduce green business practice has reportedly been related to emerging market opportunities. In the market of propulsion technology in general and marine propulsion in particular, there is strong competition between manufacturers on the energy efficiency of their products. More energy-efficient solutions are very advantageous for the customer and have much greater demand, thus contributing directly to the size of market share of certain manufacturers.

The regulations (particularly EU and US emission regulations) have also reportedly played a motivating role, but only to the extent that they affected the demand for greener propulsion solutions by pressuring the customers to use them. To satisfy the demand arising from various emission regulations in different parts of the world, Volvo Penta offers products certified by the USA's Environmental protection agency (EPA), the EU (non-road), the International Maritime Organisation (IMO), the Ministry of Construction in Japan, the Central Commission for Navigation on the Rhine and other organisations.

The cost of production of more energy-efficient propulsion solutions is higher, first of all because it requires more sophisticated electronics. The increased cost of production, however, did not discourage the adoption of this practice, as higher demand meant that it could be

compensated by the increased market price of the final product.

The economic and financial crisis actually encouraged the company to continue with development and marketing of the new system. It was (correctly) perceived as a potential means of avoiding significant losses in sales. The possibility of saving on fuel in the long term increased demand for the product, and currently a large share of sales consists of greener production.

Green business practices

The introduction of the practice followed the same key steps as other examples of product development and model change in the company. The incremental development process was based on significant amount of research carried out both internally and in collaboration with Swedish universities, innovation and testing, and was led by the product development team of the company. During tests it was discovered that reversion of propellers significantly contributes to fuel efficiency. This finding and the varied electronic solutions developed during the research process formed the main value-added aspect of the green business practice analysed in this case study.

The process of developing the product was also to some extent influenced by external actors. The desire expressed by customers for better manoeuvrability, fuel efficiency and other improvements directed the research work. It focused on optimising production for the most typical vessel driving behaviour. The final product was a new inboard propulsion system which delivered up to 30% less fuel consumption and 30% lower CO₂ emissions, as well as higher top speed, longer cruising range, lower noise level, better handling, and innovative joystick docking.

The new product brought new processes, technologies and activities to most stages of the company's functioning, including engineering, manufacturing, sales and marketing. New engineering solutions had to be developed to put the new solutions into practice, and manufacturers had to find a way to make a new type of product. Sales and marketing had to promote a new and unknown product. All these changes were, however, only to be expected from any type of technologically complex model change. No significant changes in any of these areas arose from the fact the technology was greener.

Anticipation and management of the impact of green change on quantity and quality of jobs

Impact on quantity of jobs

In the case of the new IPS system, the introduction of green technology had a positive impact on employment numbers in Volvo Penta. During the financial downturn, the total market demand for the products manufactured by Volvo Penta decreased because, for instance, there was a drop in demand for leisure items. While the total number of employees at Volvo Penta has decreased slightly, a much larger drop was prevented by the larger market share gained by a new product that offered energy efficiency and long-term savings for its users.

Of the roughly 300 persons working in product development, the jobs of at least 100 were transformed in different ways by the new transmission technology. The effects could also be felt among blue-collar workers who had to adapt to a very different technical concept. However, there is no estimate of the number of blue-collar workers affected.

There were no positions abandoned or substituted due to green change. The approach of the company is to encourage the progressive development of its people. It is routine for older practices to be abandoned, but the jobs are usually transformed. In practice, the company always keeps the number of employees more or less the same, only manoeuvres them so that the available skills base is used in the best manner possible.

Company representatives indicate that future needs for green jobs are very closely related to the success of greener products in the market. The products which are the most successful will receive the largest human resources. Of course, demand is highest for the products which are most beneficial to users in terms of energy consumption, so the general view towards the increase of green jobs is positive.

Impact on quality of jobs

Skills development

As mentioned in previous sections, the group of employees most affected were the product developers. Although their core set of skills (including substantial knowledge, and skills related to transmission and propulsion technologies, as well as the general environmental skills arising from Volvo Penta's environmental policy) remained the same, the IPS system was a completely new setup. This new technology in some senses required the acquisition of more new skills than other new products previously developed because it was more technologically advanced. A significant part of the environmental efficiency of the new product is created by the fact that it is electronically controlled and a lot of different features can be added to it. The electronics skills involved in the development of IPS were the most important that the product developers had to acquire and they were developed internally, mostly through informal transfers of knowledge among employees. The key issue in training employees in product development is that the people involved are highly innovative, and their skills are often developed through individual work, collaboration and innovation rather than through more traditional training frameworks.

The sales department also needed to know how to sell the new product to customers and to explain how to use it in the right way, as customer support is very important for maintaining the loyalty of customers and earning the trust of potential clients through word of mouth. The internal solution was that some of the engineers who worked on product development were assigned to the role of sales support, helping the customers use the products. They were also able to transfer these skills to employees directly employed as customer support staff.

The introduction of green technology did not have any effect on other dimensions of the job quality of related employees.

Collaborative approaches in anticipation and management of quality and quantity of jobs

To better manage the rising impact of the new processes in the company, including the implementation of green business practices, Volvo Penta employs a three-year strategic competence plan, summarising the most important skills from the overall company point of view. This plan mostly focuses on the existing competence gaps in the company. Its development begins with the strategy of the company and analysing the business plan. A grid of strategic competences is used, where one axis represents how difficult it is to recruit or rebuild certain skills if certain employees leave the organisation, while the other axis represents the strategic influence that a specific skill or competence has. The grid thus has four areas, and the company focuses mostly on these competences which are difficult to replace and have a large strategic

influence. In these selected areas of difficult replacement and large strategic importance, the quantity of skills needed is also forecasted. The form of the grid to be filled is provided below.

The product development section is considered to be particularly important for the company. It has its own separate strategic competence planning procedure, although it is constructed in the same way as for the rest of the company. However, it is usually very extensive since the section's employees tend to hold competences which are both hard to replace and important strategically.

As mentioned previously, Volvo Penta collaborates with a number of Swedish universities in their research work, including collaboration in transmissions technology, and provides internships for their students. Both the internships and research work collaboration also are significant opportunities to attract new employees to the company, especially in the most strategically important and difficult to replace positions related to product development.

Conclusions and recommendations

- The case study of Volvo Penta shows that green business practices may be very beneficial to companies financially if they include certain value-added aspects which are particularly attractive to customers. In the sector of propulsion technology, the energy efficiency of the products is one of the key selling characteristics. The development of a more energy-efficient product helped the company to partially overcome the negative effects of financial and economic crisis and to maintain relatively stable employment.
- Among highly skilled employees doing creative and innovative green jobs (for instance, those in the product development department), the formalised and especially external training plays a smaller role than among other employees. Instead, the individual work, collaboration with colleagues and sharing of experience is more important. The highly skilled employees could also be very effectively used in developing skills for other employees, as they did with the customer support staff at Volvo Penta.
- Strategic competence plans may be a very useful tool in anticipating and managing skills needs in greening companies, as they help to identify the skills which are most important and hard to replace in the company.
- In green practices involving high skills, the collaboration with other entities working in the field is useful. This provides both a valuable inflow of knowledge for the high skilled employees and an opportunity for the company to recruit new staff. The collaboration with universities is particularly important in this regard.

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