

**A.C. (Thanos) Bourtsalas, *Dipl.Eng., M.Sc., Ph.D.***

Lecturer in Sustainable Development and Circular Economy, Earth and Environmental Eng.  
Acting Director, Earth Engineering Center  
Co-Director, Plastics Pollution network, Climate School  
Columbia University

**Contact**

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<https://earth.engineering.columbia.edu/Research-Associates>  
<https://gwcouncil.org/our-team/>

**Education**

**Aug 2018- Dec 2018 Harvard Business School, Credential of Readiness (CORe)**

- A rigorous program consisting of: Business Analytics, Economics, and Financial Accounting

**Oct 2011- Apr 2015 Imperial College London, London, UK: PhD in Civil & Environmental Eng.**

- Advisors: Profs. Chris Cheeseman (Prof. of Materials Resources Engineering), Sue Grimes (Prof. of Waste Management), and Luc Vandeperre (Prof. in Structural Ceramics).
- Thesis: Processing industrial residues into infrastructure materials.

**Sep 2008- May 2010 Columbia University, New York: MS in Earth & Environmental Eng.**

- Advisor: Prof. Vasilis Fthenakis (Director Center for Life Cycle Analysis)
- Thesis: Nanomaterials used in PV Manufacturing

**Oct 2001- Oct 2006 University of Patras Greece: 5-year diploma, Electrical & Computer Eng.**

- Graduated first among 120 students in the class of 2006. Distinction and Dean's Honours List.

**Professional appointments**

**Sep 2019- to date Lecturer in Sustainable Development and Circular Economy, Earth and Environmental Engineering, Columbia University**

- Designing and teaching courses on sustainable development, life cycle and technoeconomic assessment, industrial ecology, carbon capture, and sustainable waste management.

**Oct 2019- to date Acting Director, Earth Engineering Center, Columbia University**

- *Main responsibilities:* (a) Managing a team of research associates on the development and optimization of systems that advance sustainable development; (b) acting as principal liaison with companies and with organizations collaborating with the Center; (c) representing the Center at international conferences, meetings and events.

- *Core technical focus:* Sustainable waste management, Development and Optimization of processes and systems, and Life Cycle and technoeconomic assessment.

**June 2022- to date Co-Director, Plastics Pollution Network, Climate School, Columbia University**

- Establishing a new Center dedicated to plastics pollution, under the auspices of the Climate School of Columbia University
- Core focus on: (a) understanding the regional and global flows of plastics in the different levels of their life cycle, and identifying solutions for reducing waste, (b) developing novel techniques to detect micro and nano plastics from water bodies.

**Oct 2018- Aug 2019 Associate Research Scientist, Earth Engineering Center, Columbia University**

- *Main responsibilities:* (a) Managing a team of research assistants; (b) participating in discussions with companies and with organizations collaborating with the Center; (c) representing the Center at international conferences, and events.
- *Core technical focus:* Sustainable Waste Management, Development and Optimization of processes and systems, Technoeconomic and business model studies.

**Sep 2015- Oct 2018 Post-doctoral Research Scientist, Earth Engineering Center (EEC), Columbia University, New York; Adj. Assistant Professor, Earth & Environmental Engineering, Columbia University**

- *Main responsibilities:* (a) Managing a team of graduate researchers; (b) coordinating activities with sponsors; (c) representing the Center in conferences, and events.
- *Core technical focus:* Sustainable Waste Management, Development and Optimization of processes and systems, Life Cycle Environmental and Cost Analysis.
- *Courses taught as Adjunct Professor:* Thermal Treatment of Waste and Biomass Materials (Grad); Industrial Ecology of Manufacturing Processes (Grad); Undergraduate teaching laboratory (ABET)

**Other professional activities**

**May 2017- July 2022 United Nations Economic and Social Council: PPP Centre of Excellence, Advisor**

- Assisted on the development of sustainable development guidelines for Public and Private Partnerships (PPP) for the Sustainable Development Goals (SDGs) for signatories of the UN Paris Agreement (group: sustainable energy) (May 2017- Sep. 2019).
- Established key performance indicators and developed toolkits to be used by the nations to monitor the progress of deployment in regard to the SDGs (group: economic effectiveness, and fiscal sustainability) (Oct. 2019-Dec. 2020).
- Designed, executed, and analyzed stakeholder survey (over 200 respondents) to understand the role of energy recovery from waste materials in low carbon/circular economy policies (Jan. 2021-July 2022). Keynote speaker UN Ministerial conference.

