



## 2008 Algae Biomass Summit

Dr. K.C. Das traveled to Seattle, WA to attend the Second Algae Biomass Summit, October, 22-25. The Algal Biomass Organization is a 'not-for-profit trade association dedicated to the advancement of the algal biomass industry.' It promotes the development of viable commercial markets for renewable and sustainable commodities derived from algae. As the world contemplates the emerging biofuels industry, this summit explored the use of algae as a biomass source for biofuels and other sustainable value added products. The two day conference was host to scientists, researchers, technologists, producers, investors, and policymakers on issues essential to this emerging industry. Discussions covered the full gamut of issues surrounding algal biofuels, from the ever evolving technologies and processing concepts to market viability and financing. Speakers presented posters and presentations addressing research at US government labs and Universities, algae sustainability and strain selection, coproducts and bioremediation, and open pond production technologies. Equally as important to research and production issues, the summit addressed the process of pushing an innovative idea from concept to commercial reality on an industrial scale, projecting intellectual property, and the financing life cycle of a company. Topics went on to explore international activities and commercial aviation as a potential market. In closing, John Benemann, founder and consultant of Benemann Associates, delivered "The Future of Microalgae Biofuels."

## 2008 ALGAE BIOMASS SUMMIT SPEAKERS

### **MARK P. ALLEN, P.E.**

*CEO & Co-Founder*

#### **A2BE CARBON CAPTURE, LLC**

Mr. Mark Allen is the Chief Executive Officer and co-founder of A2BE Carbon Capture LLC. He is a licensed professional engineer with over 25 years experience in the design, construction, and operation of large-scale engineering, infrastructure, and environmental projects including biological process systems with a capacity of over 500 million gallons per day. He holds a Civil Engineering degree from the Rochester Institute of Technology and is a successful entrepreneur having founded a venture capital backed corporate knowledge management company in 1999 where he was the Chairman and CEO. Previously he managed large engineering organizations for Rust Environment and Infrastructure, Metcalf & Eddy, SAIC, and others. For these organizations Mr. Allen had full profit and loss responsibility for multiple lines of business including: water and wastewater engineering, environmental engineering, hazardous and solid waste engineering, transportation engineering, general civil engineering, information technology, and other professional service offerings. Mr. Allen is also a former Adjunct Professor of Engineering at the Rochester Institute of Technology.

### **DR. AMI BEN-AMOTZ**

*SENIOR SCIENTIST*

#### **THE NATIONAL INSTITUTE OF OCEANOGRAPHY (ISRAEL) AND SEAMBIOTIC LTD**

Dr. Ami Ben-Amotz is presently Professor of Marine Phycology at the National Institute of Oceanography (NIO) in Haifa, Israel. Dr. Ben-Amotz focused his studies on the alga *Dunaliella* while obtaining both his MSc degree from the Hebrew University of Jerusalem and his PhD from Weizman Institute of Science (WIS), Israel. After post doctorate studies on marine microalgae at Brandeis University, USA, he returned to Israel and began research at the NIO and the WIS to study the biology, physiology, biochemistry and biotechnology of *Dunaliella* in a long collaboration with the late Prof. M. Avron of the WIS. The fruitful cooperation led the way to establishment of the commercial *Dunaliella* production plant in Eilat, known today as Nature Beta Technologies Ltd., (NBT) Israel, a subsidiary of Nikken Sohonsa Co., Japan. Along his long career with *Dunaliella*, Dr. Ben-Amotz served as Head of the Department of Marine Biology at NIO and Head of the *Dunaliella* Section at the WIS, Chief Scientist of NBT and recently as Chief Scientist of Nikken Sohonsa Co., Japan. In March 2007, Dr. Ben-Amotz was nominated as President of the 8th International Marine Biotechnology Conference in Eilat. Dr. Ben-Amotz has more than 130 publications and supervised dozens of students mostly on aspects related to *Dunaliella*, marine microalgae and natural carotenoids.

### **DR. JOHN BENEMANN**

*FOUNDER*

#### **BENEMANN ASSOCIATES**

Dr. John Benemann received his degrees at the University of California Berkeley in Chemistry (B.S.) and Biochemistry (Ph.D.). He completed his post-doctoral studies in San Diego, and in 1974 rejoined UC Berkeley as an independent investigator at the Sanitary Engineering Research Laboratory to study microalgae for wastewater treatment, biofuels and fertilizer production. While at Berkeley, he supervised the thesis work of five Ph.D. students in Civil Engineering, Biophysics and Plant Physiology. In 1980 he started a small biotechnology company and four years later became an Associate Professor at the Georgia Institute of Technology. He has been a full time consultant for nearly 20 years and during much of this time has also been a part-time researcher at UC Berkeley. His research and consulting work span across disciplines and institutions, from the fundamental problems of photosynthesis and biological hydrogen production to the engineering of wastewater treatment ponds and landfills to abate greenhouse gas emissions.

## **DR. VARUM BORIAH**

### **SANDIA NATIONAL LABORATORY**

Dr. Varun Boriah received his BTech in Mechanical Engineering from the National Institute of Technology - Karnataka, India with an emphasis in fluid mechanics. He is pursuing a Masters in Mechanical Engineering at UC Berkeley emphasizing applications of digital particle image velocimetry in micro-scale fluid devices. He is currently a summer intern in the Thermal/Fluid Science & Engineering Department at Sandia Labs in Livermore, California.

## **PROFESSOR SAMMY BOUSSIBA**

### *PRESIDENT*

### **INTERNATIONAL SOCIETY OF APPLIED PSYCHOLOGY AND HEAD OF LANDAU FAMILY MICROALGAL BIOTECHNOLOGY LAB, BLAUSTEIN INSTITUTES FOR DESERT RESEARCH, BEN GURION UNIVERSITY OF THE NEGEV**

Prof. Boussiba received his Ph.D. in Physiology and Biochemistry of Cyanobacteria in 1981 from the Ben-Gurion University of the Negev, Israel. After 2 years of postdoctoral studies at Cornell University at Ithaca N.Y., he rejoined the Microalgal Biotechnology Laboratory (MBL) at the Jacob Blaustein Institute for Desert research (BIDR), Ben-Gurion University in Israel. Prof. Boussiba is the Head of the MBL since 1995 to date. His current research interest concerns developing the biotechnology of the production of high value products, with special emphasis on astaxanthin from *Haematococcus*, use of microalgae to encounter environmental problems, and developing integrated aquaculture biosystems for efficient water utilization. As an outcome of this work, commercial enterprises have been set up, one located in the Arava at Kibutz Ketura, a plant for the production of the valuable carotenoid astaxanthin produced from the green alga *Haematococcus pluvialis*. This set up includes one the world largest and most advanced tubular photobioreactors. The second one concerns the establishment of a start-up company "BioSan" involved in the commercialization of engineered cyanobacteria for mosquito biocontrol of pest diseases. Prof. Boussiba is the author of few dozens of publications, and has been the supervisor so far of some 40 research students (M.Sc., Ph.D. and postdocs). In 2003 Prof. Boussiba was awarded "Doctor Honoris Causa" by the University of West Hungary. Also, as a reward for his achievements in Microalgal Biotechnology, Prof. Boussiba was awarded at 2004 a Chair in Economic Botany, by the Senate of the Ben-Gurion University. All the above has positioned Prof. Boussiba among the world leading scientists in the field of Microalgal Biotechnology. He currently serves as the president of the International Society of Applied Phycology (ISAP).

## **ANDREW T. BRAFF**

### *ASSOCIATE*

### **WILSON SONSINI GOODRICH & ROSATI**

Andrew Braff is an associate in the Seattle office at Wilson Sonsini Goodrich & Rosati, a member of the steering committee for the Algae Biomass Summit, and counsel to the Algal Biomass Organization. His practice focuses on renewable energy project development, including drafting and reviewing engineering, procurement, and construction agreements, operation and maintenance agreements, energy supply and offtake agreements, and equipment supply agreements for the wind, solar, geothermal, biomass, and biofuels industries. Mr. Braff also has advised on federal and state legislative and regulatory process, including the Environmental Protection Agency's implementation of the federal Renewable Fuel Standard mandated by the Energy Policy Act and various state renewable portfolio standards. Mr. Braff previously served as an extern for Justice Mary E. Fairhurst of the Washington State Supreme Court and as director for policy and public affairs for California State Assemblyman (now State Senator) Mark Wyland. In addition, he served as a legislative assistant to Congressman George R. Nethercutt, Jr. Mr. Braff received his B.A. from Whitman College and his J.D. degree from the University of Washington School of Law. He is admitted to practice law in the state of Washington.

## **DR. DAVID BRUNE**

*PROFESSOR*

**CLEMSON UNIVERSITY**

Dr. David Brune is a Professor and Newman Endowed Chair of Natural Resources Engineering at Clemson University. He holds the following degrees: Ph.D., Sanitary Engineering, University of Missouri (1978); M.S., Agricultural Engineering, University of Missouri (1975); AND B.S., Agricultural Engineering, University of Missouri (1974). Dr. Brune has been working with aquaculture for 20 years, of which the first decade was spent in raising catfish. During that time, Clemson researchers found ways to increase algal growth; the algae produced additional oxygen and treated waste in the water.

## **BILL BUCHAN**

*CEO*

**MARKET POTENTIAL, INC- NASA INNOVATIVE PARTNERSHIP**

Bill Buchan has 21 years of experience in the energy and environmental sectors as a consultant with such firms as Arthur D. Little, evaluating and commercializing new technologies in these sectors. His experiences with new technologies, including fuel cells, distributed generation, alternative fuels, renewable energy, and several air emission and water control technologies, has given him great insight into the direction of the energy and environmental markets and the adoption issues new technologies face. During the last 18 years, Mr. Buchan's focus has been in sales, marketing, and business development, while managing the business activities of his consulting operation. Throughout his career, Mr. Buchan has developed business strategies for clients in multiple industries, including energy, environment, biotech, transportation, internet, and retail sectors. He has helped raise both public and private money for the commercialization of energy and environmental technologies. Mr. Buchan was also the VP of Marketing and acting-CEO of a bio-oil venture, Sustainable Biomass Energy, and continues to be involved in other start-ups today. He is a member of the Gerson Lehrman Group Council, providing investors with market insights regarding new energy and environmental technologies. A licensed engineer, Mr. Buchan has authored over 20 publications and presentations during his career and he holds a Bachelor's degree in chemical engineering, a Master's degree in civil/environmental engineering, and an MBA with an emphasis in entrepreneurship from the University of California at Berkeley.

