

KEYNOTE





The Positive Impact Factory: Transition from Eco-Efficiency to Eco-Effectiveness

By Prof. Dr.-Ing. Christoph Herrmann

Abstract

Manufacturing of products and goods contributes to more than one-third of the global CO2 emissions caused by humankind mainly due to combustion of fossil fuels. Against the background of an exponentially growing world population and an increasing global affluence the CO2 emissions from manufacturing industry will very likely surpass the threshold regarding a 2°C peak warming. Current measures to reduce the emissions primarily focus on eco-efficiency, seeking mainly for minimized energy demand and to a smaller extend also for minimized resource consumption. However, this strategy of just "making things less bad" will not sufficiently be able to overcome the aforementioned challenges and it can not constitute an adequate long term solution for manufacturing. Instead eco-effectiveness needs to be aspired, containing manufacturing systems which lead to a positive recoupling between economy and ecology. Contemporary trends and solutions in industry prove that the metamorphosis towards eco-effectiveness has already started and is speeding up. This contribution gives an overview about related requirements for manufacturing and responds with a concept of a Positive Impact Factory. An evaluation methodology with suitable criteria is derived and applied to practical examples, allowing an evaluation of a factories' stage towards a Positive Impact Factory.

Biography

Prof. Dr.-Ing. Christoph Herrmann is university professor for Sustainable Manufacturing & Life Cycle Engineering and co-director of IWF, Institute of Machine Tools and Production Technology, Technische Universität Braunschweig. Since 2009 he leads the Joint German-Australian Research Group on "Sustainable Manufacturing and Life Cycle Management" together with Prof. Sami Kara from the University of New South Wales (UNSW), Sydney.

Prof. Herrmann has studied mechanical engineering / production engineering. After his doctor degree (Dr.-Ing.) in 2003 he habilitated in production engineering in 2008. As a company's founder (2002 - 2007) he has transferred tools and services to support design for environment into the electric/electronic and automotive industry. From 2005 to 2008 he was also scientific director of KERP Center of Excellence Environment & Electronics, Vienna. From August 2009 to February 2013 he was scientific director and member of the board of the NFF (Niedersächsisches Forschungszentrum Fahrzeugtechnik / Automotive Research Center Lower Saxony), Germany. In 2011 Prof. Herrmann's team together with colleagues from Fraunhofer and industry partners has won the German Resource Efficiency Award from the Federal Ministry of Economics and Technology, Germany. Professor Herrmann has conducted various industry and research projects in the context of life cycle engineering and sustainable manufacturing on national and international level. He was chairman of the 18th CIRP Conference on Life Cycle Engineering held in Braunschweig in 2011. He has published more than 200 papers and book publications as author, co-other and editor. Professor Herrmann is member of the International Academy for Production Engineering (CIRP).