FROM BURDENS TO BENEFITS: QUANTIFYING THE AVOIDED CLIMATE IMPACT OF SOLUTIONS IN THE SKF BEYONDZERO PORTFOLIO

Davis, J.[1], Löfgren B.[1], Berglund M.[1], Sjölin M.[1], Nilsson J-A[1], Rosén M.[2]*

[1]SKF Group Manufacturing Development Centre, [2]SKF Group Corporate Sustainability, SE-415 50 Göteborg, Sweden

**Jennifer.Davis@skf.com*

Keywords: Green portfolio; avoided climate impact; SKF BeyondZero.

ABSTRACT

An increasing number of companies actively communicate their 'net positive' impact on the environment. Based on the experience of developing the SKF BeyondZero portfolio, this paper highlights a few challenges and opportunities of shifting environmental communication from burdens to benefits. We show how SKF defines and uses a baseline for comparison of new and conventional solutions, how system boundaries are set, the iterative process of collecting data, and how SKF applies the methodology. We conclude the paper by discussing risks and opportunities of avoided emissions calculation and communication.

INTRODUCTION

Since the 90s environmentally conscious companies have published environmental reports with indicators of environmental behaviour. Reports, often following the international standard given by the Global Reporting Initiative (GRI, 2011), display how the companies strive to reduce their environmental impacts towards zero. The greenhouse gas (GHG) protocol (World Resources Institute and World Business Council for Sustainable Development [WRI/WBCSD], 2004) is a widely applied industrial standard that supports this by providing a framework for the accounting of the greenhouse gas emissions of an organization. However, an increasing number of companies actively communicate their 'net positive' impact on the environment (e.g. Siemens, 2013; BASF, 2013), something not currently supported by publicly available standards. For the purpose of contributing to the development in the area, this paper outlines a few of the challenges when turning communication from burdens to benefits, based on the experience of SKF.

In 2005, SKF launched the business strategy SKF BeyondZero to direct the global organization towards innovating solutions to help customers reduce their environmental impact. It was a game changing addition to the previous environmental strategy that aimed at continuously reducing the impact of SKF's own processes and supply chains. At the company's 100 year anniversary, two years later, a new energy efficient product range was introduced. In 2012, the next step was taken when the SKF BeyondZero portfolio was made public, containing products, services or solutions delivering significant environmental benefits without serious environmental tradeoffs.

The scope of environmental improvements enabled by these portfolio products is broad. It includes for example helping customers to preserve the balance of the atmosphere, promote efficient and responsible use of resources, and avoid discharges into water. In the portfolio management process, business considerations (e.g. market potential) and environmental aspects (e.g. material selection, energy efficiency, and reduction of lubricant leakage) are evaluated in parallel. The method presented in this paper currently focuses on the quantification of the offers' potential to avoid contributing to *climate change*, using an approach involving a number of methodological choices that requires attention and discussion. A major challenge is to find an acceptable compromise between providing credibility through detail and completeness in the analysis; at the same time as the assessment is pragmatic and time efficient.

In the following we show how SKF defines and uses a baseline for comparison of new and conventional solutions, how system boundaries are set, the iterative process of collecting data and how SKF applies the methodology. We conclude this paper by discussing the risks and opportunities related to avoided impact calculations and communication.

DEVELOPMENT OF THE QUANTIFICATION METHOD

The method has been developed through an iterative process during which learning from actual case studies have provided input to evolve the method. The aim has been to reach a sound balance between credibility and pragmatism. The method covers GHG emissions measured in kg of CO_2e. A key aspect of the method is that it quantifies *avoided emissions*, that is, the difference in emissions between the SKF solution and a defined baseline solution.

Definition of the baseline

The definition of a baseline solution significantly impacts the results of the calculations. Here, the baseline is set to the most common solution on the market, taking into account only products and solutions that are sold in the present market. This could be a previous SKF solution, or a solution providing an equivalent function that is sold by another company. A practical guidance to actually identify a relevant baseline solution is to try and find out *what alternative solution the customer likely would have bought if they had not bought the SKF solution.* An implication of this definition is that the baseline will change over time. Therefore, the baseline needs to undergo reoccurring evaluation and the quantified results need to be updated accordingly.

System boundaries

The second aspect to be carefully considered is how different parts of the system should be accounted for in the analysis. A life cycle perspective is applied when exploring the solutions. All parts or processes that are the same in both solutions being compared are excluded; see an example of this in Figure 1 where production (2) and end-of-life handling of the car (5) are excluded.

