



VERIFYING SUSTAINABILITY: UMBERTO IN WOOD CONSTRUCTION

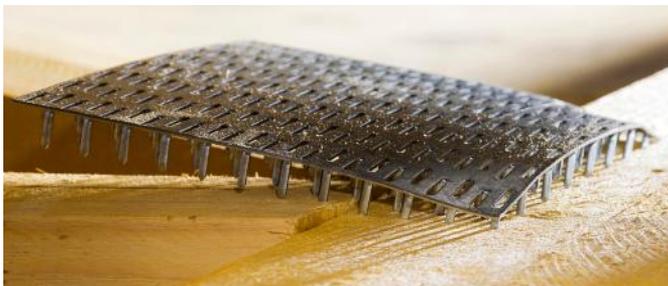
THE CHALLENGES OF EVALUATION AND VERIFIABILITY

Nowadays, ecological product characteristics are an important factor for people making their buying decisions. The need for products manufactured in climate friendly ways spans the entire value chain. "Our customers demand products that are both ecologically and economically justifiable, and rightly so," said Rolf Janssen, CEO of Janssen Holzbau GmbH. "Taking steps to save resources hasn't even been the biggest challenge," Janssen asserted. With the help of a computer-aided ordering system the company, for example, was able to reduce trimmed material to only 3%. These leftovers are used, in turn, to power a heat generation plant for drying wood and to heat office and production space. In addition, their demand for electrical power is also met in a climate friendly and cost-conscious way by using power from renewable resources and their own photovoltaic plant. "But" Janssen said to summarize the situation, „we still needed an instrument that would allow us to



evaluate all these measures and to demonstrate their success to the outside world."

