
Brett Cohen

BSc (Chem Eng), PhD UCT

email: brett@warnkenise.com.au

Languages: Fluent in English, competent in spoken and written Afrikaans, conversational French, Spanish and German

PROFESSIONAL EXPERIENCE

Nov 2002 - present

Research and Development manager, Warnken ISE Consulting, Sydney.

Warnken ISE is an environmental consultancy providing services focusing on resource recovery, and the broad area of sustainability. Roles include supervision of staff, planning of research programs, report writing and QA, preparation of marketing material, technical consulting and design of stakeholder workshops. Clients include industry, government and the not-for-profit sector.

May 2006 – present

Honorary Academic Associate, Department of Chemical Engineering, University Sydney, Sydney.

July 2002 to April 2006

Research Fellow, Department of Chemical Engineering, University of Sydney, Sydney.

Key Research Projects (Current and Completed):

- Integrated network analysis for decision making towards strategic planning and business development in the context of long-term sustainability of the energy sector (funded by Eskom).
- Facilitation of complex decision making workshops for the energy sector.
- Development of decision making frameworks towards more sustainable futures in the resources sector. Specific projects conducted on copper, nickel and aluminium.
- Development of a computer software tool to support complex decision making on the basis of environmental, social and economic considerations, (with consideration being given to managing stakeholder communication, system modeling, comparison of incommensurate information and uncertainty analysis).
- Kinetic and equilibrium modeling of the various stages in the purification of concentrate from a novel zinc recovery process towards improved resource and energy management.

Lecturing/tutoring duties:

- **Postgraduate Lecturer:** CHNG 5503 - Environmental Decision Making
- **Undergraduate Lecturer:** CHNG 3501 – Waste Management and Treatment Technologies, CHNG 4504 – Environmental Decision Making, CHNG 3401 – Project Economics, CHNG 3806- Management of Industrial Systems, CHNG 2805 – Industrial Systems and Sustainability, CHNG 1302 - Computing for Chemical Engineers 1B
- **Assistant lecturer:** CHNG 2501 – Environmental Chemical Engineering Fundamentals

April 2000 to April 2001

Environmental Consultant/Chemical Engineer, Water and Environmental Group, SRK Consulting, Cape Town, South Africa.

Consulting work including engineering input to proposals for planned industrial developments, environmental studies on existing industrial operations, auditing towards cleaner production, land

contamination assessment/remediation, and water and wastewater treatment. Worked for the mining, minerals processing, chemical production and distilleries industrial sectors and the public sector. Responsibilities included project management, budget planning and management, supervision of project teams, client communications, business development and report writing.

April 1999 to March 2000

Trainer, *Herbert Smith, Cameron McKenna and Lovells Law Firms, London, UK.*

Full-time IT training and support in multinational legal firms.

December 1997 to June 1998

Environmental Engineering Consultant, *Abbott Grobicki (Pty) Ltd, Environmental Engineering and Policy Consultants, Cape Town, South Africa.*

(1) Member of the team which developed an Environmental Management System for ISO 14000 compliance of an industrial estate. (2) Government-funded research into the impact of use of reclaimed water on total water demand regionally and nationally in South Africa. (3) Market survey on innovative water and wastewater treatment technologies in South Africa.

February 1993 to December 1997

PhD Student, *Department of Chemical Engineering, University of Cape Town, South Africa*

Full time research and ad-hoc laboratory work for sponsors of PhD. Results of this work were utilized for the design of waste treatment plants at the CJV Stainless Steel production plant.

EDUCATION AND TRAINING

PhD: Chemical Engineering, University of Cape Town, South Africa, 1993 to 1997

Research into the use of cement-based Solidification/Stabilization for the immobilization of heavy metals in solid hazardous wastes from the ferrochromium industry. Thesis assessed by examiners at Imperial College, London; University of Surrey, Guildford, UK and Mintek, Johannesburg, South Africa.

