

DISCOVERING VALUE WITH THE SLS LAB MODEL

Low-energy dewatering leading to new applications and collaborations

AVS has delivered the SLS Lab Model to collaborators across the globe, and the system is now

being used to dewater a variety of micro-solids beyond algae. While many customers utilize the SLS for dewatering microalgae, others have found the system effective for dewatering a range of different foods and other materials. As an increasing number of SLS Lab Model systems are placed into the hands of research institutions and universities, the documented portfolio of materials able to be dewatered on the machine is continually increasing.



AMD, acidic water rich in heavy metals, poses a potential risk to waterways and aquatic life.

ment agencies, industry partners, and laboratory operations in discovering new dewatering applications.

For example, AVS has received inquiries from the U.S. Department of Agriculture and the U.S. Forest Service regarding the remediation of acid mine drainage (AMD) in southeastern Ohio. In response, AVS has engaged collaborators at Ohio University to conduct testing and evaluation of their SLS system to determine its efficacy in this application. This illustrates AVS' ability to connect laboratory collaborators to partners with demonstrated needs for a dewatering solution, fostering collaboration while discovering new applications for the SLS.

Discovering Value



SLS low-energy separation is being utilized to measure the impact on improved insoluble solids capture, color, aroma, viscosity, and volatile compounds.

AVS receives and refers inquiries to evaluate the SLS for many applications.

Contact AVS at sales@algaevs.com to learn how the SLS Lab Model may add value to your organization.

Because of the SLS' distinct competitive advantages of gentle, low-energy dewatering, many are now looking to the system to dewater their specific materials. It is expected that as this technology gains an increased market presence, a strong collaborative network will be forged between govern-

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AVS RECEIVES STATE INCENTIVES TO EXPAND IN OHIO

- AVS has received a package of public incentives that will support the company's development and expansion in Ohio, and is now looking toward additional venture capital to fund continued growth.
- AVS was recently awarded a Rapid Outreach Grant totaling \$130,000 from the State of Ohio to fund machinery and equipment growth at the Marysville, OH headquarters.
- This new funding, combined with an approved \$1.5M research and development loan and six-year tax credit, will help AVS invest in technological

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CORPORATE & TECHNOLOGY

AVS Receives State Incentives To Expand In Ohio - continued from page 1

innovation and job growth. AVS has developed a plan to strengthen its manufacturing infrastructure through equipment investment and facilities expansion—a \$9M project that will result in the creation of 200 jobs in 3 years.

The suite of technologies developed by AVS for the concentration and dewatering of algae have potentially transformative applications in many other industries. Industry applications that involve removing micro-solids from liquids, including many processes in pharmaceutical, food processing, waste treatment, agriculture, and



chemical processing industries could benefit from AVS' low-energy systems. Funding from state and private sources is key in helping AVS bring new jobs and innovation to Ohio while deploying revolutionary technologies around the world.

AVS FEATURED IN COSI INNOVATION SHOWCASE EXHIBIT

On August 26, 2011, Algaeventure Systems was invited to participate in the unveiling of COSI's new Innovation Showcase, a 1,500-square-foot exhibit highlighting people, processes and innovations related to energy. AVS was featured as part of an interactive video display showcasing careers in energy with in-depth interviews from Ross Youngs (CEO), Shanon Rogers (Materials Engineer), and Meagan Aliff (Phycolo-



gist). In these videos, the AVS team describes some of the important skills and activities throughout their education that have led to success in their field, with special emphasis placed upon math and science. These stories were collected to inform and inspire middle school and high school students about the potential career paths available to them in emerging energy fields. With representation from AVS, Battelle Memorial

Institute, Greenovate, Mid-Ohio Regional Planning Commission, PPG Industries, Inc., Transportation Research Center, Watt 1 Electrical Systems, and visionary support from American Electric Power, the exhibit presents students with a diverse range of education and experience to help engage them as future energy innovators.

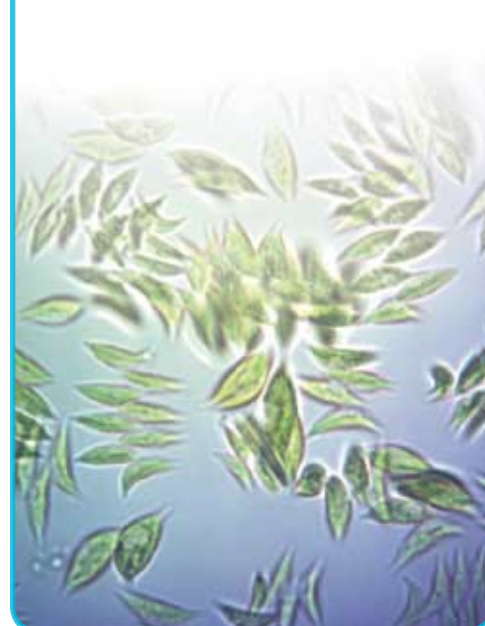


Did You Know?

Algae are some of the world's most unique life forms, and have played a very important role in shaping the world we know today.

