

**Research Institute:**

PTS München  
Heßstr. 134  
80797 München

**Head of the research institute:**

Dr. Frank Miletzky

**Project leader:**

Holger Jung  
Tel: 089 / 12146-131  
Fax: 089 / 12146-36  
E-Mail: holger.jung@ptspaper.de

Internet: [www.ptspaper.de](http://www.ptspaper.de)

**Research area: General aims**

Energy // Energy use

**Key words:**

Energy, heat, energy management system, certification

**TITLE:****Recommendations for applicable evaluation of energy and heat demand as basis for energy savings and certification****Background/Problem area**

The paper industry is one of the five biggest industrial energy consumers. The specific energy demand has been reduced extensively in the last decades e.g. by optimisation of paper machines and amounted in 2009 to an average of approx. 3.100 kWh/t of paper due to information of VDP. The biggest part of energy in the production process is necessary for the drying section. Approx. 70% of the total energy demand is represented by heat demand. Drying takes place mostly by steam.

In the field of energy and heat demand paper mills are confronted with the problem of unsatisfying observation and measuring of energy consumption. In many cases the calculation of energy consumption of single aggregates from the total energy consumption is not possible. Effects of this missing transparency are:

- A differentiated evaluation and definition of measures for reduction of heat demand is hindered or even impossible.
- A proof of the achieved savings after realisation of single measures in particular with small saving potentials is nearly impossible when only the entire heat and/or steam demand is determined.
- An investigation and assessment of saving potentials, which is necessary since the amendment of the Renewable Energy Law (EEG) was coming into effect in 2009 for the hardship provision scheme, is suitable to only a limited feasibility.
- A differentiated formulation of energy saving targets, which are testable and measurable and could be updated in connection to energy management systems within the newly established DIN EN 16001, is not succeeding.

**Objectives/Research results**

In connection to this research project recommendations for a systematic, applicable, and economical recording of heat and steam demand in paper mills were developed to provide a basis for reduction of energy demand and certification.

In a first step the current situation in the paper industry of measuring steam and heat demand was surveyed to evaluate the demand of measurement techniques. To allow an extensive examination production lines and attendant facilities were taken into account. In a second step adequate calculation and estimation methods have been assessed to allow an applicable and traceable calculation of steam and heat demand of single aggregates. Furthermore available instruments for measuring steam and heat streams in connection to its application, accuracy and costs have been rated.

The analyses of the requirements of certified systems related to collection and analyses of steam and heat consumers was also an important part of the project.

Fundamental for this project was the conformity of the proposed recommendations with the requirements of energy management systems and certifications, respectively, in connection to §41 EEG. Together with the participating companies experiences with energy management systems were discussed and integrated into the project.

Based on the generated knowledge recommendations for systematic and extensive recording of steam and heat demand were formulated. Important was to keep the necessary work for the paper mills as low as possible by suitable calculation and estimation methods and additional measurement techniques. The worked out recommendations contributed to a differentiated analyses of energy use and consumption and an identification and quantification of saving potentials. The improved recording by measuring technique and the more easy formulation and traceability of measurements led to an input for a successful energy management.

**Application/Economic benefits**

With the research results companies can evaluate and display its heat and steam demand more transparent. This is an important precondition for further reductions of the energy demand. The decision-making and responsibility of companies will be forced in this area. In addition the success of measures for steam savings will be detectable. Within the certification and implementation of energy management systems the elaborated recommendations can contribute to a better documentation of steam and heat demand and to a development of quantifiable targets for savings. Requirements will be created to afford companies to gain benefits, which can be connected in the future to the implementation of a certified energy management system.

**Project period: 01.06.2010 – 31.05.2011**

**Remarks**

The project (INFOR Nr. 145) was funded by the curatorship of research and technique of the pulp and paper industry within VDP e. V.