

E. GRANT READ

EGR Consulting Ltd



BSc. Honours(1st Class) in Mathematics
PhD in Economics and Operations Research
University of Canterbury
Christchurch, New Zealand

Grant has undertaken consultancies in several sectors, including telecommunications and gas. For over three decades, though, he has been most closely involved with the electricity sector, both as a researcher and a consultant on economic dispatch, reservoir management, expansion planning and pricing issues, having devised the models used for those purposes in New Zealand, and undertaken consultancies on these topics in Australia and North America. For the last 25 years Grant has concentrated on restructuring and market issues, having been a key adviser to the Electricity Sector Task Force and the Wholesale Electricity Market Study in New Zealand which were responsible for designing the New Zealand electricity market in the nineties, and subsequently undertaken a variety of international consultancies on related issues.

In particular, he has taken a lead role in the study of generator gaming issues, and in theoretical development and practical implementation of mechanisms for energy/reserve market co-ordination, locational pricing, energy contracting, inter-locational hedging, and transmission infrastructure cost recovery. Much of this work was incorporated into the ground-breaking design of the New Zealand electricity market, where Grant has continued to have significant involvement on regulatory matters, and with analysis of particular issues for participants. He subsequently played a significant role with respect to the development of the Australian National Electricity Market, advising on wide range of issues, particularly relating to the interpretation of the market rules, formulation of the market-clearing engine, and adaptation of the market design to deal with complexities such as ancillary service coordination, and congestion management. Grant also chaired the committee responsible for the introduction of effective retail competition in New Zealand, and was heavily involved in the design of electricity market arrangements in Ontario, Ireland, Singapore and the Philippines, and of gas market arrangements for the Australian state of Victoria. His current research focusses on water and environmental markets.

Grant holds a BSc with 1st Class Honours in Mathematics, and a PhD in Operations Research with graduate papers in Economics. He is a past president of the New Zealand Operations Research Society, and in 2012 received the Daellenbach award for his outstanding contributions to that field. Grant has published extensively, and acted as Associate Editor for *Energy Economics*, and *Energy Systems*. He established the Energy Modelling Research Group at Canterbury University, where he is now an Adjunct Professor in Management Science. He remains active as a consultant via EGR Consulting Ltd, and also in association with the Concept Consulting Group in New Zealand, and the Lantau Group in Hong Kong.

PROFESSIONAL HISTORY

- 1975-78 Doctoral research at Canterbury University on "Optimal Operation of Power Systems".
- 1978-79 Designed, implemented and tested a variety of models for short and long term scheduling of generation and reservoir operation for the New Zealand Electricity Department, providing a basis for the models now implemented and used by System Control.
- 1979-80 Responsible for electricity sector in the Planning and Forecasting section of the New Zealand Ministry of Energy, including the electricity chapter of the first Energy Plan and investigation of proposals for electricity intensive industries.
- 1981-82 Fulbright Travel Award to teach at University of California, Berkeley and University of Tennessee (ALCOA Foundation Visiting Professor). Consultant to Tennessee Valley Authority on models for system operation. Principal lecturer for international short course on modelling power systems.
- 1983-84 Responsible for research group in the Planning and Forecasting section of the Ministry of Energy, initiating the development of the methods which are now used for electricity planning, operations and pricing in New Zealand. In particular, developed a new "Dual Dynamic Programming" approach to reservoir management, as implemented in the PRISM and SPECTRA models.
- 1985-2001 Taught (part time) at Canterbury University, and continued research on optimal operation, planning, pricing, and structure of the electricity sector. Supervised research projects, on a range of topics including reservoir management, coal stockpiling, fuel allocation, transmission pricing, and provision of energy efficiency services.
- Established the Energy Modelling Research Group (EMRG), involving several faculty members, doctoral students and research assistants, undertaking research on reservoir management, transmission pricing, river chain modelling, generator unit commitment, reserve co-ordination, market design, bidding strategies, risk management and strategic planning for electrical utilities in a deregulated market environment.
- Consultant to the electricity sector working independently, and also as a specialist consultant/advisor with Arthur Young, Ernst and Young Management Sciences, CORE Management Systems, Putnam Hayes and Bartlett, and PA Consulting.
- 2002- Present Retired from Canterbury University, but continued graduate supervision and research as an Adjunct Professor, working with both the Energy Modelling Research Group and the Water Markets Research Group (WMRG). Also continued as a consultant, both independently (via EGR Consulting), and as a Senior Consultant associated with CRA International, and now with Concept Consulting Group in New Zealand, and The Lantau Group in Hong Kong.

CONSULTING EXPERIENCE (FROM 1988)

ELECTRICITY SECTOR RESTRUCTURING

1. Development of wholesale and transfer pricing frameworks for ECNZ.
2. Advice to two New Zealand government/industry task forces on electricity market reform and industry restructuring.
3. Review of electricity sector restructuring for Statkraft in Norway.
4. Chairmanship of New Zealand electricity industry committee responsible for introduction of effective retail competition via “profiling”.
5. Critique and development of proposals for restructuring of the Tasmanian electricity sector, for an Australian electricity retailer.
6. Development of proposals for wholesale price regulation for the Tasmanian Treasury.
7. Survey of international practice with respect to “single buyer markets” in the electricity sector.

ELECTRICITY MARKET DESIGN

8. Study of generator gaming opportunities, and transmission capacity right options, for the Victorian state and Australian national markets.
9. Review of dispatch/pricing proposals for the National Grid Management Council, Australia.
10. Preliminary design of electricity market arrangements for Malaysia.
11. Review of electricity market arrangements for Singapore.
12. Design and implementation of electricity market arrangements, including market, for Singapore.
13. Design of electricity market arrangements, including market rules, for the Philippines.
14. Review of proposed market based on bilateral contracting for Western Australia.
15. Development of market design and rules for the Republic of Ireland.
16. Advice on the treatment of regional boundaries, and of inter-regional and intra-regional constraints for the Ministerial Council on Energy in Australia.
17. Peer review of consultancy reports on “generator nodal pricing” for the Australian Electricity Market Commission.
18. Peer review of consultancy reports on “demand side participation” for the Australian Electricity Market Commission.
19. Critique of Commerce Commission investigation report into potential market power abuse for a major New Zealand generator.
20. Preparation of reports on critical market design issues as input into a Ministerial Review process for a major New Zealand generator.
21. Review and revision of report on electricity market performance for the New Zealand Institute of Professional Engineers.

22. Review of studies to determine electricity market price caps for the Australian Electricity Market Commission.
23. Review of analysis of market power issues and regulatory interventions for the Singapore Energy Markets Authority.
24. Analysis of impact that increasing data release to support futures trading might have on tacit collusion for the Singapore Energy Markets Authority.
25. Review of vesting contract regime and market development options for the Singapore Energy Markets Authority.

ELECTRICITY SECTOR/MARKET MODELLING AND VALUATION

26. Development of electricity price projections for two major investment consortia in Australia.
27. Review of studies on electricity sector impacts of climate change policies for the Australian Electricity Market Commission.
28. Review of models for valuation of a South American power system, for a potential purchaser.
29. Analysis of proposals to introduce a national measure of power system capacity adequacy for a major New Zealand generator.
30. Preparation of an overview report on economic behaviour in a hydro-dominated electricity market for a major New Zealand generator.
31. Design and development of an integrated modelling system to determine least cost thermal/solar/hydro development plans in a Pacific Island nation, for the World Bank.

