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**DRAFT: ENERGY EFFICIENCY OF INDUSTRIAL SYSTEMS: A DESIGN
RESEARCH PERSPECTIVE**

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ABSTRACT

Beyond the usual energy efficiency of buildings, industrial energy efficiency involves major politico-economical and environmental challenges, among which the emergence of eco-industrial parks and symbioses. Solving these challenges require reliable methodologies and tools. Having interviewed some major industrial energy stakeholders, it appeared that despite of their motivation, energy efficiency projects were not really successful because of the difficulty in identifying adequate simulation methodologies and/or tools. Moreover, in spite of multiple research projects in industrial energy efficiency, it seems that previous research works do not sufficiently support a systematic and integration view.

In this paper, we propose a critical review and a categorization of energy efficiency research methodologies and tools. The analysis of these solutions results in the building of an inventory of more than 50 modeling and simulation software tools. Furthermore, a positing matrix is designed in order to map energy efficiency solutions according to identified granularity levels of industrial systems as well as their marketing maturity level.