**May 2020-Jan. 2021 United Nations Environmental Programme (UNEP), Advisor**

- Formulated standards for the use of alternative fuels in the energy sector for the case of Lebanon.
- Assessed the energy mix of Lebanon and identified opportunities for decarbonizing the energy sector.

**April 2019- April 2020 International Finance Corporation (World Bank), Consultant**

- Prepared guidance notes and strategy on actions IFC should take or require the sponsor to take, both during due diligence and during implementation of the financing to reduce the construction, operation, and counterparty risks in infrastructure investments.
- Forecasted the additional cost to selected cities of adopting the EU Directives on resource and energy efficiency; identified a breakdown of cost for each major activity in the value chain.
- Evaluated over 10 companies and developed investment thesis, by considering results-based financing schemes.

**Sep 2014- Dec 2017 Ministry of Environment, Singapore, Member of the Technical Advisory Panel** (team of five worldwide experts)

- Collaborated on the development of a legislative framework for the sustainable utilization of urban and industrial residues.
- Analyzed technical and financial viability of several technologies presented to Ministry.
- Evaluated financial impact of the Ministry in acting as market maker for results-based payments.

**Sep 2014- Sep 2015 Co-founder, Cyclefi**

- Development of a software application that is used for tracking recyclable materials in the waste stream and for providing incentives and rewards for increasing recycling rates in municipalities.

**Dec 2011- Aug 2015 Waste to Energy Research and Technology Council-UK: Coordinator**

- Coordinated activities of the WTERT-UK, incl. the organisation of a seminar in collaboration with the WTERT-India held in the National Environmental Engineering Research Institute (NEERI) on Waste Management and Resource Efficiency in Nagpur, India.

**May 2010-Sep 2011 Research Associate WTERT-Greece and WTERT-UK:**

- Analysis of regional data and identification of systems that ‘decouple’ sustainable waste management from growth and other sustainability economic factors.
- Conducted studies for the cases of the US, the UK, Greece and a global study covering the 80% of the global population

**Academic awards and honours**

**2022** Nominated for the 2022 Presidential Awards for Outstanding Teaching

**2022** Nominated for the Bodossakis Foundation Distinguished Young Scientists Award (field: Renewable Energy)

- 2015** PhD early submission award, Imperial College London, UK
- 2014** CIWM Resource Efficiency Prize for best paper and oral presentation
- 2011- 2014** Dixon Presidential Scholarship, Imperial College London, UK
- 2008- 2010** Full graduate scholarship: Brookhaven National Laboratory, USA
- 2001-2006** Faculty of Engineering Dean's Honour List Every Single Academic Term

**Peer-reviewed publications** (Google scholar: Link [here](#); \*: corresponding author)

1. [A.C.\(Thanos\) Bourtsalas\\*](#), Waste Disposal& Sustainable Energy, Energy and materials recovery from solid wastes in China and a Green-BRI mechanism for advancing sustainable waste management of the global South, January 2023.
2. Yixi Tian, Nickolas J. Themelis, [A.C.\(Thanos\) Bourtsalas\\*](#), Shiho Kawashima, Yuri Gorokhovich, Systematic study of the formation and chemical/mineral composition of waste-to-energy (WTE) fly ash, Materials Chemistry and Physics, 2022, 126849,ISSN 0254-0584.
3. Wenchao Ma, Jicui Cui, Boré Abdoulaye, Yuan Wang, Huibin Du, [Athanasios C. Bourtsalas\\*](#), and Guanyi Chen, Air Pollutant Emission Inventory of Waste-to-Energy Plants in China and Prediction by the Artificial Neural Network Approach. Environ. Sci. Technol. 2022.
4. [AC Bourtsalas\\*](#), T Shen, Y Tian, A Comprehensive Assessment of Products Management and Energy Recovery from Waste Products in the United States, Energies 15 (18), 65-81, 2022
5. [Bourtsalas, AC Thanos\\*](#); Themelis, Nickolas J, Materials and energy recovery at six European MBT plants, Waste Management 141, 79-91, 2022
6. Tian, Yixi; [Bourtsalas, AC Thanos\\*](#); Kawashima, Shiho; Teng, Xiaoxuan; Themelis, Nickolas J; Performance of Waste-to-Energy fine combined ash/filter cake ash-metakaolin based artificial aggregate, Construction and Building Materials, 327, 127011, 2022
7. Tian, Yixi; Themelis, Nickolas J; Zhao, Diandian; [Bourtsalas, AC Thanos\\*](#); Kawashima, Shiho; Stabilization of Waste-to-Energy (WTE) fly ash for disposal in landfills or use as cement substitute, Waste Management, 150, 227-243, 2022
8. Sun, Kai; Wang, Wanli; Themelis, Nickolas J; [Bourtsalas, AC Thanos](#); Huang, Qunxing; Catalytic co-pyrolysis of polycarbonate and polyethylene/polypropylene mixtures: Promotion of oil deoxygenation and aromatic hydrocarbon formation, Fuel, 285, 119143, 2021
9. Zhang, Henry; Themelis, Nikolos J; [Bourtsalas, Athanasios](#); Environmental impact assessment of emissions from non-recycled plastic-to-energy processes, Waste Disposal & Sustainable Energy 3, 1, 2021
10. Ma, Wenchao; Ma, Chen; Liu, Xu; Gu, Tianbao; Thengane, Sonal K; [Bourtsalas, Athanasios](#); Chen, Guanyi; Nox formation in fixed-bed biomass combustion: Chemistry and modelling, Fuel 290, 119694, 2021

