Tracking down emissions

Identifying potential savings is like finding the proverbial needle in a haystack: it isn't easy, but it isn't impossible either. With a concise analysis, Syntegon created transparency regarding energy consumption and CO_2 emissions at the pharmaceutical Contract Development and Manufacturing Organization (CDMO) Siegfried and comprehensively tested its methodology in practice.

Companies in the pharmaceutical and food industries produce for different markets but pursue one overarching goal: both sectors are increasingly aiming for resource efficiency and ecological processes. However, if techno-log-ical and process-related adjustments are to succeed, companies need another important resource that is far less obvious than the systems and products themselves – data.

At its site in Hameln, Germany, the pharmaceutical CDMO Siegfried operates filling systems from Syntegon.

Siegfried AG, a pharmaceutical contract manufacturer based in Switzerland and with production sites in Germany, has focused on this resource and joined forces with Syntegon. The experts for processing and packaging technology developed their own calculation model based on so-called Life Cycle Assessments (LCA) and certified by TÜV Rheinland, a German association for technical inspection. The method allows the company to evaluate energy consumption and emissions during the entire life cycle of the machines from Syntegon's portfolio.

Insightful findings

"Siegfried wanted to determine emission savings associated with green energy," says Steffen Carbon, coordinator for development methods at Syntegon. "The company was also eager to understand the effects of modified production processes on the overall emissions at their German site." Siegfried uses certified electricity from renewable energy sources to ensure the ecological operation of its filling lines. Moreover, a nearby waste incineration plant provides steam to produce water for injection (WFI).

"The company didn't know exactly how these adjustments would affect its emissions. Our analysis provided transparency, especially as all the machines on site are from the vast Syntegon portfolio," Steffen Carbon points out. The LCA showed that by using green electricity, self-generated steam, and energy-efficient compressors to generate compressed air, the CDMO reduces its CO_2 emissions by up to 80 percent, depending on the batch.

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A second calculation focused on the effects of modified production processes on CO_2 emissions. Instead of running several individ-ual batches, the CDMO relies on so-called campaign filling, i. e. several batches in combination. The evaluation of the average times for individual and campaign batches reveals that Siegfried saves up to 20 percent in emissions during campaign operation. “Significantly reduced format changes and the one-off setting for campaign filling do the trick,” says Steffen Carbon, adding: “The LCA is not an end in itself but offers important guidance that companies can take into account when carefully planning and fulfilling regulatory requirements.”

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1%

Energy consumption for assembly: The share of electricity, gas, or heating oil of a site’s total consumption for machine assembly is important for the Life Cycle Analysis.

10%

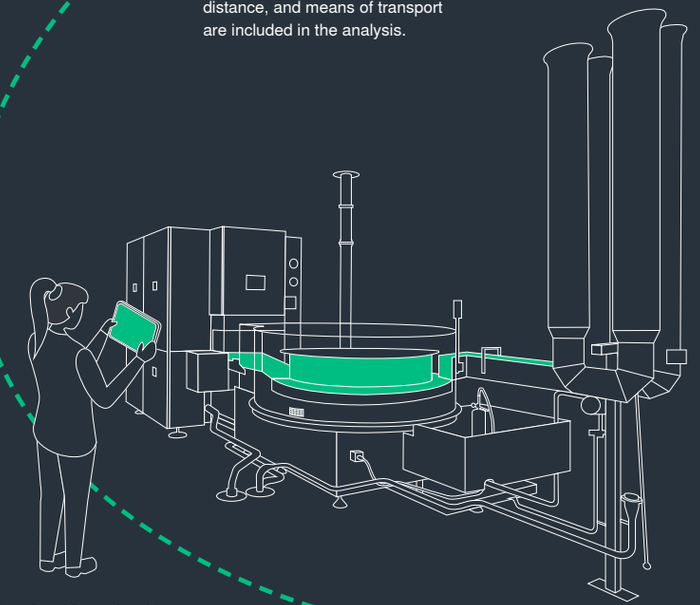
Materials: Syntegon evaluates parts lists and determines the weights, e. g. of stainless steel, aluminum, and electrical components to assess the carbon footprint of the materials.

Input

The Life Cycle Analysis considers raw materials for parts and components, electricity and thermal energy, energy consumption for production and standby times, process-related auxiliaries and media, as well as used materials.

0.1%

Transportation: The machine weight, packaging materials, distance, and means of transport are included in the analysis.



88%

Use phase: Syntegon analyzes the operating profile of the machine (production times, waiting times, idle times) and determines consumption values for the respective operating status, e. g. electricity, compressed air, process-related auxiliaries and media, as well as materials such as glue and water.

0.3%

Scrapping & recycling: In this phase, the focus is on material data, energy consumption for dismantling, as well as transportation to the recycling company.

Output

Syntegon uses the acquired data to support Siegfried in improving processes in terms of sustainable production and cost reduction.

With the **cloud-based software solution Synexio,** users can evaluate and visualize machine and production data.

Learn more about Synexio

The values in the graph apply to an eco-energy mix. Siegfried obtains 100 percent of its electricity from renewable energy sources.