

Establishing LCA in the Healthcare Sector



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Abstract Novo Nordisk has used Life Cycle Assessment (LCA) for many years and a few years ago the company took a major step forward and completed a mapping of the product carbon footprint of the company's key products. Through successful cross-organisational collaboration, technical LCA data and results have been translated into easy-to-understand messages that have helped the organisation to understand the LCA concept, drive improvements across the life cycle and to communicate about the environmental impact of products to external stakeholders such as patients, healthcare professionals, payers and policy-makers.

1 Introduction

Novo Nordisk is a global healthcare company with more than 90 years of innovation and leadership in diabetes care. Headquartered in Denmark, Novo Nordisk employs approximately 42,000 people in 77 countries and markets its products in more than 165 countries.

A key element in Novo Nordisk business philosophy is the triple bottom line principle, which is about balancing financial, social and environmental considerations. This is anchored in the Novo Nordisk Articles of Association. The company has a long history of optimising the environmental performance through ambitious strategies and partnerships. One example is the Kalundborg Symbiosis, where Novo Nordisk was one of the founders of an industrial symbiosis partnership. Another example is the 10-year long partnership between Novo Nordisk and DONG Energy, which has resulted in major energy savings and ensured that all Novo Nordisk production sites in Denmark are powered by renewable energy from an offshore wind farm.

Novo Nordisk has taken the next step in the journey towards environmental responsibility and intensified the focus on the environmental impact at the product

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level. This allows Novo Nordisk to make choices in R&D and production that minimise carbon emissions from products and at the same time, support the commercial part of the organisation with environmental messages. This article describes how Novo Nordisk has taken the lead in reducing carbon emissions at the product level.

2 Building a Common Framework for Product Carbon Footprints in the Healthcare Sector

For more than 25 years, Novo Nordisk has used LCA as the basic methodology to measure environmental impacts across the product life cycle. These LCAs follow the international LCA standards ISO 14040 and 14044.

In 2008, the UK NHS identified pharmaceuticals as one of the key contributors to the carbon footprint of the UK healthcare system [1]. This sparked the need for more detailed guidelines on how to calculate the carbon footprint of pharmaceutical products. Together with the NHS, Novo Nordisk and a handful of other healthcare companies founded the international Coalition of Sustainable Pharmaceuticals and Medical Devices (CSPM). The coalition initiated the development of a sector-specific guideline on product carbon footprint. In 2012, the Greenhouse Gas Accounting Sector Guidance for Pharmaceutical Products and Medical Devices [2] was published. It was reviewed by WRI for conformance with the GHG Protocol Product Life Cycle Standard and earned the “Built on GHG Protocol” mark.

Novo Nordisk was the first diabetes company to apply the guideline for product carbon footprint of pharmaceuticals and medical devices. The first two carbon footprint reports were carried out by an external consultant and finalised in 2013. To ensure compliance with the new guideline, a third party review was performed by the consultancy company ERM, who had prepared the sector guideline for the CSPM. Since 2013, Novo Nordisk has had internal LCA expertise and has continued to use the guideline.

The sector-specific guideline and the ISO 14040/44 LCA standards ensure a scientifically solid approach to calculating product carbon footprints. The sector-specific guideline gives clear guidance on scoping, data collection and reporting specifically focusing on the production processes and products in the healthcare sector. All product carbon footprints within the healthcare industry should comply with this guideline as it is considered best practice.

All Novo Nordisk product carbon footprint reports are third party validated according to the international guidelines by an internationally recognised accountancy company. The pharmaceutical industry has a large responsibility of ensuring patient safety, and the industry is strictly regulated to protect the patients. Therefore, third party validation of product carbon footprint ought to be standard in the healthcare industry.

3 Implementing LCA in Novo Nordisk

Novo Nordisk has used LCA as a tool for decision support for more than 25 years. During these years, the LCA methodology and data availability has improved significantly. In 2011, LCA became an integrated part of Novo Nordisk environmental strategy, and a programme was launched with the aim of mapping the carbon footprint of the diabetes portfolio. Novo Nordisk was the first to calculate the carbon footprint of one year diabetes treatment, including the active pharmaceutical ingredient (API), device and needle.

The programme was anchored in an executive management committee and was driven by a cross-organisational team with representatives from production, R&D, marketing and stakeholder engagement. The top management commitment and collaboration across organisational boundaries were essential to the success of the programme.

Achieving a sufficiently high quality of data is critical when LCA is used for supporting decisions. Novo Nordisk has a long history of environmental reporting, which focuses on resource consumption, emissions and waste amounts. Environmental data has for many years been monitored and reported on building/site/company level and related to KPIs. However, it is a challenge to convert these datasets to the product level, and it requires close collaboration with local production experts. Novo Nordisk has proven that it is worth the effort: It provides the organisation with a completely new perspective on environmental impacts, which in the longer term allows for new approaches to setting targets and benchmarking across production units, e.g. by measuring energy consumption per unit produced instead of energy consumption per building.

