



**CORPORATE  
INFORMATION**



Fall 2009

## Overview

Process Ecology works with client companies to integrate various information and knowledge sources in a coherent way to support better decision making. Our mission is to deliver integrated services, software tools and state-of-the-art decision support to the Energy Industry and contribute to improve the environmental and economic performance of the sector.

Process Ecology delivers value to clients via four core areas:

- Emissions estimation and management
- Process analysis consulting
- Software development
- Training

## Who we are

Process Ecology was founded in Calgary, Alberta in 2003. We have substantial experience in engineering consulting for the oil and gas industry, as well as detailed knowledge of the process simulation software business, acquired by the founders over the last decade while working with leading process simulation software companies Hyprotech/Aspentech and as part of our independent software and services activities.

We have expertise in the following areas:

- Steady-state simulation
- Dynamic simulation
- Process modeling and optimization
- Physical properties modeling
- Energy and water efficiency
- Engineering software development

We have been involved in the development of large and complex simulation models (both steady state and dynamic modes); our involvement typically requires the building of simulation models, plant data matching (validation), systems integration, development of graphical user interface and performance monitoring tools.

We have participated directly in the design and development of some of the most innovative simulation tools such as RefSys, HX-Net, Distil, Icarus and others. We have developed specialized extensions both for unit operations and fluid property packages, including heavy oils. Our team of world-class experts in the development and application of process simulation and optimization software products offer a combined set of competencies that enables our clients to extract real value from our solutions.

Process Ecology also has access to a worldwide network of associates that extends from North America to the Middle East and Far East as well as Europe and South America, all of which have been active in process modelling and simulation projects ranging from conceptual design to detailed design and costing of process plants.

The Process Ecology Management Team represents over 40 years of experience in process simulation development and modelling.

### James Holoboff (Principal) – Short Bio

James Holoboff (james@processecology.com) is a Senior Project Manager with Process Ecology. His experience includes process engineering, simulation and project support, primarily in the oil & gas sector. In 1994, Mr. Holoboff joined Hyprotech Ltd., initially providing support, services and training for a broad range of Hyprotech software, ultimately managing the technical support group in Calgary in addition to various business development roles. He has a Masters of Science in Engineering (MSc) degree from the University of Calgary and is a member of APEGGA. Since 2003 he has been providing process engineering consulting support primarily for oil and gas production/midstream companies.

### Mohammad Khoshkbarchi (Principal) – Short Bio

Dr. Mohammad Khoshkbarchi (mohammad@processecology.com) is a Senior Project Manager with Process Ecology. Dr. Khoshkbarchi holds a Ph.D. degree in Chemical Engineering from McGill University in Montreal. He joined Hyprotech Ltd. in Calgary, Alberta in 1996 as an R&D engineer and during 10 years with Hyprotech and subsequently Aspentech Inc., he served in various capacities such as Manager of Thermodynamics, HYSYS, RefSYS and Upstream development teams. During this period he has designed, developed and managed several new initiatives such as COMThermo and RefSYS (the first refinery wide simulator). Dr. Khoshkbarchi has also been involved in several strategic alliances, often as team lead, with companies such as Spiral and UOP to integrate their technologies into the software products.

### Alberto Alva-Argaez (Principal) – Short Bio

Dr. Alberto Alva-Argaez (alberto@processecology.com) is a Senior Project Manager with Process Ecology. Dr. Alva-Argaez holds an MBA degree from ITESM and a PhD degree at the Centre for Process Integration, UMIST, U.K. In 1999 he joined Hyprotech Ltd. in Calgary, AB as a Business Manager for the Conceptual Design suite of software products (HX-Net, DISTIL, Hyprop, COMThermo) and Thermodynamics and later joined the Industrial Systems Optimization at Natural Resources Canada. Dr. Alva-Argaez has been involved in a number of projects to identify and simulate energy efficiency improvements through the application of process integration tools, mainly in the Pulp and Paper and Oil Refining sectors. His project experience also covers the design and optimization of water distribution, reuse and treatment systems for oil refineries, steel mills and pulp and paper mills.

### Trevor Shober – Short Bio

Mr. Schober (trevor@processecology.com) has 11 years experience in the chemical and petroleum industries. He has acquired a strong background in the development, economic evaluation, and management of projects, as well as, design, operation, and troubleshooting of related equipment and pipelines. Mr. Schober is a Chemical Engineer graduated from the University of Calgary and has worked as a Process Engineer for Union Carbide, O'Rourke Engineering, Paramount Resources, Trilogy Energy and more recently as a Senior Process Engineer for Keyera Energy where his main responsibilities have included facility and pipeline system troubleshooting and optimization as well as development plans for new and existing plants and pipelines.

### Laura L. Chutny – Short Bio

Laura Chutny (laura@processecology.com) is a Senior Process Engineer with Process Ecology. Laura brings more than 19 years of experience in process engineering and chemical engineering research with strengths in process modeling and dynamic simulation, analyzing and interpreting simulation results, distillation optimization, conceptual design and project front end loading. Her industrial experience is rather diverse with projects performed in upstream and downstream oil & gas, chemical and polymer industries. She has worked as a Process Engineer for Shell Canada, SNC Lavalin, Fluor, Aspentech and Nova Chemicals. Laura holds a MEng in Chemical Engineering from the University of Delaware and obtained her first degree also in Chemical Engineering from the University of Alberta.

