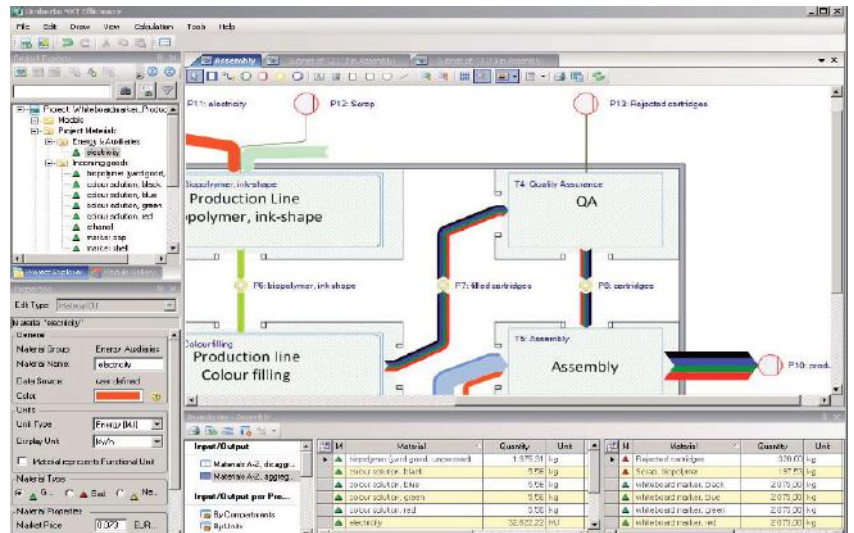# UMBERTO EFFICIENCY+

A software for calculation, analysis, and improvement of the material, energy, and cost efficiency of production systems

TRANSPARENCY

In every manufacturing company, the constant "flow" of material, energy, and - ultimately - costs, is an integral part of the production system. Managing the flow of materials has proven to be the right approach to a better and more efficient distribution and use of resources within the production process. At the same time, any inherent inefficiencies are brought to light. By modelling different scenarios, it becomes evident which combination of improvements is best suited to achieve a specific savings goal or to reach a higher production volume.

By creating a graphic model of your production system with Umberto, including all relevant material and energy flows, you achieve transparency and a comprehensive understanding of the entire system.

COST DRIVERS

By utilizing Umberto for cost accounting, it's easy to determine the relationships between material and energy inputs and the resulting costs. The setting up of material and energy balances helps to pinpoint the cost drivers within a given production system and, utilizing the next step, integrated

Sankey diagrams clearly visualize the potential for cost reductions – making the information instantly accessible for anyone. An additional Material Flow Cost Accounting (MFCA) feature allows identifying material losses and the costs caused by these inefficiencies.

MODELLING ENERGY AND MATERIAL FLOWS

- Hierarchical model structure (multiple subnet levels)
- Linear process specifications with input/output coefficients
- Non-linear process specifications with mathematical functions

- Global and local parameters
- Allocation in coupled processes (co-products)
- Graphical modelling editor: copy&paste and undo&redo fully supported
- Store entire models and model sections to Module Gallery for reuse

SANKEY DIAGRAMS

Using Sankey diagrams to represent flows quantitatively creates intuitive understanding. Even for decision makers with non-technical backgrounds, the diagrams readily visualize all the relevant inter-connections. With easy-to-understand Sankey diagrams, all parties involved can develop a common understanding of the system. Sankey diagrams are used to visualize material, energy and costs.

PRESENT AND DECIDE

Working with Umberto Efficiency+ offers an ideal basis for developing decisions. The following reports, analyses and graphics can be generated:

- Mass and energy balances for entire systems as well as for any sub-section of a model
- Analyses per process, per material group, per product, ...

- Cost calculation and analysis per cost center, cost type and cost unit
- Export of results to Microsoft Excel
- Comfortable export of Sankey diagrams and all other result graphics
- Carbon footprint for assessment of environmental performance

APPLICATION AREAS AND SUCCESS STORIES

Umberto users are process engineers, chemical engineers, energy experts and other staff from industry or consulting firms. The software has helped them to realize a broad array of projects in different areas of application.

One chemical company, for instance, managed to reduce their solvent emissions by more than 60% through scenario analyses of various recycling

options. By adopting the most efficient approach, the firm reduced its cost of treating emissions by 75%. Over a five-year period, its savings amounted to a total of 1,2 million EUR.

In another case, by optimizing its process, a brewery was able to achieve a 70% reduction in its consumption of diatomaceous earth, a filtering agent used in the production of beer.

You can find more successful projects with Umberto at:
go.ifu.com/cases_resource_efficiency

SELECTED SOFTWARE FUNCTIONS

- Material and energy flow modelling
- Mass and energy balances
- Sankey diagrams
- Cost calculation including material direct costs and process costs

- Material Flow Cost Accounting (MFCA) according to ISO 14051
- Live Links to Microsoft Excel for comfortable data import
- Carbon Footprinting

NEXT STEPS

1. Visit ifu.com/en/umberto/
2. Join a free web demo at go.ifu.com/umberto-web-demos
3. Get a trial version of Umberto and get to know our software at go.ifu.com/trial_version_umberto_efficiency

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