Ecodesign framework for developing wind turbines - DTU Orbit (09/11/2017)

Ecodesign framework for developing wind turbines

Despite a wind turbines perceived environmental benefits, there are still many improvements that can be made in the product development process to improve its environmental performance across life cycles. This is especially important as the wind power industry continues to grow, both in volume and size, in response to increasing global market demands. Planning, implementing, monitoring, documenting and communicating product related environmental activities of wind turbines in a life cycle management context is the focal point of this article. The development and application of an ecodesign framework specific to the organizational context of Siemens Wind Power is described. The framework was developed using an iterative, action research design approach which relied on the participation of cross-functional employees. Five iterations occurred over a four year time frame and methods such as workshops, pilots, interviews and life cycle assessment were applied. The ecodesign framework was aligned with the company's formal product lifecycle management process. When combined with life cycle assessment, the framework can identify potential environmental improvements and contribute to coherent and transparent environmental target setting. Examples of this are demonstrated at the technological, organizational and societal levels of the company. Lessons learned obtained during the design iterations call for assigned responsibility through key performance indicators at project and functional levels; adaptive learning approaches to ecodesign based on continuous improvements; and additional capacity building amongst employees in life cycle thinking. The article proposes that a life cycle based ecodesign framework can be a driver for sustainable innovations in components, product systems, technologies and business models.

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