11. Themelis, Nickolas J; Bourtsalas, AC Thanos\*; Methane Generation and Capture of US Landfills, *Journal of Environmental Science and Engineering A*, 199-206, 2021
12. Bourtsalas, AC\*; Huang, Qunxing; Zhang, Hanwei; Themelis, Nickolas J; Energy recovery in China from solid wastes by the moving grate and circulating fluidized bed technologies, *Waste Disposal & Sustainable Energy* 2, 1, 27-36, 2020
13. Zhu, Liangliang; Zhao, Wei; Yan, Yuan; Liao, Xiangbiao; Bourtsalas, Athanasios; Dan, Yong; Xiao, Hang; Chen, Xi; Interaction between mechanosensitive channels embedded in lipid membrane. *Journal of the Mechanical Behavior of Biomedical Materials* 103, 103543, 2020
14. Sun, Kai; Themelis, Nickolas J; Bourtsalas, AC Thanos; Huang, Qunxing; Selective production of aromatics from waste plastic pyrolysis by using sewage sludge derived char catalyst, *Journal of Cleaner Production*, 268 , 122038, 2020
15. Tian, Yixi; Bourtsalas, AC Thanos\*; Kawashima, Shiho; Ma, Siwei; Themelis, Nickolas J; Performance of structural concrete using Waste-to-Energy (WTE) combined ash. *Waste Management*, 118, 180-189, 2020
16. Lu, Peng; Huang, Qunxing; Bourtsalas, Athanasios C; Chi, Yong; Yan, Jianhua; Effect of operating conditions on the coke formation and nickel catalyst performance during cracking of tar Waste and biomass valorization, 10, 1, 155-165, 2019
17. Lu, Peng; Huang, Qunxing; Bourtsalas, AC Thanos; Themelis, Nickolas J; Chi, Yong; Yan, Jianhua; Review on fate of chlorine during thermal processing of solid wastes, *Journal of Environmental Sciences*, 78, 13-28, 2019
18. Bourtsalas, AC Thanos\*; Themelis, Nickolas J; Major sources of mercury emissions to the atmosphere: The US case, *Waste Management*, 85, 90-94, 2019
19. Bourtsalas, AC Thanos\*; Seo, Yoonjung; Alam, Md Tanvir; Seo, Yong-Chil; The status of waste management and waste to energy for district heating in South Korea, *Waste Management*, 85, 304-316, 2019
20. Wang, Wanli; Themelis, Nickolas J; Sun, Kai; Bourtsalas, Athanasios C; Huang, Qunxing; Zhang, Yunhe; Wu, Zhaohui; Current influence of China's ban on plastic waste imports, *Waste Disposal & Sustainable Energy*, 1, 1, 67-78, 2019
21. Vehlow, Juergen; Bourtsalas, AC\*; WTE: Management of WTE Residues in Europe Recovery of Materials and Energy from Urban Wastes, 159-181, 2019
22. Bourtsalas, AC\*; WTE: Non-recycled Combustible Wastes in Cement Production, Recovery of Materials and Energy from Urban Wastes, 141-157, 2019
23. Kyriakis, Efstathios; Psomopoulos, Constantinos; Kokkotis, Panagiotis; Bourtsalas, Athanasios; Themelis, Nikolaos; A step by step selection method for the location and the size of a waste-to-energy facility targeting the maximum output energy and minimization of gate fee, *Environmental Science and Pollution Research*, 25, 27, 26715-26724, 2018
24. Bourtsalas, AC Thanos\*; Zhang, Jiao; Castaldi, MJ; Themelis, NJ; Karaiskakis, Alexandros N; Use of non-recycled plastics and paper as alternative fuel in cement production, *Journal of cleaner production*, 181, 2018
25. Lu, Peng; Huang, Qunxing; Bourtsalas, AC Thanos; Chi, Yong; Yan, Jianhua; Synergistic effects on char and oil produced by the co-pyrolysis of pine wood, polyethylene and polyvinyl chloride, *Fuel* 230, 359-367, 2018

