

CURRICULUM VITAE

Vasilis M. Fthenakis, Ph.D., AIChE Fellow

Energy Sciences & Technology Department
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EDUCATION

New York University, New York Ph.D. in Fluid Dynamics and Atmospheric Science, 1991.
Thesis topic: Modeling of water spraying of toxic gas releases; with Dr. Victor Zakkay
Columbia University, New York M.S. in Chemical Engineering, 1978.
Thesis topic: Modeling on the methanation of carbon monoxide; with Dr. John Happel.
University of Athens, Greece Diploma in Chemistry, 1975.
Brookhaven National Laboratory *Emergency Planning; Environmental Protection; 1991-2000*
American Institute Chem. Eng. *Layer of Protection Analysis, 2002*

PROFESSIONAL EXPERIENCE

Scientist (2003-present); Senior Research Engineer (1995-2003); Research Engineer I (1987-1995); Research Engineer II (1980-1987)

Environmental Sciences Department, **Brookhaven National Laboratory**, Upton, NY
Current research focuses on environmental impact analysis, air pollution prevention and control, and modeling of accidental chemical releases. He is the Head of the National Photovoltaic Environmental, Health and Safety (EH&S) Research Center, since 2002. www.pv.bnl.gov

Leads international collaborations on life cycle analysis (LCA) and he **founded and directs** the Columbia University Center of Life Cycle Analysis (May 2006-present) www.clca.columbia.edu

Major Contributions/Recognitions:

Initiated life cycle environmental assessments (LCA) of energy technologies; formed collaborations with researchers in the Netherlands, Germany, Italy and Switzerland. Hired Dr. H.C. Kim with expertise on LCA, to work in this activity. Started an International Energy Agency (IEA) PV-EH&S Task.

Established a laboratory for studies on recycling of spent photovoltaic modules and manufacturing scrap, using hydrometallurgical separation technologies. Hired Dr. W. Wang, an expert on metallurgical operations to run this lab.

Designed experiments for simulating the effect of fire on photovoltaics using a variety of techniques included NSLS-x ray diffraction analysis of molten glass

Highly praised technical consulting to dozens of photovoltaic companies and to several major chemical; oil-refinery and; semiconductor companies.

Developed several fluid- flow models that are used by the industry; the major, peer reviewed ones are: a) HFSPRAY and HGSPRAY, heavy-gas-liquid fluid dynamics models; b) the "Fthenakis-Rohatgi" model of two-phase flow from large breaks in pressurized vessels, and c) the "Barge model" of liquid releases from a submerged vessel.

Authored the book "Prevention and Control of Accidental Releases of Hazardous Gases" which is used by air quality practitioners nationwide.

Published several highly praised, high-impact articles.

Received Commendations from the DOE Assistant Secretary for EE and the Director of the NREL for exemplary performance on PV EH&S and safety analysis reviews.

Presently serves at the Editorial Board of two journals, is a Fellow of the AIChE and the IEF and an adj. Professor of Earth and Environmental Engineering at Columbia University.

Expert reviewer of the EPA Report to Congress on HF; IPCC Guidelines for National Greenhouse Gas Inventories, and several NREL, DOE, and industry association official documents. Continues to serve in conference and symposia organizing committees and journal submission reviews.

Safety/Environmental Consulting

- Expert witness in major chemical release cases
- Exxon/Mobil, Fairfax, VA (5/1/2001-12/2002)
- Dow Chemical, Pittsburg, CA (12/1999- 12/2000)
- 3M Corp., St. Paul, MN (7/1997- 8/1988)
- CITGO, Corpus Christi, TX (7/1995-7/1996)
- Webb, Murray & Associates, Inc., Houston, TX (8/1995-4/1996)
- Radian/SEMATECH, Austin, TX, 6/1994-12/9/1995)
- UNO-VEN, Lemont, IL (5/1992-12/1992)
- Allied Signal, Morristown, NJ (10/1992-12/1993)
- Tecsa, Bergamo, Italy (11/1992 – 11/1993)
- Amoco Chemical Co., Texas City, TX (1992)
- Industry Cooperative HF Mitigation Program (5/1990 - 12/1990)
- Ultramar Corp., Wilmington, CA (5/1991)
- Mobil Corp., Princeton, NJ (5/1990 - 1994))
- Amoco Corp., Chicago, IL (8/ 1990 - 1992)
- Eastman Kodak Co., Rochester, NY (6/1990)
- Standard Microsystems Corporation, Hauppauge, NY (5/1987)

