Energy Efficiency Optimization of a Cheese Factory

Motivation & Objectives
In the current trend of high resources price volatility, the rational use of energy in industrial processes becomes more important. The aim of this study is the energy efficiency optimization of a cheese factory using energy integration method.

Methodology
- Compilation of the heating and cooling requirements
- Evaluation of heat recovery potential using pinch analysis
- Comparison of different utility setup the process requirements

Case study
The production plant can be represented in a block diagram showing the interactions between the production processes and the utility units. In order to produce cheese from the raw products, the plant consumes energy and rejects wastes.

Utility integration
Once the process MERs are determined, utility setups fulfilling those requirements are investigated. The production plant can benefit from the integration of both a cogeneration engine and heat pumps, as it will reduce the operating costs and exergy losses.

Conclusion
Based on the process pinch analysis it has been shown that the current hot and cold consumptions can be reduced by more than 45%. Moreover, the process can benefit from the integration of cogeneration engine and heat pumps. However, further studies should be conducted to take into account industrial constraints.