DYNAMIC FIBER FLOWS MODEL

DYNAMIC FIBER FLOWS Q&A

Why did AF&PA develop this recovered paper research project?
There has been much debate over the years about environmental benefits of increasing the utilization of recovered fiber in paper products, with many policy makers and corporate procurement professionals believing that more recycled content is always better. These impressions were often based on available tools or calculators that compared products with different levels of recycled content. Simplistic tools, however, cannot adequately capture the effects that occur in a complex recovered fiber system. We wanted to explore a more comprehensive way to evaluate the real-world environmental consequences of changes to paper recovery and utilization and chose MIT to lead the research.

Why MIT?
Researchers at MIT were pioneers in Systems Dynamics Thinking and are at the forefront of modeling change within intricate systems. The processes and material flows involved from fiber acquisition through product production, recovery, reuse and end-of-life are very complex. MIT had experience in complex systems, plus they were able to combine Systems Dynamics with consequential life cycle assessment methodology to create a whole new way of examining the recovered paper system.

What makes the Dynamic Fiber Flows Model unique?
The model advances the perspective from a traditional static comparison of product attributes to assessing the consequences of changes that occur throughout the product system. It recognizes that shifts in recovered paper utilization or collection do not occur in isolation, but have cascading effects across many links in the value chain. The model quantifies those effects for the entire system, providing a comprehensive and holistic viewpoint to simulate real-world outcomes.

What does the model measure?
The simulation model is designed to quantify the effects of a change to recovered paper utilization or a change in paper recovery relative to a baseline level, which currently is 2017. It first models how the virgin and recovered paper flows would change in response to a change introduced in the system (e.g. increasing the recycled fiber content of printing papers by X %).Then, the model calculates how biogenic and fossil fuel-based energy use and GHG emissions would change as a result of the new fiber flows from the forest to end-of-life of the product.

What types of paper are included in the Dynamic Fiber Flows Model?
The products in the model are containerboard, paperboard, tissue, freesheet printing papers, and mechanical printing papers/newsprint. In addition, the model includes recovered paper grades- mixed paper, Old Corrugated Containers (OCC), high-grade deinking, newsprint, and pulp substitutes.

Is the Dynamic Fiber Flows Model intended to replace current tools?
No, this model can't really be compared with other tools or calculators because it takes an entirely different approach. While other tools may make value judgements based on environmental attributes they assign for product comparisons, this model does not compare products, but reveals trade-offs and consequences associated with a specific change in the system. Unlike other tools or calculators, this model differentiates among the various types of recovered paper that can be recycled to make new products, and recognizes constraints in fiber availability, suitability, technology, and economic tradeoffs that occur in real-world scenarios.

How will the Dynamic Fiber Flows Model benefit the industry?
The intent of the model is to inform policy makers or decision makers with paper in their supply chains of the system-wide consequences and trade-offs to changes in paper recovery and recovered paper utilization. The model reveals that recovered fiber utilization or paper recovery changes do not occur in a vacuum, but cascade throughout the system in response to those shifts. Omission of the system-wide effects of those interactions can result in misleading conclusions and unintended consequences. This more comprehensive perspective can benefit stakeholders by helping them make more informed decisions.

Why are the results of the Dynamic Fiber Flows Model presented as case studies?
As the name suggests, there are lots of dynamics involved in credibly assessing the fiber flows within the paper value chain. Because of the complex interactions, the multiple variables at play, and the cascading effects that occur within fiber consumption and production of different paper product categories, the model results are best presented in the form of case studies. Each study represents a question, or a scenario related to a potential change of paper recovery or recovered paper utilization. The quantitative outputs require interpretation. By putting the numbers into context, the case studies may be useful to better inform policymakers and corporate decision makers regarding system-wide environmental effects within their supply chains.