Project Engineer Fossil Energy Laboratory, Columbia University, NY (1979-1980)

Performance evaluation studies on a moving bed coal-biomass gasifier.

**Research Assistant Catalysis Laboratory, Columbia University, NY (1977-1979)
Catalysis Research Co., Palisades Park, NJ (6/1977-9/1977)**

Development of mathematical models for various catalytic chemical reactions.

Chemist ChemiResearch, Chania, Greece (1974-1976)

Laboratory work on Water Quality Analysis.

TEACHING EXPERIENCE

Adjunct Professor (1997-present)	Earth & Environ Engineering Dept., Columbia University
Adjunct Associate Professor (1993-1996)	
Adjunct Professor of Env. Eng.(1996-present)	
Adjunct Associate Professor (1992-1995)	Civil Eng. Dept., City College, CUNY

STUDENT MENTORING

Yvonne Liao, Half-Hollow Hills High School
Birger Lofgren, Chalmers U., Sweden, M.S. Thesis, 2005
Gustaf Zettergren, Chalmers U., Sweden, M.S. Thesis. 2005
Daniel Churn ,Columbia U, Summer Intership Program, 2004
Summer Intership Program, Chem Eng Practice, MIT, 1990-1991

HONORS/AWARDS

- US DOE Certificate of Appreciation “*for superior technical, management and communications skills exhibited in photovoltaic environmental research and in effective dissemination of research results*”, March 2006
- Fellow of the International Energy Foundation, 2/2004
- Energy Environment and National Security (EENS) Directorate, Scientific Excellence Distinction, 2004
- Energy Environment and National Security (EENS) Directorate, Scientific Excellence Distinction, 2002
- Fellow of the American Institute of Chemical Engineers, 2/2002 “*in recognition and appreciation of superior attainments, valuable contributions, and service to Chemical Engineering*”
- Certificate of Appreciation for EH&S services, DAS, Brookhaven National Laboratory, 11/27/96.
- Commendation from the Assistant Secretary for Conservation and Renewable Energy, DOE “*for exemplary performance on safety analysis*”, 3/6/92.
- Commendation from the Director of NREL for safety analysis, 9/1/92.

- Graduate Research Scholarships (3), Columbia University, 1977, 1978 and 1979.

EDITOR

- Editorial Board of the “Journal of Loss Prevention”, 1998-present
- Editorial Board of the Journal “Progress in Photovoltaics Research and Applications”, 1996-present.
- Editor of the newsletter "Fossil Energy and the Environment", 1991-1993.

COMMITTEE & PANEL ASSIGNMENTS

- BNL Research Library Advisory Committee 2004-
- BNL Equal Employment Opportunity Committee 2004-
- Solar Cells 2004, International Scientific Advisory Committee, May 2004, Badajoz, Spain.
- Petroleum Energy Research Forum (PERF) Modeling Subcommittee, 2001.
- Panel of Experts - Center of Chemical Process Safety of the AIChE, Mitigation Workshop, 1991
- Expert Reviewer of the EPA Report to Congress on HF Mitigation, 1992.
- AIChE, Health & Safety Division, Chair of Membership Committee & Member of Executive Committee, 1992-1996.
- Probabilistic Safety Assessment & Management (PSAM-III) Technical Programme Committee, 1996.
- Advisory Committee for starting an Environmental Engineering Department at the Technical University of Crete, Greece, 1992-1993.
- Coordinating Group on Computational Fluid Dynamics, ASME, Fluid Engineering Div., 1990.
- AIChE, Health & Safety Planning Committee, 1988-1992.