26. Lu, Peng; Huang, Qunxing; Bourtsalas, AC Thanos; Chi, Yong; Yan, Jianhua; Experimental research of basic properties and reactivity of waste derived chars, Applied Thermal Engineering, 119, 639-649, 2017
27. Hu, Binhang; Huang, Qunxing; Bourtsalas, AC Thanos; Ali, Mujahid; Chi, Yong; Yan, Jianhua; Effect of chlorine on the structure and reactivity of char derived from solid waste, Energy & Fuels, 31, 7, 7606-7616, 2017
28. Koralewska, Ralf; Cheeseman, Christopher R; Bourtsalas, Athanasios\*; Keramische Werkstoffe aus trocken ausgetragener Feinfraktion der Rostschlacke, Waste Management, 6, 445-456, 2016
29. Bourtsalas, A Thanos\*; Detsch, Rainer; Boccaccini, Aldo R; Cheeseman, Christopher; Initial studies on the cytotoxicity of ceramics prepared from dry discharge incinerator bottom ash dust, Ceramics International, 42, 15, 17924-17927, 2016
30. Vardelle, Armelle; Moreau, Christian; Akedo, Jun; Ashrafizadeh, Hossein; Berndt, Christopher C; Berghaus, Jörg Oberste; Boulos, Maher; Brogan, Jeffrey; Bourtsalas, Athanasios C; Dolatabadi, Ali; The 2016 thermal spray roadmap, Journal of thermal spray technology, 25, 8, 1376-1440, 2016
31. Bourtsalas, Athanasios\*; Vandeperre, LJ; Grimes, SM; Themelis, Nickolas; Cheeseman, Christopher R; Production of pyroxene ceramics from the fine fraction of incinerator bottom ash, Waste management, 45, 217-225, 2015
32. Bourtsalas, Athanasios\*; Vandeperre, Luc; Grimes, Sue; Themelis, Nicolas; Koralewska, Ralf; Cheeseman, Chris; Properties of ceramics prepared using dry discharged waste to energy bottom ash dust, Waste Management & Research, 33, 9, 794-804, 2015
33. Kalogirou, Efstratios; Bourtsalas, Athanasios; Klados, Manolis; Themelis, Nickolas J; Waste management in Greece and potential for waste-to-energy, Waste to Energy, 219-235, 2012

### **Peer-Reviewed Journal Papers submitted or to be submitted**

1. A. Bourtsalas\*, I. Yepes, Y. Tian, Journal of Environmental Management, Effect of China's import ban on plastic waste trade of the U.S. fifty states (submitted Nov. 2022)
2. Y. Tian, A. Bourtsalas\*, S. Kawashima, N. Themelis, Journal of Materials in Civil Engineering, Using Waste-to-Energy fine combined ash as sand or cement substitute in cement mortar production (submitted October 2022)
3. Warda Ashraf, Adhora Tahsin, Salman Siddique, Melanie Sattler, Thanos Bourtsalas. Journal of Cleaner Production. Durability and Environmental Impact Assessment of Seawater-Activated Portlandite-Calcined Clay Binder (submitted September 2022)

### **Editorials**

1. N.J. Themelis, A.C. (Thanos) Bourtsalas\*, Recovery of Materials and Energy from Urban Wastes, A Volume in the Encyclopedia of Sustainability Science and Technology, Second Edition, Springer, 2019. [Link](#)

### **Policy reports**

1. A.C. Bourtsalas, J. Yu, T. Bonnici, C. Malafosse. Guidelines on Public and Private Partnerships for the Sustainable Development Goals in Waste-to-Energy projects for Non-Recyclable Waste: Pathways towards a Circular Economy. United Nations, Committee on Innovation, Competitiveness, and Public and Private Partnerships, August 2022
2. Ranjith Annepu, Athanasios Bourtsalas, Rotchana Intharathirat, Sasima Charoenkit. Chapter 15: Urban Waste. Assessment Report on Climate Change and Cities. Prepared for the UN Climate Change Conference (Paris Agreement), on behalf of Earth Institute, Columbia University, New York, USA, May 2015

