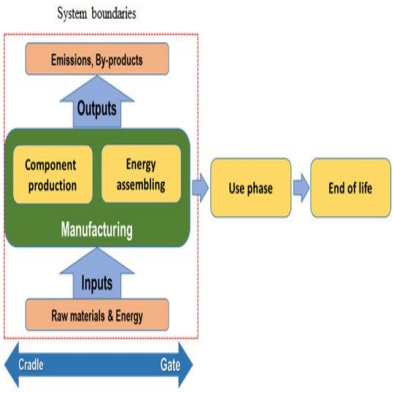
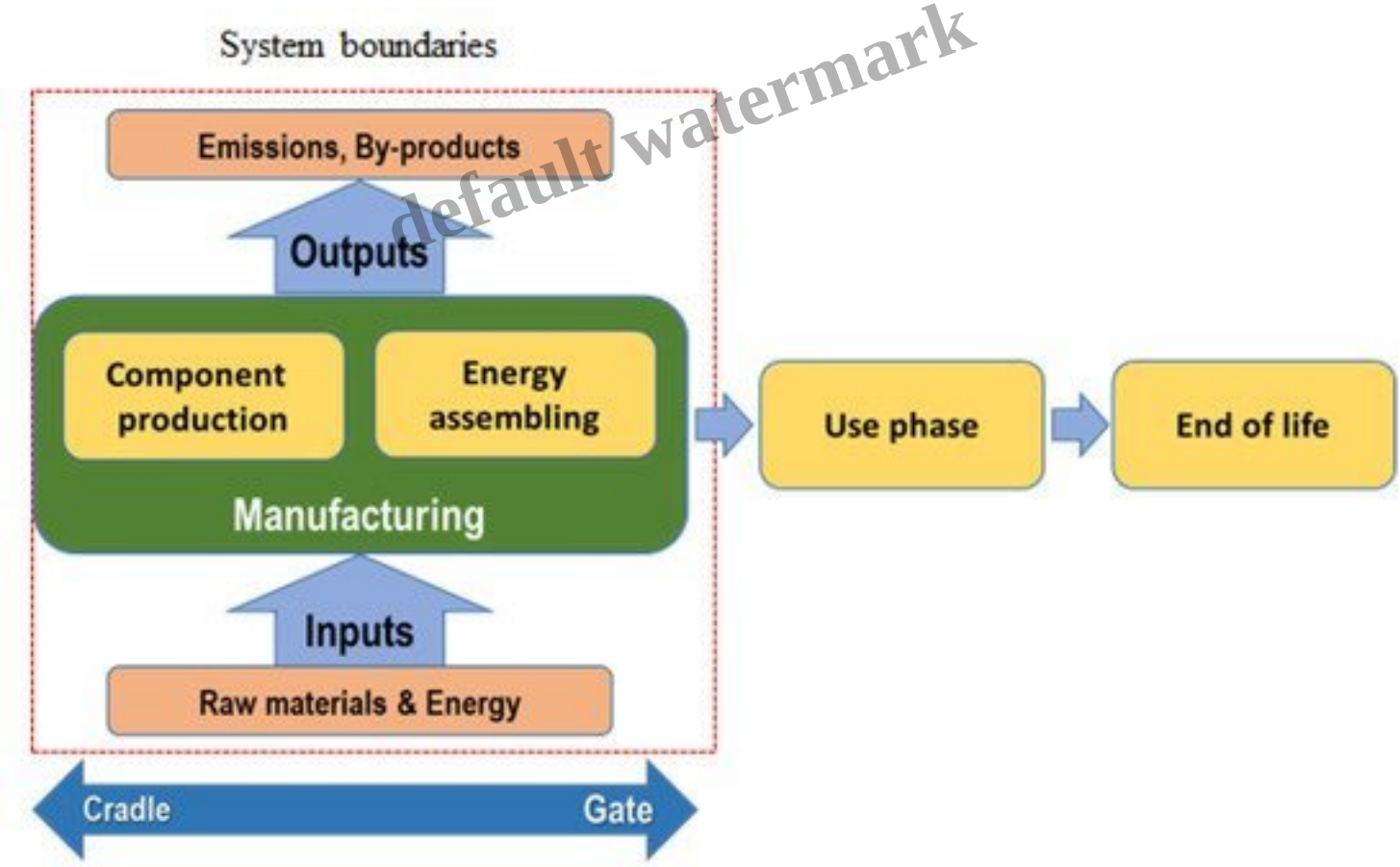


Environmental Assessment of Electrochemical Energy Storage Device Manufacturing to Identify Drivers for Attaining Goals of Sustainable Materials 4.0

Description



Electricity from the combination of photovoltaic panels and wind turbines exhibits potential benefits towards the sustainable cities transition. Nevertheless, the highly fluctuating and intermittent character limits an extended applicability in the energy market. Particularly, batteries represent a challenging approach to overcome the existing constraints and to achieve sustainable urban energy development. On the basis of the market roll-out and level of technological maturity, five commercially available

battery technologies are assessed in this work, namely, lead–acid, lithium manganese oxide, nickel–cadmium, nickel–metal hydride, and vanadium redox flow. When considering sustainable development, environmental assessments provide valuable information. In this vein, an environmental analysis of the technologies is conducted using a life cycle assessment methodology from a cradle-to-gate perspective. View Full-Text

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