CONFERENCE ORGANIZER & CHAIR

- Organizer & Leader of International Energy Agency Task on PV EH&S, 5-yr task starting in 2007
- MRS Fall Meeting, Symposium “Life Cycle Analysis Tools for "Green" Materials and Processes Selection”, November 2005, Boston.
- International Energy Agency (IEA) Environmental Aspects of PV Power Systems, PV Expert Workshop, Utrecht, Holland, June 25-27, 1997: "Health, Safety and Environmental Aspects of Cell Technologies".
- ESREL '96-PSAM III Conference, European Safety & Reliability Association, International Association for Probabilistic Safety Assessment and Management, "Environmental Impacts."
- AIChE 1994 Summer National Meeting, Denver, CO, August 14-17, 1994: "Chemical Risk Assessment of Fossil Fuel Power Plants and Refineries"
- AIChE 1993 National Meeting, Seattle, WA, Aug. 15-19, 1993: "Mitigation of Hazardous Releases Through Design" and "Mitigation of Hazardous Releases: Modeling and Evaluation".
- AIChE 1992 National Meeting, Minneapolis, MN, Aug. 9-12, 1992: "Prevention and Control of Accidental Releases of Hazardous Gases "
- AIChE 1990 National Meeting, Orlando, March 18-22, 1990: "Safe Procedures for Accident Prevention in Chemical Industries"
- AIChE 1989 National Meeting, Philadelphia, Aug. 20-23, 1989: "Controls of Hazardous Gases I & II"

OTHER: Fellow of the American Institute of Chemical Engineers (AIChE), Fellow of the International Energy Foundation. He has been a member of the American Chemical Society (ACS), American Meteorological Society (AMS), Semiconductor Safety Association (SSA), Association of Environmental Engineering and Science Professors. Listed in “Who is Who in America” (1997-present) and “Who is Who in Science & Engineering” (1992-present).

PERSONAL: U.S. Citizen; married, two children.

VASILIS M. FTHENAKIS - PUBLICATIONS

BOOK

1. Fthenakis, V.M., Prevention and Control of Accidental Releases of Hazardous Gases, Van Nostrand Reinhold, New York, 1993.