### **Book chapters**

1. A.C. (Thanos) Bourtsalas, K. Aravossis (2018), ‘Worldwide Waste to Energy business models: technical, environmental and financial considerations’, Developments in biotechnology and bioengineering: waste treatment processes for energy generation’, Eds: A. Padney, R. Kumar, S. Kumar, Springer 2018
2. E. Kalogirou, A. Bourtsalas, M. Klados, N.J. Themelis (2012), ‘Waste management in Greece and potential for Waste-to-Energy’, Waste-to-Energy: Opportunities and Challenges for Developing and Transition Economies, Springer, p.219-235.

### **Articles in newspapers**

1. Kathimerini, three articles on sustainable waste management and the benefits for the Greek society. January 2017 to September 2017

### **Invited speaker**

#### **Conferences:**

1. A.C.(Thanos) Bourtsalas, virtual, ‘Evaluation of recycling systems in the EU’, Conference on resource recovery, Columbia Global Center, Beijing, July 2022
2. A.C.(Thanos) Bourtsalas, ‘Sustainable economy and waste management: state-of-the-art, and future prospects’, United Nations Conference on Circular Economy, Barcelona, May 2022
3. A.C. (Thanos) Bourtsalas, virtual, ‘The role of waste to energy in low carbon policies’, United Nations Economic Cooperation for Europe, conference on low carbon policies, December 2021
4. A.C. (Thanos) Bourtsalas, virtual, ‘Mitigation of carbon emissions from waste management in the global south’, Global Conference on decarbonizing the economies of the global south. N. Delhi, October 2021
5. A.C.(Thanos)Bourtsalas, virtual, ‘Optimizing the recovery of energy and materials in circular economy systems’, Global Waste Management Conference, Paris, September 2021
6. A.C. (Thanos) Bourtsalas, virtual, ‘Development of integrated sustainable waste management systems towards circular economy’, Waste-to-Energy World Summit, October 2020
7. A.C. (Thanos) Bourtsalas, ‘Beneficial uses of industrial and urban residues for a circular economy society’, Global Waste Management Summit, Zhejiang, China, November 2019

8. A.C. (Thanos) Bourtsalas, Hong Kong, UN ECE conference for the development of Public and Private Partnerships (PPP) in waste management, November 2019
9. A.C. (Thanos) Bourtsalas, ‘Closing the loop: recovery of materials from waste products’, Global Waste Management Conference, Heraklion, Greece, June 2019
10. A.C. (Thanos) Bourtsalas, ‘The role of Energy recovery in a circular economy society’, Renewable Energy Conference, Mumbai, India, January 2019
11. A.C. (Thanos) Bourtsalas, ‘Achieving maximum recovery of resources from residues of our humanity’, Circular Economy Conference, N. Delhi, August 2018
12. A.C. (Thanos) Bourtsalas, ‘Renewable district heating from urban residues for cities of Colombia’, Global Renewable Energy conference, Medellin, June 2018
13. A.C. (Thanos) Bourtsalas, ‘Beneficial reuse of industrial residues for civil engineering applications’, NAWTEC, April 2018
14. A.C. (Thanos) Bourtsalas, ‘Transformation of open dumps into eco-industrial parks: The case of N. Delhi’, Global Waste Management Conference, Jakarta, January 2018
15. A.C. (Thanos) Bourtsalas, ‘EEC-CU research activities’, ISWA World Congress, Baltimore, USA, September 2017
16. A.C. (Thanos) Bourtsalas, L. Ao, ‘Carbon mitigation costs of waste management systems: The case of US’, Waste Management International Conference, Athens, Greece, June 2017
17. A.C. (Thanos) Bourtsalas, ‘The role of WtE in a circular economy society’, UN Ministerial conference, Astana, Kazakhstan, June 2017
18. A.C. (Thanos) Bourtsalas, D. Yan, ‘Thermal spray coatings to combat corrosion in the superheaters section of WTE plants’, NAWTEC, April 2017
19. A.C. (Thanos) Bourtsalas, N.J. Themelis, ‘Global WTERT activity summary’, Energy Recovery Council meeting, New Hampshire, December 2016
20. A.C. (Thanos) Bourtsalas, K. Aravossis, N.J. Themelis, ‘The role of informal recycling in advancing recycling in S. Eastern Europe: the case of Greece’, ISWA World Congress, Serbia, September 2016
21. E. Kalogirou, A.C. (Thanos) Bourtsalas, ‘Status of WTE worldwide and the potential for developing nations’, ISWA World Congress, Novisad, Serbia, September 2016
22. A.C. (Thanos) Bourtsalas, ‘Waste management of nations: A global socio-economic analysis’, NAWTEC, West Palm Beach, May 2016
23. A. Bourtsalas, L. Vandeperre, S. Grimes, N. Themelis, R. Koralewska, C. Cheeseman, ‘Production of pyroxene ceramics from the fine fraction of incinerator bottom ash’, ISWA World Congress, Antwerp, Belgium, September 2015
24. A. Bourtsalas, L. Vandeperre, S. Grimes, N. Themelis, R. Koralewska, C. Cheeseman, ‘Beneficial reuse of the fine fraction of incinerator bottom ash from a dry discharge system in the manufacture of pyroxene ceramics’, WASCON conference, Santander, Spain, June 2015
25. A. Bourtsalas, C. Cheeseman, University College London, Department of Civil and Environmental Engineering: ‘Production of pyroxene ceramics from the fine fraction of waste to energy bottom ashes’, June 2014