## **THOMAS BYRNE**

*PRESIDENT & CEO*

**BYRNE & COMPANY, LTD**

Thomas Byrne, owner of Byrne & Company Limited, is one of the ethanol industry's most experienced consultants. He received his B.S. degree in Accounting from St. Cloud State University. His experience dates back to 1979 where he began his career as an accountant and later becoming a consultant to the biofuels industry. Since forming Byrne & Company Ltd, Tom has worked on many successful projects for clients, offering a broad array of services. These services include feasibility studies; business plan preparation; organization of equity meetings; structuring and negotiating debt with public and private financing organizations, from raising capital to the completion of the project; and applications for federal and state grant incentives. Tom also has spoken at conferences in New York, Costa Rica, Poland, and Panama on the securing of financing within the biofuels industry and the future of biofuels. As the president and CEO, he has the responsibility to manage the planning and delivery of services provided to clients, as well as preparing complex financial models and overseeing project development services. His experience has allowed him to introduce development projects to equity and financial organizations, Departments of Trade and Economic Development, and federal, state, and local organizations to provide financial and other assistance. Mr. Byrne is a member of the Renewable Fuels Association, American Council on Renewable Energy, Economic Development Association of Minnesota, American Coalition for Ethanol, Minnesota Society of Certified Public Accountants, and the American Institute of Certified Public Accountants.

## **DR. FENG CHEN**

*ASSOCIATE PROFESSOR*

**CENTER OF MARINE BIOTECHNOLOGY, UNIVERSITY OF MARYLAND BIOTECHNOLOGY INSTITUTE**

Dr. Feng Chen is Associate Professor at the University of Maryland Biotechnology Institute's Center of Marine Biotechnology (COMB). Dr. Chen received his Ph.D. in Marine Microbial Ecology in 1995 from the University of Texas at Austin. He has published more than 40 scientific papers and book chapters, covering both basic and applied aspects of marine microbiology and biotechnology. His research focuses on ecology, physiology, genomics and proteomics of microbes which include viruses, bacteria and microalgae in the marine environment. Dr. Chen has extensive experience with isolation and characterization of microalgae from aquatic environments, and is a member of algal research team at COMB. Dr. Chen has been invited to deliver multiple speeches at international conferences. He has served in several review panels for federal funding agencies and has received research funds from NSF, DOE, NOAA, Sea Grants, and other private interests. Currently, he is developing several research programs related to algal biofuels.

## **BEN CLOUD**

*PRESIDENT & COO*

**XL RENEWABLES**

For over 25 years, Ben Cloud was a farmer, farmland developer and consultant with operations in Arizona and Southern California. His early adoption of drip irrigation has provided a clear vision for the application of proven irrigation components in the development and operation of large-scale algae biomass production systems. In 2006 he co-founded XL Renewables, Inc. to produce renewable motor fuels. The Company's initial project is a \$260 million integrated biorefinery in Vicksburg, Arizona. Mr. Cloud attended the University of Arizona, College of Agriculture and currently serves as President of the Project CENTRL (Center for Rural Leadership) Alumni Council. He was a co-founder of Gold Canyon Bank in Gold Canyon, Arizona in 2005. Mr. Cloud is a resident of Chandler, Arizona.

## **DR. KEITH COOKSEY**

*PROFESSOR OF MICROBIOLOGY*

**MONTANA STATE UNIVERSITY**

Dr. Keith Cooksey is one of many U.S. scientists who studied the feasibility of turning algal oil into biodiesel in the 1980's. From 1978 to 1995, the U.S. Department of Energy funded, and the National Renewable Energy Laboratory administered, a study to investigate algae as a source of fuel and its ability to consume the greenhouse gas carbon dioxide.

## **RUPERT CRAGGS**

*GROUP MANAGER*

**NATIONAL INSTITUTE OF WATER AND ATMOSPHERIC RESEARCH (NEW ZEALAND)**

## **EZIO NICOLA D'ADDARIO**

*R & D DEPARTMENT MANAGER*

**ENI DIVISION R&M**

Ezio D'Addario currently manages the Ecomanagement and Environmental Protection group at the Environmental Research Centre of Eni Division Refining & Marketing in Monterotondo, Italy. Mr. D'Addario is responsible for researching

environmental monitoring of marine basins, biomarkers and bioindicators, Life Cycle Assessment of new systems for energy and biofuel production and CO<sub>2</sub> biofixation with microalgae. A chemical engineer, Mr. D'Addario has worked for many companies in the Eni group beginning with Snamprogetti as a petroleum process engineer. Since studying biotechnology at the Massachusetts Institute of Technology in Boston, he has worked in the R&D units of Eni corporate for many years, developing biotechnological processes for pharmaceutical intermediates and sweeteners production. Throughout his career, Mr. D'Addario has managed multiple international R&D projects by utilizing his biotechnological experiences to develop technologies related to waste and wastewater treatment, soil bioremediation and biofuel production. Mr. D'Addario spent three years in London at the Agip Kazakhstan Oil Consortium where he was in charge of the Environmental Impact Assessment of offshore facilities at the Kashagan oil field in the Caspian Sea.

## **BILLY M. GLOVER**

*MANAGING DIRECTOR FOR ENVIRONMENTAL STRATEGY*

### **BOEING COMMERCIAL AIRLINES**

Billy Glover leads an enterprise-wide team responsible for developing and implementing a global environmental strategy for Boeing Commercial Airplanes. Under his leadership the team is addressing key issues facing the aviation industry including reducing aircraft noise and greenhouse gas emissions, alternative fuels research, and influencing public policy and opinion. His cross-functional team is also providing input on key product design elements for maximizing the environmental performance of Boeing aircraft. Mr. Glover, who previously led derivative product development for Commercial Airplanes, has held various engineering assignments with the company involving 707, 727, 737, 747, 757, 767, 777 and 787 airplanes, as well as product development, research programs, and government and commercial contracts. He also has extensive experience leading government and industry relations initiatives. Mr. Glover is an associate fellow of the American Institute of Aeronautics & Astronautics. He is also a member of the Industrial Advisory Committee for Herrick Labs, Purdue University and is a board member of the Air Transport Action Group (ATAG). He is co-chair of the Algal Biomass Organization.

Mr. Glover joined Boeing in 1978, after graduating from Purdue University with a Masters of Science in Engineering, with an emphasis in engineering acoustics. He received his Bachelor of Science in Interdisciplinary Engineering in 1976 from Purdue University. In addition, Glover has completed executive education studies at the Harvard Business School.

## **DR. STEVEN J GLUCK**

*SCIENTIST*

### **DOW CHEMICAL, ENVIRONMENTAL TECHNOLOGY CENTER**

Dr. Steven Gluck is a scientist for the BioSciences platform within The Dow Chemical Company. Dow Chemical BioSciences defines renewable resource opportunities for existing Dow products. He is responsible for assessing and identifying routes for technology breakthroughs in the commodity scale production of algae oils. In addition to fuel applications, these oils are also being developed by his team as feedstocks for other chemical processes. Dr. Gluck's leadership of technical due-diligence teams creates additional algal opportunities by evaluating external technologies and partnering with other companies and universities when applicable.

Dr. Gluck has worked for Dow Chemical since 1979. Prior to his work at BioSciences, he was responsible for developing new environmental treatment technologies particularly with respect to water, wastewater, and greenhouse gases. Dr. Gluck also optimized operations support as well as being the organization's Intellectual Capital Manager. He is the president of the Instrumentation Testing Association and is very active in the Water Environment Federation. Dr. Gluck received a BS from Whitworth College, an MS from the University of Idaho and a PhD from the University of Leipzig.

## QUINN GORETZKY

*PROJECT MANAGER*

**INNOVATIONS CANADA**

## DR. BEN GRAZIANO

*R&D MANAGER, INNOVATIONS*

**THE CARBON TRUST (UK)**

Dr. Ben Graziano joined the Carbon Trust's Innovations Team in March 2008. The Innovations Team helps to develop commercially promising low carbon technologies through funding, partnerships, expert advice and large-scale demonstrations. Within Innovations, he is responsible for the Carbon Trust's Algae Biofuels Challenge, which is part of the Bioenergy Directed Research Programme. Dr. Graziano's other responsibilities include managing a portfolio of Applied Research projects and informing the Carbon Trust of new low carbon technology commercialization opportunities. The Carbon Trust is a private company, backed by the UK government. Its mission is to accelerate the move to a low carbon economy by working with organizations to reduce carbon emissions and develop commercial low carbon technologies.

## JOSH L. GREEN

*PARTNER*

**MOHR DAVIDOW VENTURES**

Josh Green joined MDV's investing team with a focus on Cleantech companies. Cleantech spans multiple, independent value chains ranging from solar to biofuels to clean coal. He applies his experience in a broad range of industries including semiconductors, biotechnology and networking to help Cleantech entrepreneurs define their markets and products. Mr. Green has more than 25 years of experience working with companies from startup phase to large public company, and has helped many management teams focus their energy on building value for the enterprise and its stakeholders. Throughout his career he has guided entrepreneurs and helped to build some of the most successful emerging growth companies in Silicon Valley including the Internet (Yahoo!), biotechnology (Geron), medical devices (Target Therapeutics), telecommunication/networking (Cerent) and semiconductors (Xilinx). Mr. Green has a track record of growing and developing teams and organizations. He was instrumental in expanding Venture Law Group to over 110 lawyers and assisting in the successful merger with Heller Ehrman in 2003. Previously, he practiced law at Brobeck, Phleger & Harrison LLP, and developed the Palo Alto office from six to well over 100 lawyers. Mr. Green has completed initial public offerings, mergers and acquisitions and venture capital transactions that rank among the largest and most successful in Silicon Valley history. Together, these transactions total more than \$10 billion dollars. His work was recognized when he was named to the Forbes Midas List. He graduated *magna cum laude* from UCLA in 1977 and the UCLA School of Law in 1980 where he was on the Law Review.

