



CASE STUDY

Liquid Light Achieves Process Simplification and Reduces Production Costs



“aspenONE® Engineering has played an important role in our day-to-day activities. It has helped us model all elements of our process, from reactions to separations. We look forward to exploring and applying additional capabilities of aspenONE Engineering in the future.”

- Yizu Zhu, Process Engineering Fellow, Liquid Light, Inc.



Based out of Monmouth Junction, NJ, Liquid Light, Inc. is a startup company focused on green chemical and fuel technology. To turn environmental challenges into an opportunity, they focus on the use of the industry’s most abundant emission—carbon dioxide—as the starting point for the production of marketable materials.

In order to meet their design need of maintaining a 25% cost advantage over conventional chemical processes, the engineers at Liquid Light need a flexible software solution to find key property data (even for non-ideal

Leveraging Aspen Plus® and Aspen Properties, the members of Liquid Light have been able to make meaningful predictions about system behavior, moving them closer to full scale production.

CUSTOMER PROFILE - Liquid Light, Inc. - *Green Chemicals and Fuel*

CHALLENGE

Design and scale-up process for the conversion of CO₂ into chemicals and fuel

SOLUTION

aspenONE Engineering, Aspen Plus and Aspen Properties

BENEFITS

- Increase decision support for management and guidance to R&D
- Achieve significant capital and operating expense savings
- Gain reliable electrolyte property data
- Model separations, reactions and process integration

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and electrolyte systems), conduct “what-if” and case analyses, model reaction systems, select solvents, and scale-up quickly and reliably.

This solution has come in the form of aspenONE Engineering. Leveraging Aspen Plus and Aspen Properties, the members of Liquid Light have been able to make meaningful predictions about system behavior, moving them closer to full scale production.

Liquid Light is an innovative chemical and fuel company that is rising to meet that challenge with an innovative approach: fueling processes with carbon dioxide.

ENVIRONMENTAL AWARENESS: THE NEED FOR CHANGE

Sustainability has come into focus as a key driver of new technologies. The triple threat of fossil fuel consumption, pollution and climate change has made it imperative to develop green alternatives for existing industrial processes. Liquid Light is an innovative chemical and fuel company that is rising to meet that challenge with an innovative approach: fueling processes with carbon dioxide. Using process engineering expertise, the engineers at Liquid Light are looking to commercialize this technology at a fraction of the price of existing processes and yielding a fraction of the environmental impact.

THE CHALLENGES OF NEW TECHNOLOGY

The technology developed by Liquid Light features a complex electrochemical process for producing useful materials out of CO₂ - from high-volume commodities to high-value niche chemicals. As a part of research and development and the evaluation of process scale-up, the engineers must consider everything from reaction and transport properties to capital and variable costs. A key goal is to evaluate designs from an integrated energy perspective. The widely varying needs of developing this kind of new, advanced technology demands a comprehensive software solution—aspensONE Engineering.

Use of aspenONE Engineering in this phase of work has enabled Liquid Light to achieve significant process simplification, saving considerable CAPEX costs.

THE COMPREHENSIVE MODELING SOLUTION

To start, they leverage the expansive data available in Aspen Properties to reduce required lab work for screening process materials and a wide range of potential end products. They rely on Aspen Plus to model different elements of their process, from reaction and separations to recycle streams. The ability to rapidly screen alternatives and understand the potential process economics at a commercial scale are crucial in the R&D and financing stages of new process development. Use of aspenONE Engineering in this phase of work has enabled Liquid Light to achieve significant process simplification, saving considerable CAPEX costs. Furthermore, Aspen Plus makes it easy to conduct crucial “what-if” analyses, providing support for day-to-day decision making.

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LOOKING TOWARDS A GREENER FUTURE

Companies such as Liquid Light are a vital step towards commercializing innovative, sustainable processes. They look to the tools provided by aspenONE Engineering to successfully transform scientific innovations into commercial technologies. Down the road, the engineers at Liquid Light will use the scalable models developed in Aspen Properties and Aspen Plus to complete the design and operation of a pilot plant, gathering the data necessary to develop a plan for a full-scale industrial facility—bringing the dream of clean chemicals technology into reality.

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world’s leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit www.aspentech.com.

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