26. A. Bourtsalas, N.J. Themelis (2012), ‘Analysis of Data on Generation and Disposition of MSW in the United Kingdom and the Role of Waste to Energy’, 2nd BIT conference, Xi’an, China
27. A. Bourtsalas, N.J. Themelis, E. Kalogirou (2012), ‘Waste Management in Greece and China and Potential for Waste to Energy’, ISWA World conference, Daegu, S. Korea
28. V. Fthenakis, H. Kim, S. Gualtero, A. Bourtsalas (2009), ‘Nanomaterials in PV Manufacture: Some Life Cycle Environmental and Health Considerations’, IEEE PV Specialist Conference, Philadelphia, USA.

**Seminars:**

1. A.C. (Thanos) Bourtsalas, virtual, ‘The role of energy recovery from wastes in low carbon/circular economy policies’, Yale School of the Environment, October 2021
2. A.C. (Thanos) Bourtsalas, virtual, ‘Transformation of open dumps into sustainable infrastructure’, IIT Delhi, India, Department of Civil Engineering, June 2020
3. A.C.(Thanos) Bourtsalas, Airlangga University, Indonesia, Department of Chemical Engineering: ‘Improving the infrastructure of Indonesia by utilizing Public and Private Partnerships, along with results based (blended) financing’, July 2018
4. A.C.(Thanos) Bourtsalas, Columbia Global Center Santiago, Chile: ‘Transforming waste into resources for civil and mechanical engineering applications’, August 2017
5. A.C.(Thanos) Bourtsalas, University of Concepcion, Chile, departmental seminar: ‘Developing integrated waste management systems: The case of Concepcion’, August 2017
6. A.C. (Thanos) Bourtsalas, ‘Developing waste to energy in India’, NEERI, Nagpur, India, April 2017
7. A.C. (Thanos) Bourtsalas, Columbia Global Center Mumbai, India: ‘Alleviating the problem of open dumping through waste to energy: The case of Mumbai’, April 2017
8. A.C. (Thanos) Bourtsalas, IIT Delhi, India, roundtable on waste management, where all the major stakeholders of waste management in India participated: ‘The importance of waste to energy to ‘move away’ from open dumps: The case of Delhi’, April 2017
9. A.C. (Thanos) Bourtsalas, MS-Ramaiah University, Bangalore, India, departmental seminar: ‘Recovering energy and resources from waste materials’, April 2017
10. A.C. (Thanos) Bourtsalas, Michigan Technological University (MTU), departmental seminar: ‘The role of Waste to Energy in closing the loop of sustainable waste management’, February 2017
11. A.C. (Thanos) Bourtsalas, Nanyang University of Technology (NTU), Singapore, departmental seminar: ‘Beneficial uses of WTE residues’, March 2016
12. A. Bourtsalas, National Technical University of Athens, Greece, Department of Chemical Engineering, ‘Beneficial uses of waste-to-energy residues’, May 2013
13. A. Bourtsalas, Tsinghua University, Environmental Engineering Department, departmental seminar: ‘Advances in the processes for the use of WTE residues in civil engineering applications, March 2013.