BSc: Chemical Engineering, University of Cape Town, South Africa, 1989 to 1992

Matric, Riverside High School, Vereeniging, South Africa, 1988

OTHER ACHIEVEMENTS

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| 2003 | Facilitated the workshops which won an Eskom internal award for best research transfer into company operation. The workshops were to identify an optimal energy generation alternative between 2 options, taking on board including multi-stakeholder viewpoints and multiple criteria. |
| 2000 | Umgeni Water annual award for best research paper published in "Water South Africa" on reclaimed water usage in South Africa. |
| 1993-1997 | University of Cape Town Research Grant
Foundation for Research and Development Scholarship |
| 1989-1992 | Anglo American Corporation Group Scholarship |

ANNEXURE A - LIST OF PUBLICATIONS

BOOK CHAPTERS

R. Kempener, B. Cohen, L. Basson, and J. Petrie, 'A Framework for Analysis of Industrial Networks', in Dynamics of Industrial Ecosystems, M. Ruth and B. Davidsdottir (eds), for publication late 2006.

JOURNAL PAPERS

1. B. Cohen, D.S. Shipley, A.R. Tong, S.J.G. Casaroli and J.G. Petrie, 'Technical note: Precipitation of iron from concentrated chloride solutions: literature observations, challenges and preliminary experimental results', *Minerals Engineering*, Volume 18, Issues 13-14, November 2005, Pages 1344-1347.
2. S.J.G. Casaroli, B. Cohen, A.R. Tong, P. Linkson and J.G. Petrie, 'Cementation for Metal Removal in Zinc Electrowinning Circuits', *Minerals Engineering* Volume 18, Issues 13-14, November, Pages 1282-1288, 2005.
3. A.C. Dustan, B. Cohen and JG Petrie, 'Modelling Dewatering Behaviour through an Understanding of Solids Formation Processes. Part I - Solids Formation Considerations', *Advances in Colloid and Interface Science*, Vol 113/2-3, 2005, pp 99-110.
4. A.C. Dustan, B. Cohen and JG Petrie, 'Modelling Dewatering Behaviour through an Understanding of Solids Formation Processes. Part II - Solids Separation Considerations', *Advances in Colloid and Interface Science*, Vol 113/2-3, pp 85-97, 2005.
5. B. Cohen and J.G. Petrie, 'The Application of Batch Extraction Tests for the Characterisation of Solidified Ferro Alloy Waste Products', *Journal of Environmental Management*, Vol 76 Iss 3, pp 221-229, 2005.
6. B. Cohen and J.G. Petrie, 'Experiences from the Large-Scale Implementation of Solidification/Stabilization Processes', *The Journal of Solid Waste Technology and Management*, Vol 30, No 4, November 2004.
7. M. Warnken and B. Cohen, 'Wood Waste Utilization - Technologies and Practices in Europe', *Waste Management World*, July-August 2002.
8. B. Cohen, A.E. Lewis, J. Petersen, H. von Blottnitz, S.C. Drews and S.I. Mahote, 'The TCLP and Its Applicability for the Characterisation of Worst Case Leaching of Wastes from Mining and Metallurgical Operations', *Advances in Environmental Research*, vol 3, no 2, 1999-2000.
9. A. Grobicki and B.Cohen, "A flow balance approach to scenarios for water reclamation", *Water SA*, vol 25, No 4, Oct 1999, pp. 473-482.
10. A.Grobicki and B.Cohen, "Water Reclamation for Direct Re-Use in Urban and Industrial Applications in South Africa and its Projected Impact upon Water Demand", *Water Research Commission*, Pretoria, 1999. ISBN 1 86845 481 9
11. B. Cohen and J.G. Petrie, 'Containment of Chromium and Zinc in Ferrochromium Flue Dusts by Cement-Based Solidification', *Canadian Metallurgical Quarterly*, vol 36, no 4, 1997.

12. B. Cohen, J.J. Cilliers and J.G. Petrie, 'Optimization of Solidification/Stabilization Treatment of Ferro-Alloy Waste Products through Factorial Design', *Journal of Hazardous Materials*, 54, 1997, pp. 175-188.
13. B. Cohen and J.G. Petrie, 'Cement Based Solidification of Ferro Alloy flue dusts' in: S.R. Rao, L.M. Amaratunga, G.G. Richards and P.D. Kondos (Eds.), *Waste Processing and Recycling in Mineral and Metallurgical Industries II, Proceedings of the International Symposium*, Vancouver, 1995, Canadian Institute of Mining, Metallurgy and Petroleum, Montreal, 1995, pp. 297-308.

