

The missing link – bringing research to the market place

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The very reason for doing biomass research is to bring solutions to the market place, where they must be reliable and competitive to other energy sources. Sometimes, this final goal is overlooked by researchers, whose research only ends up as reports on university shelves. Furthermore, this research might not be able to meet the demands of the users in the market place.

This reduces the ability of for instance, equipment manufacturers to design and construct new technology, reduces the impact of investments for companies as well as governments seeking environmentally friendly energy production to meet growing concerns related to global warming, local pollution and security of supply.

A very important means to avoid this missing link is to include “knowledge carpenters” who can speak the language of both the scientists and the end users, securing that the research work meets the market needs.

Objective

The objective with this paper is to describe the importance of linking research with the needs in the market. This will be done with four examples suggesting how this link can be performed and how it enhances the outcome of the projects.

Example one: Development of downdraft gasification models

The Technical University of Denmark has many years of expertise with downdraft gasifiers and have developed a model to describe the behaviour of fixed char beds, using specialised software developed at the Department of Mechanical Engineering, Energy Engineering.

The Danish gasifier producer TK Energy A/S develops and constructs downdraft gasifiers on a semi-commercial scale. To proceed further towards commercialisation, the producer must optimise the gasification process and reduce both installation costs and maintenance costs in order to make his gasifiers competitive.

Link: dk-TEKNIK has been making computer models and process simulators for thermal plants in more than a decade, and has extensive knowledge on gasification. It is the task of dk-TEKNIK to convert the specialised computer models of the university to simple, yet accurate models with a suitable user interface. This way, the detailed and theoretical knowledge of the university will be made available to the user in a way specified by the user.

Example two: On-line measurement of moisture in wood chips

For many years, it has not been possible to measure the moisture in wood chips online. Consequently, wood chips samples are taken from the trucks and the moisture content is measured by weight loss by oven drying. As the moisture content is not known at the time of combustion, the process cannot be regulated to its optimum setting, giving increased emissions and reduced efficiency.

Link: dk-TEKNIK has discovered a way to determine the fuel moisture on-line. By further developing this method, the emissions can be reduced significantly and the efficiency increased. In a dialogue with several heating plants and the Danish District Heating Association, dk-TEKNIK has determined their needs for the system. By adding a supplier of measuring instruments and involving the Danish Energy Agency, it is secured that the needs of all partners are met by the theoretical knowledge, which in turn is used so that all partners benefit from it.

Example three: Development of new CFB concept

A small Danish company has invented and patented a new, innovative circulating fluid bed concept. To prove the viability of the concept the company has gone into cooperation with the Technical

University of Denmark, the Danish utilities, a manufacturer, a plant host, and dk-TEKNIK as “knowledge carpenter”.

Link: dk-TEKNIK participate in most of the project tasks, acting as the “glue” that keeps the project together. The responsibility is to secure that the design work, the laboratory analyses, test runs, etc. are performed so that the thoughts of the inventor as well as the theory of the university is brought to the manufacturer, setting him in a position to build plants after this concept.

Example four: Centre for Biomass Technology

As a competitor to fossil fuels, biomass has several disadvantages. The prices are higher (unless tax incentives are used), logistics are more difficult, the business financially weaker etc.

Link: The Danish Center for Biomass Technology is financed by the Danish Energy Agency to help new biomass initiatives into business, and build up and disseminate knowledge on biomass. Two of the four partners in the Centre (Danish Forest and Landscape Research Institute and Danish Institute of Agricultural Sciences) represent the procurement of wood and straw for biomass utilisation. The third partner, Danish Technological Institute, focuses on straw and wood conversion technologies. The fourth partner, dk-TEKNIK also focuses on these elements and is project manager and secretariat.

Centre for Biomass Technology has played a significant role in establishing and problem solving in about half of the now approx. 120 biomass fired district heating plants in Denmark. In the year 2000 the centre had approx. 1,200 enquiries, wrote articles and helped new initiatives.

Conclusion

“Knowledge carpentering” is an important element in the success of projects and ideas. In four examples the role of “knowledge carpentering” has been described in terms of adding the missing link between research and practical utilisation. In all four examples the link has been established in order to make the successful projects and eventually bring research to the market place.