## NATHANAEL GREENE

*SENIOR POLICY ANALYST*

**NATURAL RESOURCES DEFENSE COUNCIL**

Nathanael Greene received his Bachelor of Arts degree in Public Policy from Brown University and a Master of Science Degree in Energy and Resources from University of California Berkeley. He joined NRDC in 1992 and worked two years before continuing his studies. Upon obtaining his master's degree in 1996, he returned to NRDC and worked there since. Mr. Greene is a senior policy analyst and is responsible for working on energy policy and related issues including utility

restructuring, energy taxes, energy efficiency, renewables, and low-income services. His particular expertise is clean energy technologies including wind, solar and biomass energy, fuel cells, combined heat and power, and energy efficiency as well as the regulations and policies necessary to promote these technologies. For the last few years Mr. Greene has been focusing on assessing the sustainable potential for biofuels and developing policies to advance them.

## **DENIS HAYES**

*PRESIDENT*

### **BULLITT FOUNDATION**

Denis Hayes directs The Bullitt Foundation from the perspective of a practical visionary who has devoted his life to conservation. With mixed feelings, he acknowledges that he is probably still best known for having been National Coordinator of the first Earth Day when he was 25. But he also is the seasoned veteran of many environmental, legislative, and litigation victories over the years. Internationally, he is recognized for expanding Earth Day to more than 180 nations. It is now the world's most widely observed secular holiday. During the Carter Administration, Mr. Hayes directed the federal National Renewable Energy Laboratory. He has been a visiting scholar at the Woodrow Wilson Center, a senior fellow at the Worldwatch Institute, an adjunct professor of engineering at Stanford University, and a Silicon Valley lawyer. Mr. Hayes has received the national Jefferson Medal for Outstanding Public Service as well as the highest awards bestowed by the Sierra Club, The Humane Society of the United States, the National Wildlife Federation, the Natural Resources Council of America, the Global Environmental Facility of the World Bank, the interfaith Center for Corporate Responsibility, the American Solar Energy Society, and the Commonwealth Club. Mr. Hayes has served on dozens of governing boards, including those of Stanford University, the World Resources Institute, the Federation of American Scientists, The Energy Foundation, Children Now, the National Programming Council for Public Television, the American Solar Energy Society, Greenpeace, CERES, and the Environmental Grantmakers Association. He continues to chair the board of the international Earth Day Network. Mobilizing the resources of The Bullitt Foundation, Mr. Hayes intends to make the Pacific Northwest – the best-educated, most environmentally aware, most progressive corner of America – a global model for sustainable development.

## **DR. DAVID HAZLEBECK**

*PROGRAM MANAGER*

### **GENERAL ATOMICS**

## **DR. CARL N. HODGES**

*CHAIRMAN OF THE BOARD OF DIRECTORS*

### **THE SEAWATER FOUNDATION**

Dr. Carl Hodges is the founder and chairman of The Seawater Foundation and an internationally known scientist and innovator. An atmospheric physicist and mathematician, Dr. Hodges' work can be seen in Seawater Farms Eritrea (SFE), an integrated agricultural and aquacultural farm in Africa. Critical to the success of the Eritrea project has been Dr. Hodges' experiences with controlled environmental agriculture in the Middle East and the Americas, the Land Pavilion at EPCOT Center at Walt Disney World in Florida, scientific consulting on Biosphere 2 and many corporate associations including Coca-Cola, Disney, Kraft Foods, W.R. Grace, Lufthansa, and Resorts International. Replicating SFE and advancing the integrated seawater farm systems now being built in Sonora will provide the planet with its first new agriculture in 10,000 years.

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## **DR. QIANG HU**

*DIRECTOR*

**LABORATORY FOR ALGAE RESEARCH AND BIOTECHNOLOGY, ARIZONA STATE UNIVERSITY**

Qiang Hu, Ph.D. is Assistant Professor of Biology and Biotechnology at Arizona State University (ASU) with 20 years of knowledge and experience in applied phycology, photobioreactor system design, and mass culture of microalgae for various commercial applications. Pioneering high-density algal culture methodology, Dr. Hu has contributed to the understanding of biological principles underlying photosynthetic productivity in high-density algal mass cultures. An expert in photobioreactor system design, he has developed various types of culture systems in China, Israel, Japan, and USA. Prior to ASU, Dr. Hu was engaged in the final phase of a 10-year national algae-based carbon sequestration program in Japan. Dr. Hu has published over 30 research papers and is an inventor and holder of 14 patents related to algae-based biofuel production, carbon sequestration, wastewater treatment, and high-value products from algae.

## **DR. MICHAEL H. HUESEMANN**

*STAFF RESEARCH ENGINEER*

**PACIFIC NORTHWEST NATIONAL LABORATORY-MARINE SCIENCE LABORATORY**

Dr. Michael Huesemann (Ph.D., Chemical Engineering, Rice University, Houston, Texas) has conducted both experimental and theoretical research in environmental and marine biotechnology for more than fifteen years. Dr. Huesemann currently is or has been the principal investigator on numerous major U.S. Department of Energy funded research projects focusing on diverse areas such as photosynthetic hydrogen production, optimization of microalgal lipid and hydrocarbon production, biofixation of carbon dioxide from flue gases by marine microalgae, the effects of ocean carbon sequestration on nitrogen cycling, and hydrocarbon bioavailability in aged petroleum contaminated soils undergoing bioremediation treatment. He is also the principal investigator on an Office of Naval Research funded project on in-situ phytoremediation of PAH and PCB contaminated marine sediments with sea-grasses. In addition, Dr. Huesemann has published journal articles on the metabolic regulation of solvent production in anaerobic fermentations, the modeling of the leaching kinetics of hydrocarbons in aged soils, statistical soil sampling, critical analyses of mitigation responses to global climate change, environmental policy analysis, sustainable development, and professional ethics. He currently also serves as editorial board member of *Soil and Sediment Contamination: An International Journal*, and *Progress in Industrial Ecology*.

## **DR. MARK HUNTLEY**

*CHIEF SCIENCE & TECHNOLOGY OFFICER*

**CELLANA**

Dr. Mark Huntley (Ph.D., Biological Oceanography, Dalhousie University 1980) is a thought-leader in marine biological sciences. One of the most frequently-cited researchers in his field, an organizer of global research initiatives, and an entrepreneur, Dr. Huntley has been active in biofuels research and development for more than 20 years. He has held research faculty positions at both Scripps Institution of Oceanography and University of Hawaii. He held a senior management role for 10 years in the GLOBEC program, a \$300 million international scientific research program investigating the impact of global change on marine ecosystems. Dr. Huntley was cofounder of Aquasearch, Inc., an algae biotechnology public company, and co-founder of HR BioPetroleum. He currently serves as Chief Science and Technology Officer for both Cellana and HR BioPetroleum.

## CONGRESSMAN JAY INSLEE

*MEMBER OF THE ENERGY AND COMMERCE COMMITTEE*

### U.S. REPRESENTATIVE FROM 1<sup>ST</sup> DISTRICT OF WASHINGTON STATE

Raised on the shores of Puget Sound, Congressman Jay Inslee comes from a long line of Washingtonians and wants to protect the state's natural beauty for his three sons and generations to come. Congressman Inslee has worked at the federal level – as representative for the 4th Congressional District from 1992-1994 and the 1st Congressional District since 1999 – to protect the environment of Washington state and address the problem of global warming. Congressman Inslee fought to restore protections for roadless areas in national forests and led a successful campaign in the House to keep limits on oil-tanker traffic in Puget Sound. Since 2005, he has used his seat on the powerful House Energy and Commerce Committee to promote his vision for a clean energy future, the New Apollo Energy Act, and to advance other legislation that would reduce greenhouse-gas emissions. In March 2007, he was appointed to the 15-member Select Committee on Energy Independence and Global Warming. Beyond advocating sound environmental policies, Congressman Inslee has used a common-sense approach in Congress to help expand the region's high-tech economy, promote privacy protections for American consumers and strengthen programs for seniors like Social Security and Medicare. He also has supported increased spending for port security and veterans' services. Congressman Inslee backed the war in Afghanistan to root out terrorists; but he voted against the war in Iraq and has been an outspoken critic of administration policies there. Even before his election to the U.S. Congress, Congressman Inslee was a public servant. He was a state legislator and prosecutor in Selah, Wash. He holds a bachelor's degree in economics from the University of Washington and earned his law degree from Willamette University.

## DR. SCOTT C. JAMES

*PRINCIPAL MEMBER OF THE TECHNICAL STAFF, THERMAL/FLUID SCIENCE & ENGINEERING DEPARTMENT*

### SANDIA NATIONAL LABORATORY

Dr. Scott James received his BS and MS in Mechanical Engineering from UC San Diego with emphases in fluid mechanics and numerical methods. In 2001, he graduated from UC Irvine with a doctorate in Engineering with emphasis on solving environmental flow and transport problems. Shortly thereafter, he joined Sandia National Laboratories' Performance/Risk Assessment and Decision Analysis Department in Carlsbad, New Mexico, in charge of certifying the Waste Isolation Pilot Plant, the only operating transuranic nuclear waste repository in the world. Next, he joined the Geohydrology Department in Albuquerque and contributed significantly to the Yucca Mountain Project and International Programs. Dr. James is currently a Principal Member of the Technical Staff in the Thermal/Fluid Science & Engineering Department at Sandia Labs in Livermore, California, where he continues to work on a wide variety of environmental flow and transport modeling problems. Recently, he has focused on modeling open-channel flow systems in an attempt to optimize algae growth for biofuel production.

