

<p>KLM Technology Group</p>	<table border="1"><tr><td data-bbox="570 128 821 243">KLM</td><td data-bbox="821 128 1154 243">Technology</td></tr><tr><td colspan="2" data-bbox="821 243 1154 338">Group</td></tr></table> <p>Consulting, Guidelines and Training Engineering Solutions</p> <p>www.klmtechgroup.com</p>	KLM	Technology	Group		<p>Page 1 of 6</p> <p>Rev 1.0</p>
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Introduction to Techno-Economic Analysis (TEA) Training Course

The success of every company depends on each employee's understanding of the key business components. Employee training and development will unlock the companies' profitability and reliability. When people, processes, and technology work together as a team developing practical solutions, companies can maximize profitability and assets in a sustainable manner. Training and development are an investment in future success - give yourself and your employees the keys to success.

It is strategically important that your team understands the fundamentals of Techno-Economic Analysis concepts to enhance manufacturing competitiveness and sustainability. Techno-Economic Analysis (TEA) is a method for evaluating the economic performance of a technology.

Whether you have a team of new or seasoned employees, an introduction or review of these concepts are very beneficial in sustainability. Most studies show that a continuous reinforcement of best practices is the most effective way to obtain the desired results. Training and learning should be an ongoing continuous lifelong goal.

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Course Objective

This course will guide the participants to develop key concepts and techniques for Techno-Economic Analysis to enhance manufacturing competitiveness and sustainability.

- 1) Process design and simulation**
- 2) Process economics and business planning**
- 3) Process intensification to improve the process / energy and development of modular processes**
- 4) Life-cycle assessment.**
- 5) Technology Benchmarking**

This seminar focuses on the core building blocks of Techno-Economic Analysis with examples to enhance manufacturing competitiveness. Process simulation with Process Intensification are keys to economics business planning. Process intensification with energy and emissions reductions is a way to decarbonize the process.

Life cycle assessment must be performed to get a complete picture of the technology. A small section of the technology may look promising, but the overall picture must be developed.

Course Duration and Delivery

Typical course duration is 3 to 5 days based on the background of the participants. One of our Senior Technical Professional with over 25 years of experience would lead the class. Instruction can be in house or in an online seminar.

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Outline

Introduction

- Overview of the Chemical Processing Industry

Review of Process Incidents

- Safety for the Chemical Processing Industry

Overview of Techno-Economic Analysis

1. Process design and simulation
2. Process economics and business planning
3. Process intensification to improve the energy and development of modular processes
4. Life-cycle assessment
5. Technology Benchmarking

Process Design and Simulation

- a. Principles of yield and conversion
- b. Process simulation overview
- c. Tuning model to the real world
- d. Limits of process simulation
- e. Example of yield improvements
- f. Example of energy improvements

Process Economics and business planning

- a. Capital Cost Estimation
- b. Operating Cost Estimation
- c. Profitability Evaluation
- d. Typical Industry Cost Benchmarks

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Process intensification to improve the design, energy and development of modular processes

- a. Introduction to process intensification
- b. Developing breakthrough technologies to dramatically improve the energy efficiency – decarbonizing the process
- c. Developing novel manufacturing processes and enabling development of modular processes.
- d. Process Decarbonization

Life-cycle assessment

- a. Introduction to Life Cycle Assessment (LCA)
- b. Estimating Raw Material embodied energy and emissions
- c. Estimating Manufacturing Energy Consumption and Emissions
- d. Estimating Use Phase Energy and Emissions

Technology Benchmarking

- a. Understanding the cost, emissions, and energy profiles of a technology.
- b. Comparing the performance of a new technology to its commercial benchmark.
- c. Using scenario analysis to identify performance factors that lead to emissions and cost improvements throughout the technology's lifetime.

Examples

- a. Yield Improvement Example
- b. Energy Improvement Example
- c. Waste Heat Recovery Example
- d. Ethylene Catalyst Example

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Who Should Attend:

- **People who are making day to day decisions regarding operation, design, and economics of processing plants;**
 1. **1st Line Operations personnel,**
 2. **Operation Supervisors,**
 3. **1st Line Maintenance personnel,**
 4. **Maintenance Supervisors,**
 5. **Senior Plant Supervisors,**
 6. **Operations Engineers**
 7. **Process Support Engineers,**
 8. **Design Engineers,**
 9. **Cost Engineers**
 10. **Environmental Support Personnel**
 11. **R&D Engineers**
 12. **Technology Managers**
 13. **Graduate Students**
- **Ideal for veterans and those with only a few years of experience who want to review or broaden their understanding in Techno-Economic Analysis.**
- **Other professionals who desire a better understanding of subject matter**

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What you can expect to gain:

- **An introduction to Techno-Economic Analysis**
- **Review of Process Design and Simulation**
- **Process Economics and business planning**
- **Process Intensification**
- **Modular Construction**
- **Life Cycle Review**
- **Technology Benchmarking**