Multicriteria Decision Support Model for Selection of Fiberglass Suppliers:
A Case Study in a Wind Industry Company

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EXECUTIVE SUMMARY

This chapter presents a real case of a decision problem in supplier selection of one of the main raw materials of a wind blades industry. The study considered all currently qualified suppliers according to considerably rigorous standards and specifications and one in qualification process. It is a complex choice, given the strategic importance of the product and the multiplicity of criteria to be considered, both quantitative and qualitative. The strong competitiveness requires a special attention which concerns the supplier selection; not only the price matters; in fact, a day of stoppage due to failure in a delivery, for example, corresponds to high losses that would have justified the purchase from a supplier with a higher price but with no delivery failures. In order to contribute to the problem resolution, the methodologies PROMETHEE and AHP were applied, whose results allow the authors to stablish a ranking of the considered suppliers. The results will support the company on the selection of fiberglass suppliers and in some cases clarify where they can find the main trade-offs.

INTRODUCTION

The literature is unanimous with regard to the growing importance of the purchasing process and the consequent selection of suppliers, as is the case of (de Boer, Labro, & Morlacchi, 2001) when they mention that with the increasing significance of the purchasing function, purchasing decisions become more important. As organisations become more dependent on suppliers the direct and indirect consequences of poor decisions making become more severe.

According to (Izadikhah, 2012) cited by (Azadfallah, 2017), the success of a supply chain is highly dependent on selection of good suppliers.

On (Katsikeas & Leonidou, 1996) perspective, international supplier selection is a complex decision-making problem. The complexity stems from a multitude of quantitative and qualitative factors influencing supplier choices as well as the intrinsic difficulty of making numerous trade- offs among these factors.

According to (Monczka et al., 1998), cited by (Chen, Lin, & Huang, 2006), the supplier selection problem has become one of the most important issues for establishing an effective supply chain system. The overall objective of supplier selection process is to reduce purchase risk, maximize overall value to the purchaser, and build the closeness and long- term relationships between buyers and suppliers. In fact, on the company herewith studied the invitation to one supplier to start the qualification process came from a long term relationship supplying similar material.

The impacts of this choice, according to (Dias, 2015) may spread from the specific purchasing area to other areas of the company, with a final impact on the profits obtained. According to (Çebi & Bayraktar, 2003) the supplier selection problem involves several criteria that conflict with each other. It is therefore important in decision making to consider as many criteria as possible, covering different perspectives, in order to make the choice sustained and informed.

With the COVID-19 pandemic, all of world's wind turbine and component factories are now open following the easing of restrictions across world. Sanitary measures are strengthened within sites to guarantee full compliance with government recommendations. Wind power installations in 2020 were down 30% compared to industry forecasts. It was also found that any continuous restriction on the movement of goods and people reduced activity and increased capital expenditures (CAPEX). Like many other manufacturing or service enterprises, supply chains in the wind sector will continue to be impacted in the months ahead. Some project milestones will be deferred, with impacts being felt throughout the whole value chain, whilst at the operational level; turbines, blades, component and material orders will be cancelled or unfulfilled (Eddie Rae, 2020). The biggest challenges for entities of any size is the dramatic reductions in revenue creation that have occurred and continue to occur. Unfortunately, in a business crisis, one of the first immediate solutions