## VINOD KHOSLA

*FOUNDER*

### KHOSLA VENTURES

Vinod Khosla grew up dreaming of being an entrepreneur, despite growing up in an Indian Army household with no business or technology connections. Since age 16, when he first heard about Intel starting up, he dreamt of starting his own technology company. Upon graduating with a Bachelors in Electrical Engineering from the Indian Institute of Technology, Delhi, Mr. Khosla failed, at age 20, to start a soy milk company to service the many people in India who did not have refrigerators. He came to the US and got his Masters in Biomedical Engineering at Carnegie-Mellon University. His startup dreams attracted him to Silicon Valley where he got an MBA at Stanford University in 1980. Upon graduation Mr. Khosla was one of the three founders of Daisy Systems, which was the first significant computer aided design system for electrical engineers. The company went on to significant revenue, profits and an IPO, but he, driven by the frustration of

having to design the computer hardware on which the Daisy software needed to be built, started the standards based Sun Microsystems in 1982 to build workstations for software developers. At Sun he pioneered "open systems" and RISC processors. Sun was funded by long time friend and board member John Doerr of Kleiner Perkins Caufield & Byers. In 1986 Mr. Khosla switched sides and joined Kleiner Perkins where he was and continues to be a general partner of KPCB funds through KP X. There, through the years, with other partners, he took on Intel's monopoly with Nexgen/AMD (the only microprocessor to have significant success against Intel, sold to AMD for 28% of AMD), incubated the idea and business plan for Juniper to take on Cisco's dominance of the router market, to formulate the very early advertising based search strategy for Excite, and to transform the moribund telecommunications business and its archaic SNET implementations with Cerent (sold to Cisco for \$7B), and many other ventures. Mr. Khosla helped in creating value, having fun, succeeding, failing (remember Dynabook?) and driving impact in partnership with entrepreneur, and the partners at KPCB. In 2004, Mr. Khosla, driven by the need for flexibility to accommodate four teenage children and a desire to be more experimental, to fund sometimes imprudent "science experiments", and to take on both "for profit" and for "social impact" ventures, formed Khosla Ventures, funded entirely with family funds. His goals remain the same - work and learn from fun and knowledgeable entrepreneurs, build impactful companies through the leverage of innovation, and spend time as a partnership making a difference. He has a passion for nascent technologies that can have a beneficial effect and economic impact on society. Mr. Khosla's greatest passion is being a mentor to entrepreneurs, assisting entrepreneurs and helping them build technology based businesses. He assists or serves on the boards of a number of the companies including EASIC (programmable ASIC platform), Infinera (optical communications), Kovio (printed electronics), Skyblue (internet PC), Spatial Photonics (Micromirror displays), Xsigo (datacenter switch), among others. Mr. Khosla is a charter member of TIE, a not-for-profit global network of entrepreneurs and professionals founded in 1992 that now has more than forty chapters in nine countries. He is also a Founding Board member of the Indian School of Business. His current passion is Social Entrepreneurship with a special emphasis on Microfinance as a poverty alleviation tool. He is a supporter of many microfinance organizations in India and Africa. He has been experimenting with global housing. Mr. Khosla is also passionate about alternative energy, petroleum independence, and the environment.

## **DR. ROBIN KODNER**

*DIRECTOR OF RESEARCH*

### **BODEGA ALGAE, LLC**

Dr. Robin Kodner is a geobiologist and has been doing interdisciplinary research on algae for over 10 years. She completed her PhD in Biology from Harvard University where her research was collaboration among the Biology and Earth Sciences Departments at Harvard and Earth, Atmospheric, and Planetary Sciences at MIT. Her research has focused on lipids from algae, their preservation potential in the geologic record, and interpreting ancient organic matter sourced by algae, which is often preserved in the form of petroleum. In working with the biofuels industry and with Bodega Algae, Dr. Kodner is able to apply her knowledge of the diversity of algae and their associated lipids and lipid biosynthesis to making biofuels. Currently she is working on strain development and growth optimization for Bodega's modular bioreactor. Dr. Kodner is also continuing her academic research as a postdoctoral research fellow at the University of Washington, applying the same analytical tools to investigate algal biomass contributions to the global carbon cycle, as well as investigating the evolution of algal lipids and lipid biosynthesis.

## **DR. JOSEPH A. KOCAL**

*DIRECTOR OF RENEWABLES RESEARCH*

### **RENEWABLE ENERGY & CHEMICALS GROUP, UOP, A HONEYWELL COMPANY**

Joe Kocal has been with UOP for 27 years in the Research and Development department. He has worked in the areas of catalyst and process development focussing primarily on new technology for UOP and the industry. Dr. Kocal has 45 patents that protect the new technologies that have been commercialized. He was previously manager of the Exploratory Platforms research group. Currently Dr. Kocal is a Sr. Fellow and Director of the Renewable Energy and Chemicals Research group. He has a Ph.D in chemistry from the University of Wisconsin at Madison.

## **TYLER J. KRUTZFELDT**

*PRINCIPAL*

### **MONT VISTA CAPITAL**

Tyler Krutzfeldt, a Board Member of the ABO, is Founder and Managing Director of Mont Vista Capital, a merchant banking firm focused exclusively on alternative energy sector. Mont Vista Capital clients represent the full spectrum of alternative energy industries including geothermal, algae, ethanol, wind energy, and waste to energy. He is a featured nationwide speaker at major industry conferences such as the national USGBC GreenBuild conference, Bloomberg analytics, and on public television. Mr. Krutzfeldt is the author of an article titled "*Carbon Intensity - Opportunity vs. Threat*" published in an international biofuels publication in June 2008. He holds the Chartered Financial Analyst (CFA) designation and is a Board Member of Miami CFA. He received a Bachelor's of Science degree in Applied Agricultural Economics from Texas Tech University and is a member of the American Bar Association's Alternative Energy Resources Committee. Mr. Krutzfeldt and his family are also 3<sup>rd</sup> generation Montana ranchers involved in agribusiness.

## **DR. ADELHEID KUEHNLE**

*PRESIDENT & FOUNDER*

### **KUEHNLE ARGOSYSTEMS, INC.**

Dr. Kuehnle has over 20 years of experience in plant breeding and biotechnology. More than two dozen tropical flower varieties developed by Dr. Kuehnle are now cultivated and traded globally. She is on leave as Professor from the University of Hawaii, Department of Tropical Plant and Soil Sciences, to devote her entrepreneurial talent to Kuehnle AgroSystems, Inc. Dr. Kuehnle has a B.A. degree from Middlebury College and a PhD from Cornell University. Dr. Kuehnle has authored six books and book chapters, more than 60 scientific papers, and is an inventor of 14 patents. Recently, Dr. Kuehnle was named the 2008 Scientist of the Year at the University of Hawaii, winner of the 2008 Hawaii Technology Industry Award, and a finalist as 2008 Pacific Business News Business Woman of the Year.

## **ALINA KULIKOWSKI-TAN**

*VICE PRESIDENT*

### **CARBON-CAPTURE CORPORATION**

Alina Kulikowski-Tan initially joined Carbon-Capture Corporation (CCC) as a consultant and actively engaged private-public partnership opportunities on behalf of the company. Prior to joining CCC, Mrs. Kulikowski-Tan was senior vice-president with the ADEPT Group, a consulting firm specializing in research, development, and commercialization of new technologies in transportation and energy applications. Her expertise includes project management, strategic planning, capitalization and market research.

## **DR. DAVID LEWIS**

*SENIOR LECTURER*

### **SCHOOL OF CHEMICAL ENGINEERING, THE UNIVERSITY OF ADELAIDE LEADER, MICROALGAL ENGINEERING RESEARCH GROUP**

Dr. David Lewis is a senior lecturer in the School of Chemical Engineering at the University of Adelaide. He enrolled at the University in 1993, completing a Bachelor of Engineering (Chemical) Honours Degree in 1998. In 1999 David began his Ph.D. in the School of Civil and Environmental Engineering. His Ph.D. project was funded by the CRC for Water Quality and Treatment and focused on the control of cyanobacteria in water supply reservoirs. Dr. Lewis became a lecturer in 2002 and setup the Microalgal Engineering Research Group (MERG) with a research focus on water and wastewater

quality & treatment, commercial and environmental applications for microalgae. A key research project within MERG is the optimization of microalgal removal from secondary treated wastewater for agricultural applications. This project directly addresses the challenge of harvesting microalgae from open ponds and the techniques perfected in this area are critical for our biodiesel project. As a Chemical Engineer with a trade background (Electrical Fitter/Mechanic), Dr. Lewis is well equipped to undertake commercial and industrial scale research and development. His engineering background provides the necessary skills to be able to conceptualise and scale-up processes that are economically and environmentally sustainable.