**Guest lecturer:**

1. North-western University, Xi'an, China. 3 weeks of classes to senior undergraduate students of the Chemical Engineering Department. Classes related to life cycle environmental and technoeconomic assessment, and flow analysis. June 2019
2. Universidad del Desarrollo, Santiago, Chile. 2 weeks of classes to graduate students of the Environmental Engineering Department. Classes related to sustainable development goals, and systems analysis. August 2017

### **Membership in Professional Societies**

- Registered (Licensed/Chartered) Professional Electrical Engineer in Europe (116007)
- Member of the International Society for Industrial Ecology
- Member of the Working Group on Energy Recovery-International Solid Waste Association (ISWA: 11-1589)
- Vice Chair of the Materials and Energy Division of the American Society for Mechanical Engineers (ASME-MER: 100779364)
- Member of the Chartered Institution of Waste Management, UK (CIWM)

### **Committees and Service**

#### **Conference committees:**

Organizer for Global WTERT bi-annual meeting, 2019

Co-Organizer for International Conference on Sustainable Waste Management, 2019-2022

Co-Organizer for International Solid Waste Association, World Congress, 2016-2019

Session Chair for Recycling and Circular Economy, International Solid Waste Association, World Congress, 2018

#### **Review Panels:**

2021 Virtual panel for REMADE, DoE.

2021 Virtual panel for NSF SBIR.

2021 Virtual review panel for NSF CBET Environmental Engineering.

2020 Virtual review panel for NSF SBIR.

#### **Journal editorial boards:**

Sustainability (impact factor: 2.8)

#### **Journals reviewer:**

Fuel Processing Technology, Energy and Fuels, Waste Management, Journal of Cleaner Production, Journal of Environmental Management, Journal of Industrial Ecology, Waste Management & Research, International Journal of Process Systems Engineering

#### **Internal Service:**

**Dept. of Earth and Environmental Engineering**

Chair ABET Committee	2019–Present
Graduate Awards and Nomination Reviewer	2019- Present

**Graduate Program**

Chair Graduate admissions committee	2019-Present
Graduate Advising Committee	2019-Present

**Undergraduate Program**

Undergraduate Advising Committee	2021–2022
Undergraduate Program/Curriculum	2020-2022

**Teaching at Columbia University**

1. E4302 Carbon Capture, 3 credits. Fall 2020: 32 students; Fall 2021: 26 students
2. E4210 Thermal Treatment of Waste and Biomass Materials, 3 credits. Fall 2016: 14 students; Fall 2017: 17 students; Fall 2018: 15 students
3. E4200 Global Engineering Track, 3 credits. Fall 2021: 56 students; Fall 2022: 68 students
4. E4160 Solid and Hazardous Waste Management, 3 credits. Spring 2020: 36 students; Spring 2021: 68 students; Spring 2022: 82 students
5. E2100/4100 A Better Planet by Design, 3 credits. Fall 2019: 57 students; Fall 2020: 72 students; Fall 2021: 81 students; Fall 2022: 122 students
6. E4001 Industrial Ecology, 3 credits. Spring 2017: 42 students; Spring 2018: 38 students; Spring 2019: 49 students; Spring 2020: 54 students; Spring 2021: 48 students; Spring 2022: 57 students
7. E3800 Earth and environmental engineering laboratory (Developed a 200-page laboratory manual), 6 credits. Spring-Fall 2019: 14 students; Spring-Fall 2020: 18 students; Spring-Fall 2021: 12 students; Spring-Fall 2022: 19 students
8. E1102 Art of Engineering, 1 credit. Fall 2020: 18 students; Fall 2021: 22 students; Fall 2022: 25 students

**Supervision of graduate students****Current graduate students:**

1. S. Parsley. Project: Extraction of aluminum and improvement of the mineral fraction of WTE residues (co advised with Prof. C. Cheeseman, Imperial College London). PhD: 09/20-present
2. Mohammed Sharief Alnahas. Project: Technoeconomic and life cycle assessment of hydrogen used as fuel for transport. MS: 01/22-present
3. Y. Fam. Project: Technical survey of various ash-derived products used in Europe and Asia. MS: 09/21-present

4. I. Lia. Project: Identifying the learning curves of waste management technologies. MS: 09/21-present
5. B. Kumar. Project: Development of indicators for assessing plastic pollution at the corporate level. MS: 01/22- present