LIST OF CONFERENCE PROCEEDINGS

1. J.M Beck, B Cohen and JG Petrie, 'The Influence Of Uncertainty On Industrial Systems Modelling For Sustainability', accepted for presentation at Chemeca, Auckland, New Zealand, 2006.
2. R.T.M. Kempener, B. Cohen and JG Petrie, 'Designing Industrial Networks Towards Improved Sustainability', accepted for presentation at Chemeca, Auckland, New Zealand, 2006.
3. J.G. Petrie, B. Cohen, J. Beck, R. Malan, R., Kempener, and L. Basson, Analysis and Design of Industrial Networks for Sustainability Objectives, 21st European Conference on Operational Research, July 2-5, 2006, Reykjavik, Iceland.
4. B. Cohen, L. Basson, J. Petrie, A software platform for industry decision support - a focus on stakeholder interaction, decision auditing and communication, and management of uncertainty, accepted for oral presentation at 18th International Conference on Multiple Criteria Decision Making, June 19-23, 2006 Chania, Greece.
5. R. Kempener, L. Basson, R. Malan, B. Cohen, J. Beck, J. Petrie, The use of MCDA to model agent decisions in complex industrial networks, accepted for oral presentation at 18th International Conference on Multiple Criteria Decision Making, June 19-23, 2006 Chania, Greece
6. G.W. Barton, A. Abbas, B. Cohen, V.G. Gomes, A.T. Harris, P. Holt, B.S. Haynes, T.A.G. Langrish, J. Orellana, J.G. Petrie, J.A. Romagnoli, H.T. See, M. Valix and D. White, 'Graduating 'Competent' Chemical Engineers In The 21st Century – From Vision To Reality', to be presented at 11th Asia Pacific Confederation of Chemical Engineering, 27-30 August 2006, Kuala Lumpur, Malaysia.
7. B. Cohen, R. Kempener, L. Basson, and J. Petrie, 'A Complex Systems Approach to Energy Network Design and Analysis: A South African Bio-energy Case Study', accepted for oral presentation at the International Energy Workshop, Cape Town, 27-29 June 2006.
8. B. Cohen, S.J.G. Casaroli, P. Linkson, A.R. Tong and J.G. Petrie, 'Purification of zinc-halide leachates prior to electrowinning', poster presented at 7th World Congress of Chemical Engineers, Glasgow, Scotland, 10-14 July 2005.
9. L Basson, R Malan, B Cohen, R Kempener, J Beck and J.G Petrie, Disaggregated Analyses of Industrial Networks, paper presented at Third International Conference of the International Society of Industrial Ecology held the Royal Institute of Technology in Stockholm, Sweden 12-15 June, 2005.
10. R. Kempener, B. Cohen, L. Basson, J. Beck and J. Petrie, Application of Business Innovation Concepts to Design of Industrial Networks, paper presented at Third

International Conference of the International Society for Industrial Ecology, Royal Institute of Technology in Stockholm, Sweden 12-15 June 2005