### **JIM LONG**

*VENTURE PARTNERS*

#### **GABRIEL VENTURES**

Jim Long is a Venture Partner at Gabriel who handles investments as well as advises other Gabriel portfolio companies. He is on the boards of Aurora BioFuels, Connectbeam, PlantSense, and YLX. Mr. Long brings with him many years of experience and success in building businesses in the high technology industry, as well as in developing new technologies and patents for the Internet and PC environments. Recently, Mr. Long has been an advisor for several start-ups such as Ruckus Wireless (WiFi video), Skipper Wireless (mesh nets & VoIP), Coghead (SaaS for the long tail), and Jibe Networks (acquired by Citrix). Previously, Mr. Long was the CEO of RioPort, a leading music application service provider (ASP) via its digital distribution infrastructure and MP3 player software. RioPort, powered MTV.com, Best-Buy.com, Yahoo, HP, Nike.com, and Microsoft; was the first internet company to license digital songs for resale from all five major record labels and enabled the first music cell-phones via a partnership with Nokia. Before joining RioPort, Mr. Long was the CEO and Founder of Starlight Networks. Starlight pioneered video streaming and video multicasting with award-winning Internet video infrastructure software and coined the term, "streaming video". Mr. Long is known as the "father" of that industry. Starlight provided Internet video communications products for Fortune 2000 businesses including Smith Barney, General Electric, Bloomberg, Viacom, Disney, Harvard, and Peoplesoft. Starlight Networks was the leader in the corporate video streaming market when it was acquired by PictureTel in November 1998. Later, he helped transition the business to PictureTel by developing a SaaS business strategy. Mr. Long has also worked with various venture capital firms and start-ups. He was instrumental in the successful turn-around of Tolerant Systems to Veritas Software, a leader in the storage management software market. Mr. Long began his career in software development and product marketing at Hewlett Packard where he invented the first presentation graphics application. Later, he spent four years as a venture manager for Fred Adler Venture Capital. Mr. Long holds an MBA with Distinction from Harvard University and a BS in Electrical Engineering and Computer Science from UC Berkeley.

### **DR. TRYG J. LUNDQUIST**

*PROFESSOR*

#### **CALIFORNIA POLYTECHNIC STATE UNIVERSITY, PROJECT P.I., ENERGY BIOSCIENCES INSTITUTE**

Tryg J. Lundquist, Ph.D., P.E. is on the Civil and Environmental Engineering faculty at California Polytechnic State University, San Luis Obispo. His research group develops technologies related to water treatment, energy, and resource recovery. Prior to joining Cal Poly, he worked as a researcher and engineer on algae production and wastewater reclamation projects with the late William J. Oswald at Lawrence Berkeley National Laboratory.

### **MICHAEL MASSINGILL**

*EXECUTIVE VICE PRESIDENT*

#### **KENT SEATECH CORPORATION**

Mr. Massingill is the Executive Vice President of Kent SeaTech Corporation (KST). Since its inception in 1980, he has

been influential in the design, development, and operational success of their commercial striped bass aquaculture facility, the world's first and largest, with annual seafood sales of 3.5 million lbs of "California Farmed Striped Bass"®, tilapia, carp, and catfish. Mr. Massingill has also been active in Kent SeaTech's R & D programs and has been instrumental in establishing its microalgae-based technologies. Working jointly with Clemson University, Kent SeaTech has developed unique methods for producing microalgae for energy, biomass, and water treatment applications. Based on 40 years of algae culture experience, Kent SeaTech's technology resolves nearly all of the technical and economic obstacles remaining in the development of commercial-scale production of liquid fuels from algae. KST has also obtained exclusive rights to Clemson patented technologies, including groundbreaking new techniques for harvesting microalgal biomass and converting it to forms of biolipids that are much easier and economical to extract and process. Kent SeaTech's microalgae technology is now refined sufficiently so that outside investor participation is being solicited.

## **PATRICK MAZZA**

*RESEARCH DIRECTOR*

### **CLIMATE SOLUTIONS**

Patrick Mazza is Research Director for Climate Solutions, a research and advocacy group missioned to accelerate global warming solutions. He has written extensively on biofuels and related sustainability issues. A recent series, "Growing Sustainable Biofuels," is available at [www.harvestcleanenergy.org](http://www.harvestcleanenergy.org). Mr. Mazza also wrote the Energy Foundation framing paper on agriculturally produced energy, *The New Harvest: Biofuels and Wind Power for Rural Revitalization and National Energy Security*. Other major papers in recent years include a MacArthur Foundation funded report, *Carrying the Energy Future: Comparing Hydrogen and Electricity for Transmission, Storage and Transportation*, and *Powering Up the Smart Grid*.

## **DR. MARGARET MCCORMICK**

*GENERAL MANAGER*

### **TARGETED GROWTH, INC. (TGI)**

Margaret McCormick is the General Manager for Bio-based Materials at Targeted Growth, Inc. (TGI). She is also a partner at Integra Ventures, a life science venture capital firm. Dr. McCormick has been part of the founding management company of several biotechnology companies including Sapphire Therapeutics, Spectral Genomics and Bacterial BarCodes. She was formerly with BCM Technologies (the venture subsidiary of Baylor College of Medicine) and McKinsey & Company. Dr. McCormick is the treasurer and on the executive board of the Washington Biotechnology and Biomedical Association and on the Biotechnology Scientific Advisory Board of Sigma-Aldrich. Dr. McCormick earned a Ph.D. in Biology from the Massachusetts Institute of Technology and a BS degree from the University of Wisconsin – Madison.

## **DR. B. GREGORY MITCHELL**

*PROFESSOR*

### **UNIVERSITY OF CALIFORNIA SAN DIEGO, SCRIPPS INSTITUTION OF OCEANOGRAPHY**

Dr. Brian G. Mitchell is a Research Biologist and Senior Lecturer at the University of California - San Diego, Scripps Institution of Oceanography. Dr. Mitchell received his Bachelor of Science degree with honors in aquatic biology from the University of Texas at Austin and in 1987 he received his PhD in Biological Oceanography from the University of Southern California. From 1990-1992, Dr. Mitchell served NASA as Program Manager for the Ocean Biochemistry Program and Program Scientist for the SeaWiFS Ocean Color Satellite Mission. His research on phytoplankton photosynthesis, plankton ecology, ocean optics and satellite remote sensing has been sponsored by the Office of Naval Research, NSF, NASA and NOAA. Dr. Mitchell's laboratory work focuses on growth and photophysiology of phytoplankton. Field projects explore mechanisms that transport shelf-derived iron into the Scotia Sea, application of new optical methods for inferring

ecosystem structure and function, and parameterization of models for phytoplankton photosynthesis. He is currently active in coordinating research and commercial demonstration of algae mass culture for biofuel and CO<sub>2</sub> abatement. The focus of his research on algae commercial applications is optimization of yields of bioenergy molecules in the light-temperature-nutrient matrix that regulates algae. More details can be found here: [www.spg.ucsd.edu](http://www.spg.ucsd.edu).

## **LISSA MORGENTHALER-JONES**

*FOUNDING CEO*

**LIVEFUELS, INC**

Lissa Morgenthaler-Jones is the founding CEO of Live Fuels, Inc, an alliance of scientists expecting to make algae 'biocrude' a viable biodiesel oil source by 2010. She graduated from Princeton University with a degree in economics. Ms. Morgenthaler-Jones has written for such publications as *Barron's* and *TheStreet.com*. She's been quoted in *The New York Times* and *BusinessWeek*, has appeared on radio, CNBC and Wall Street Week with Louis Rukeyser.

## **JEFF MUHS**

*EXECUTIVE DIRECTOR*

**UTAH STATE UNIVERSITY ENERGY LAB**

Jeff Muhs organized elab after being hired as a USTAR professor at Utah State University and now serves as its Executive Director. He and his colleagues at USU founded elab to create new energy innovations to help free America from its energy dilemma within a generation and to spin off successful businesses across Utah and the U.S. that capitalize on these technologies. A lifelong innovator, Mr. Muhs grew up on a farm in Southern Illinois and spent summers with his dad building houses by day and driving tractors at night. After graduating from college, he worked at Amphenol Fiber Optic Products and developed their line of multimode fiber optic splitters used in local area networks. Mr. Muhs next worked for DOE's Oak Ridge National Laboratory. Among his inventions there was a vehicle weigh-in-motion system now being deployed at military facilities worldwide to speed U.S. air deployments. He also invented a system that remotely monitors the security of special nuclear materials using optical fibers, a technology now in use at U.S. nuclear storage facilities. Mr. Muhs' last invention at ORNL was hybrid solar lighting systems. He served as the Vice President of Research with Sunlight Direct, Inc. – an energy technology company that spun the technology out of ORNL in 2004. During his tenure at ORNL, Mr. Muhs was named Engineer/Scientist of the Year in 1997 and Science Communicator of the Year in 2004. In 2005, Mr. Muhs' perspective on life changed dramatically when he served as an energy and science policy advisor in the U.S. Senate. He drafted several provisions included in the Energy Policy Act of 2005 and led initial staff-level efforts for U.S. Senator Lamar Alexander, who served as a congressional catalyst for launching President Bush's American Competitiveness and Advanced Energy Initiatives while Mr. Muhs was on his staff. His most important take-away messages from a year on Capitol Hill were that: a) America's energy problem is not going away anytime soon, b) consensus top-level national energy goals were both lacking and needed to guide future research, and c) politicians were relying on researchers like him to innovate America out of its energy problem rather than enact mandates. He received his B.S. in Electro-Optics from the University of Houston in 1986.

## **ROBERT T. NELSEN**

*CO-FOUNDER AND MANAGING DIRECTOR*

**ARCH VENTURE PARTNERS**

Robert Nelsen is a co-founder and a Managing Director of ARCH Venture Partners. Mr. Nelsen joined ARCH at its founding and has played a significant role in the early sourcing, financing and development of more than thirty companies including Sapphire Energy, Ikaria, Illumina (ILMN), Adolor (ADLR), Aviron (AVIR, acquired by Medimmune-MEDI), Caliper Life Sciences (CALP), Trubion Pharmaceuticals (TRBN), Array BioPharma (ARRY), NetBot, deCODE Genetics (DCGN),

Nanosys, Alnylam Pharmaceuticals (ALNY), XenoPort (XNPT), GenVec (GNVC), R2 Technology (acquired by Hologic-HOLX), IDUN Pharmaceuticals (acquired by Pfizer-PFE), Genomica (GNOM, acquired by Exelixis-EXEL), Surface Logix, NeurogesX (NGSX), Classmates.com (acquired by United Online-UNTD), Nura (acquired by Omeros), Kythera Biopharmaceuticals, Elixir Pharmaceuticals, Spaltudaq, VLST, Ensemble Discovery, Accelerator, Apoptos, Fate Therapeutics, Agios Pharmaceuticals, and Everyday Learning. Mr. Nelsen is a director of Ikaria, Sapphire Energy, Fate Therapeutics, Agios Pharmaceuticals, NeurogesX, and Kythera Biopharmaceuticals. He previously served on the boards of Trubion Pharmaceuticals, Surface Logix, Adolor, NetBot, Everyday Learning, Spaltudaq, Array BioPharma, Caliper Life Sciences, Illumina, R2 Technology, and Classmates.com, among others. He also serves as a director of the Fred Hutchinson Cancer Research Institute. Mr. Nelsen holds an M.B.A. from The University of Chicago and a B.S. in Economics and Biology from the University of Puget Sound.

