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**Research area: General aims**

Energy // Energy use

**Key words:**

Drying, Energy

**Title: Innovation to reduce the energy demand of paper drying****Background/Problem area**

The dramatic rise in energy costs poses a danger to papermaking profitability. The energy requirements involved in papermaking are largely the result of the water-based production method: water that cannot be removed from the formed sheet must be removed by evaporation.

Energy issues could be resolved or at least defused by successfully solving the following problems:

- designing preceding process steps in such a way that the actual drying process is rendered more energy-efficient,
- reducing the water content prior to drying by using new approaches or
- significantly reducing the energy demands of the drying process.

Existing systems and possible alternatives have more or less reached their limits. The only way to improve the situation is to bring about a radical change by developing a fundamentally new approach.

**Objectives/Research results**

Against the background described above, the objective of this project was therefore to identify technical methodologies ranging from the innovative to the absolute visionary.

Two innovation workshops were conducted. Experts from the papermaking sector compiled and discussed both currently existing and new approaches during the first workshop. The second workshop entailed a meeting of representatives from science and industry in other industrial sectors who also make use of drying processes. This pooling of theoretical and practical expertise in an intensive, interdisciplinary workshop gave rise to a number of innovative ideas that were discussed and structured. The results of both workshops were then arranged in a mind map to ensure a clearly arranged display of results. A few examples of approaches to possible solutions include the use of adsorbents, the formation of bonds other than hydrogen bonds in the paper, the possibility of making water retention switchable, alternative forms of radiation drying, displacing capillary water by nanoscale additives or alternatives based on water-free papermaking.

**Application/Economic benefits**

The results were discussed in the Governing Body for Research and Technology in the German Pulp and Paper Association (VDP) and in the Paper Research Cluster. Initial approaches for research and development work were highlighted. The results will provide a basis on which ideas can be further honed and polished, and the innovations can be made available to the paper industry in the form of selectively submitted research projects.

**Project period: 01.10.2008 – 31.03.2009**

**Remarks**

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