FORMULATIONS AND SOFTWARE FOR CLEARING ELECTRICITY MARKETS

32. Review of dispatch/pricing formulation, and audit of software for the New Zealand electricity market.
33. Review of dispatch/pricing formulation, and audit of software for the Australian National Electricity Market.
34. Review of initial experience with electricity market software for Queensland, Australia.
35. Review of market design and market clearing formulation issues for Ontario, Canada.
36. Review of rule and software changes to accommodate entry of “entrepreneurial interconnectors” in the Australian national electricity market.
37. Design of the electricity market clearing formulations for Singapore.
38. Design of a proposed electricity clearing formulations for the Philippines.
39. Review of several rule change proposals the Singapore Electricity Market Company.
40. Comprehensive review and documentation of all changes to the market-clearing formulation and related procedures for the Singapore Electricity Market Company.
41. Development of experimental formulation change proposals to facilitate “progressive constraint softening” in market-clearing solutions for the New Zealand Electricity Authority.
42. Investigation of the potential benefits from introducing multi-period optimisation of unit commitment to the Singapore electricity market, for the Energy Market Company.

43. Review of various formulation change proposals to improve consistency, and handling of offer tie-breaking, non-physical losses, minimum running limits, constraint violation prioritisation, battery-based regulation, multi-unit station representation, demand response, and concatenation of ancillary service categories in the Singapore market clearing engine for the Energy Market Company.
44. Teach graduate course on electricity market design for University of Melbourne., Australia

ANCILLARY SERVICE MARKET DESIGN

45. Development of the “co-optimisation” concept as the basis for an integrated energy/reserve market framework for New Zealand.
46. Review of ancillary service cost recovery proposals for the Australian National Electricity Code Administrator.
47. Review of ancillary service market proposals for the Philippines.
48. Review of proposed changes to modelling of ancillary service requirements for the Singapore Electricity Market Company.
49. Development of proposals and formulations for a frequency keeping market for the New Zealand Electricity Commission.
50. Analysis of the impact of solar generation on ancillary service requirements for the Singapore Energy Markets Authority.
51. Review of formulation and rule changes to accommodate changes to changes to ancillary service definitions for the Singapore Electricity Market Company.

LOCATIONAL PRICING AND HEDGING IN ELECTRICITY MARKETS

52. Development of theory, and design and testing of a model, for nodal transmission pricing in an AC system.
53. Development of an inter-regional “hedging” framework based on “settlements residue auctions” for Australia.
54. Review of constraint pricing effects and locational pricing arrangements in the Australian national electricity market.
55. Review of conflicting financial transmission right proposals, and development of a framework for future electricity industry development for the New Zealand Ministry of Economic Development.
56. Review of constraint representation issues for the Australian national electricity market, and development of “constraint orientation” theory for zonal markets.
57. Development of an innovative conceptual framework for interconnector support in the Australian national electricity market.
58. Development of analytical framework to understand pricing impacts of security constraints in the New Zealand electricity market.
59. Development of a theoretical framework for congestion management and pricing for the Australian Electricity Market Commission.

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60. Report on treatment of “spring washer” pricing effects due to transmission system loop constraints for the New Zealand Electricity Commission.
61. Report on locational hedging options for the New Zealand Electricity Commission.
62. Advice to the New Zealand Electricity Authority with respect to the development and implementation of an FTR based regime for locational price risk management.
63. Review of nodal pricing and related risk management options for the Singapore Energy Markets Authority.

TRANSMISSION SYSTEM PLANNING AND COST RECOVERY

64. Development of an innovative transmission pricing framework for New Zealand.
65. Review of UK transmission pricing regime for a major UK power company.
66. Review of Australian transmission pricing proposals for the National Generator’s Forum.
67. Specification of methodology for evaluating interconnector proposals in Australia.
68. Development of a transmission pricing proposal for Ontario, Canada.
69. Advice on securing effective transmission access for an Australian generator.
70. Critique of justification for a major interconnector expansion in Australia.
71. Critique of the analysis of transmission development proposals for a major New Zealand generator.
72. Development of alternative transmission pricing proposals for a major New Zealand generator.
73. Review of competing modelling approaches for transmission expansion planning in a market environment for the New Zealand Electricity Commission.
74. Identification of economic issues in risk assessment for a major New Zealand transmission development.
75. Advice to the New Zealand Electricity Authority with respect to transmission pricing.
76. Analysis of economic signalling impact of alternative bases for transmission charging in regions of increasing congestion for the New Zealand Electricity Authority.
77. Critique of proposed transmission pricing guidelines for the New Zealand Electricity Authority.

RESERVOIR MANAGEMENT AND MARKET INTERACTION FOR HYDRO SYSTEMS

78. Advice to Electricity Corporation of New Zealand (ECNZ) on hydro-thermal power system co-ordination and planning models.
79. Design and testing of models for river chain scheduling, unit commitment, and short term hydro/thermal co-ordination for ECNZ.
80. Review of dispatch development/internal management proposals, and related automation and remote control investment for ECNZ.
81. Review of reservoir management models for a large municipal water supply in New Zealand

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82. Design of reservoir management and bid optimisation models for a major Australian power company.
83. Review of an optimisation model for a Canadian hydro system.
84. Review of modelling requirements in the new market environment for a major New Zealand hydro generator.
85. Review of design for dispatch/commitment optimisation models for a major Australian hydro generator.
86. Development of analytical framework for contract and offer management for a major Australian hydro generator.
87. Review of operational modelling for a major New Zealand hydro development.
88. Advice to the New Zealand Electricity Commission on modelling of hydro-electric reservoir management.
89. Analysis and development of a water management agreement to maintain optimal reservoir management while accounting for independent downstream power development, for a major Canadian electricity generator.
90. Scoping of potential for development of a water market involving trading between irrigation and electricity generation interests in New Zealand, for an electricity generator.
91. Development of a contractual virtual reservoir regime to mitigate potential problems due to separating ownership of upstream/downstream reservoirs in a market environment, for a major New Zealand electricity company.
92. Development of a contractual virtual reservoir regime to support a proposal to form competing traders in Tasmania, Australia.

GAS

93. Review of market logic, and formulation, design and testing of modelling systems, for an innovative gas market for the Australian state of Victoria.
94. Development of analytical framework and model formulation to determine LNG stockpiling requirements for the state of Victoria, Australia.
95. Review of gas market development proposals for Victoria, Australia.

ENERGY

96. Design and testing of an energy sector modelling system for a major private sector client in New Zealand.
97. Advice on design of energy sector modelling systems for the New Zealand Ministry of Economic Development.
98. Review of model formulations for coal blending, and advice on modelling for strategic development, for a major coal producer in New Zealand.
99. Teach graduate course on energy sector modelling for University of Canterbury, New Zealand.

OTHER

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100. Review of organisational structure, planning procedures, database requirements, and modelling tools for a major New Zealand telecommunications company.

PUBLICATIONS AND PRESENTATIONS FOR DR E GRANT READ

Doctoral Dissertation

1. E.G. Read: *Optimal Operation of Power Systems* Dept of Economics, University of Canterbury, Christchurch, New Zealand. August 1979.