PEER REVIEW PUBLICATIONS

2. Happel, J., Suzuki, I., Kokayeff, P., and Fthenakis V. Multiple Isotope Tracing of Methanation Over Ni Catalyst, Journal of Catalysis **65**:57-77 (1980).
3. Happel, J., Fthenakis, V., Suzuki, I., Yoshida, T., and Ozawa, S. Transient Isotope Tracing of Methanation Over Ni Catalyst, VII International Congress on Catalysis, 542-553, Tokyo, Elsevier (1981).
4. Happel, J. et al. and Fthenakis, V. Multiple Isotope Tracing of Methanation, II, Journal of Catalysis **75**:314-328 (1982).
5. Fthenakis, V.M. and Leigh, R.W. An Analysis of Selected Surface Characteristics and Latent Heat Storage for Passive Solar Space Heating, BNL 30441; Alternative Energy Sources **4**(1):367-380, Ann Arbor Science (1982).
6. Fthenakis, V.M. On the Effect of Melting Point in the Performance of Phase Change Thermal Storage, Alternative Energy Sources, **5**(A):263-270, Elsevier (1983).
7. Fthenakis, V.M. and Leigh, R.W. The Value of Improvements in Absorbing and Glazing Surfaces of Solar Devices, Solar Energy, **32**(3):367-376 (1984).
8. Fthenakis, V.M., Moskowitz, P.D., and Lee, J.C. Manufacture of Amorphous Silicon and Gallium Arsenide Thin-Film Solar Cells: An Identification of Potential Health and Safety Hazards, Solar Cells, **13**:43-58 (1984).
9. Wilenitz, I., Fthenakis, V.M., and Moskowitz, P.D. Costs of Controlling Emissions from the Manufacture of Silicon Dendritic Web Photovoltaic Cells, Solar Cells, **15**:247-266 (1985).
10. Moskowitz, P.D., Fthenakis, V.M., Hamilton, Lee, J.C., and Bulawka, A. Gas Health and Safety Hazards and Controls Associated with the Production of Thin-Film Photovoltaic Cells. Eighteenth IEEE Photovoltaic Specialists Conference, 1261-1266, 1985.
11. Fthenakis, V.M. Electrical and Electromagnetic Hazards in Thin-Film Solar Cells Manufacturing, Solar Cells, **19**(1):45-58 (1986).
12. Moskowitz, P.D., Fthenakis, V.M., Hamilton, L.D. and Lee J.C. Public health Issues in Photovoltaic Energy Systems: An Overview of Concerns, Solar Cells, **19**:287-299 (1986-1987).
13. Fthenakis, V.M., and Moskowitz, P.D., Characterization and Controls of Phosphine Hazards in Photovoltaic Cell Manufacture, Solar Cells, **22**:303-317 (1987).
14. Morris S.C., Moskowitz, P.D., Fthenakis, V.M., and Hamilton, L.D., Chemical Emergencies: Evaluation of Guidelines for Risk Identification, Assessment, and Management, Environment International, **13**:305-310 (1987).
15. Fthenakis, V.M., Moskowitz, P.D., and Hamilton, L.D. Personal Safety in Thin-Film Photovoltaic Cell Industries, Solar Cells, **19**:269-281 (1986-1987).
16. Fthenakis, V.M. and Moskowitz, P.D., Photovoltaic Energy Systems, Energy Technologies & the Environment, **19**, 367-381, U.S. Department of Energy, Wash. DC, 1988.
17. Fthenakis, V.M., Moskowitz, P.D., and Sproull, R.D., Control of Accidental Releases of Hydrogen Selenide and Hydrogen Sulfide in the Manufacture of Photovoltaic Cells: A Feasibility Study, Journal of Loss Prevention, **1**:206-212 (1988).

18. Fthenakis, V.M. and Moskowitz, P.D., Health and Safety Aspects of Thin-Film Photovoltaic Cell Manufacturing Technologies, Plant/Operations Progress, 7(4):236-241 (1988)
19. Moskowitz, P.D., V.M. Fthenakis, and P.D. Kalb, Preventing and Controlling Accidental Gas Releases, Photovoltaic Safety, (AIP 166), 161-174, American Institute of Physics, New York (1988).
20. Fthenakis, V.M. and Moskowitz, P.D., Control of Accidental Releases of Hydrogen Selenide in Vented Storage, Photovoltaic Safety, (AIP 166), 79-88, American Institute of Physics, New York (1988).
21. Fthenakis, V.M., The Feasibility of Unconfined Releases of Toxic Gases by Liquid Spraying, Chemical Engineering Communications, 83, 173-189, 1989.
22. Moskowitz, P.D., Fthenakis, V.M. and Lee J.C., Protecting Worker Health and Safety in Photovoltaic Research and Development Laboratories, Solar Cells, 27, 149-158, 1989.
23. Moskowitz, P.D., Fthenakis, V.M., Morris S.C. and Hamilton L.D., Approaches for Identifying, Characterizing and Managing Risks from Accidentally Released Toxic gases, Hazard Assessment and Control Technology in Semiconductor Manufacturing, 22, 271-283, Lewis Publishers, Michigan, 1989.
24. Moskowitz, P.D., Fthenakis, V.M., Youngblood and Mendez S.R., Evaluating Risks Associated with the Use of Silane, , Hazard Assessment and Control Technology in Semiconductor Manufacturing, 10, 97-113, Lewis Publishers, Michigan, 1989.
25. Moskowitz, P. D. and Fthenakis, V. M., Identification, Characterization and Management of Risks from Accidentally Released Toxic Gases, Hazard Assessment of Chemicals, (Saxena, ed.), 83-109, Hemisphere Publishing, (1990).
26. Moskowitz, P.D. and Fthenakis, V.M., Toxic Materials Released from Photovoltaic Modules During Fires: Health Risks, Solar Cells, 29, 63-71, 1990.
27. Fthenakis, V.M. and Moskowitz, P.D., An Assessment of the Hazards of Silane Explosions, Solid State Technology, 33(1), 81-85, 1990.
28. Moskowitz, P.D., V.F. Fthenakis, L.D. Hamilton, P. Kalb, and J. Lee, Risks in New Technologies - Controlling Toxic and Hazardous Gas Releases During Photovoltaic Cell Manufacture, New Risks: Issues & Management (L.A. Cox and P.F. Ricci, ed.), 129-135, Plenum Press, New York, 1990.
29. Morris, S.C., P.D. Moskowitz, and V.F. Fthenakis, Comparison of EPA, ILO, and World Bank Guidelines for Risk Identification, Assessment, and Management of Chemical Emergencies, New Risks: Issues & Management (L.A. Cox and P.F. Ricci, ed.), 23-32, Plenum Press, New York, 1990.
30. Moskowitz, P.D., Zweibel, K., and Fthenakis, V.M., Health, Safety and Environmental Issues Related to the Production, Use and Disposal of Cadmium-Based Photovoltaic Modules, Twenty-first IEEE Photovoltaic Specialists Conference, 1040-1042, 1990.
31. Fthenakis, V.M., K.W. Schatz and V. Zakkay, A Theoretical Study of Absorption of Toxic Gases by Spraying, Journal of Loss Prevention, 3(2), 197-205, 1990.
32. Moskowitz, P.D. and Fthenakis, V.M., Environmental, Health and Safety Issues Associated with the Manufacture and Use of II-VI Photovoltaic Devices, Solar Cells, 30, 89-99, 1991.