## **DR. AMIR NEORI**

*ASSOCIATE RESEARCHER*

**ISRAEL OCEANOGRAPHIC AND LIMNOLOGICAL RESEARCH, NATIONAL CENTRE FOR MARICULTURE**

## **KELLY OGILVIE**

*CEO*

**BLUE MARBLE ENERGY**

Kelly Ogilvie is a co-founder and President of Blue Marble Energy (BME). Based in Seattle, BME is an algae biomass to energy company that is pioneering algae applications for petroleum displacement and other renewable products. He has a strong political and business background, with a wide range of experience extending from working for the Mayor of Seattle Greg Nickels, former Washington State Governor Gary Locke, other national and local campaigns, Paul Allen's Vulcan, and the Greater Seattle Chamber of Commerce. Mr. Ogilvie has a passion for alternative energy and clean technology which led him to pursue the development of BME's algae to energy technology and business model with James Stephens in May 2005.

## **DANIEL J. OH**

*CHIEF OPERATING OFFICER*

**RENEWABLE ENERGY GROUP, INC.**

For more than 20 years, Daniel Oh has led a diverse range of business and management organizations. Currently, Oh serves as the chief operating officer of Renewable Energy Group®, Inc. Renewable Energy Group, Inc., (REG) is a biodiesel industry sales leader and is a full-service biodiesel company offering plant management, risk management, raw material procurement, plant construction management, and biodiesel production, sales and marketing services. REG's network of biodiesel production facilities includes wholly-owned biodiesel plants and management of third party-owned plants. Renewable Energy Group, Inc., markets biodiesel to fuel distributors and customers in many industries including on-highway fleets, original equipment manufacturers, maritime, military, home heating and agriculture industries. Prior to REG, Mr. Oh served as vice president and member of senior management at ABG, Inc., an agribusiness consulting firm, responsible for the management consulting and market research practice. Prior to ABG, Mr. Oh was a leader in the Corporate Finance and Investment Banking area of Corporate Strategy and Business Development Group at Eli Lilly and Company, a global pharmaceutical company, where Mr. Oh focused on structured financing, all aspects of M&A including integration activities and corporate strategy. Mr. Oh has also served as a consultant with McKinsey & Company. Mr. Oh's post-graduate career began with the U.S. Army where Mr. Oh served as an infantry officer for 11 years and held the rank of Major; service included combat, overseas and stateside assignments. Mr. Oh holds an M.B.A. from the University of Chicago with concentrations in finance, accounting and strategic



management as well as a Bachelor's of Science degree from the United States Military Academy with a concentration in economics. Mr. Oh serves as Chairman of the Iowa Biodiesel Board.

## **DR. PHILLIP PIENKOS**

*RESEARCHER*

### **NATIONAL RENEWABLE ENERGY LABORATORY**

Philip T. Pienkos, Ph.D., is a Principal Research Supervisor in the Applied Biology Group at NREL, joining that organization in August, 2007. Dr. Pienkos has 25 years of biotechnology experience, working on projects in the pharmaceutical, chemical and energy sectors. He was one of the founders at Molecular Logix where he acted as research director in this early stage drug discovery/development company. Prior to that Dr. Pienkos served as research director at Energy BioSystems where he led a group involved in fermentation development and biocatalyst improvement and at Enchira Biotechnology where he led a group responsible for protein therapeutic discovery and production. He was a founding scientist at Celgene Corporation, involved in the development of biotechnology-based methods to produce pharmaceutical intermediates, and worked at Lederle Laboratories, where he developed novel mode-of-action screens for new antibiotics. Dr. Pienkos has co-authored numerous technical publications (including papers on chloroplast replication in algae and nitrogen fixation in cyanobacteria) and regularly speaks at national and international conferences. He received his Ph.D. in Molecular Biology from the University of Wisconsin and post-doctoral training at the University of Texas. He served six years on the editorial board of Applied and Environmental Microbiology and is a founding member of the Algal Biomass Organization, currently serving on the board of directors for that organization.

## **JOHN F. PIERCE**

*PARTNER*

### **WILSON SONSINI GOODRICH & ROSATI**

John F. Pierce is a partner in Wilson Sonsini Goodrich & Rosati's Seattle office, where he represents clients in connection with the development and finance of projects involving wind, solar (including photovoltaic, concentrated, and thermal), geothermal, and biomass energy, as well as those involving alternative fuels such as ethanol, biodiesel, and advanced-generation biofuels. Mr. Pierce's practice encompasses project sponsors and investors, and is international in scope, with extensive dealings in South Asia, Southeast Asia, China, India, Africa, and the Middle East. His clients include both venture-backed companies in the renewable energy industry and traditional renewable energy project companies. Among many transactions, Mr. Pierce has advised on the development of ethanol production facilities in western states, as well as on their project financing and construction. He has provided counsel on wind energy projects in the U.S. and Canada, advised U.S. energy companies regarding joint ventures in a biomass-fuel-powered project in the Philippines, and provided counsel on the acquisition of Indonesian geothermal power projects and the development of plants in the Philippines, including the drafting of the principal transactional documents and negotiations with lenders, as well as major overland and sub sea gas pipelines in Asia. Mr. Pierce also has broad international experience in infrastructure development and financing, including projects involving ports (bulk and containers) and industrial zones; joint ventures and other transactions in the aviation field; investments in Internet and software companies; telecommunications-related regulatory, commercial, and licensing matters; and the financing of oil and gas projects. Mr. Pierce received his B.S. degree from San Francisco State University and his J.D. degree from the University of Washington, School of Law. He is admitted to practice law in the states of Oregon and Washington.

## **DR. JASON PYLE**

*CHIEF EXECUTIVE OFFICER*

### **SAPPHIRE ENERGY**

Dr. Jason Pyle was formerly Chief Technical Officer and co-founder of Epoc, Inc., a privately held medical engineering company. Dr. Pyle holds an appointment as adjunct professor of bioengineering at Vanderbilt University where he has worked to develop cross-disciplinary programs of biological and engineering research. As the co-founder and Chief Technical Officer of Pria Diagnostics, Dr. Pyle was named Innovator of the Year (2006) by Frost and Sullivan. Dr. Pyle holds numerous pending and issued patents in the engineering and biological sciences and has worked in diverse cross-discipline areas such as nanofabrication, optical engineering, and structural biology. In addition to his broad technical abilities, Dr. Pyle has established numerous corporate partnerships between small technical companies and some of the world's largest corporations. He has directly supervised and coordinated both business development and operational activities within large co-development partnerships. Dr. Pyle has worked in finance, technical and manufacturing transactions in Singapore, Japan, and China. His post-doctoral research focused on the large-scale expression and control of neural proteins. He holds a Ph.D. in Molecular and Cellular Physiology and an M.D. from Stanford University. He received degrees in optical engineering and physics from the University of Arizona.

## **SEBASTIEN REMY**

*HEAD OF ALTERNATIVE FUELS RESEARCH PROGRAM*

### **AIRBUS**

## **MARK TEGEN**

*CEO*

### **INVENTURE CHEMICAL**

Mark Tegen brings over 18 years of petroleum industry manufacturing, marketing and logistics experience to Inventure. Before co-founding Inventure, he was President of Senergy Chemical, which he formed after licensing a novel patent to convert crude biodiesel glycerin into propylene glyco, a technology which won the 2006 Presidential Green Chemistry Award. In the subsequent two years, Mr. Tegen has worked diligently to develop the technology, form partnerships with Fortune 50 companies and build Senergy into a profitable start up with projected revenues in excess of \$200 million. Prior to Senergy, Mr. Tegen was Vice President/General Manager of Pacific Fluids LLC, the largest bulk marketer and terminal of Biodiesel in the Pacific Northwest. He continues to serve as a steering committee member of the Seattle Clean Cities Coalition, and is a member of the Washington State Department of Agriculture Biofuels Advisory Committee. Mr. Tegen received his degree in Business Finance from the University of Washington

## **DR. MARIO TREDICI**

*PROFESSOR OF MICROBIOLOGY*

### **DEPARTMENT OF AGRICULTURAL BIOTECHNOLOGY, UNIVERSITY OF FLORENCE, FLORENCE, ITALY**

## **DEAN TSOUPEIS**

*CEO*

**CULTURING SOLUTIONS, INC**

Dean Tsoupeis is a veteran of the renewable energy sector, having more than 7 years experience. IN 2005 he designed, engineered, and built a pilot plant to refine waste vegetable oil into ASTM D-6751 approved biodiesel. Mr. Tsoupeis recently performed a feasibility study for a 60MMGY biodiesel refinery in the Tampa Bay area. This project is currently in its funding phase and is awaiting approval of air permits. He recently founded Culturing Solutions, Inc which has been licensed by Varicon Aqua Solutions to carry their internationally patented continuous algae production platform, the BioFence. The BioFence allows algae farms to be built regionally at sources of CO<sub>2</sub> (power plants and industrial facilities) and can support co-located biodiesel refineries that provide affordable fuel to the Green Corridors Program. Current proposals include an algae farm that will mitigate CO<sub>2</sub> from a power utility and utilize it to create 60MMGY of biodiesel and 40MMGY of ethanol and another algae farm in South Texas that will produce both 10MMGY of biodiesel and highly nutritious algal protein.