Journal Articles

2. R.G. Smith, L.R. Foulds & E.G. Read: "A Political Re-districting Problem", *New Zealand Operational Research*, vol. 4, no. 1, January 1976, p.37-53
3. L.R. Foulds, E.G. Read & D.F. Robinson: "A Manual Solution Procedure for the School Bus Routing Problem", *Australian Road Research*, vol. 7, no. 1, March 1977, p.21-25.
4. E.G. Read: "Economic Oil Stockpiles: Analytical Solution for Minima" *Energy Economics*, vol. 4, no. 1, January 1982, p.29-35.
5. J.F. Boshier, G.B. Manning & E.G. Read: "Scheduling Releases from New Zealand's Hydro Reservoirs" *Transactions of the Institute of Professional Engineers in New Zealand*, vol. 10, no. 2/EMCh, July 1983, p.33-41.
6. E.G. Read: "Reservoir Release Scheduling for New Zealand Electricity - A Non-Linear Decomposition Algorithm", *New Zealand Operational Research*, vol. 11, no. 2, July 1983, p.125-142.
7. E.G. Read: "Managing New Zealand's Oil Stockpile", *New Zealand Operational Research*, vol. 14, no.1, January 1986, p. 29-50.
8. E.G. Read & J.A. George: "Dual Dynamic Programming for Linear Production/Inventory Systems", *Journal of Computers and Mathematics*, vol. 19, no. 11, 1990, p.29-42.
9. E.G. Read, J.G. Culy & S.J. Gale: "Operations Research in Energy Planning for a Small Country", *European Journal of Operational Research*, vol. 56, 1992, p. 237-248.
10. E.G. Read, V.H. Coad & J.G. Culy: "OR Models for the Electricity Corporation of New Zealand", *Communications of the OR Society of Japan* (in Japanese translation), vol. 39, no 1, 1994 p.16-17.
11. B.J. Ring & E.G. Read: "Short Run Pricing in Competitive Electricity Markets", *Journal of the Canadian Economics Association*, Special issue XXIX, 1996, p. S313-15.
12. E.G. Read: "OR Modelling for a Deregulated Electricity Sector", *International Transactions in Operations Research*, vol. 3, no. 2, 1996, p. 129-138.
13. T.J. Scott & E.G. Read: "Modelling Hydro Reservoir Operation in a Deregulated Electricity Sector", *International Transactions in Operations Research*, vol.3, no.3-4, 1996, p. 209 221.
14. W.W. Hogan, E.G. Read & B.J. Ring: "Using Mathematical Programming for Electricity Spot Pricing", *International Transactions in Operations Research*, vol. 3, no.3-4, 1996, p. 243-253.
15. E.G. Read: "Transmission Pricing in New Zealand", *Utilities Policy*, Vol. 6, No. 3, 1997, p. 227-236.
16. E.G. Read: "Electricity Sector Reform in New Zealand: Lessons from the Last Decade" *Pacific Asia Journal of Energy* Vol 7, No 2, 1997, p. 175-191
17. H.G. Daellenbach & E.G. Read: "Success and Survival of OR groups: Where to From Here?" *Journal of the Operational Research Society* Vol 49, No 4, 1998, p. 430-433
18. E.G. Read & M. Yang "Analytical Dual DP for Reservoir Management with Correlation" *Water Resources Research*, Vol 35, no 7, 1999, p. 2247-2257
19. D. Chattopadhyay, B.B. Chakrabarti & E.G. Read "A Spot Pricing Mechanism for Voltage Stability" *International Journal of Electrical Power & Energy Systems* Vol. 25, 2003, p 725-734

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20. J.F. Raffensperger, M.W. Milke & E. G. Read, "A Deterministic Smart Market Model for Ground Water" *Operations Research*, v57, no 6, Nov-Dec 2009, pp. 1333-1346.¹
21. R.A. R. Prabodanie, J.F. Raffensperger, E. Grant Read & M.W. Milke "LP Models for Pricing Diffuse Nitrate Discharge Permits" *Annals of Operations Research* Vol 189, Sep 2011, pp.1-23
22. A. Pinto, J.F. Raffensperger, T.A. Cochrane & E.G. Read "A Proposed Smart Market Design for Sediment Discharge" *Journal of Water Resources Planning and Management*, v139, no1, 2013, pp 96-108. [http://dx.doi.org/10.1061/\(ASCE\)WR.1943-5452.0000228](http://dx.doi.org/10.1061/(ASCE)WR.1943-5452.0000228).

Book Chapters

23. E.G. Read, J.G. Culy, T.S. Halliburton & N.L. Winter: "A Simulation Model for Long-term Planning of the New Zealand Power System", in G.K. Rand (ed.) *Operational Research 1987*, North Holland, p.493-507.
24. E.G. Read: "A Dual Approach to Stochastic Dynamic Programming for Reservoir Release Scheduling", in A.O. Esogbue (ed.) *Dynamic Programming for Optimal Water Resources System Management*, Prentice Hall NY, 1989, p.361-372.
25. E.G. Read & J.F. Boshier: "Biases in Stochastic Reservoir Scheduling Models", in A.O. Esogbue (ed.) *Dynamic Programming for Optimal Water Resources System Management*, Prentice Hall NY, 1989, p.386-398.
26. E.G. Read & B.J. Ring: "A Dispatch Based Pricing Model for the New Zealand Electricity Market" in R Siddiqi & M.Einhorn (eds.) *Transmission Pricing and Access*, Kluwer, 1995. p 183-206. Reprinted in A Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power, 1995.
27. J.G. Culy, E.G. Read & B. Wright: "Structure and Regulation of the New Zealand Electricity Sector", in R Gilbert & E Kahn (eds.) *International Comparison of Electricity Regulation*, Cambridge University Press, 1996, p. 312-365.
28. E.G. Read, G.R. Drayton-Bright & B.J. Ring: "An Integrated Energy/Reserve Market for New Zealand", in G. Zaccours (ed) *Deregulation of Electric Utilities*, Kluwer, Boston, 1998, p. 297-319.
29. F.C. Graves, E.G. Read, P.Q. Hanser & R.L. Earle: "One Part Markets for Electric Power: Ensuring the Benefits of Competition" in M. Ilic, F. Galiana & L. Fink (eds) *Electricity Deregulation*, Kluwer, Boston, 1998, p243-280.
30. E.G. Read "OR Modelling for the Electricity Sector" in H.G. Daellenbach (ed) *The Informed Student Guide to the Management Sciences*, Thomson Learning, London, 2002, p17-18.
31. E.G. Read "Energy Modelling" in H.G. Daellenbach (ed) *The Informed Student Guide to the Management Sciences*, Thomson Learning, London, 2002, p18-19.
32. E. G. Read & M. Hindsberger "Constructive Dual DP for Reservoir Optimisation" in S. Rebennack, P.M. Pardalos, M.V.F. Pereira & N.A. Iliadis (eds) *Handbook on Power Systems Optimisation* Springer, 2010, Vol I p3-32
33. E. G. Read "Co-Optimization of Energy and Ancillary Service Markets" in S. Rebennack, P. M. Pardalos, M.V.F. Pereira & N.A. Iliadis (eds) *Handbook on Power Systems Optimisation* Springer, 2010, Vol I, p307-327
34. J. Tipping & E. G. Read "Hybrid bottom-up/top-down modelling of prices in hydro-dominated power markets" in S. Rebennack, P.M. Pardalos, M.V.F. Pereira & N.A. Iliadis (eds) *Handbook on Power Systems Optimisation* Springer, 2010, Vol II, p213-238

¹ Best paper award, INFORMS Energy, Natural Resources and Environment Section, 2011