33. Fthenakis, V.F. and P.D. Moskowitz, A Checklist of Suggested Safe Practices for the Storage, Distribution, Use and Disposal of Toxic and Hazardous Gases in Photovoltaic Cell Production, Solar Cells, 31, 513-525, 1991.
34. Fthenakis, V.M., K.W. Schatz and V. Zakkay, Modeling of Water Spraying of Field Releases of Hydrogen Fluoride, International Conference and Workshop on Modeling and Mitigating the Consequences of Accidental Releases of Hazardous Materials, 403-429, American Institute of Chemical Engineers, New York, 1991.
35. Fthenakis, V.M. and K.W. Schatz, Numerical Simulations of Turbulent Flow Fields Caused by Spraying of Water on Large Releases of Hydrogen Fluoride, FED-Vol. 131, Fluid Dynamics of Sprays, Book No. H00715, pp. 37-44, 1991.
36. Moskowitz, P.D., Fthenakis, V.M., and A. Hemenway, The Clean Air Act Amendments of 1990: Hazardous Air Pollutant Requirements and the DOE Clean Coal Technology Program, EPRI TR-101890, Managing Hazardous Air Pollutants: State of the Art, 439-453, 1991.
37. Fthenakis, V.M., R.W. Youngblood and P.D. Moskowitz, The Role of Fault Tree Analysis in Assessing Hazards from Hazardous Materials Used in Semiconductor Industries, SSA Journal, 6 (1), pp. 51-56, 1992.
38. Fthenakis, V.M. and D. N. Blewitt, Performance Assessment of Water Spraying Systems for HF Mitigation, Journal of Loss Prevention, 6(4), 209-218, 1993.
39. Fthenakis, V.M., HGSPRAY: A complete model of spraying unconfined gaseous releases, Journal of Loss Prevention, 6(5), 327-331, 1993.
40. Fthenakis, V.M., K.W. Schatz, U.S. Rohatgi and V. Zakkay, Computation of flow fields induced by water spraying of an unconfined gaseous plume, Transactions of the ASME, Journal of Fluid Engineering, 115, 743:750, 1993.
41. Moskowitz P.D., Fthenakis, V.F., Crandal R.S., and Nelson B.P., Analysis of Risks Associated with the Use of Hazardous Production Materials in Research Laboratories, Solid State Technology, 37(7), 121-129, 1994.
42. Schatz K.W. and Fthenakis V.M., Mitigation of Hydrogen Fluoride Aerosols by Dry Powders, Journal of Loss Prevention, 7(6), 451-456, 1994.
43. Fthenakis V.M., Lipfert F. and Moskowitz P.D., An Assessment of Mercury Emissions and Health Risks from Coal Combustion, Proceedings AICHE National Meeting, Denver, August 15, 1994.
44. Fthenakis V.M. and Blewitt D.N., Recent Developments on Modelling Mitigation of Accidental Releases of Hazardous Gases, Journal of Loss Prevention, 8(2), 71-77, 1995.
45. Fthenakis V.M. and Moskowitz P.D., Control of Particulate and Gas in Photovoltaic Module Manufacture, Progress in Photovoltaics: Research and Applications, 2, 317-326, 1994.
46. Fthenakis V.M., Hazardous fluid releases, Journal of Loss Prevention, 7(3), 261-262, 1994.
47. Lipfert F.W, Moskowitz P.D., Fthenakis V.M., DePhillips, Viren J. and Sarrof, L., An assessment of adult risks of paresthesia due to mercury from coal combustion, Water, Air & Soil Pollution, 80: 1139-1148, 1995.
48. Fthenakis V.M. and Moskowitz P.D., Plasma Etching: Safety, Health and Environmental Considerations, Progress in Photovoltaics: Research and Applications, 3, 129-134, 1995.

