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CASE STUDY /

Ansys + DEKO

Proactively Reducing Product Carbon Footprints at DEKO

"By making the right material trade-offs and knowing what we needed from our suppliers, we were able to reduce a product's CO_2 footprint by 20%."

Simon Søndergaard Bjarno Jensen
Sustainability Project Manager / DEKO

As governments are progressively increasing sustainability related legislation, engineers are having to react more quickly to ensure their raw materials, supply chain, and products can cope. DEKO is facing this challenge, having to proactively reduce the CO_2 footprint for their range of products to remain competitive in the future.

CHALLENGES

The team at DEKO had a range of aluminum alloys, PVC rubber gasket seals, and other polymers used across their range of 28 products. But new legislation in the building industry required alternative, more sustainable materials to be found. It faced several challenges:

1. Assess alternative materials that fit the criteria for: price, manufacturing process, substances of concern, and sustainability metrics. This had to be done early in design.
2. Source new, more sustainable materials from suppliers or alternative sources.
3. Be confident that the new materials in the product would assure compliance with documented Environmental Product Declaration (EPD).
4. Be able to complete the EPD processing in time for when the new legislation hits the market.

Figure 1 - Typical product from DEKO - glass with natural materials

TECHNOLOGY USED

- Ansys Granta Selector

ENGINEERING SOLUTION

The team at DEKO used Ansys Granta Selector to initiate the process of reducing their product CO_2 footprint. The project leader was familiar with the tools and data, having used Granta EduPack at university.

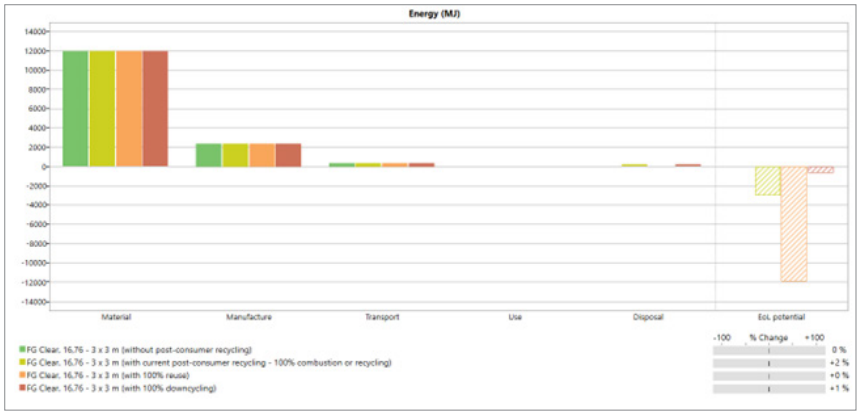

Figure 2 - Tracking energy use across the lifecycle in Granta Selector

This was their solution:

1. Granta Selector's Eco Audit tool was used early in design to compare different materials to assess the CO_2 footprint over the entire product life. This required an assessment of various linked factors:
   a. Material embodied energy and CO_2 footprint
   b. Manufacturing process energy and CO_2 footprint
   c. Transportation modes used
   d. In-use energy: mass, thermal and electrical loss
   e. End-of-life: recyclable materials, toxicity
2. Using the output from the Eco Audit tool, an internal report was used to make a detailed value comparison of the CO_2 footprint for different material solutions for a product.

   Information from this report was then combined with Granta Selector's powerful material selection capabilities to find the right material. This used the MaterialUniverse™ dataset that holds a complete and comparable set of material properties across a range of polymers, metals, etc. – including technical, economic, and environmental.

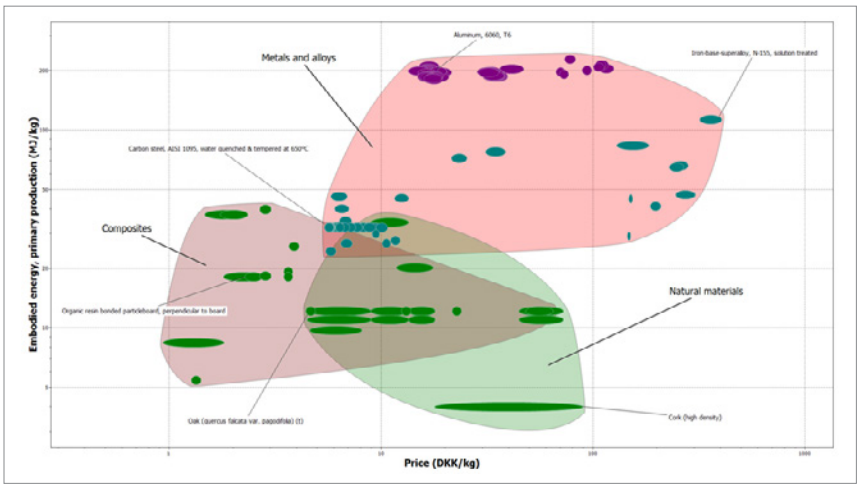

Figure 3 - Using Granta Selector to trade off embodied energy with price

Charting and comparison table capabilities were used to trade off competing factors such as mechanical performance, restricted substance content, price, health aspects, and manufacturing process compatibility while quickly highlighting any 'red flags' in properties of candidate materials. Knowing exactly which material was required and its properties gave DEKO bargaining power in negotiations with the supplier.

3. Knowing that the materials in the product were going to produce a lower CO_2 footprint for their existing product, the team then went on to complete the Environmental Product Declaration (EPD) to comply with future building regulations in Denmark.

BENEFITS

By taking the material selection decision into their own hands, DEKO was able to pre-define early in design the right material for their product from a technical, economic, and environmental perspective – inluding sustainability in product design from an early stage. Instead of copying what others were doing, they have taken a proactive approch to finding the most sustainable material, building in the technical nuances of their products. Eco Audit was much faster early in the design stages (1-2h) – requiring less user input, less time and investment than a full LCA (estimated at 40h+) while still providing powerful guidance on how to reduce product environmental impact.

With the results from Granta Selector's Eco Audit tool, backed by market-leading data, the team at DEKO is confident that the materials they've selected for the product will result in the lowest CO_2 footprint they can achieve. This makes the final step of a validated EPD a formality that will future-proof their product portfolio for upcoming legislation.

Some of the key business benefits include:

1. Most sustainable material selected
2. 20% CO_2 footprint reduction for the same product
3. Maintain compliance with new legislation
4. Data-driven approach to supply chain decisions

COMPANY DESCRIPTION

DEKO is one of the leading companies in Europe producing and supplying demountable system as well as glazed partitioning solutions and matching door systems.

ANSYS, Inc.
Southpointe
2600 Ansys Drive
Canonsburg, PA 15317
U.S.A.
724.746.3304
ansysinfo@ansys.com

ansys.com