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Carbon-enhanced manufacturing supporting recycling of CO₂

Climate change requires answers beyond the pure optimization of resource consumption and energy demand management in areas like manufacturing. CO₂ as a supply for new synthetic raw materials and products as well as markets is a 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 opens many 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 CO₂ neutral forms of renewable energy as well as chemical production technologies, which synthesizes fuels and materials for manufacturing from CO₂ sources which then yield the recycling of CO₂. One economic driver is the merging of different energy grids. The focus lies on renewable supplies that fulfill the demands of future manufacturing technologies in terms of additive manufacturing processes which are mainly using carbon materials coming from renewable and biodegradable resources. The transformation process requires new manufacturing systems in a decentralized and mostly digitalized manner. A new additive manufacturing process based on this carbon feedstock is one promising application field with the advantage to transfer the CO₂ load into discrete products. Hence, low carbon in the atmosphere can be realized by green cycles, i.e. CO₂ recycling and advanced carbon-based materials and manufacturing.

Biography

Dominik Rohrmus works for Corporate Technology of the Siemens AG in different functions in the area of manufacturing since 2005. In 2009, he found the company program sustainable production and rolled several demonstrator projects out. Particularly, energy efficient production planning which set the focus. Also, cycle economy technologies and cycle business development in cooperation with Siemens business units and external partners is part of the program with several pilot realizations. Since 2013, he is the Head of Manufacturing Systems Engineering. The research group is responsible for shop-floor developments of future technologies for the Siemens factories worldwide.

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