49. Fthenakis V.M., Lipfert F. and Moskowitz P.D., An assessment of mercury emissions and health risks from a Coal-Fired Power Plant, Journal of Hazardous Materials, 44(2), 267-283, 1995.
50. Fthenakis V.M. and Moskowitz P.D., Thin-Film Photovoltaic Cells: Health and environmental Issues in their Manufacture, Use and Disposal, Progress in Photovoltaics Research and Applications, 3(5),295-306, 1995.
51. Fthenakis V.M. Blewitt D.N. and Hague W.J., Modelling Absorption and Dilution of Unconfined Releases of Hazardous Gases by Water Curtains or Monitors, Proceedings of the International Conference and Workshop on Modeling and Mitigating the Consequences of Accidental Releases of Hazardous Materials, New Orleans, LA, September 26-29, 1995.
52. Fthenakis V.M., Mitigation Options for Accidental Releases of Hazardous Gases, Proceedings of the International Conference and Workshop on Modeling and Mitigating the Consequences of Accidental Releases of Hazardous Materials, New Orleans, LA, September 26-29, 1995.
53. Moskowitz P.D., R. Pardi, Fthenakis V.M., Hotzman S., Sun I.C., and Irla B., An Evaluation of Three Representative Multimedia Models Used to Support Cleanup Decision-Making at Hazardous, Mixed, and Radioactive Waste Sites, Risk Analysis J., 16(2), 1996.
54. Lipfert F.W, Moskowitz P.D., Fthenakis V.M., and Sarrof, L., Probabilistic Assessment of Health risks of Methylmercury from Burning Coal, NeuroToxicology, 17(1):197-212, 1996.
55. Lipfert F., Fthenakis V.M., Moskowitz P.D., and Saroff L., Limiting the Propagation of Error in Probabilistic Risk Assessment Modeling: Methylmercury as an Example, Probabilistic Safety Assessment and Management'96, June 24-28, 1996, ESREL'96/PSAM-III, Vol. 3, pp. 2215-2220, Springer, London, 1996.
56. Fthenakis V.M, Eberspacher C., and Moskowitz P.D., Recycling Strategies to Enhance the Viability of CIS Photovoltaics, Progress in Photovoltaics: Research and Applications; 4, 447-456 (1996).
57. Moskowitz P.D., Bernholc N., Fthenakis V.M., Pardi R.M., Steinberger H. and Thumm W. Environmental, Health and Safety Issues Related to the Production and Use of Cadmium Telluride Photovoltaic Modules, Vol. 10, Advances in Solar Energy: An Annual Review of Research and Development (ed. K.W. Boer), 4, 211-245, American Solar Energy Society, Inc., Boulder, CO, 1995.
58. Lee J.C., Fthenakis V.M., Morris S.C., Goldstein G. and Moskowitz P.D, Projected Photovoltaic Energy Impacts on U.S. CO₂ Emissions: An Integrated Energy-Environmental Economic Analysis, Progress in Photovoltaics: Research and Applications, 5, 277-285, 1997.
59. Fthenakis V.M., Mitigation of Unconfined Releases of Hazardous Gases via Liquid Spraying, Invited Paper, Proceedings American Nuclear Society Meeting on Emergency Preparedness and Response, Vol. II, pp. 677-680, San Francisco, , April 22-25, 1997.
60. Fthenakis V.M., Approaches for Preventing and Mitigating Accidental Gaseous Chemical Releases, Proceedings American Nuclear Society Sixth Meeting on Emergency Preparedness and Response, Vol. II, pp. 673-676, San Francisco, Invited Paper, April 22-25, 1997.
61. Fthenakis V.M. and Moskowitz P.D., Emerging Photovoltaic Technologies: Environmental and Health Issues Update, 14th NREL Photovoltaics Program Review, American Institute of Physics, Conference Proceedings 394, 903-914, 1997.

