



DR. KIRAN C. PATEL COLLEGE OF
GLOBAL SUSTAINABILITY

George Philippidis, Ph.D.

Associate Professor, Patel College of Global Sustainability, University of South Florida (USF)

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EXPERTISE

Dr. Philippidis has 25 years of experience in directing applied R&D, leading strategic business units, and advising in renewable energy, biofuels, bioproducts, biomass, and algae in the public and private sectors.

EDUCATION

Ph.D. Chemical Engineering, University of Minnesota, Minneapolis, 1989

M.B.A. University of Denver, Colorado, 1995

B.S. Chemical Engineering, Aristotle University of Thessaloniki, Greece, 1984

PROFESSIONAL EXPERIENCE

2011-present **Associate Professor**, Patel College of Global Sustainability (formerly at Dept. of Chemical and Biomedical Engineering), University of South Florida, Tampa, FL

Directs externally-funded applied research in biofuels, bioproducts, and bioenergy with a focus on production of cellulosic sugars, ethanol, and organic acids, algae cultivation and processing, novel algae bioreactor engineering and scale-up, advanced biodiesel production, power generation from biomass via gasification/anaerobic digestion, and techno-economic analysis of renewable technologies. Advises students and directs renewable energy curriculum.

2002–2011 **Energy Director**, Applied Research Center, Florida International University (FIU), Miami, Florida

Developed and directed energy programs worth over \$6M and technology evaluation and deployment projects in biofuels, renewable energy, and environmental technologies funded by the US Department of Energy, the US Department of Defense, the State of Florida, and the private sector.

1996–2001 **Director**, Biochemical Development, Thermo Fibergen, Inc., Bedford, Massachusetts

Member of management team of a subsidiary of Thermo Electron Corp. (now

Thermo Fisher), a Fortune 500 company. In charge of energy and environmental research and development and product commercialization.

1989–1996 **Leader**, Research and Development, National Renewable Energy Laboratory (NREL), Golden, Colorado

Directed \$29M joint R&D venture between the U.S. Department of Energy and the private sector for development of advanced biofuel technologies.

PROFESSIONAL HONORS AND AFFILIATIONS

1. Fulbright Scholar (Specialist)
2. NATO and European Union travel fellowships
3. Scientific journal reviewer
4. DOE Bioenergy Technologies Office (BETO) invited expert reviewer
5. Kauffman Foundation entrepreneurship award
6. Advisor to US State Department, USDA, and Florida Governor's Energy Office
7. Advisory Board Member of Culture Fuels Inc. and ClimeCo International, Inc.
8. American Institute of Chemical Engineers, Senior Member

PATENTS (select)

1. **World Patent 029475** "Cell Mass from Fermenters as Nutrient Source in Biomass-to-Ethanol Conversion" (1994).
2. **US Patent 5,705,369** "Prehydrolysis of Lignocellulose" (1998).
3. **US Patent 5,777,086** "Method of Recovering Lignin from Pulp and Paper Sludge" (1998).
4. **US Patent 5,876,505** "Method of Producing Glucose from Papermaking Sludge Using Concentrated or Dilute Acid Hydrolysis" (1999).
5. **US Patent 5,919,424** "Method of Recovering Minerals from Papermaking Sludge and Sludge-Derived Ash" (1999).
6. **US Patent 5,961,941** "Production of Precipitated Calcium Carbonate from Papermaking Sludge and Sludge-Derived Ash" (1999).
7. **US Patent 6,156,226** "Liquid and Solid De-Icing and Anti-Icing Compositions and Methods for Making Same" (2000).
8. **US Patent 6,758,996** "Cellulose-Reinforced Thermoplastic Composite and Methods of Making Same" (2004).
9. **Patent Application (PCT/US14/43765)** "Floating Photobioreactor System Comprising a Floating Photobioreactor and an Integrated Paddle Wheel and an Airlift and Methods of Use" (2014).

PUBLICATIONS (select recent)

1. Philippidis, G. "Energy Security Achievable with Biofuels Made in the Americas", Ethanol Producer Magazine, Vol. 14, 8, 232-235 (2008).
2. McFarlane R. and Philippidis, G. "How Free Trade Can Help Solve the Energy Crisis", Wall Street Journal, July 26-27, p. A9 (2008).