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35. E.G. Read, B.J. Ring, S.R. Starkey & W. Pepper "An LP Formulation for a Natural Gas Market" in P.M. Pardalos, M.V.F. Pereira & A Sorokin (eds) *Handbook of Networks in Power*, Springer, 2012 Vol II, p77-114
36. W. Pepper, B.J. Ring, E.G. Read & S.R. Starkey "Implementation of a Scheduling and Pricing Model for Natural Gas" in P.M. Pardalos, M.V.F. Pereira & A. Sorokin (eds) *Handbook of Networks in Power*, Springer, 2012, Vol II, p3-36
37. E.G. Read & P.R. Jackson "Experience with FTRs and Related Concepts in Australia and New Zealand" in J. Rosellon & T. Kristiansen (eds) *Financial Transmission Rights: Analysis, Experiences and Prospects*, Springer, 2013, p305-332

Significant Public Documents

38. E.G. Read (with Planning Division Staff) "Sector Forecast and Plan: Electricity" Chapter 8 of the first *New Zealand Energy Plan*, New Zealand Ministry of Energy, 1980.
39. E.G. Read: "Electricity Sector Performance Measures and Regulatory Structures", Background Report EI8603 to *Energy Issues 1986*. Released by the New Zealand Ministry of Energy.
40. E.G. Read & D.P.M Sell: *A Framework for Electricity Pricing*. Released by the Electricity Corporation of New Zealand, November 1987.
41. E.G. Read: *Management of Hydro Storage*. Released by the New Zealand Government Task Force on Electricity Sector Structure, 1989.
42. E.G. Read & D.P.M. Sell: "Pricing and Operation of Transmission Services: Short Run Aspects". In A Turner (ed.) *Principles for Pricing Electricity Transmission* Trans Power New Zealand, August 1989. ²
43. E.G. Read: "Pricing and Operation of Transmission Services: Long Run Aspects". In A Turner (ed) *Principles for Pricing Electricity Transmission*, Trans Power New Zealand, August 1989.
44. E.G. Read & D.P.M. Sell: "A Framework for Transmission Pricing". In A. Turner (ed.) *Principles for Pricing Electricity Transmission*, Trans Power New Zealand, August 1989.
45. J.G. Culy, E.G. Read & F.T. Baird: *Issues for Wholesale Electricity Market Reform*, New Zealand Wholesale Electricity Market Study Report WEMS/1 August 1992.
46. J.G. Culy, E.G. Read & F.T. Baird: *Options for Wholesale Electricity Market Reform*, New Zealand Wholesale Electricity Market Study Report WEMS/2 September 1992.
47. E.G. Read: *Wholesale Electricity Market Reform: Analysis of Options*, New Zealand Wholesale Electricity Market Study Report, WEMS/3 October 1992.
48. E.G. Read: *A Managed Transition Toward a Facilitated Market: Rationale*, New Zealand Wholesale Electricity Market Study Report, WEMS/4 October 1992.
49. E.G. Read (with PHB/NZIER Staff) *Towards a Competitive Wholesale Electricity Market*, New Zealand Wholesale Electricity Market Study Report, WEMS/5 October 1992.
50. E.G. Read & B.J. Ring: "Dispatch Based Pricing: Philosophy and Methodology" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.
51. E.G. Read & B.J. Ring: "A PQ Model with Line Constraints" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.
52. E.G. Read & B.J. Ring: "A PVQ Model with Nodal Constraints" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.

² This volume available at http://www.hks.harvard.edu/hepg/rlib_rp_transmission_flowgate.html or (as individual chapters) <http://www.mang.canterbury.ac.nz/research/emrg/historicpapers.shtml>

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53. E.G. Read & B.J. Ring: "A PVQ Model with General Constraints and Variables" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.
54. E.G. Read, B.J. Ring & M. Rosevear: "Dispatch Based Pricing: Technical Reference" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.
55. E.G. Read & B.J. Ring: "Behaviour of Nodal Power Prices" in A. Turner (ed.) *Dispatch Based Pricing for the New Zealand Power System*, Trans Power New Zealand, July 1995.
56. E.G. Read: *Review of the Dispatch/Pricing Formulation for the New Zealand Electricity Market*. Released by the Electricity Market Company of New Zealand, September 1996.
57. E.G. Read (with PHB Staff) *Certification of the TP35 Dispatch/Pricing Software*. Released by the Electricity Market Company of New Zealand, December 1996.
58. E.G. Read (with PHB Staff) *Inter-Regional Hedging in the Australian National Electricity Market: Theoretical Framework*. Released by the National Electricity Market Management Company of Australia, September 1997.
59. E.G. Read (with PHB Staff) *NEMMCO's role in the Hedging Market*. Released by the National Electricity Market Management Company of Australia, September 1997.
60. (with PHB Staff) *Ontario Electricity Market Transmission/Distribution Pricing and Access: "Theoretical Framework" and "Outline Proposal"* PHB reports to Ontario Market Design Committee, 1998. Both at http://www.theimo.com/imoweb/historical_devel/Mdc/ArchivedDocuments.asp
61. E.G. Read (with PHB Staff) *Dispatch/Pricing Formulation Review: Compliance with Market Rules*. Released by the National Electricity Market Management Company of Australia, September 1997 (with subsequent revisions to 2001).
62. E.G. Read (with PHB Staff) *Dispatch/Pricing Formulation Review: Software Audit*. Released by the National Electricity Market Management Company of Australia, September 1997 (with subsequent revisions to 2001).
63. L.E. Ruff & E.G. Read *Victorian Gas Market Clearing Logic: Version MCL 1.2*. Released by the Victorian State Energy Networks Corporation, November 1997.
64. E.G. Read (with M-co/KPMG staff) *Customer Switching, Registry and Reconciliation Rules (MARIA Chapter 2)*. Released by the Electricity Market Company of New Zealand, March 1999.
65. M. Thomas & E.G. Read *Operationalisation of the Grid System Operator: Bringing Benefits to Malaysian Consumers and Industry*. Released by the Economic Planning Unit, Prime Minister's Department of Malaysia, September 1999 (with subsequent revisions to 2000).
66. B. Graydon, B.J. Ring & E.G. Read (with PHB staff) *Market Clearing and Dispatch Process*. Released by the Ontario Energy Board, February 2000.
67. E.G. Read & J.A. George (with PA Staff) *Wholesale Electricity Spot Market Clearing Formulation*. Released by the Philippines Department of Energy, November 2000 (with subsequent revisions to 2002).
68. E.G. Read & J.A. George (with PA/Freehills staff) *Wholesale Electricity Spot Market Rules: The Market*. Released by the Philippines Department of Energy, November 2000 (with subsequent revisions to 2002).
69. E.G. Read & F.T. Baird (with PA Staff) *Singapore Electricity Market Rules: Market Operations*. Released by the Singapore Energy Market Authority, November 2001.
70. E.G. Read, B. Graydon & B.J. Ring (with PA staff) *Singapore Electricity Market Rules: Market Clearing Formulation*. Released by the Singapore Energy Market Authority, November 2001.
71. E.G. Read *Financial Transmission Rights for New Zealand: Issues and Alternatives*. Released by the Ministry of Economic Development, May 2002.
72. E.G. Read & F.T. Baird *Network Constraint Formulation: Impact on Market Efficiency*. Released by the National Electricity Market Management Company of Australia, January 2003.
73. E.G. Read (with CRA staff) *Constraint Orientation: Principles and Pricing Implications*. Released by the National Electricity Market Management Company of Australia, March 2003.