## **DAVID WAIMANN**

*CEO*

**CEQUESTA, LTD**

## **DR. JOSEPH C. WEISSMAN**

*VICE PRESIDENT OF OPERATIONS*

**AURORA BIOFUELS, INC**

Dr. Joseph Weissman received his bachelor's degree in physics from Cornell University in 1972, a Masters in Mechanical Engineering, and a Ph.D. in Biophysics from University California, Berkeley in 1978. He is currently the President of SeaAg, Inc. a private Florida research and development firm as well as the Vice President for Outdoor Operations of Aurora Biofuels, Inc. in Alameda CA. Dr. Weissman is recognized as an expert in engineered systems for waste treatment, alternative fuels and chemicals, and aquaculture. He has over 30 years experience in the analysis, design, and operation of such systems. Dr. Weissman was awarded the contract for the development of the Outdoor Test Facility in Roswell NM by the Aquatic Species Program. He advises and consults internationally on algal mass cultivation. Dr. Weissman is Principal Investigator for US Department of Energy projects that utilize photosynthetic organisms for the production of biofuels and biofertilizers. He is also the owner of one of the largest clam seed hatcheries in Florida and for nearly 20 years has produced algal biomass for shellfish feed.

## **KRISTINA WEYER**

*RESEARCH SCIENTIST*

**SOLIX BIOFUELS**

Kristina Weyer received her B.S. in Physics from Williams College in 2003 and received her M.S. in Mechanical Engineering from Colorado State University in the spring of 2008. While pursuing her Master's degree, Ms. Weyer worked at Solix Biofuels through a graduate study program at CSU's Engines and Energy Conversion Lab. Ms. Weyer focused her work on thermal modeling of algae growth systems and titled her thesis: "Heat-Balance Model and Thermal Analysis of an Algae Growth System for Biofuel." Ms. Weyer's broad experience includes work at the Southface Energy Institute promoting energy efficient home building and at the Aprovecho Research Center conducting research on clean burning stoves in Turkey and India. She currently works for Solix Biofuels as an analytical engineer, focusing her work on gas

delivery research and data acquisition and analysis.

**BRIAN YOUNG**

*DIRECTOR OF INTERNATIONAL BUSINESS DEVELOPMENT*

**IMPERIUM RENEWABLES, INC.**

## 2008 ALGAE BIOMASS SUMMIT POSTER PRESENTERS

### **BELLINGHAM H.S. STUDENTS**

*STUDENTS*

**CALVIN ATKINS, DYLAN ALBRECHT, SAM LEWIS AND SIERRA RIVERS**

Calvin Atkins, Dylan Albrecht, Sierra Rivers, and Sam Lewis are part of a research group led by chemistry teacher, Jamie Yoos, at Bellingham High School. They are studying the use of algae to sequester CO<sub>2</sub> off of concrete plants and in turn, harvest the algae to produce biodiesel. Calvin, Dylan, and Sam were all part of the winning project in the technology challenge at WSU's Imagine Tomorrow Competition. With the addition of their new team member Sierra, the group has plans to compete at Imagine Tomorrow once again, as well as continue the algae research throughout the year. In the future, Calvin Atkins is planning on studying biochemistry at Stanford University next fall. Sierra Rivers hopes to attend the UW Honors program in 2009. Dylan Albrecht has plans to attend UC Berkeley to study nuclear engineering, and Sam Lewis is applying to University of Rochester for next fall. All four plan careers studying renewable sources of energy.

### **DR. ALEXANDER S. BELIAEV**

*SENIOR STAFF SCIENTIST*

**BIOLOGICAL SCIENCE DIVISION, PACIFIC NORTHWEST NATIONAL LABORATORY**

Dr. Alex Beliaev is senior staff scientist in the Biological Science Division of Pacific Northwest National Laboratory, Washington, USA. Since receiving a doctorate in 1999 from the University of Massachusetts at Amherst, he has worked in the area of microbial physiology, ecology and functional genomics of environmentally relevant microorganisms. His current research interests involve developing systems-level understanding of respiration, central metabolism and the regulation of energy metabolism in bacteria. Dr. Beliaev is a Principal Investigator for several US DOE-funded Genomics:GTL Program (GTL) projects that are focused on understanding fundamental metabolic processes leading to production of biological fuels using cutting-edge metabolic engineering technology. He has authored over 30 publications in peer-reviewed journals (including PNAS and Nature) and made over 100 presentations at national and international professional meetings.

### **DR. JOANNE BELOVICH**

*PROFESSOR OF CHEMICAL & BIOMEDICAL ENGINEERING*

**CLEVELAND STATE UNIVERSITY**

### **DR. JAY BURNS**

*CHIEF ALGAE SCIENTIST*

**BIONAVITAS**

Dr. Jay Burns received a Ph.D. in Marine, Estuarine and Environmental Science from the University of Maryland, College Park and a B.S. in Marine Science, Biology from Long Island University, Southampton. His previous research focused on nitrogen and carbon cycling in ocean, coastal and estuarine environments, as well as sediment environments, such as salt marshes and mangroves. This included extensive research on the cyanobacteria, *Trichodesmium* and *Richelia* (a diatom symbiont). While working at the University of Southern California, he expanded his research to include nutrient uptake in kelp. Dr. Burns has also participated in research and monitoring of harmful

algal blooms (HABs) while employed as the Marine Biologist and Marine Policy Analyst for the Quileute Indian Tribe. He is responsible for day-to-day laboratory activities, such as maintenance of algal cultures and conducting experiments. He is currently working on algal species selection, optimization of algal growth parameters and lipid production.

### **DR. ROSE ANN CATTOLICO**

*PROFESSOR OF MARINE MOLECULAR BIOLOGY*

**UNIVERSITY OF WASHINGTON**

Dr. Rose Ann Cattolico received her doctorate at the State University of New York, Stony Brook, in 1973 and served as a postdoctoral fellow at McGill University until 1975 when she joined the faculty of the University of Washington. Her main research interests have been in the area of chloroplast genome architecture and gene function in non-chlorophyll containing algae as well as functional genetic diversity within stramenopile populations. She currently teaches classes in cell biology and algology. Dr. Cattolico has been significantly invested in training minority students as well as students with disabilities. Recently she has hosted undergraduates from Native American tribes through UW's Stars and Bridges program and the Temple University Young Physicians Program. Through work-study and undergraduate research programs, she has also consistently supported minority women. Dr. Cattolico also routinely participates in the NASA, Mary Gates and Hughes programs that foster undergraduate research. During her tenure at the University of Washington she has successfully mentored ten PhD students and six masters degree students in the completion of their degrees, and hosted fifteen postdoctoral fellows. She sponsors three to six undergraduates per year in the lab. Dr. Cattolico enjoys hiking in the North Cascades and Olympic mountains, parenting, raising chickens, and restoring an old, broken down house.

### **R. CAMERON COATES**

*GRADUATE STUDENT*

**SCRIPPS INSTITUTION OF OCEANOGRAPHY, UNIVERSITY OF CALIFORNIA, SAN DIEGO**

### **JEFF COLLIER**

*PRODUCT DEVELOPMENT DIRECTOR*

**ENERGY DERIVED**

Jeff Collier is the Product Development Director and co-founder of Energy Derived LLC, headquartered in Queen Creek, Arizona. Energy Derived is working to establish itself as a global leader in the design and manufacture of algae production process systems. For the last two years Mr. Collier has been extensively involved in the design and development of algae production systems. His initial involvement in the industry stems from a project to design and build vertical algae bioreactor systems at the Arizona State University. Since then Mr. Collier has worked diligently to develop solutions for the processing and mass production of algae feedstock. Prior to the creation of Energy Derived, Mr. Collier was an engineering consultant providing services to the semiconductor industry on implementation and execution of system improvement and quality issues. He has spent the last 15 years developing solutions for companies throughout the semiconductor and electronics industries including IBM, Motorola, Western Digital, and Storage Technologies. Mr. Collier is currently pursuing a graduate degree at Arizona State University in addition to his degrees in Manufacturing Technology and Robotic Automation.

### **DR. KEITH E. COOKSEY**

*RESEARCH PROFESSOR OF MOLECULAR BIOLOGY*

**MONTANA STATE UNIVERSITY**

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**DR. JOEL L. CUELLO**

*ASSOCIATE PROFESSOR OF AGRICULTURAL AND BIOSYSTEMS ENGINEERING*

**THE UNIVERSITY OF ARIZONA**

**Joel L. Cuello , Ph.D., Associate Professor**

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**Education**

**The Pennsylvania State University**, Ph.D. Biological and Agricultural Engineering, Minor in Chemical Engineering, May 1994

**The Pennsylvania State University**, M.S. Plant Physiology, May 1999

**The Pennsylvania State University**, M.S. Agricultural Engineering, August 1990

**The University of the Philippines**, B.S. Agricultural Engineering, *cum laude*, April 1984

**Postdoctoral Research Experience**

**NASA John F. Kennedy Space Center**, U.S. National Research Council Research Associateship,  
December 1993 – December 1994

**DR. AL DARZINS**

*GROUP MANAGER/PRINCIPAL RESEARCHER*

**NATIONAL BIOENERGY CENTER, NREL**

**DR. JOE DRAGAVON**

*DEPARTMENT OF CHEMISTRY*

**UNIVERSITY OF HULL (U.K.)**

**KEVIN DRUMM**

*DIRECTOR OF BUSINESS DEVELOPMENT*

**SOLUTION RECOVERY SERVICES**

**DR. MARK EDWARDS**

*PROFESSOR*

**ARIZONA STATE UNIVERSITY**

Mark R. Edwards, PhD, graduated from the US Naval Academy in mechanical engineering, oceanography and meteorology. Jacques Cousteau motivated and mentored his interest in the oceans and global stewardship. He holds an MBA and PhD in marketing and consumer behavior and has taught food marketing, leadership, sustainability and entrepreneurship at Arizona State University for over 30 years. As founder and CEO of the software firm TEAMS

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International, Dr. Edwards served as lead assessment and leadership development consultant for over 400 firms globally.