62. Fthenakis V.M., Mitigation of Ammonia Aerosol Release via Water Spraying, Proceedings AICHE Symposium Ammonia Plant Safety, vol. 38, pp. 155-163, San Francisco, CA, Sept. 22-24, 1997.
63. Eberspacher C. and Fthenakis V.M., Disposal and Recycling of End-of-Life PV Modules, 26th Proceedings IEEE Photovoltaics Specialists Conference, Anaheim, October 1997, pp. 1067-1072, Institute of Electrical and Electronics Engineers, Piscataway, NJ.
64. Fthenakis V.M. and Lee J.C., The Impact of Photovoltaics on CO2 Emissions' Reduction in the US. The World Resource Review, 10(3), 434-445, 1998.
65. Fthenakis V.M., Prevention and Control of Accidental Releases of Hazardous Materials in PV Facilities, Progress in Photovoltaics: Research and Applications, 6, 91-98, 1998.
66. Eberspacher C. and Fthenakis V.M., Disposal and Recycling of End-of-Life PV Modules, 26th IEEE Photovoltaic Specialists Conference, pp. 1067-1072, 1997.
67. Fthenakis V.M., Mitigation of Ammonia Release via Water Spraying, Ammonia Plant Safety, vol. 38, pp. 155-163, American Institute of Chemical Engineers, New York, 1998.
68. Ciccarelli G. Fthenakis V.M. and Boccio J., A Simple Method of Analysis for Gas Explosions, Journal of Loss Prevention, 12, 157-165, 1999.
69. Fthenakis V.M. The Value and Feasibility of Proactive Recycling. NCPV Program Review Meeting, Sept. 8-11, 1998, Denver CO; American Institute of Physics Conference Proceedings 462, pp. 332-337, American Institute of Physics, Woodbury, NY, 1999
70. Fthenakis V.M. and Rohatgi U.S., A model of Liquid Releases from a Submerged Vessel, Journal of Loss Prevention, 12, 437-449, 1999.
71. Fthenakis V.M. and Themelis N., Assessing and Managing Risks in Engineering, EARTHmatters, Columbia Earth Institute, winter 1998-99, 20-21, 1999.
72. Fthenakis V. Morris S.C., Moskowitz P.D. and Morgan D., Toxicity of CdTe, CIS and CGS, Progress in Photovoltaics: Research and Applications, 7, 489-497, 1999.
73. Fthenakis V.M., HGSYSTEM: A Review, Critique, and Comparisons with Other Models, Journal of Loss Prevention, 12, 525-531, 1999.
74. Fthenakis V.M. and Moskowitz P.D., Photovoltaics: Environmental, Safety and Health Issues and Perspectives, Progress in Photovoltaics: Research and Applications 8, 27-38, 2000.
75. Fthenakis V., End-of Life Management and Recycling of PV Modules, Energy Policy Journal, 28, 1051-1058, 2000.
76. Andrijievskij A, Fthenakis V.M., Loukashevich A, and Trifonov A., LOCADIS, A model and numerical code for simulating local aerosol dispersion, Journal of Loss Prevention, 14(1), 61-67, 2001.
77. Fthenakis V.M., Water Spray Systems for Mitigating Accidental Indoor Releases of Water-Soluble Gases, Journal of Loss Prevention, 14(3), 205-211, 2001.
78. Fthenakis V., A Release of Nitrogen Oxides in Bogalusa, Louisiana and Similarities of Causation to the Bhopal MIC Release, Journal of Loss Prevention, 14(4), 245-250, 2001.