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74. E.G. Read *Dealing with NEM Interconnector Congestion: A Conceptual Framework*. Released by the National Electricity Market Management Company of Australia, March 2003
75. E.G. Read *NEM Interconnector Congestion: Dealing with Interconnector Interactions*. Released by the National Electricity Market Management Company of Australia, October 2004.
76. E.G. Read *NEM Regional Boundary Issues: Theoretical Framework* Released by the Australian Ministerial Council on Energy, October 2004.
77. E.G. Read & G. Thorpe (with R. Simes & A. Rattray) *NEM Transmission Region Boundary Structure*. CRA report. Released by the Australian Ministerial Council on Energy, September 2004.
78. E.G. Read *Constraint Pricing Effects in the New Zealand Electricity Market: An initial review*. CRA report, released by the New Zealand Electricity Commission, July 2005
79. G H Thorpe, M T Thomas & E.G Read *A Report to ERIG on Transmission in the National Electricity Market*. CRA report to the Energy Reform Implementation Group (ERIG) of the Council of Australian Governments (COAG), December 2006. Available at: http://www.ret.gov.au/energy/Documents/erig/Transmission_study_CRAinternational20070413115229.pdf
80. E.G. Read *GEM and PLEXOS in the SOO/GIT Process: Conceptual Commentary* EGR Consulting report. Released by the New Zealand Electricity Commission, October 2007
81. E.G. Read *Locational Transmission Pricing: A Formulaic Approach* EGR Consulting report. Released by Mighty River Power, February 2007. <http://www.ea.govt.nz/our-work/programmes/priority-projects/transmission-pricing-review/stage1/>
82. E.G. Read *Network Congestion and Wholesale Electricity Pricing in the Australian National Electricity Market: An Analytical Framework for Describing Different Options* EGR Consulting Report to the AEMC, Released February 2008
83. E.G. Read & T. Gregan *Congestion Pricing Options for the Australian National Electricity Market: Overview* AEMC Report, Released February 2008
84. E.G. Read *Frequency Regulation Market Integration Study: Appendix C: Regulation Market Issues* EGR Consulting report. Released by the New Zealand Electricity Commission, April 2008
85. E.G. Read *Frequency Regulation Market Integration Study: Appendix D: Scheduling Pricing and Dispatch Software Model Formulation: Draft adaptations to allow for a market in frequency keeping "regulation" service* EGR Consulting report. Released by the New Zealand Electricity Commission, April 2008
86. E.G. Read *Economic Behaviour in a Hydro-Dominated Electricity Market* EGR Consulting report. Released by Mighty River Power, March 2009
87. E.G. Read *Spring Washer Pricing: Options for Modification or Moderation* EGR Consulting report. Released by the New Zealand Electricity Commission, October 2009. <http://www.ea.govt.nz/document/15605/download/our-work/advisory-working-groups/lprt/23nov11/>
88. E.G. Read *Locational Hedging Options for New Zealand: Issues and Options* EGR Consulting report. Released by the New Zealand Electricity Commission, November 2009. <http://www.ea.govt.nz/document/2426/download/our-work/consultations/priority-projects/locational-price/>
89. E.G. Read *Scarcity Pricing for New Zealand: A Personal Perspective* EGR Consulting report. Released by the New Zealand Electricity Commission, October 2010. <http://www.ea.govt.nz/our-work/advisory-working-groups/spdbtg/21Oct10/>

Invited/Keynote Presentations

90. J.F. Boshier & E.G. Read: "A Stochastic Single Reservoir Model for Optimal Operation of the New Zealand Power System", *Proceedings of the Energy Modelling Symposium*, Wellington, New Zealand, 1979, p. 179-205.
91. E.G. Read: "A Deterministic Multi Reservoir Model for Optimal Operation of the New Zealand Power System", *Proceedings of the Energy Modelling Symposium*, Wellington, New Zealand, 1979, p. 206-214.
92. E.G. Read: "Scheduling Reservoir Releases in the New Zealand Power System", keynote presentation to *Optimisation Days*, Montreal, Canada, 1981.
93. E.G. Read: "Economic Principles of Reservoir Operation I: Perfect Foresight", *International Short Course on Reservoir Scheduling*, University of Tennessee, Knoxville, 1982 (CBA Working Paper No. 151) and *United Nations Short Course on Hydro Systems*, Belgrade, Yugoslavia, 1982.
94. E.G. Read: "Economic Principles of Reservoir Operation II: Uncertain Future", *International Short Course on Reservoir Scheduling*, University of Tennessee, Knoxville, 1982 (CBA Working Paper No. 152) and *United Nations Short Course on Hydro Systems*, Belgrade, Yugoslavia, 1982.
95. E.G. Read: "Approaches to Stochastic Modelling" *International Short Course on Reservoir Scheduling*, University of Tennessee, Knoxville, 1982 (CBA Working Paper No. 153) and *United Nations Short Course on Hydro Systems*, Belgrade, Yugoslavia, 1982.
96. E.G. Read, J.G. Culy, T.S. Halliburton & N.L. Winter: "A Simulation Model for Long-term Planning of the New Zealand Power System", National Contribution to *IFORS 87*, Buenos Aires, 1987.
97. E.G. Read: "Transmission Pricing for Operational and Investment Signalling: a New Zealand Perspective" *IEEE PES Winter Conference*, New York, 1997.
98. E.G. Read: "OR in the Evolving Electricity Sector: The Australasian Experience", Keynote Address, *APORS Triennial Conference*, Melbourne, 1997.
99. E.G. Read (with Mco/KPMG staff) "MARIA Retail Competition: an Overview of the Reform Package" MRCC Chairman's presentation to the New Zealand electricity industry, February 1999.
100. E. G. Read, M. Thomas & D. Chattopadhyay "The Impact of Risk on Capacity Investment in Electricity Markets" Keynote Address, *IAEE Proceedings*, Wellington, 2007.
101. E. G. Read "Allocating Transmission Costs to Beneficiaries: Lessons from New Zealand Experience" Invited presentation, *Australian Competition and Consumer Commission Annual Regulatory Conference* Brisbane, Australia July, 2012. (At <http://www.accc.gov.au/content/index.phtml/itemId/1034271>)
102. E. G. Read: "Economics and Operations Research: A Past, Present and Future Duality" Daellenbach Prize presentation and Keynote Address. *ORSNZ Conference*, Wellington, 2012.

