

Press release

Lucerne, August 30 2017

Save energy and costs in industry with PinCH 3.0

Reducing energy consumption is becoming increasingly important for industrial enterprises. The key to increasing energy efficiency and profitability is process integration with the help of pinch analysis. Up to 40 percent savings can be achieved with the analysis. The PinCH software of the Lucerne University of Applied Sciences and Arts helps both large companies as well as SME with the practical application of pinch analysis. Following the release of PinCH 3.0, a software tool is now available for the first time that allows the integration of thermal energy storage systems.

Heating and cooling needs account for a large share of the energy consumption and cost in industrial processes. As a result, energy efficiency becomes a question of competitiveness. Yet, the complexity of the processes and the associated concern of changes to product quality caused by energy saving measures often put companies off modifying functioning systems. "Experience, however, has shown that the optimum combination of energy flows for better heat recovery in the overall process generally brings more than the costly improvement in the efficiency of individual unit operations," says Beat Wellig, Head of the Competence Center Thermal Energy Systems and Process Engineering of the Lucerne University of Applied Sciences and Arts. Here is where pinch analysis steps in: with this analysis it is possible to determine systematically and holistically how the energy flows have to be connected to achieve high efficiency and minimum costs. Heat recovery and improved energy supply measures can be derived from the results of the analysis. In addition to optimizing existing systems, the pinch analysis is also a valuable instrument when it comes to designing new production plants and infrastructure systems.

PinCH: an engineering tool for the praxis

The Lucerne University of Applied Sciences and Arts has over the last several years developed the user-friendly PinCH software for the practical application of the pinch analysis method with the support of the Swiss Federal Office of Energy. The software allows for a quick familiarization with the method as well as for its goal orientated and cost effective practical application. Using PinCH, both continuous and discontinuous processes and those with different operating cases can be optimized. "The combination of several processes, simple changes to process data and the investigation of different scenarios enable comprehensive variant studies and sensitivity analyses to be performed," says Beat Wellig. Other important features are the graphic design of heat exchanger networks, the integration of heat pumps and CHP plants as well as practical tools to optimize energy supply systems. The software supports a systematic approach to energy optimization, creates transparency by visualizing the present state and the potential savings, and quickly helps find optimum solutions.

PinCH 3.0: new features for storage integration

In industry a large number of products are manufactured using discontinuous operation. Often the production schedule is irregular or the need for time flexibility so great that heat recovery with storage is the only possible optimization strategy. The installation of energy storage systems opens up additional savings potential: excess process heat is stored and used again at a later point in time. "The new release PinCH 3.0 is ideal for the rapid identification, dimensioning and profitability assessment of thermal energy storage systems in industrial companies," says Beat Wellig. With these new features it is possible to determine whether energy storage is economically feasible,

which heat sources and heat sinks have to be taken into account and how the storage capacities and temperatures should be chosen.

Application in the praxis

A number of practical examples show that pinch analyses are worthwhile. CSL Behring AG in Bern is an internationally active biopharmaceutical company that develops and produces medicines from human blood plasma. The company places great value in energy saving and environmentally friendly processes. “With the completion of the pinch analysis a reduction in the cooling demand needed for process and refrigeration unit cooling water treatment of approximately 30 percent was uncovered,” confirms Michael Hirschi, Functional Manager for Utilities - Energy at CSL Behring AG, the benefits of the pinch analysis. The energy required for industrial processes can typically be reduced by between 10 and 40 percent, with payback periods of two to three years for the implementation of the measures.

Competence Center supports industrial companies and engineering firms

Apart from the software development, the Lucerne University of Applied Sciences and Arts also operates a Process Integration Center in cooperation with the Swiss Federal Office of Energy. The Center provides industrial companies and engineering firms extensive support in the practical application of pinch analysis and use of the PinCH software. Practical training, customized company courses, individual coaching and consulting round off the Center’s range of services.

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Legends:

Figure 1:

User interface of the engineering software PinCH 3.0, with which heat storage systems can be systematically integrated in the process.

Figure 2:

Pinch analysis at CSL Behring AG, Bern: left to right Michael Hirschi (CSL Behring AG), Dr. Andrea Grüniger (Grüniger PLUS GmbH), Don Olsen (Project Lead of Software Development PinCH 3.0) and Prof. Dr. Beat Wellig (Head of the Competence Center Thermal Energy Systems and Process Engineering of the Lucerne University of Applied Sciences and Arts).