79. Fthenakis V., Multilayer Protection Analysis for Photovoltaic Manufacturing Facilities, AICHE Process Safety Progress, 20(2), 1-8, 2001.
80. Morris S.C., Goldstein G.A. and Fthenakis V.M., NEMS and MARKAL-MACRO models for energy-environmental-economic analysis: A comparison of the electricity and carbon reduction projections, Environmental Modeling and Assessment, 7, 207-216, 2002.
81. Fthenakis V.M., Rohatgi U.S. and Chung B.D., A Simple Model for Predicting the release of Liquid-Vapor Mixture from a Large Break in a Pressurized Container, Journal of Loss Prevention, 16, 61-72, 2003
82. Lemley J., Fthenakis V. and Moskowitz P., Security Risk Analysis for Chemical Facilities, AICHE Process Safety Progress, 22(3), 153-162, 2003.
83. Fthenakis V., Ammonia Mitigation Study, Proceedings AICHE 48th Annual Safety in Ammonia Plants and Related Facilities Symposium, Vol. 44, pp. 89-93, Sept. 15, 2003, Orlando, FL.
84. Fthenakis V., Overview of Potential Hazards, Chapter VII in Practical Handbook of Photovoltaics: Fundamentals and Applications, (Editors: T. Markvart and L. Gastaner), Elsevier, 2003.
85. Fthenakis V., Modeling of Accidental Releases of Anhydrous Ammonia and their Atmospheric Dispersion, Proceedings AICHE 49th Annual Symposium Safety in Ammonia Plants, Vol. 45, pp. 284-293, September 20-23, 2004, Denver CO.
86. Fthenakis V., Life Cycle Impact Analysis of Cadmium in CdTe Photovoltaic Production, Renewable and Sustainable Energy Reviews, 8, 303-334, 2004.
87. Fthenakis V. and Bulawka A., Photovoltaics, Environmental Health and Safety Issues, Chapter in Encyclopedia of Energy, Academic Press, 2004.
88. .M. Fthenakis V.M., Alsema E., and M.J. de Wild-Scholten, Life Cycle Assessment of Photovoltaics: Perceptions, Needs, and Challenges, Proceedings 31st IEEE Photovoltaic Specialists Conference, ISBN: 0-7803-8708-2, pp 1655-1658, 2005.
89. Wang W. and Fthenakis V.M. Kinetics Study on Separation of Cadmium from Tellurium in Acidic Solution Media Using Cation Exchange Resin, Journal of Hazardous Materials, B125, 80-88, 2005.
90. Fthenakis V.M., Fuhrmann M., Heiser J. Lanzirotti A., Fitts, J. and Wang W., Emissions and Redistribution of Elements in CdTe PV Modules during Fires, Progress in Photovoltaics: Research and Applications, 13: 713-723, 2005.
91. Mason J., Fthenakis V.M., Hansen T. and Kim C. Energy Pay-Back and Life Cycle CO2 Emissions of the BOS in an Optimized 3.5 MW PV Installation, Progress in Photovoltaics: Research and Applications, 14, 179-190, 2006.
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