Conference Papers

103. H.G. Daellenbach & E.G. Read: "Survey on Optimisation for the Long-Term Scheduling of Hydro-Thermal Power Systems", *ORSNZ Annual Conference*, 1976.
104. E.G. Read: "Scheduling a Multi-Load Hydro-Thermal System for Minimum Fuel Cost", *ORSNZ Annual Conference*, 1977.
105. E.G. Read: "Stochastic Long Term Scheduling Models for a Power System", *ORSNZ Proceedings*, 1979, p.41-52.
106. E.G. Read: "This Week's Electricity: Where to generate it? What will it cost?" *Proceedings of the 4th New Zealand Energy Conference*, Auckland 1979, p.348-354.
107. E.G. Read: "Optimal Oil Stockpiles for New Zealand", *ORSNZ Annual Conference*, 1980.
108. J.F. Boshier, G.B. Manning & E.G. Read: "Scheduling Reservoir Releases for New Zealand's Hydro Reservoirs", *IPENZ Annual Conference*, Hamilton, 1983.
109. R.L. Gordon & E.G. Read: "Using Stochastic Dynamic Programming for Oil Stockpiling Policy", *ORSNZ Proceedings*, 1983, p. 69-78.
110. E.G. Read: "A New Electricity Simulation Model", *ORSNZ Proceedings*, 1984, p. 61-64.
111. E.G. Read: "A New Variant of SDP for Multi-Reservoir Release Scheduling", *ORSNZ Proceedings*, 1985, p. 4-9.
112. J.G. Culy, E.G. Read, T.S. Halliburton & N.L. Winter: "Progress on Electricity Simulation" *ORSNZ Proceedings*, 1985, p. 1-3.
113. S.J. Gale, E.G. Read & J.G. Culy: "Structure Performance Measures for the Electricity Sector", *TIMS XXVII*, Brisbane, Australia, 1986.
114. E.G. Read and J.A. George: "Dual Dynamic Programming for Linear Production/Inventory Systems", *ORSNZ Proceedings*, 1986, p. 133-136.
115. S.J. Gale, E.G. Read, and J.G. Culy: "Measuring Economic Performance in a Deregulated Electricity Sector", *ORSNZ Proceedings*, 1986, p. 115-118.
116. P.D. Cosseboom & E.G. Read: "Dual Dynamic Programming for Coal Stockpiling", *ORSNZ Proceedings*, 1987, p. 15-18.
117. M.L. Pickup & E.G. Read: "Optimal Allocation of Fuels to Multi-Fuelled Stations Using a Network Algorithm", *ORSNZ Proceedings*, 1987, p. 9-12.
118. M. Yang & E.G. Read: "A Dual Dynamic Programming Approach to Reservoir Scheduling with Correlated Inflows", *ORSNZ Proceedings*, 1990, p. 21-26. Reprinted in *Proceedings of the ECNZ Optimal Generation Scheduling Workshop*, Wellington, 1993.
119. E.G. Read, J.G. Culy & S.J. Gale: "OR in the Energy Sector: the Impact of Privatisation", *TIMS XXX*, Rio de Janeiro, 1991.
120. E.G. Read & M. Yang: "DDP Approach for a Reservoir Management Problem with Correlated Inflows", *Second Triennial APORS Conference*, Beijing, China, 1991.
121. B.J. Ring & E.G. Read: "Aspects of Electricity Transmission Pricing", *ORSNZ Proceedings*, 1992, p. 150.
122. T.J. Scott & E.G. Read: "Single Period Response Curves for a Duopolistic Electricity Market", *ORSNZ Proceedings*, 1992, p. 151-158.
123. E.G. Read: "Short Run Transmission Pricing Issues in New Zealand", in *Coping with the Energy Future: Markets and Regulations*, Proceedings of the International Association of Energy Economists, Tours, France, 1992, p. A17-A24.
124. E.G. Read, G.R. Drayton, B.W. Lamar & A.J. Turner: "Optimisation of Generation and Spinning Reserve in an Electrical Power System", *ORSNZ Proceedings*, 1992, p. 142-149.

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125. T.J. Scott & E.G. Read: "Optimising Reservoir Management in a Deregulated Electricity Market", *ORSNZ Proceedings*, 1993, p. 92-99.
126. B.J. Ring, E.G. Read & G.R. Drayton: "Optimal Pricing for Reserve Electricity Generation Capacity", *ORSNZ Proceedings*, 1993, p. 84-91.
127. J.G. Culy, E.G. Read & B. Wright: "The Evolution of New Zealand's Electricity Supply Structure", in *International Regulation of Electric Power*, Proceedings of the International Conference on Electricity Sector Regulation, Toulouse, France, 1993.
128. B.J. Ring & E.G. Read: "Nodal Pricing and Extensions to the Theory" in *Proceedings of the ECNZ Optimal Generation Scheduling Workshop*, Wellington, 1993.
129. T.J. Scott & E.G. Read: "A Medium Term Simulation Model of Reservoir Management in a Deregulated Market", in *Proceedings of the ECNZ Optimal Generation Scheduling Workshop*, Wellington, 1993.
130. E.G. Read & T.J. Scott: "Hydro-Generator Gaming in a Deregulated Electricity Market", *Proceedings of the 10th Conference of the Electricity Supply Industry*, Christchurch, New Zealand, September 1994 p377-387.
131. B.J. Ring & E.G. Read: "Pricing for Reserve Capacity in a Competitive Electricity Market", *TIMS XXXII*, Anchorage, Alaska, June 1994.
132. B.J. Ring & E.G. Read: "Pricing for Reserve Electricity Generation Capacity to Meet Stochastic Contingencies", *ORSNZ Proceedings*, 1994, p154-159.
133. E.G. Read, J.A. George & A.D. McGregor: "Dual Dynamic Programming with Lagged Variables", *ORSNZ Proceedings*, 1994, p148-153.
134. E.G. Read, B.W. Lamar, G.R. Drayton & A.J. Turner: "Non-linear Optimisation of Spinning Reserve in an Electrical Power Network", *TIMS/ORSA Joint National Meeting*, New Orleans, April 1994.
135. B.J. Ring & E.G. Read: "Short Run Pricing in Competitive Electricity Markets", *Annual Conference of the Canadian Economics Association*, Calgary, June 1994.
136. J.A. George, E.G. Read & R.E. Rosenthal: "Unit Scheduling in a Hydro-electric Power System", *INFORMS*, Los Angeles, April 1995.
137. B.J. Ring & E.G. Read: "Best Compromise Nodal Electricity Spot Pricing", *TIMS XXXIII*, Singapore, June 1995.
138. E.G. Read, B.J. Ring & T.J. Scott: "Modelling for a Deregulated Electricity Sector", *IFORS Conference on Energy Models for Policy and Planning*, London, July 1995.
139. T.J. Scott & E.G. Read: "Modelling Hydro Reservoir Operation in a Deregulated Electricity Sector", *IFORS Conference on Energy Models for Policy and Planning*, London, July 1995.
140. B.J. Ring & E.G. Read: "Using Mathematical Programming for Electricity Spot Pricing", *IFORS Conference on Energy Models for Policy and Planning*, London, July 1995.
141. B.J. Ring & E.G. Read: "Best Compromise Spot Pricing for an Electricity Market", *ORSNZ Proceedings*, 1995, p117.
142. E.G. Read: "Lessons from Modelling the New Zealand Electricity Market", Invited Presentation to the *Energy Modelling Forum WG15*, Washington DC, 1996.
143. G.R. Drayton-Bright & E.G. Read: "Using LP to Form a Market for Spinning Reserve", *ORSNZ Proceedings*, 1996, p119-124.
144. A.L. Kerr & E.G. Read: "Integer Programming Heuristics for Hydro Unit Commitment", *ORSNZ Proceedings*, 1996, p111.
145. G.R. Drayton-Bright & E.G. Read: "An Integrated Framework for Energy and Reserve Market Offers", *INFORMS*, San Diego, 1997.
146. G.R. Drayton-Bright & E.G. Read: "An Integrated Approach to Modelling Power Station Energy and Reserve Capability", *INFORMS*, San Diego, 1997.