**Previously supervised graduate students:**

1. Jiasheng Ding. Production of ultra-lightweight proppants for hydraulic fracturing (partially co-advised by Prof. N. Yip). PhD: 08/2020-12/2022.
2. Yixi Tian. Beneficial uses of WTE residues for civil engineering applications: processing, leaching and economic evaluations (partially co-advised by Prof. Kawashima- Columbia University). MS: 09/16-12/17; PhD: 01/18-12/21.
3. K. Zhang. Project: Pre-Feasibility Study of a Waste-to-Energy Plant in Santiago, Chile. MS: 09/19-09/20
4. J. Madero. Project: Electronic waste treatment in Mexico: viability and obstacles. MS: 01/18—5/19
5. F. Cabanas. Project: Integrated sustainable waste management and inclusion of the informal sector in Santiago de Chile (co-advised with Prof. Godoy. University of Santiago). MS: 09/17-12/18
6. P. Santos. Project: Legal aspects of introducing waste-to-energy (WTE) technology in Sao Paulo State of Brazil: The case studies of URE Barueri and city of Sao Paulo (co-advised with Prof. Themelis, Earth and Env. Eng.). MS: 09/17-06/18
7. H. Spathi. Project: Life Cycle Assessment of SNCR and SCR technologies for WTE facilities. 01/17-12/17
8. J. Smith. Project: Life Cycle Cost Analysis of corn-based ethanol fuels in U.S. MS: 03/17- 09/17
9. Z. Guo. Project: Pre-feasibility study of a waste-to-energy (WTE) plant for Baotou, China. MS: 09/16-01/18
10. J. Wu. Project: Analysis of capital costs of waste-to-energy (WTE) plants built in recent years in China and in the U.S. MS: 09/16-12/17
11. Y. Xu. Project: Carbon mitigation cost of WTE and LCA comparison with other waste management methods. MS: 09/16-12/17
12. Y. Dian. Project: Application of thermal spray techniques for combatting high temperature corrosion in waste-to-energy boilers (co-advised with Prof. Themelis, Earth and Env. Eng., Columbia and Prof. A. Vardelle, University of Limoges). MS: 09/16-05/17
13. R. Shen. Project: Marketing survey of beneficial use of waste-to-energy bottom ash for civil engineering applications. MS: 06/16-12/16
14. H. Dwyer. Project: An inventory analysis of WTE mercury emission in U.S. (co-advised with Prof. Themelis, Earth and Env. Eng.). MS: 01/16-12/16
15. Y. Zhang. Project: Evolution of public health benefits from improvements in waste management: The NYC case study. MS: 01/16-09/16

16. G. Peters. Project: Energy and environmental benefits from the use of MRF residue in the production of cement (co-advised with Prof. Themelis, Earth and Env. Eng.). MS: 12/15-12/16

#### **Previously supervised visiting students:**

17. L. Peng, visiting PhD student, Zhejiang University. Project: Solid waste gasification and tar catalytic cracking (co-advised with Prof. Q. Huang of Zhejiang University, China). 09/18-09/19.
18. K. Sun, visiting PhD student, Zhejiang University. Project: Laboratory production of metals and minerals from industrial residues. 09/17-09/18.

### **Supervision of undergraduate students**

#### **Current undergraduate students:**

1. S. Chen. Project: Characterization of industrial residues. 05/22-present
2. I. Burgoyne. Project: Processing of industrial residues for novel materials. 05/22-present
3. J. Huang. Project: Life Cycle Analysis of processes for resource recovery from Waste-to-Energy bottom ash: A comparative analysis between US and EU. 01/22-present

#### **Previously supervised undergraduate students:**

1. L. Futrell. Project. Assessment of waste management of NYC. 09/19-06/21
2. E. Grunblatt. Project: Evaluation of recycling systems in NYC. 09/18-06/20
3. I. Yepes. Project: Effect of China ban on plastic recycling in the fifty US. 09/20-12/21
4. M. Rodriguez. Project: Novel techniques for metals production. 06/20-06/22
5. A. Cawley. Project: Techno economic assessment of district heating system for Alexandria, VA. 06/21-05/22
6. M. Emerson. Project: Assessment of global methane production from waste management. 01/22-05/22

### **Skills and Abilities**

**Software** Environmental (Simapro, LeachXS), Programming (Matlab, C++, Java, Python), Mapping (Arc-GIS), Design of experiments (JMP, Stat-ease), Database and Statistics (SPSS, Excel, Originlab, MySQL, R), Flow Analysis (Software for Substance Flow Analysis: STAN, Ansys)

**Languages** Greek (native), English (fluent), German (fluent)

### **Public Engagement**

1. College of Engineering “Modernization of Undergraduate Education Program”, Ramaiah University (September 2019)
2. Faculty Advisor, Engineers without borders (2020-current)
3. SHAPE program for high school students, Summer 2022