- Algae were the earth's original remediator, transforming the harsh carbon dioxide atmosphere into one that can sustain life, sequestering carbon and releasing oxygen.
- Algae took over 3 billion years to create enough oxygen to support other plant life.
- Algae are an excellent source of food for many types of organisms, offering a range of important proteins, minerals and vitamins to sustain life. Algae biomass supplies food for over 100 times more organisms than any other food source.
- Algae are extremely capable survivors, able to double their biomass in a matter of hours. This ability to adapt and grow has led to an estimated 10 million unique species.

Adapted from: Algae Industry Magazine



EXPANSION OF RESEARCH AND ALGAL GROWTH CAPACITY

To support accelerated development and deployment of algal technologies and products, AVS is expanding its research and growth capacity in Marysville, OH. Improvements and reconfiguration of our existing facility began in mid-2011 and will continue into 2012, and are focused on AVS' outdoor algal growth systems and indoor laboratory space.

To this point, AVS has utilized a 5,000-square-foot engineering laboratory dedicated to the custom manufacturing of AVS's proprietary technologies, as well as continued development and lab-scale testing. The setup of an adjacent 2000-square-foot lab space will provide test and evaluation support for new equipment, as well as new technologies and capabilities to support the development of an algal product line.

AVS' original outdoor growth cells, each measuring 11 ft. x 200 ft. x 18 in. with a total water capacity of roughly 20,000 gallons, have been reconfigured to



better support operations, and to provide, AVS engineers with algal biomass for equipment development. An exciting new development is the conversion of one of these cells into a binary raceway growth system, and its adjacent cell into an array of open bioreactors. These are contained in an enclosed greenhouse and we are embarking upon modifications to support algal growth through the winter months. Stay tuned for updates as we continue to expand and enhance our Marysville headquarters.



PROJECT UPDATES

ARPA-E DEMONSTRATION

Demonstrating industrial-scale SLS technology



AVS is progressing with the development of the SLS technology under the DOE ARPA-E grant, meeting and surpassing project milestones. Following the successful laboratory demonstration of the SLS Industrial Model, AVS is evaluating prospective demonstration sites for the project's field testing phase. The SLS Industrial Model is designed for automated processing of large quantities of dilute algal solutions (3-20 g/L), dewatering to 25-30% solids. In the field testing phase, the nation's leading algae producers will have the opportunity to demonstrate the system under real-world conditions in an algal production environment.

RECENT EVENTS & PRESENTATIONS



1st International Conference on Algal Biomass, Biofuels & Bioproducts

St. Louis, MO
July 17-20, 2011

Presented:

Ross Youngs spoke in a presentation entitled "Low-Energy Concentration and Dewatering of Micro-Algae for Fuels, Products & Remediation."



Biomass 2011

National harbor, MD
July 26-27, 2011

Attended:

AVS was mentioned by ARPA-E Deputy Director for Technology Eric Toone in his opening address to the event attendees, highlighting the SLS technology as an example of innovation supported by the ARPA-E program.



NAA Collaboration, Strategic Alliances and Networking Conference

Santa Fe, NM
August 1, 2011

Presented:

David Coho, Vice President of Business Development, presented about AVS technology development and the discovery of new customer applications.

ARPA-E Algae Day Meeting

Algaeventure Systems
August 25, 2011

Presented:

The Advanced Research Projects Agency (ARPA-E) held an event at Algaeventure Systems with many collaborators working to advance algae as a global solution to a variety of issues. Presentations were given by all attendees, and the visit concluded with a tour and demonstration of Algaeventure Systems facilities and technologies.

IN THE NEWS



Biorefining Magazine's Algae Technology & Business

Spring 2011
Making Algae Work in the Midwest



Columbus Monthly

July 2011
The Algae Evangelist



Biorefining Magazine

September 2011
High Risk, High Reward

Water and Energy Nexus Technology Innovation Forum

Dayton, OH
October 5-6, 2011

Presented:

Chief Scientist Dr. Stephanie Smith presented in a discussion of AVS technologies and their connection to water conservation and remediation.



Algae Biomass Summit 2011

Hyatt Regency Minneapolis
1300 Nicollet Mall, Minneapolis, MN
October 24-27, 2011

5:00 pm

<http://algaebiomasssummit.org>

At the Algae Biomass Summit 2011, AVS will join industry professionals from the world's leading algae utilization organizations to discuss the current state and exciting future of the algae industry. With an exhibit space (booth #102) and two technical poster sessions, AVS will present some of the many promising developments with our low-energy algal technologies.

Attendees will have the opportunity to learn about our transformative Solid-Liquid Separation (SLS) and Rapid Accumulation & Concentration (RAC) technologies, and discuss sales and licensing opportunities with the AVS executive team.

Performance Validation and Scaling of a Capillary Membrane Solid-Liquid Separation System

AVS has been selected to present a technical poster to discuss several of the research efforts surrounding our SLS technology. The poster is open for viewing Tuesday and Wednesday from 5:30-7:00 PM.