LCA screenings have for several years been an integrated part of the device development process in Novo Nordisk. One of the keys to ensure that the screenings are carried out is the integration into the development manual, which means that the LCA screenings are obligatory. The LCA screenings are based on the same LCA model as is used for the marketed products, which ensures consistency across the organisation.

Life cycle thinking was introduced in the ISO14001 standard on environmental management systems in 2015. Product carbon footprint is a great method to help determine the environmental hotspots and focus environmental initiatives within production to create the most impact. Moreover, Novo Nordisk uses LCA and carbon footprint calculations as decision-support tool across the organisation, both in relation to initiatives and projects driven by the environmental organisation and in relation to projects and changes with a significant environmental impact.

Novo Nordisk has built an advanced LCA model for APIs, devices and needles and it creates a strong fundament for updating the carbon footprint of products and adding new scenarios. Since the LCA model covers the majority of Novo Nordisk products and relates to most production sites, new LCA calculations are made very effectively. This allows for providing quick answers to the organisation to support decision processes.

4 Communicating About LCA and Product Carbon Footprint in the Healthcare Sector

Novo Nordisk experiences an increasing interest in the environmental impact of healthcare products from authorities, insurance companies, doctors and patients. Novo Nordisk believes that stakeholders have the right to know about the environmental impact of the products. This was one of the reasons why Novo Nordisk decided to map the carbon footprints across the diabetes portfolio.

The cross-organisational collaboration has been crucial in ensuring that the extensive work on the mapping of product carbon footprints is also translated into stories and messages that are understandable for non-experts.

Many LCA practitioners experience that it is difficult to communicate the relatively technical results of an LCA including the underlying assumptions. The details of LCA conflict with the need for clear and short statements that can be disseminated to a wide audience with no previous knowledge on product carbon footprint. Translating the technical results into easy-to-understand messages requires a close collaboration between environmental experts and communicators and that both parties have the resources and willingness to listen and learn from each other. This is a challenge that is common in many companies, and Novo Nordisk is actively seeking sparring with other companies on this and other issues related to the use of LCA in large companies. Novo Nordisk was one of four initiators of a Danish LCA and ecodesign network consisting of representatives from major companies and academia in Denmark working within the field of LCA. The purpose of the network is to share knowledge and learn from each other with focus on implementation of LCA in companies.

In Novo Nordisk, it became clear that communicating the specific carbon footprint in kg CO₂ equivalent did not hold value for the target audiences as they found it difficult to relate to this number. Therefore, we focus on comparisons with other consumables. An example of a message that has resonated well with the target groups is that daily diabetes treatment has a carbon footprint equivalent to a cup of tea [3]. We also use comparisons like driving a car and air travel to put product carbon footprints into perspective. It helps both internal and external stakeholders to understand, remember and communicate the size of the footprint.

A comparison with competing products is not relevant, as this requires that the carbon footprints are calculated using the same system boundaries and assumptions and that we would have access to competitor production data. As a patent-driven pharmaceutical company, most of our products are unique and therefore product-to-product comparisons e.g. per unit of insulin are not relevant.

Communication to doctors and other healthcare professionals is in many countries strictly regulated and marketing claims related to specific products must be based on peer reviewed publications that documents the clinical efficiency of a drug on the basis of clinical trials. There are no guidelines on the use of

environmental messages in the marketing of pharmaceutical products. The Guidelines for Providing Product Sustainability Information being developed by UNEP and International Trade Centre points at third party validation as the most reliable assurance model for sustainability claims [4]. Klöppfer [5] points to the fact that an LCA study can only be claimed to be in accordance with the ISO 14040 and 14044 standards if a third party review has been performed, whereas an LCA published in a peer reviewed scientific journal cannot be claimed to be ISO compliant based on the peer review process alone as this does not follow the requirements for the review process set out in the ISO standards. A third party reviewer will often have access to more background data, LCA models etc. and have more time assigned for a review than peer reviewers appointed by a scientific journal. Therefore, Novo Nordisk supports the use of third party validation as the best way to ensure validity of the LCA results.

5 The Future of LCA in Healthcare

Novo Nordisk has demonstrated that product carbon footprints provide a basis for communicating with internal and external audiences about the environmental impact of pharmaceutical products. There is a great potential for driving further improvements across the product life cycle of Novo Nordisk current and future products and LCA will play an increasingly important role in ensuring that the environmental perspective is present in decision making across the organisation.

In the healthcare sector, LCA can bring valuable knowledge about the environmental impact of treating patients. However, it is important that pharmaceuticals are considered in a full care pathway perspective—or what Novo Nordisk calls the ‘patient carbon footprint’. The impact from treating patients goes beyond pharmaceuticals and medical devices. Diabetes can lead to complications such as eye problems, kidney disease, amputations etc. that are also associated with carbon emissions from hospitalisation, surgeries, frequent visits to clinics etc. This means that more efficient treatment leads to a reduced carbon emissions related to complications. Methods for quantifying the environmental impact of the patient carbon footprint are currently being developed [6].

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