Over the years, Dr. Edwards has consulted with both public and private institutions and organizations across the economy. He retained by the US Departments of Energy and Defense, as well as the National Laboratories and other agencies. He has served on the board of a Fortune 50 transportation and foods company and has done extensive R&D on new foods and food sources. He has also consulted for Monsanto, Pioneer Seeds, DuPont, GE, Quaker Oats, General Mills, Borden and many other agribusiness companies. Dr. Edwards has also worked with senior executives at 15 large US oil and gas firms as well as British Petroleum and Saudi Aramco. He has consulted with over a dozen power and water utilities such as Duke Energy, PG&E, and FP&L, in addition to pipeline and energy distribution firms.

Dr. Edwards has published over 100 articles on advanced assessment technologies as well as several books, including a business bestseller, 360° Feedback. He currently serves on several boards, including the Arizona Science Center, whose mission is to motivate students to learn and to pursue engaging careers in science and math.

## **DR. DAVID GIORGI**

*PRESIDENT & CEO*

### **OPTISWITCH TECHNOLOGY CORPORATION**

Dr. Giorgi has been the president and CEO of OptiSwitch Technology Corporation since its incorporation in 1999. He previously spent over 14 years at Energy Compression Research (ECR) originating new concepts and directing research in the design and development of high power, fast rise-time systems which incorporate Light Activated Silicon Switches (LASS). These systems range from sources for high power microwaves and impulse RADARs to high dI/dt switches for capacitive discharges. From 1995 to 1998 Dr. Giorgi focused on the development of a high speed (<1 ns) and high voltage (7 kV) Pockels Cell driver and a short pulse (200-1000 ps) Q-switch microlaser, both of which are based on LASS technology. Dr. Giorgi holds a BSEE, MSEE and Ph.D. from the University of California San Diego; has co-authored three patents; and authored numerous papers in the area of light activated switching.

## **SAM HILL**

*PRESIDENT*

### **BODEGA ALGAE, LLC**

Sam Hill has been a research scientist in the optical engineering and image-processing field for over 10 years. Most recently, he worked for the 1997 MIT \$50K finalist Actuality Systems Inc., developing novel flat panel based 3D displays for oil and gas exploration and radiation oncology. Over the past two years he has been involved with organizing panels for the MIT 2.0 Energy Conference as well as consulting on several clean-energy projects in New England. Mr. Hill's is currently President of Bodega Algae, Inc., an MIT startup developing novel photobioreactor technology for algae biomass production as well as the investigation of light sensitive bacteria. His experience in lighting and mesh network sensor arrays supports Bodega's product development efforts. He has a M.S. in Optical Engineering from the University of Arizona and a M.S. from the Massachusetts Institute of Technology Media Lab.

## **DR. ALEXANDRA HOLLAND**

### **UNIVERSITY OF WASHINGTON**

After completing high school in Paris, France, Dr. Alex Holland graduated with Honors from UC Berkeley (2001, Chemical Engineering) and earned her PhD at the University of Washington (2007, Chemical Engineering). Her undergraduate research in Professor Jay Keasling's laboratory introduced her to the areas of metabolic engineering, polyphosphate metabolism and bioremediation, which she explored in depth as a graduate student in Professor Mary

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Lidstrom's research group. As an NSF Fellow (GRFP 2002-2004), Dr. Holland extensively engineered mutations in the radiation-resistant bacterium *Deinococcus radiodurans*, for which she characterized the polyphosphate and phosphate metabolisms, and which led her to elucidate novel regulatory mechanisms. The last two years of her graduate studies were funded by a NSF IGERT MCCE fellowship (Multi-National Collaboration on Challenges to the Environment 2006-2007). The fellowship provided an interdisciplinary framework for the pursuit of an independent project to address sustainable development avenues. In this context, Dr. Holland taught a Chemical Engineering Independent Research class for seniors with a goal of introducing basic algae physiology research along with sustainable process design concepts. The research results and teaching experience were presented at the 2006 AIChE (American Institute of Chemical Engineers) National Conference in San Francisco. Such a course initiative represented a very progressive attempt to integrate sustainable development into the Chemical Engineering curriculum. Dr. Holland's IGERT fellowship international experience was hosted by Professor Jhuma Saddhukhan (Center for Process Integration) and Professor David Sigeo (Faculty of Life Science, expert in algae ecology) at the University of Manchester, UK. As a visiting scholar, Alex's stay was extended through the summer of 2008, which enabled most of the work presented here. Dr. Holland is currently looking to pursue her work on algae metabolism and physiology in Paris with Professor Giles Johnson (University of Manchester, Faculty of Life Science) and his collaborators at the Institut de Biologie Physico-Chimique, in order to benefit from their expertise in electron transport mechanisms and *Chlamydomonas* genetics.

## **DR. JEAN FRANCOIS JENCK**

*PRESIDENT*

**ALGOSOURCE TECHNOLOGIES**

## **BEN LUCKER**

*RESEARCH ASSOCIATE*

**WASHINGTON STATE UNIVERSITY**

Ben Lucker received his doctorate degree in biochemistry from the University of Idaho in late 2006. His focus was the assembly of intraflagellar transport protein complexes and their roll during assembly and maintenance of flagella in *Chlamydomonas reinhardtii*. Following graduate school he worked as a postdoctoral fellow with Mike Skinner researching transgenerational epigenomics. Dr. Lucker is currently a research associate within Dr. Shulin Chen's laboratory at Washington State University. His research is based on isolation and characterization of algae strains found within the Northwest, with a future focus on development of native algae species for biomass production.

## **GLEN MEIER**

*RESEARCH & DEVELOPMENT MANAGER*

**RENEWABLE ENERGY GROUP, INC.**

## **DR. ANN MESCHER**

*ASSOCIATE PROFESSOR, DEPARTMENT OF MECHANICAL ENGINEERING*

**UNIVERSITY OF WASHINGTON**

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## **DR. K.Y. SIMON NG**

*PROFESSOR OF CHEMICAL ENGINEERING AND MATERIAL SCIENCE*

**WAYNE STATE UNIVERSITY**

Dr. K.Y. Simon Ng received his BSE, MSE, and PhD in chemical engineering from the University of Michigan. He is currently a Professor of Chemical Engineering and Materials Science at Wayne State University (WSU), a Gershenson Distinguished Faculty Fellow, the Director of WSU's Graduate Programs in Alternative Energy Technology, and the Director of WSU / NextEnergy's National Biofuel Energy Laboratory. His research interests include alternative energy technology, alternative fuels, environmental and fuel conversion catalysis, polymers, smart sensors, and biomedical devices. He has published and presented over 250 research papers. Dr. Ng is a member of American Institute of Chemical Engineers, American Oil Chemists Society, and American Society for Testing and Materials, and a licensed Professional Engineer in the State of Michigan. Recently, he served as a special advisor to the Michigan Renewable Fuel Commission.

## **DR. RON PUTT**

*ASSISTANT RESEARCH PROFESSOR, CHEMICAL ENGINEERING DEPARTMENT*

**AUBURN UNIVERSITY**

Dr. Ron Putt received his Bachelors Degree in Chemical Engineering at the University of Delaware in 1969. After four years in the U.S. Naval Submarine Service he did graduate work at the University of California at Berkeley, receiving his Masters Degree in Chemical Engineering in 1975. He then spent 31 years in industrial R&D, mostly in the field of electrochemical technology and including the last twenty years with various technology startups. Dr. Putt joined the Department of Chemical Engineering at Auburn University in 2007 as an assistant research professor, where he discovered the exciting potential of algaculture for biofuels feedstocks. His vision is to develop the Southeastern U.S. into a major supplier of these feedstocks for the country.

## **JIM SEARS**

*PRESIDENT & CHIEF TECHNOLOGY OFFICER*

**A2BE CARBON CAPTURE, LLC**

Jim Sears is the Chief Technology Officer and co-founder of A2BE Carbon Capture and co-founder of Solar Democracy, a provider of algae industry support services. He previously founded Solix Biofuels where he was responsible for technology development, strategy, financial models, team building, and IP development. Mr. Sears has 32 years experience leading advanced technology development teams including 16 years as an entrepreneur. Named Principal Investigator on 6 SBIR projects, he holds 4 patents and has held critical path responsibility for a \$100 million aerospace program. Mr. Sears has an Electrical Engineering degree from the Georgia Institute of Technology and extensive postgraduate training. Prior to running his own corporation, he spent 6 years as a research engineer for the Navy Surface Warfare Center and 10 years with Ball Aerospace in a variety of system engineering, R&D and management rolls. Extensively traveled, Mr. Sears grew up in the United Nations and US Forestry communities.

## **DR. TEODORA RUTAR SHUMAN**

*ASSOCIATE PROFESSOR*

**SEATTLE UNIVERSITY**

Teodora Rutar Shuman is an Associate Professor in the Mechanical Engineering Department at Seattle University and Paccar Chair. She received her PhD from the University of Washington in Seattle in 2000 focusing on NOx and CO

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formation in lean-premixed combustion. Her Master of Science in Mechanical Engineering, also from UW, focused on reburning with  $N_2O$ . She received her Mechanical Engineering undergraduate degree from Belgrade University in Serbia.

## **VINCENT TOEPOEL**

*CONSULTANT – TECHNOLOGY & ALTERNATIVE FUELS*

**INTERNATIONAL AIR TRANSPORT ASSOCIATION**

## **IAN WOERTZ, M.S.**

*RESEARCH ENGINEER*

**CAL POLY STATE UNIVERSITY**

## **GARY WOOD, M.S.**

*CEO*

**DESERT SWEET BIOFUELS**

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