

Carbon-enhanced manufacturing and digitalization supporting cycle economy

Dominik Rohrmus
Siemens AG, Germany

The global challenge climate change calls for answers beyond the pure optimization of resources and energy consumption in manufacturing - a major CO₂ causer. CO₂ as a supply for new synthetic raw materials and products as well as markets is a new long-term approach to establish a green cycle economy. We define green cycles as CO₂ sinks. The Siemens green cycle vision for green production and green raw materials as displayed in Figure 1 opens new manufacturing models and new product markets to provide an answer for the world's hunger for materials. These materials have a promising future for non-food related components such as electronic parts. Green cycle factories apply the concept of green cycles to the discrete manufacturing industries. The prerequisites are renewable energy and chemistry production technologies, which are synthesizing fuels and materials for manufacturing from CO₂ sources. The world has to focus on renewable supplies, which fulfill the demands of future manufacturing technologies in terms of additive manufacturing processes that are then mainly using carbon materials. Our new findings can help to contribute to a greener future as carbon-based materials come from renewable, biodegradable resources. The transformation process requires new competitive manufacturing systems in a decentralized and digitalized manner. An additive manufacturing process based on this carbon feedstock is one promising application field with the advantage to transfer the carbon load into discrete products. Hence, low carbon in the atmosphere can be realized by green cycles and advanced carbon-based materials and manufacturing.

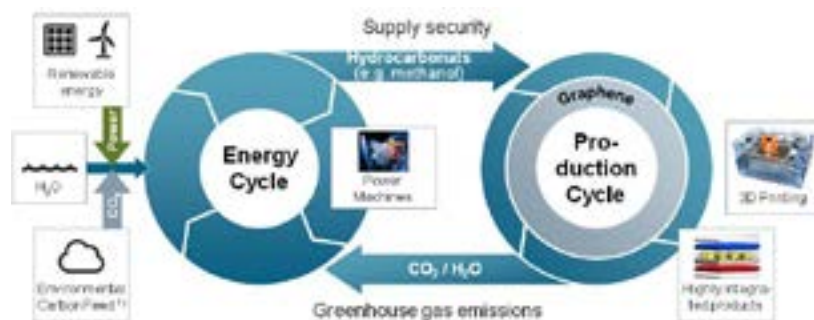


Figure 1: Vision of future energy and production cycles economy

Biography

Dominik Rohrmus works at Siemens Corporate Technology in Munich, Germany in different functions in the area of manufacturing development and production equipment realization since 2005. In 2009, he founded the company program, Sustainable Production Engineering and rolled several demonstrator projects company-wide out. In particular energy efficient production planning and technology on the shop-floor set the focus of that program. Also cycle economy and cycle business development in cooperation with Siemens business units and external partners is part of the program and yield already several pilot projects. Since 2013, he is the Head of the research group, Manufacturing Systems Engineering at Siemens Corporate Technology. The research group is responsible for shop-floor equipment standardization and development of the future for the Siemens factories worldwide.

dominik.rohrmus@siemens.com

Notes: