

ME24_11 ■ Power and Process Combined Simulation: Novel Approaches to Design Validation

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Abstract - This paper presents a novel and renewed Co-Simulation approach integrating dynamic process and electrical simulation tools for design validation in project design phases. The method addresses three core concerns: supporting and validate feasibility study sizing, accurate design options comparison, and achieving time and cost savings through scenario execution prior and during the detailed design phase. By combining power and process models, this approach supports users throughout the project lifecycle, linking transient process and electrical simulations to provide insights into process load requirements. Key benefits include reduced power and process risks, capital expenditure savings, improved process energy utilization, and reduced engineering time.

The Co-Simulation tackles growing complexity in process electrification, allowing assessment of dynamic design performance, and ensuring appropriate equipment sizing. The paper outlines software integration techniques, validation procedures, and a case study demonstrating Co-Simulation's application in sustainable energy transitions, highlighting steps undertaken and recommended to support the growth of such tool which leads design accuracy improvements, and project timeline reductions.