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147. B.J. Ring, E.G. Read & A.J. Turner “The application of OR Techniques in the Certification of Software Used to Clear Electricity Markets” *APORS*, Melbourne, 1997.
148. R.J. Kaye, E.G. Read & S. Ranatunga “Risk Management using Stochastic Dynamic Programming” *APORS*, Melbourne, 1997.
149. E.G. Read & B.J. Ring “The Impact of Transmission Cost Recovery Mechanisms on Generator Investment” *IAEE Proceedings*, Quebec City, 1998.
150. Kerr, R.J. Kaye & E.G. Read, “Stochastic Dynamic Programming with Risk Aversion” *INFORMS*, Tel Aviv, 1998.
151. G.J. Bell, D. Chattopadhyay & E.G. Read “Analysis of Non-Physical Dispatch in Gas and Electricity Pricing Models”, *ORSNZ Proceedings* 1998, p145-146.
152. A.L. Kerr, E.G. Read & R.J. Kaye “Reservoir Management with Risk Aversion”, *ORSNZ Proceedings* 1998, p167-176.
153. E.G. Read & D. Chattopadhyay, “Transmission Constraints in Zonal Spot Pricing Models of Electricity Markets” *IFORS*, Beijing, 1999
154. J. Bushnell., C. Day, M. Duckworth., R. Green, A. Halseth., E.G. Read. J. Scott Rogers, A. Rudkevich T. Scott, Y. Smeer., H. Huntington. “An international comparison of models for measuring market power in electricity. *Energy Modeling Forum*, Stanford, 1999.
<http://emf.stanford.edu/files/pubs/22414/EMF17.1.pdf>
155. E.G. Read & D. Chattopadhyay, “Electricity Market Models: Lessons from Australasian Experience” *ORSNZ Proceedings 1999*, p33-42.
156. E.G. Read “Dual OR: a Partial Paradigm for the Future?” *ORSNZ Proceedings* 1999, p255-264.
157. B.B. Chakrabarti, E.G. Read & D. Chattopadhyay “Optimal Reactive Power Management in Electric Power System” *ORSNZ Proceedings*, 2000, p75-6.
158. E.G. Read, D. Chattopadhyay “Aspects of Pricing in Australasian Electricity Markets” *IAEE Proceedings* Sydney, 2000.
159. E.G. Read, D. Chattopadhyay “Electricity Market Models: Primal/Dual Formulation Issues” *ORSNZ Proceedings*, 2000, p157.
160. J.A. George, E.G. Read & A.S. Duffy “Using Cournot Gaming Models for Deciding Vesting Contracts for an Emerging Electricity Market” *ORSNZ Proceedings*, 2001, p295.
161. D. Chattopadhyay, B.B. Chakrabarti & E.G. Read “Pricing for Voltage Stability” *Proceedings of the IEEE/PICA Conference*, Sydney, 2001, pp. 235-40.
162. E.G. Read “NEM Inter-Connector Congestion: A Conceptual Framework” *ORSNZ Proceedings*, 2003
163. J. Tipping, D.C. McNickle & E.G. Read “Incorporating Storage Levels into a Model for New Zealand Spot Prices” *EPOC Winter Workshop*, Auckland, 2004
164. P. Stewart, E.G. Read & R James: “Intertemporal Considerations for Supply Offer Development in Deregulated Electricity Markets” *IAEE Proceedings*, Zurich 2004
165. J. Tipping, E.G. Read & D.C. McNickle “The Analysis of Spot Price Stochasticity in New Zealand’s Electricity Market” *IAEE Proceedings*, Zurich 2004
166. B.B. Chakrabarti & E.G. Read “Pricing Implications of Security Constrained Dispatch” *ORSNZ Proceedings*, 2004
167. E.G. Read & D. Chattopadhyay. “A Theoretical Framework for Zonal Electricity Markets” *ORSNZ Proceedings*, 2004
168. J. Tipping, D.C. McNickle, E.G. Read & D Chattopadhyay “A Model for New Zealand Hydro Storage Levels and Spot Prices” *EPOC Winter Workshop*, Auckland, 2005
169. E.G. Read “Generalising the Spring Washer Pricing Effect” *EPOC Winter Workshop*, Auckland, 2005

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170. E.G. Read, M. Thomas & D. Chattopadhyay “Risk-Adjusted Discount Rates and Optimal Plant Mix: A Conceptual Analysis for Electricity Markets” *ORSNZ Proceedings*, 2005
171. J Tipping, E.G. Read, D Chattopadhyay & D.C. McNickle “Can the shoe be made to fit? Cournot modelling of Australian electricity Prices” *ORSNZ Proceedings*, 2005
172. E.G. Read & D. Chattopadhyay “Risk-Adjusted Discount Rates and Optimal Plant Mix: A New Formulation for Electricity Market Optimisation” *ORSNZ Proceedings*, 2006
173. E.G. Read, P. Stewart, R. James & D. Chattopadhyay “Offer Construction for Generators with Inter-temporal Constraints via Markovian DP and Decision Analysis” *EPOC Winter Workshop*, Auckland, 2006
174. E.G. Read, J. Tipping & D. Chattopadhyay “Incorporating Bottom-Up Structure into Top-Down Electricity Market Models”, *IAEE Proceedings*, Wellington, 2007
175. E.G. Read & D. Chattopadhyay “A Congestion Management Mechanism for Zonal Electricity Markets” *IAEE Proceedings*, Wellington, 2007
176. E.G. Read “An LP Formulation for Inter-Island Trading of Regulation Services” *EPOC Winter Workshop*, Auckland, 2008
177. E.G. Read “An Expanded Co-optimisation Formulation for New Zealand’s Electricity Market” *ORSNZ Proceedings*, 2008
178. E.G. Read “Energy Storage Management for Upstream/Downstream Reservoir Operators” *EPOC Winter Workshop*, Auckland, 2010
179. S.R. Starkey, E.G. Read, B.J. Ring, W. Pepper & S. Dye “A Natural Gas LP Formulation to Enhance Allocation with Market Pricing Mechanisms” *ORSNZ Proceedings*, 2010
180. S.R. Starkey, S. Dye, E.G. Read, J.F. Raffensperger & B.J. Ring “Enhancing Urban Water Allocation: An Evolving Framework for Trading Stochastically” *19th Triennial IFORS Conference*, Melbourne, 2011
181. R.T. Miller & E.G. Read “The EA’s 2-Hub FTR Market” *EPOC Winter Workshop*, Auckland, 2011. <http://www.ea.govt.nz/development/work-programme/wholesale/ftr-development/events/presentations-to-epoc-workshop/>
182. E.G. Read & R.T. Miller “Possible FTR Developments” *EPOC Winter Workshop*, Auckland, 2011. <http://www.ea.govt.nz/development/work-programme/wholesale/ftr-development/events/presentations-to-epoc-workshop/>
183. S. Dye, E.G. Read, R.A Read & S.R. Starkey “Easy Implementations of Generalised Stochastic CDDP Models for Market Simulation Studies” *Proceedings 4th IEEE/Cigré International Workshop on Hydro Scheduling in Competitive Markets*. Bergen, Norway, 2012. Available at <https://www.dropbox.com/sh/mwv661hy1yotqr0/D7mvUIPBx4>
184. S.R. Starkey, S. Dye, E.G. Read, R.A Read, “Stochastic vs. Deterministic Water Market Design” *Proceedings 4th IEEE/Cigré International Workshop on Hydro Scheduling in Competitive Markets*. Bergen, Norway, 2012 Available at <https://www.dropbox.com/sh/mwv661hy1yotqr0/D7mvUIPBx4>
185. L.A. Barroso, S. Granville, P.R. Jackson, M.V. Pereira & E.G. Read “Overview of Virtual Models for Reservoir Management in Competitive Markets” *Proceedings 4th IEEE/Cigré International Workshop on Hydro Scheduling in Competitive Markets*. Bergen, Norway, 2012. Expanded version at: <http://www.psr-inc.com.br/portal/psr/iframe.html?altura=4000&url=/app/publicacoes.aspx>
186. S. Dye, P.R. Jackson, R. James, I. Mahakalanda, A. Pinto, J.F. Raffensperger, E.G. Read, RA Read & S.R. Starkey “Integrated Modelling of Electricity and Water Markets: A Progress Report From Canterbury” *EPOC Winter Workshop*, Auckland, 2012. Available at <http://www.epoc.org.nz/ww2012.html>