3. Philippidis, G. "Energy Diversity Based on U.S. and Latin American Biofuels" in *From Energy Crisis to Energy Security*, Foundation for Defense of Democracies, Washington DC, 69-79 (2008).
4. Munroe, N., Philippidis, G., Gill, P. K. S., Haider, W., and Amruthaluri, S. "Submerged Jet Mixing of Non-Newtonian Fluids in Waste Tanks", Proceedings of ASME 2009 International Mechanical Engineering Congress and Exposition (2009).
5. Philippidis, G. "Powering America with Sustainable Energy in the 21st Century", *J. Renewable Sustainable Energy*, 4, 062801 (2012).
6. Shah, K., Dulal, H.B., Philippidis, G., and Brodnig, G. "Developing Biofuels Industry in Small Economies: Policy Experiences and Lessons from the Caribbean Basin Initiative", *Mitig. Adapt. Strat. Glob. Change*, 10.1007/s11027-012-9437-8 (2012).
7. Vairavamoorthy, K., Eckart, J., Philippidis, G. and Tsegaye, S. "Water and Energy in the Urban Setting" in *Energy and Water: The Vital Link for a Sustainable Future*, 33, SIWI, Stockholm (2014).
8. Brown T.R., Dogaris I., Meiser A., Walmsley L., Welch M., Philippidis G. "Development of a Scalable Cultivation System for Sustainable Production of Algal Biofuels". Proceedings of the 23rd EUBCE (European Biomass Conference and Exhibition), Vienna, Austria, pp. 104-107 (2015).
9. Dogaris, I., Welch, M., Meiser, A., Walmsley, L., Philippidis, G. "A Novel Horizontal Photobioreactor for High Density Cultivation of Microalgae", *Bioresource Technology*, 198, 316-324 (2015).
10. Dogaris I., Brown T.R., Loya B., Philippidis G. "Cultivation of microalgae in a scalable photobioreactor for production of algal biomass". *Biomass Bioenergy*, 89, 11-23 (2016).
11. Spiegel-Feld, D., Rudyk, B., Philippidis, G. "Allocating the economic benefits of renewable energy between stakeholders on Small Island Developing States (SIDS): Arguments for a balanced approach", *Energy Policy* (accepted, 2016).

PRESENTATIONS (select recent)

1. Philippidis, G. "Global Risks and Challenges from Climate Change", 3rd US-Brazil Forum, Sao Paulo, Brazil (2010).
2. Philippidis, G. "Renewable Energy Opportunities in Florida and the Americas", 2nd Renewable Energy Fair, Valladolid, Spain (2010).
3. Philippidis, G. "Agroenergy Business Opportunities in the Americas", 2nd International Congress of Biofuels, Guayaquil, Ecuador (2011).
4. Philippidis, G., Welch, M., Walmsley, L., and Meiser, A. "Overcoming the Challenges in the Commercial Cultivation of Algae", 10th Annual World Congress on Industrial Biotechnology, Montreal, Canada (2013).
5. Walmsley, L., Meiser, A., Welch, M., and Philippidis, G. "Highly-Productive, Low-Cost Floating Cultivation Platform", Algae Biomass Summit, Orlando, FL (2013).
6. Philippidis, G. and La Trecchia, P. "Reframing Urban Food Waste as a Renewable Resource", 5th AESOP Conference on Sustainable Food Planning, Montpellier, France (2013).
7. Cerniga, Z., Deshpande, S., Townsend, D., Driscoll, A., Cogswell, K., McGranahan, E., Sunol, A., Philippidis, G., and Pandey, M. "Biodiesel Production from Waste Oil by Supercritical Transesterification", National Biodiesel Conference & Expo, Ft. Worth, TX (2015).

8. Brown T-R, Dogaris I, Meiser A, Walmsley L, Welch M, and Philippidis G. "Development of a Scalable Cultivation System for Sustainable Production of Algal Biofuels", 23rd European Biomass Conference & Exhibition, Vienna, Austria (2015).
9. Dogaris, I., Meiser, A., Walmsley, L., Welch, M., Philippidis, G. "Development of a low-cost horizontal photobioreactor for high density cultivation of microalgae", World Congress on Industrial Biotechnology. Montreal, Canada (2015).
10. Dogaris, I., Welch, M., Walmsley, L., Meiser, A., and Philippidis, G. "Scale-up of a Horizontal Bioreactor Designed for Commercial Cultivation of Microalgae", American Biomass Summit, Washington, DC. (2015).
11. Deshpande, S., Townsend, D., Driscoll, A., Cogswell, K., Sunol, A., Philippidis, G., and Pandey, M. "Design of a Supercritical Transesterification Pilot Plant to Power the USF Bus System", National Biodiesel Conference & Expo, Tampa, FL (2016).

EXTERNAL FUNDING (select recent)

1. "Development of a Microalgae Production Platform" funded by Culture Fuels Inc., \$90,000 (2011-2013).
2. "Production of High-Value Algae Biomass in a Novel Cultivation System" funded by Culture Fuels, Inc., \$54,000 (2012-2014).
3. "Renewable Energy Education Program at USF's Patel College of Global Sustainability" funded by the Florida Energy Systems Consortium, \$85,000 (2014-2016).
4. "Cost-Effective Scalable Cultivation of Algae for Renewable Fuel and Animal Feed Production in Florida" funded by the Florida Office of Energy, \$672,000 (2014-2016).

STUDENT ADVISING and MENTORING

Currently major and co-major advisor of two doctoral students and three master students in Chemical Engineering, Biology, Global Sustainability, and Environmental Science & Policy. In the past mentored numerous graduate and undergraduate students in Chemical, Mechanical, and Biomedical Engineering, Environmental Studies, and Research Experience for Undergraduates (REU) programs.

CURRICULUM DEVELOPMENT and TEACHING

Developed and currently teach graduate courses for USF's M.A. program in Global Sustainability (both in-class and on-line).

- *"Renewable Transportation Fuels"*
- *"Renewable Power Portfolio"*
- *"Economics and Finance for Sustainability"*

Developed and taught undergraduate courses *"Engineering Thermodynamics"* and *"Chemical Engineering Thermodynamics"*.