11. B. Cohen, R. Kempener, L. Basson, J. Beck and J. Petrie, Modelling tools for Simulation and Optimisation of Complex Networks, paper presented at Third International Conference of the International Society for Industrial Ecology, Royal Institute of Technology in Stockholm, Sweden 12-15 June 2005.
12. J. Beck, B Cohen, M. Stewart and J.G. Petrie, 'Dynamic modelling of biomass networks for greenhouse gas minimisation', poster presented at Third International Conference of the International Society for Industrial Ecology, Royal Institute of Technology, Stockholm, Sweden 12-15 June 2005.
13. S.J.G. Casaroli, B. Cohen, P. Linkson, A.R. Tong and J.G. Petrie, 'Purification of Zinc-Halide Leachates for Electrowinning', presented at Bio- & Hydrometallurgy 05, Cape Town, South Africa, 16-18 March 2005.
14. D.S. Shipley, B. Cohen, A.R. Tong, S.J.G. Casaroli, and J.G. Petrie, 'Precipitation of Iron from Zinc-Halide Leachates', presented at at Bio- & Hydrometallurgy 05, Cape Town, South Africa, 16-18 March, 2005.
15. B. Cohen, M. Stewart and J.G. Petrie, "The Relevance of Commonly Used Reporting Indicators in Decision Making for Sustainable Development" presented at the Second International Conference "Sustainable Development in the Minerals Industry", Aachen, Germany 18-20 May 2005.
16. S. Casaroli, B. Cohen, A. Tong and J.G. Petrie, 'Purification of Zinc-Halide Leachates for Electrowinning', paper presented at *Chemeca*, Sydney, 26-29 September 2004.
17. S. Casaroli, B. Cohen, P. Linkson and J.G. Petrie, Purification of Zinc Halide Leachates Prior to Electrowinning – Experimental Observations, JKMR International Student Conference, Brisbane, 6-7 September 2004.
18. B. Cohen, J.G. Petrie, L. Basson and M. Stewart. 'Systems Analysis Tools for Promoting Effective Energy/Minerals Partnerships in Regional Development', paper presented at Green Processing conference, Fremantle, 10-12 May 2004.
19. B. Cohen, M. Stewart and J.G. Petrie, 'Environment and Sustainability in the Chemical Engineering Curriculum: Experiences in the Application of WebCT', poster paper presented at College of Science and Technology Teaching Research Showcase, University of Sydney, 4 November 2003.
20. B. Cohen, M. Stewart, L. Basson and J.G. Petrie, 'Network Analysis of the Energy - Minerals Supply Chain' presented at *Chemeca* 2003, Adelaide, September/October 2003.
21. M. Stewart, B. Cohen and J.G. Petrie, 'Network Analysis and Sustainability in Waste Management: Assessing Highest Resource Recovery through Combinations of Open and Closed Loop Recycling', presented at *Second International Society for Industrial Ecology Conference*, Ann Arbor, Michigan USA, June 29-July 2, 2003.
22. J.G. Petrie, , L. Basson, M Stewart and B Cohen (2003), "Systems Analysis Tools for Promoting Effective Energy / Minerals Partnerships in Regional Development", presented at *Second International Society for Industrial Ecology Conference*, Ann Arbor, Michigan USA, 29 June - 2 July, 2003.
23. B. Cohen and M. Warnken, 'Issues associated with Recovery of Resources from Waste Products using Energy from Waste Technologies: Stakeholder Perspectives', presented at

Second International Society for Industrial Ecology Conference, Ann Arbor, Michigan USA, 29 June - 2 July, 2003.

24. M. Warnken and B. Cohen, Characterisation and Assessment of Waste Oil Utilisation as a Heating Fuel in the Hydroponics and Greenhouse Industries, presented at the *Australian Hydroponics and Greenhouse Conference*, Melbourne, 26-29 July 2003.
25. M. Stewart, B. Cohen, D. Giurco, G. Brent and J.G. Petrie, 'Life Cycle Management and the Metals Value Chain: A Focus on the Sustainable Development of Metals Production', poster presented at *SETAC Europe Annual Conference*, Vienna, Austria, May 2002.
26. M. Warnken and B. Cohen (2002), 'What is Happening to Wood Waste in NSW in 2002?', *Proceedings of the NSW Waste Management Waste Conference and Expo 2002*, Waste Management Association of Australia, NSW Branch, Sydney, 2002.
27. B. Cohen and J.G. Petrie, 'Strength of Cementitious Solid Waste Agglomerates with Leachable Constituents', paper presented at *World Congress on Particle Technology*, Brighton, UK, 7-9 July 1998.
28. J.G. Petrie, J. Petersen, B. Cohen & A. Dustan, 'Rehabilitation of Ferro Alloy Waste Deposits', paper presented at *Mining and Environment Research Network Workshop, International Centre for the Environment*, Harare, Zimbabwe, 1996.
29. Cohen, B. and J.G. Petrie, 1995, Containment of Chromium and Zinc in Ferrochromium Flue Dusts by Cement Based Solidification, *Proceedings of the 2nd International Symposium on Waste Processing and Recycling in the Mining and Metallurgical Industries*, Vancouver, B.C. ,II, 20 –24 August 1995, 297 – 308
30. B. Cohen and J.G. Petrie, 'Solidification/stabilisation of Hazardous Waste Industrial Wastes: Minimisation of Environmental Liability associated with disposal Practices', paper presented at *13th Annual Mineral Processing Symposium of the South African Institute of Mining and Metallurgy*, Gordon's Bay, 4-5 August 1994.
31. B. Cohen and J.G. Petrie, Solidification/Stabilisation of Hazardous Wastes, *1st Conference on Environmental Management, Technology and Development*, SA Institution of Civil Engineers, Johannesburg, South Africa, March 1994