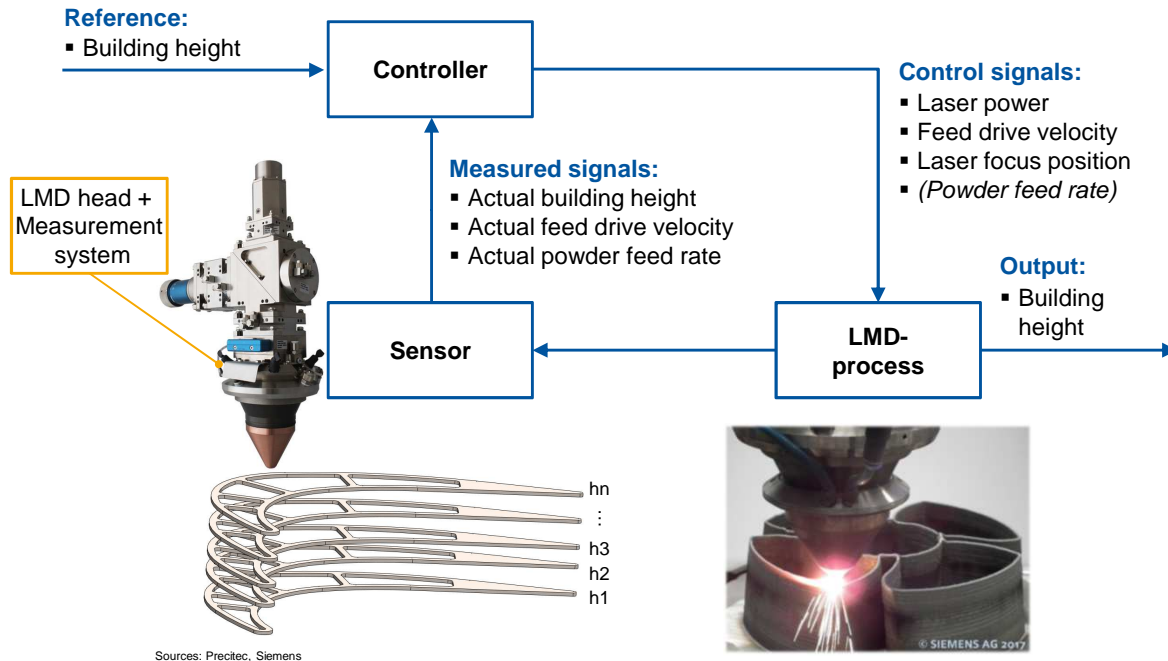


# PARADDISE

ER2: Closed-loop control systems for hybrid AM & SM manufacturing



## Consortium



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## Project objective

The overall objective of PARADDISE project is to rationalize, to structure and to make available to the stakeholders of manufacturing value chain the knowledge and the tools for combining two antithetical processes: Laser Metal Deposition (LMD) and Machining (milling and turning). The project will develop expert CAX technologies, smart components and monitoring and control systems tailored for the hybrid process in a cost-effective way and with structured knowledge about LMD process. The PARADDISE solution will offer a synergetic combination among: i) the high flexibility for the designs and for the materials to be used, the high material efficiency and the high savings in material resources and its associated costs of the LMD operations; and ii) the high accuracy, the high robustness and the high productivity of subtractive operations.

## Controller development

During any LMD-process various parameters have an impact on the quality and performance of the manufacturing process. In the project features to monitor and control the building height and powder flow rate will be developed. The realization of fast monitoring and closed loop control functions will use the technology of modern CNC, e.g. the integration of fast compile cycles. With it the adjustment of the building height can be realized by changing the feed drive velocity, laser power or laser focus position. For different manufacturing situations different controllers will be used, which have to be designed robust for all kinds of process variation during the respective LMD-process. The control and monitoring functions of the powder flow rate can be implemented directly on the powder feeder or on the LMD head.



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