



# THE CWB INSIDER

A CLEARWATERBAY TECHNOLOGY INC. QUARTERLY

JULY 2008

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## ENERGY SAVINGS STUDY DOES NOT ALWAYS MEAN HEAT EXCHANGER NETWORKING

Due to the recent high price of oil, energy savings projects are again becoming a hot topic. This is the first paper of a series intended to share some of our thinking, philosophy and solutions for solving the above problem. Firstly, of course we need to clearly define our objective – energy savings, in order to set up the correct solution strategy. What are they? How to achieve them?

Many people in the world relate an energy savings study to a Pinch study or even a Heat Exchanger Networking Study. Why is that? Is that correct? Let's consider the area-energy plot shown in Fig. 1. Using Pinch Technology and/or other technology it is possible to calculate the limit of energy consumption for a given area and/or capital cost investment. The figure can be obtained by simply plotting this theoretical minimum of area and energy together in one plot. Since the curve shows the theoretical minimum, it is infeasible to have any design located on the left side of the plot. However, for any existing design, it is then depending on the level of "correctness" of the heat exchanger network/heat recovery design, the design will lie on the right side of the curve.

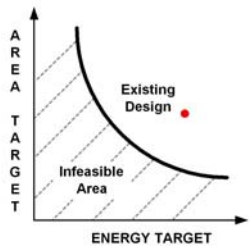


Figure 1: Area-Energy Target Plot



Figure 2: Energy Savings Project for Poor Design

Many years ago, without the knowledge of Pinch Technology and/or the advanced numerical technology, the design may have been somewhat far away from the ideal curve. Consequently, simply correcting the Heat Exchanger Network, significant energy savings could be achieved, as shown in Fig. 2. Since

mid-80's, the design of heat exchangers network has become a popular topic and many projects and/or modifications of "old" processes have been implemented.

Twenty years later today, if we continue to only use Pinch Technology and/or other technologies for improving only the heat exchanger network, the situation will become something like Fig. 3. A very significant capital cost is needed for very minor improvement. However, does that mean that we can no longer improve the energy efficiency of the process?

In CWB Tech, we believe that today's energy savings project is no longer only a heat exchanger network improvement. It has to be a process improvement. Our MOPD (Multiscale Objective-oriented Process Development) is one of the most effective methods for analyzing the existing process and to identify effective process improvement direction. After successful process modifications we can apply the appropriate Pinch Technology and/or heat exchanger network design to capture the energy savings as shown in Fig. 4. In doing so we can reduce the energy savings significantly with a fast payback period.



Figure 3: Energy Savings Project for New Design using HENs

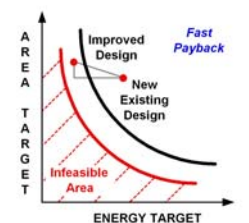


Figure 4: Today's Energy Savings Project for New Design

In conclusion, we can say that today's energy savings project can no longer be the ordinary Pinch Technology studies from 20 years ago. It is necessary to combine them with successful and effective process modifications. Contact us today for your process development needs!

### SPECIAL POINTS OF INTEREST:

- **TECH TIP:** "Heat Exchanger Networking does not equal energy savings study"
- **FREE Sales seminar in Japan**
- **Sleek-EX:** SLEEK for solid-liquid equilibrium experiments

## IN THE NEWS

## FREE SEMINAR

**Title:** Total Solution for Crystallization Process Development - from Lab to Plant

**Venue:** Pacifico Yokohama, Japan

**Date:** September 18, 2008

**Topics:**

- Explanation of what you observe in the lab or plant based on solid-liquid equilibrium (SLE) behavior of the system;
- Identification of bottlenecks and potential improvements for your existing crystallization and/or solids handling process;
- Feasible process alternatives to your existing process, which may be more advantageous from the economic and/or operational point of view;
- Conceptual design of next generation crystallization-based separation processes based on first principles.

Our services in the area of crystallization are aimed at providing a "Total Solution", i.e. Training, Consulting, Software and Experiments.

We also recently gave a talk on:

**Title:** Importance of Solid Liquid Equilibrium Behavior in Crystallization Process Development

**Conference:** 20th "Latest trends in chemical engineering physical property values" lecture meetings

**Venue:** Nippon University Department of Science and Engineering, Tokyo, Japan

**Date:** June 24-25, 2008

**Topics:**

This conference discussed themes from a manufacturing process point of view. They have been held regularly in the past several years and are well-attended. The topics include study of physical property values, the basic data required for the design of various manufacturing processes etc. The proceedings are edited by the Society of Separation Process Engineers as "Collection of physical properties for practical use in manufacturing processes"

## A FIRST LOOK AT SLEEK-EX \* NEW PRODUCT



One of the biggest problems an engineer has to overcome when dealing with design of crystallization processes is the lack of data on

solid-liquid phase equilibrium. In many instances the problem becomes even more pronounced due to a lack of suitable experimental methods and a lack of systematic methods for processing the data.

Through SLEEK-EX, we have taken a major step forward to solve this problem. SLEEK-EX combines the solid-liquid equilibrium technology we have pioneered through SLEEK with a multi-vessel solubility measurement setup we have developed over the last five years.

A closer look and details on the SLEEK-EX technology will appear in the next edition of this newsletter.

Register today for our joint course with ASME/AICHE Course "Multi-Disciplinary Process Development: From Lab to Plant" Venue: Orlando, FL Date: November 10-11, 2008 Registration: [www.asme.org/education](http://www.asme.org/education) Course: CH757, Credits: 1.5CEUs or 15PDHs

**Software**

- SLEEK
- ARODESK
- Total Site Modeling
- Custom Software Solutions

**Consulting**

- Reaction Engineering
- Separations Technology
- Total Site Energy Management
- Solids Processing
- Crystallization
- Distillation Synthesis
- Process Design

**Experiments**

- Experimental Design
- SLEEK-EX
- New Products

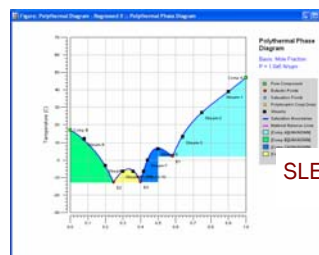
**We provide the Keys to your Total Solution**

- Improved Process R&D Workflow
- Shorter Development time
- Lower Development Cost
- Innovative Solutions

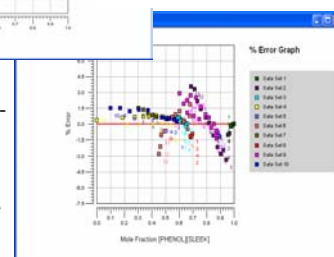
"Strategic alliance with CWB Tech through consulting, training, and software solutions has helped us in developing more cost effective processes quickly. We are confident that our relationship will provide us the edge to stay ahead of the competition."

Dr. Yasukazu Ogino, General Manager, Business Development Division, API Corporation, Japan

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SLEEK Screenshots



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Course: CH757, Credits: 1.5CEUs or 15PDHs

For detailed information on our upcoming training courses, contact us at [shortcourse@cwbtech.com](mailto:shortcourse@cwbtech.com), or Hideo Iketani of I.T. Solutions at [iketani@its-ykh.co.jp](mailto:iketani@its-ykh.co.jp)

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