### Ahmed Hamdan – Short Bio

Ahmed Hamdan (ahmed@processecology.com) is a Senior Process Engineer with Process Ecology. Ahmed has over fifteen years of experience in process and chemical engineering. He has accumulated extensive experience in oil and gas processing through working with major oil and gas companies. Ahmed is an expert in modeling and simulation application for the Upstream industry. Most of his practical experience has been in the area of process dynamics and process control as well as advanced process control for gas processing industries using leading edge technologies in the area of steady state modeling, dynamic modeling, production planning, operator training systems and real time optimization. His project work experience first with Hyprotech and later Aspentech in the EMEA region allowed him to perform projects for companies such as Saudi Aramco, TOTAL, Abu Dhabi Gas Company and GASCO in Egypt. Ahmed obtained his degree in Chemical Engineering from Cairo University, Egypt.

## Emissions estimation and management

Emissions reduction is one of the most serious challenges the energy industry is currently facing. Process Ecology enables companies in the energy industry to quantify, manage and reduce emissions.

Process Ecology has developed a novel concept that is embodied in our portal [www.processemisissions.com](http://www.processemisissions.com) which is a centralized location where we can work with companies to meet their emissions management requirements. The system facilitates the various steps involved in managing an emissions reduction strategy:

- data gathering - streamline the effort of bringing relevant data to a centralized location
- emissions calculations - we have the technical background and are aware of current industry requirements, ensuring consistent and credible emissions quantification
- regulatory reporting - we develop automatically the documentation needed for regulatory bodies
- emissions reductions - we help find economic opportunities for emissions reduction
- data management - information is stored in a centralized location, can be accessed at any time and trends can be reviewed

## **Benzene Emissions Management**

Process Ecology, through its internet portal [Processemisissions.com](http://Processemisissions.com), provides an efficient way for the Natural Gas Processing Industry to manage benzene emissions data from glycol dehydration:

- provides improved calculation methods to ensure accuracy
- enables automated reporting for compliance with ERCB Directive 039 (Canada) at a significantly reduced cost
- adds more value to operators of glycol dehy units
- identifies economic solutions to reduce emissions
- advanced analysis and trending can be performed

The Online Benzene Emissions Manager allows engineers and operators to focus on their core business objectives - our online service concept means there is no need for software licensing and installation headaches

## Sample Projects

Our history with many different types of process modelling and engineering studies has led to a unique consulting practice. Whether it's reviewing plans for a new plant or pipeline, debottlenecking of existing assets, operational and KPI optimization, or emissions reductions and management, our consulting clients rely on us to deliver fast, honest, rigorous feedback. Some examples of the way we have helped our clients include:

- Development of a custom software module (HYSYS extension) for the calculation of a **4-phase flash** to detect the presence of a third liquid phase in a process simulation model (detection of trace mercury)
- Development of a novel software module (HYSYS extension) for the analysis of gas **hydrate formation**, the impact of inhibitors and electrolytes, and energy consumption associated with glycol regeneration
- Evaluation of technology alternatives to inhibit hydrate formation along a natural gas pipeline
- Modelling and **simulation of an oil refinery**, including atmospheric unit, vacuum unit and heat exchanger network.
- Development of an **Operations Surveillance System** that relies on a dynamic simulation model of the assets to calculate instant well productions and compare model results with measured values in real time
- Evaluation of alternatives for **greenhouse gas emissions** reductions for a large natural gas integrated firm
- An **internet-based** service to calculate and manage **BTEX emissions** from glycol dehydrators and ensure compliance with governmental regulations.
- Optimization of operating conditions at a natural gas plant based on key performance indicators and product economics
- **Training services** for the use of commercial simulation software (Process Ecology is an AspenTech Training Partner)
- Simulation-based oil characterization services for **heavy oil and Canadian bitumen**
- Evaluation of the design of a solvent separation system from chemical lab and bench tests
- Plant capacity review using HYSYS and other rating tools

## Aspentech Training

We are an "Aspentech Training Partner" and can provide training for Aspentech (heritage Hyprotech) software such as HYSYS, Flarenet, RefSYS and HX-Net. We have experience teaching several versions of HYSYS courses:

- Oil & Gas Focus
- Refining Industry Focus
- Advanced Process Modeling
- Extension Development
- Dynamic Modeling

We can also tailor the training to meet your requirements using training examples from your own industry.

If you require training licenses or a training facility, as an Aspentech Training Partner we will work with Aspen Technology to facilitate the training course.

A sample of recent training courses that have been delivered by Process Ecology Inc follows:

- Public Flarenet (Calgary, November 2008)
- Suncor HYSYS Oil & Gas (Sarnia, November 2008)
- Public HYSYS Oil & Gas (Calgary, November 2008)
- Public HYSYS Oil & Gas (Calgary, December 2008)
- Public HYSYS Advanced (Calgary, December 2008)
- Oxy Flarenet (Bakersfield, December 2008)
- Amec HYSYS Oil & Gas (Calgary, February 2009)
- Public Flarenet (Calgary, February 2009)
- Enogex HYSYS Oil & Gas (Oklahoma City, March 2009)
- Public HYSYS Dynamics (Calgary, May 2009)
- Western HYSYS Refining (New Mexico, August 2009)
- Western Shell & Tube Exchanger (New Mexico, August 2009)
- Western Simulation Workbook (New Mexico, August 2009)



## Partial Client List

- EnCana Corporation
- ConocoPhillips
- Western Refining
- Pioneer Resources
- PennWest Energy
- Total
- Paramount Energy Trust
- Paramount Resources
- Trilogy Energy Trust
- Fluor
- Aspentech
- Oxy
- Frontier Oil
- Keyera
- Kereco Energy
- Canadian Natural Resources Ltd.
- OPTI Canada