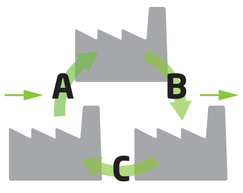
Smart Circular Economy strategies

	Restore, reduce & avoid impact in the areas of: Raw materials & sourcing	**Recirculate parts & products** Extend existing use cycles	**Recirculate materials**
Prescriptive	**Automatic gathering and processing of real-time and aggregated information** in self-managing and adaptive sourcing plans or configurations. ***Requires:*** self-optimisation algorithms (e.g. swarm intelligence), open data and well-functioning eco-networks with extensive resource coverage	**Autonomous determination by parts/ products of the need for and scheduling of the appropriate life cycle extending operations**. E.g. through predictive maintenance. ***Requires:*** deep learning (e.g. long short term memory network), live operation data streams paired with maintenance logs and failure modes	**Autonomous cost-benefit analysis and execution** of end-of-life strategy of parts/ products based on material quantity, composition and quality. ***Requires:*** self-optimisation and reliability algorithms (e.g. swarm intelligence and long short term memory network) and openly accessible material databases
Predictive	**Anticipate changes to sourcing and value chain dynamics** and alert for potential upcoming issues**.** ***Requires:*** value chain analysis and value stream mapping	**Prediction and/or automated planning of product/part life-cycle extending operation** based on condition data (i.e. Product health) and aggregated (failure) data for product (group) and taking into account user-activity cycles for minimal disruption of operations. ***Requires:*** condition monitoring, machine learning, and signal processing.	**Predict the impact of recycling and cascading on material composition and quality** and Direct materials to appropriate treatment systems. ***Requires:*** impact measuring, analysis of recycling activities
Diagnostic	**Identify new scenarios for the application of raw materials** that optimise sustainability impact (invironment, social, economic) and reduce (the impact of) quantity, quality and timing fluctuations**.** ***Requires:*** self-optimisation algorithms and impact analysis	**Determine the need for life-cycle extending operations** based on elapsed time and use statistics for product. ***Requires:*** statistical analysis and operation management	**Determine material quantity and health** by means of analysing purity, constitution, and quality. ***Requires:*** purity analysis and quantity analysis
Descriptive	**Identify quality, quantity and timing etc. of current input flows.** ***Requires:*** aggregated information from internal sourcing, inventory, and logistics databases	**Trigger request for repair based on alert of sudden product failure.** E.g. through with reactive maintenance. ***Requires:*** root cause analysis algorithms and an Internet of Things device, or corresponding sensor/machine data	**Automatic identification of materials and material grades for correct selection of end-of-life strategy**. E.g. automated waste sorting. ***Requires:*** an Internet of Things device, or barcode to scan and recognise material, predetermined rules of material degredation linked with end-of-life srategy choices
	 *for example:* **Industrial Symbiosis**	 *for example:* **Maintenance**	 *for example:* **Recycling**

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