

SUPRA-1

Sustainable Production and Assembly Technologies in Future Production Systems



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MOTIVATION & GOALS

High variances in electric power demand of a production site must be provided from power supplier and result in high electric power connection to the power grid. Machine downtimes and unproductive set-up time decreases the machine efficiency. Both is and cost factor in production sites which cannot be neglected.

The goal of this project is a holistic approach to **reduce variances in power demand** of production sites and **reduce machine downtimes** and finally **saving costs**.

Project FactBox

Project Name SUPRA-1
Project ID MFP II 4.2.2-1
Duration 4,5 Years

Area_4.2
Cognitive Production Systems

Project Lead
Dr. Markus Brillinger

APPROACH

ENGINEERING

Pro²Future

Objective Functions

$$C = T \cdot R_M + E \cdot R_E + PD \cdot R_{PD}$$

Constraints

$$PD = \max \left\{ \frac{1}{n+1} \sum_{i=0}^n P_i \Big|_{15min} \right\}$$

Solution

$$PD = P_b \pm \sqrt{\frac{E_{kin}}{R_{PD}} \cdot (R_M + P_b \cdot R_E)}$$

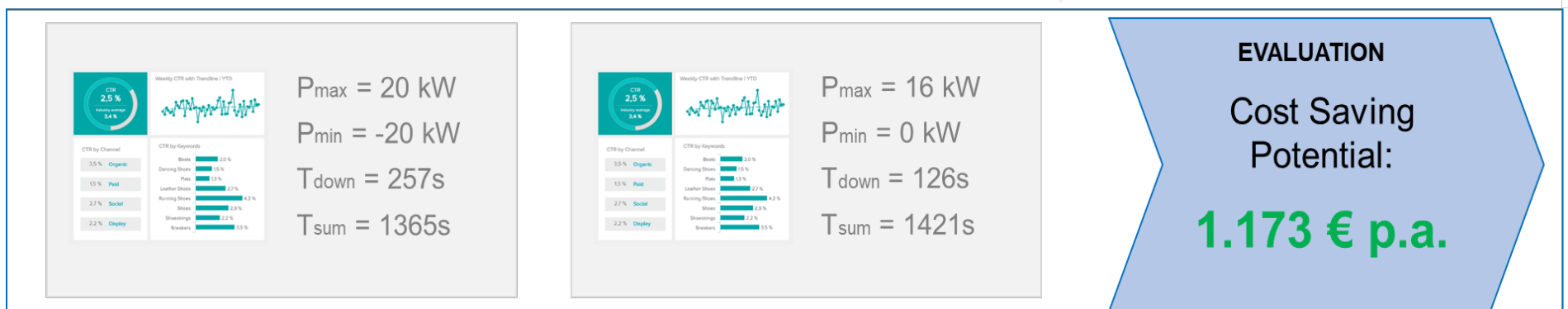
CONTRIBUTION

Scientific contribution

- 4 scientific publications planned
- Scientific collaboration with TU Graz
- Extensive state-of-the-art analysis on how to reduce energy consumption and power demand of production facilities
- New power smoothing algorithms

Economic contribution

- Smoothing power demand of production facilities
- Decrease in power grid volatility
- High cost saving potential
- Approach to Green Manufacturing



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