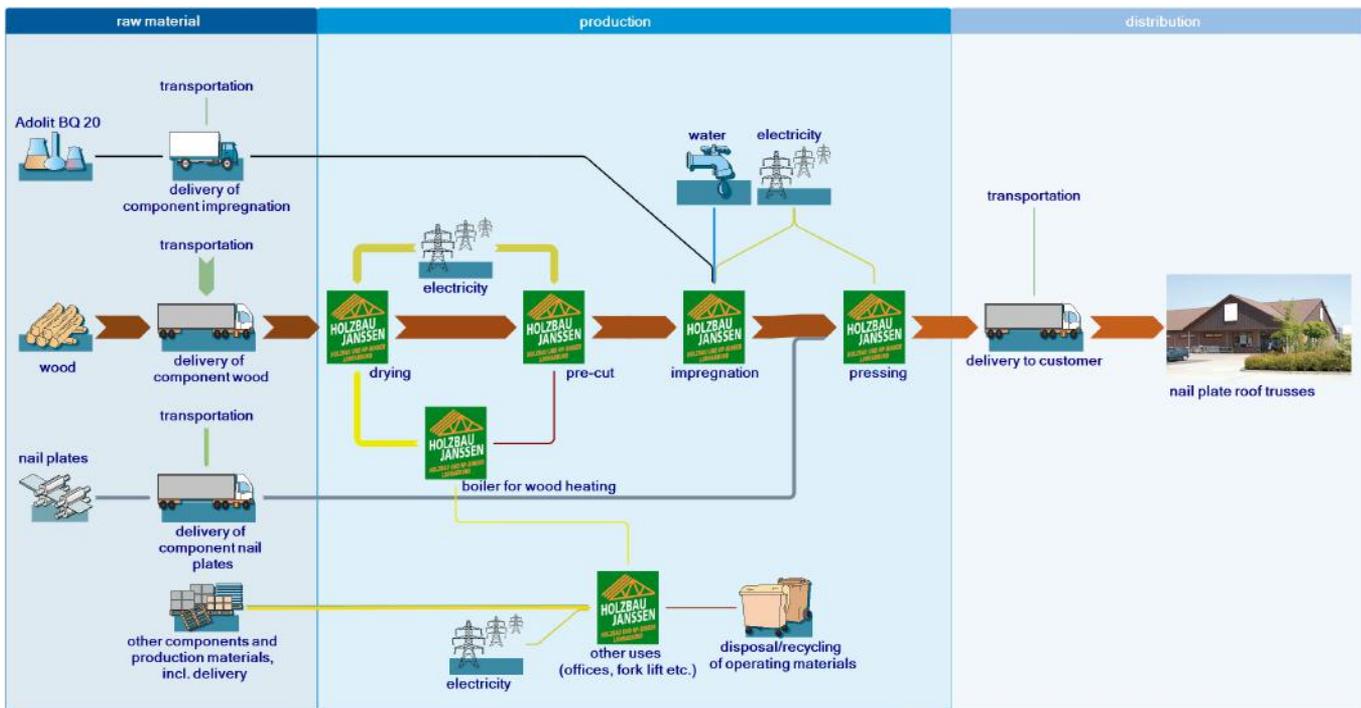
THE CO₂ BALANCE DELIVERS ANSWERS



The CO₂ balance (also called a CO₂ footprint) is just such an instrument. It provides information about the climate effectiveness of a product or company. Ifu Hamburg conducted an analysis of typical roof construction for Holzbau Janssen, since that represents the company's main product, and thus allows most of the company's production processes to be incorporated. The procedure for such an analysis is based on internationally established standards that guarantee comparability and verifiability of the findings. Participating parties use the PAS 2050 standard as well as ISO 14040 and ISO 14044 as guidelines for the product's ecological balance. All climate-relevant emissions are taken into account, from resource extraction to delivery of the finished product at the construction site, which is in keeping with the "Cradle to Grave" and the "Business to Business" models that are part of PAS 2050. In roof construction, this mostly concerns wood trusses held together with nail plate connectors. In addition to the nail plates, three other

upstream products are analyzed regarding their carbon footprint: the impregnating compound "Adolit BQ 20", the raw wood, and all other components and operating supplies. Information for each important component and its transportation were acquired from the suppliers and freight forwarders and supplemented by environmental data from the ecoinvent database as well as other relevant databases and literature. Energy use during the production phase also becomes part of calculating the CO₂ footprint. This is where the results of the electrical power analysis, conducted by energy provider EWE ENERGIE AG, come into play. For a duration of two weeks, ten metering points were installed to collect data on the electrical energy flow. In addition, Janssen Holzbau delivered data on the use of thermal energy, all of which contributed to calculate the overall energy use during production.

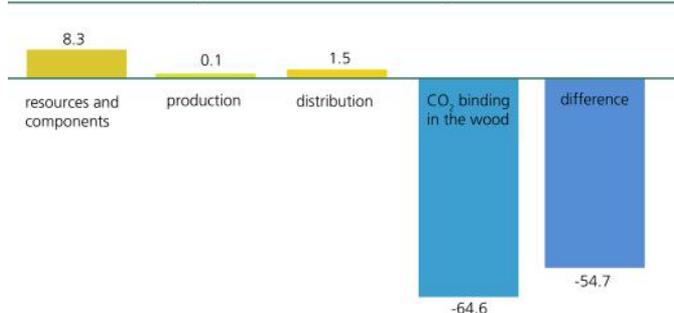
In accordance with the "Business to Business" model from PAS 2050, the transportation of the finished product to the companies involved in their continued processing are considered as well. The figures used here are a combination of Holzbau Janssen's own data and available ecological balances. To calculate and visualize the resulting carbon footprint, the company uses Umberto software developed by ifu Hamburg GmbH.



Model of a CO₂ balance calculated with the Umberto software

FROM CO₂ BALANCE TO ENERGY MANAGEMENT

CO₂ footprint of roof construction using nail plate trusses and bound CO₂ in the wood (in t CO₂ eq.)



"Our CO₂ footprint is actually negative - and that's really positive!" said Rolf Janssen, who pointed out the advantages of wood as a resource. According to the aforementioned ecological balance standards, the resulting carbon footprint for a typical roof using nail plate construction (volume of wood, nail plates, roof battens and other parts) is 9.9 t CO₂ eq. (tons carbon dioxide equivalent). In contrast, 64.6 t of CO₂ are stored in the wood, which is six times more CO₂ than is released during production

and delivery. In addition, without the company's elaborate energy use concept, the carbon footprint would be about 11% higher. "We now have an instrument at hand that allows us to keep working on this issue. We don't see sustainability as an end-goal, but as a continuous process in which we keep scrutinizing our actions," said Rolf Janssen. "The Umberto models with their easy-to-read energy and materials streams allow me, as the CEO, to make the right decisions, quickly and well-founded. The carbon footprint is the ideal instrument to evaluate the measures we have taken, document and communicate them to the outside world, and to identify new ways toward even greater sustainability and efficiency."