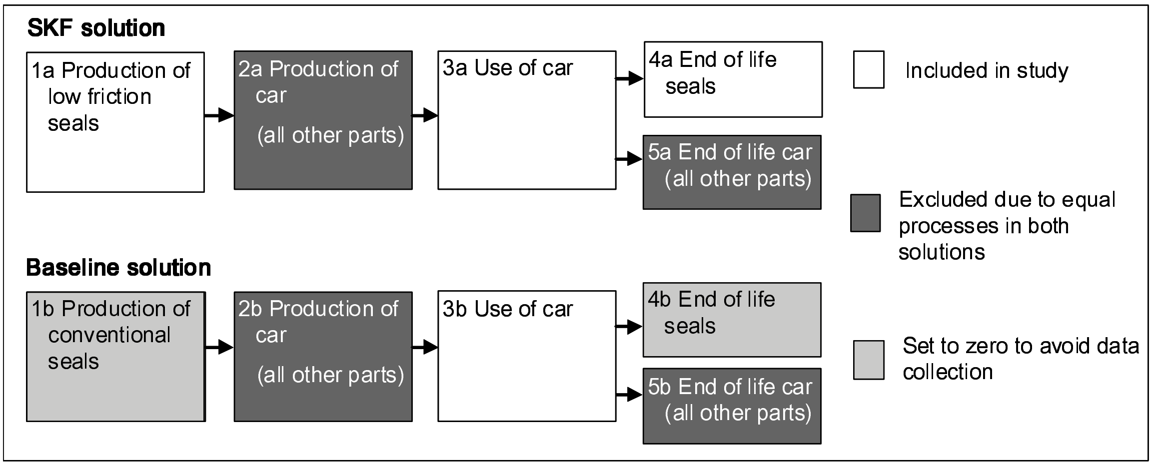

Figure 1. System boundaries for studied solutions (one example case)

Iterative data collection process

After excluding identical parts, the next step is to make sure that the data collection focuses on the processes that impact the result the most. The following work procedure is performed in order not to overestimate the CO_2e-saving, while at the same time limit the data collection to parts where it is most needed.

First, the emissions for the lifecycle step where the most obvious improvement lies are quantified, in the example in Figure 1 this is the use phase (3). Then, the impact for the rest of the life cycle steps for the SKF solution are quantified (1a and 4a in Figure 1), using generic data from databases, while assuming zero impact for the rest of the life cycle steps for the baseline solution (1b and 4b). If the impact from the other life cycle steps for the SKF solution represents *less* than 10% of the overall improvement, no more data collection is undertaken. In this way, detailed data is collected for all life cycle steps that together contribute to *more* than 10% of the overall improvement, while life cycle steps that contribute to *less* than 10% are either treated by using generic data (the SKF solution) or set to zero (the baseline solution). The baseline solution is set to zero to avoid overestimating the effect.

For many SKF solutions the main saving in greenhouse gas emissions is found in the use phase, i.e. when running the application, so in practice this means that in many cases the emissions associated with producing and handling the product at the end-of-use, may be modelled with generic data (and set to zero for the baseline solution). However, there are also cases where the production and end-of-use phases are the most prominent life cycle stages, in terms of emission savings.

APPLICATION OF METHOD TO PORTFOLIO SOLUTIONS

The method described in this paper is applied on solutions that are included in the SKF BeyondZero portfolio. In practice, the quantification process starts with a meeting between the solution owner and the specialist engineer responsible for the calculation, in which the system boundaries and functional unit are set and the relevant baseline solution defined. Then, the required data is collected by the solution owner (e.g. material composition and service life of the solution, documentation of test results, simulations etc.) and all data is documented in a common template. When material and energy use is determined for the studied systems, this is translated into GHG emissions, by using life cycle inventory (LCI) data from commercial databases, as well as data collected by SKF. The final result is summarized in a short memo, and communicated internally to the solution owner, the SKF BeyondZero portfolio board, and to colleagues within marketing and communications.

The method is developed centrally and can be applied by various engineering functions supporting SKF business processes.

IMPLICATIONS OF THE APPROACH

Traditional lifecycle based environmental assessments provide highly credible results but require a lot of time and resources. In the development of this method we have strived for safeguarding the strengths of life cycle thinking while making it more efficient from a time and resource perspective. This has been a balancing act and the resulting approach has some implications, these are:

(1) The method focuses on differences between an SKF solution and a baseline solution. It is thereby possible to demonstrate the amount of avoided emissions. However it is not possible to determine the improvement relative to the complete system.

(2) The approach presented in this paper is based on a streamlined data collection procedure where we focus on details where details are needed, at the same time avoiding details where they are not needed. This makes the calculations efficient while not sacrificing the credibility of the results. In this way it has been proven possible to manage a large number of calculations with limited resources.

(3) By setting the impact of some life cycle steps of the baseline solution to zero while always accounting for the impact of the SKF solution, we help to avoid overestimations and thereby contribute to making the environmental claims made by the SKF Group conservative.

By employing this quantification approach, SKF can communicate the avoided GHG emissions of an entire product portfolio, internally as well as externally. By visualizing the avoided emissions in actual numbers, the effect is inevitably more tangible, compared to if a general statement is made.

Future development of the quantification method includes a widening of the scope so that other environmental impacts than GHG emissions can be quantified. Also, continued build up of LCI data on materials and production routes for SKF solutions, as well as typical use profiles in the various applications, will further facilitate the calculations.

REFERENCES

BASF. 2013. BASF Report 2012 (p.103). Retrieved from www.basf.com

GRI. 2011. Sustainability Reporting Guidelines, version 3.1. Global Reporting Initiative, PO Box 10039, 1001 EA Amsterdam, the Netherlands. Retrieved from www.globalreporting.com.

Siemens. 2013. Sustainability report 2012. Key performance indicators (p.2). Retrieved from www.siemens.com

WRI/WBCSD. 2004. World Resources Institute and World Business Council for Sustainable Development. The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard, revised edition.