

Simulation of Greenhouse Gas Emissions in the Value Chain

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Based on the full report:

Development of a Simulation Tool to Support the Process of Setting Climate Targets

– An Exploratory Study at IKEA

To avoid the worst effects of climate change, the world’s governments have agreed to limit global warming to 2°C compared to pre-industrial temperatures. To achieve this, the private sector must take action and companies must reduce their greenhouse gas (GHG) emissions. This article demonstrates how simulation has enabled IKEA to apply an iterative, flexible and fact-based approach when setting science-based climate targets.

The Science-based Target initiative (SBTi) encourages companies to set ambitious targets aimed at GHG emissions throughout the whole value chain. When committing to the initiative, companies must align their reduction targets with the global carbon budget to limit warming above 2°C. To assure that the targets are in line with science, policies must be formulated and evaluated. These may consist of efficiency improvements, use of clean energy and more sustainable sourcing options for materials, to name a few. Simulation may serve as a valuable tool when evaluating which impact the policies have, and if sufficient or not.

With the help of the simulation modelling process, the root causes of emissions and how they may be influenced can be identified. Parameters for steering, e.g. making a supplier 100% renewable, can then be applied in the simulation model. Such an approach is further illustrated in Figure 1 and has been applied at IKEA in their process of setting SBTs.

As can be seen in the figure, is the role of simulation central for evaluating if the formulated policies are in line with the requirements. If not, new scenarios and activities must be developed. This approach enables flexibility as the policies can be formulated, simulated and evaluated within a relatively short time frame.

Visual representations support decision-makers to quickly identify focus areas where additional attention must be directed. To mitigate the risk of too optimistic reduction projections, the simulation tool is constructed with consideration to policy overlap. Furthermore, the use of the simulation tool has enabled project stakeholders to gain insights of the value chain, not only through policy evaluation but also during the course of its development while mapping the emission drivers and identifying steering parameters.

In conclusion, simulation has a proven to be an essential component for IKEA in their climate target setting process. It has enabled an iterative, flexible and fact-based approach while simultaneously facilitating communication of how the targets are to be reached. Therefore, the authors would like to urge succeeding research to continue to explore application of simulation in the context of sustainability. In order to build sustainable business development, we need tools and fact-based approaches to support it. Simulation provides such methodology.

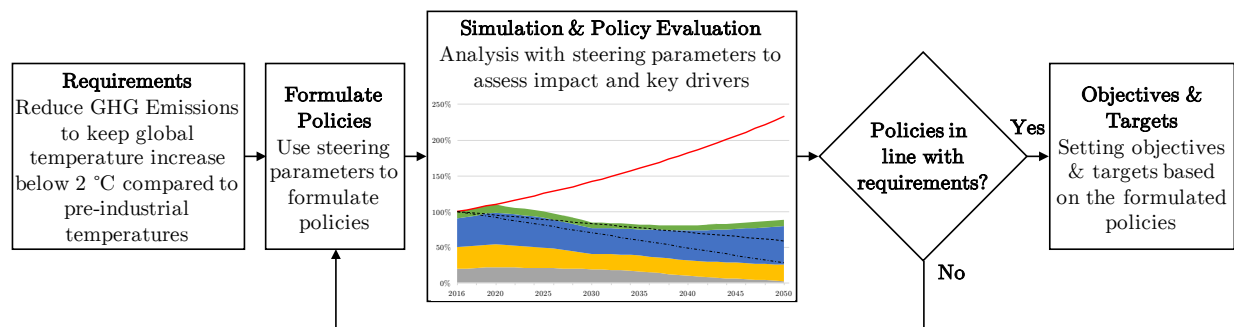


Figure 1. The process of setting climate targets using simulation.