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187. I. Mahakalanda, S. Dye, R James, J.F. Raffensperger & E.G. Read “Using Constructive Dual DP to Clear Water Markets in a Multi-Use Catchment: An Illustrative Example” *EPOC Winter Workshop* , Auckland, 2012. Available at <http://www.epoc.org.nz/www2012.html>
188. E.G. Read, P.R. Jackson & S. Dye: “Gaming, Risk and Investment in Electricity Markets: An Antipodean Perspective” Presented to *Energy Centre Workshop*, Auckland, August 2012
189. S.R. Starkey, S. Dye, E.G. Read & R.A. Read: “Stochastic vs. Deterministic Water Market Design: Some Experimental Results” Waterways Postgraduate Student Conference. Christchurch, New Zealand, 2012
190. S. Dye, E.G. Read, R.A. Read & S.R. Starkey: “An Evaluation Tool for Reservoir Management” *ORSNZ Proceedings*, 2012 , https://secure.orsnz.org.nz/conf46/content/ORSNZ12_conference_proceedings.pdf
191. I. Mahakalanda, S. Dye, E.G. Read & J.F. Raffensperger: “Intra-period Market Clearing for a Multi-Use Catchment via CDDP” *ORSNZ Proceedings*, 2012 , p211- 219 https://secure.orsnz.org.nz/conf46/content/ORSNZ12_conference_proceedings.pdf
192. R.A. Read, S. Dye & E. G. Read “Generalized CDDP for Reservoir Management” *ORSNZ Proceedings*, 2012 , p297-306³ https://secure.orsnz.org.nz/conf46/content/ORSNZ12_conference_proceedings.pdf
193. J.F. Raffensperger & E.G. Read: “Smart Markets for Hydrological Resources: Mechanisms and Applications” Invited presentation to *Designing Water Markets for Environmental and Economic Outcomes* Carlton Connect Water Productivity and Innovation Workshop, Melbourne, 2013.
194. A. Pinto, J.F Raffensperger, T.A Cochrane, S.Dye & E.G Read. (2013) Propuesta de un modelo de mercado restringido "Smart Market" para usos del suelo considerando lluvias inciertas. Universidad de Concepción, Concepción, Chile: X Congreso del Instituto Chileno de Investigación Operativa Optima 2013 VI Red-M, 27-30 Oct 2013.
195. E.G. Read, S. Dye, S.R. Starkey, I. Mahalakanda, R.A. Read, J.F. Raffensperger & B.J. Ring “Smart Markets for Hydrological Resources: Some current work at Canterbury”, Invited presentation to *Designing Water Markets for Environmental and Economic Outcomes* Carlton Connect Water Productivity and Innovation Workshop, Melbourne, 2013.
196. I. Mahakalanda, S.Dye, E.G.Read & S.Starkey “Representing flow mixing demands in a multi-nodal CDDP model of a mixed used catchment” In Piantadosi, J., Anderssen, R.S. & Boland J. (eds) MODSIM2013, 20th International Congress on Modelling and Simulation. Modelling and Simulation Society of Australia and New Zealand, December 2013, pp. 2552–2558. ISBN: 978-0-9872143-3-1. www.mssanz.org.au/modsim2013/L5/mahakalanda.pdf
197. E.G.Read & P.R Jackson “Financial Reservoir Models: Supporting Competition in Integrated Hydro Systems” Presented to ORSNZ conference, Wellington 2014
198. I. Mahakalanda, E.G.Read, S.R. Starkey & S. Dye “Financial Hedging Instruments for Water Markets” Presented to ORSNZ conference, Wellington 2014
199. A.Miller, M.Hwang, S. Lemon, E.G. Read & A.Wood “Economics of Photovoltaic Solar Power and Uptake in New Zealand” EEA Conference, Wellington 2015.
200. I. Mahakalanda, E.G. Read & S. Dye “Financial Rights and Obligations for Water Delivery in Mixed Use Catchments” Presented to ORSNZ conference, Christchurch 2015

³ ORSNZ Young Practitioner’s Prize, Best Undergraduate Paper, 2012

Relevant Graduate Supervision

1. E. Laing “Project Management of Solar Energy Development Projects in the South Pacific” PhD Thesis (current)
2. P. Jackson “Private Investment Risk and Generation Capacity in Restructured Electricity Markets” PhD Thesis (current)
3. I. Mahakalanda “Analysis of Participant Behavior in an Integrated Electricity-Water Market” PhD Thesis (2017)
4. S. Starkey “Urban Water Scheduling – Enhancing Allocation with Market Pricing Mechanisms” PhD Thesis (2014)
5. A. Pinto “Smart Markets for Runoff and Sediment Discharge” PhD Thesis (2013)
6. R. Prabodanie “A Market Mechanism for the Optimal Control of Groundwater and Surface Water Pollution from Nitrates” PhD Thesis (2010)
7. J. Lau “The Market Impact of Wind Integration in the New Zealand Energy System” MEM Thesis (2010)
8. J. Tipping “The Analysis of Spot Price Stochasticity in Deregulated Wholesale Electricity Markets” PhD Thesis (2007)
9. P. Stewart “Inter-temporal Considerations for Supply Offer Development in Deregulated Electricity Markets” PhD Thesis (2007)
10. B. Chakrabarti “Optimal Reactive Power Management in Electric Power Systems” PhD Thesis (2004)
11. S. Batstone “Aspects of Risk Management in Deregulated Electricity Markets” PhD Thesis (2003)
12. A. Kerr “Stochastic Utility Maximising Dynamic Programming Applied to Medium-Term Reservoir Management” PhD Thesis (2003)
13. B. Painter “Optimal Design of Permeable Reactive Barrier Systems for the Remediation of Contaminated Groundwater” MSc Thesis (extended to PhD, 2002)
14. N. McSporran “Representing River Chain Capabilities for Market Purposes” BCom(Hons) Project (2001)
15. T. Jones “Electricity Demand Side Management at a Large Manufacturing Site” MEM Project (2000)
16. O. McCahon “Non-Inferior Set Scenario Analysis” PhD Thesis (2000)
17. A. Ward “Reactive Power Pricing” ME Thesis (1999)
18. G. Bell “Non-Convex Network Models and Applications to Energy Modelling” PhD Thesis (1998)
19. C. Jewell “Technology Scenarios for the Electricity Industry” MEM Project (1997)
20. J. Lindsay “Mergers and Acquisitions Strategy in the Electricity Sector” MCom Project (1997)
21. T. Scott “Medium Term Simulation of a Competitive Electricity Market” PhD Thesis (1997)
22. J. Hyde “Management of Energy Utilisation for Canterbury University” MEM Project (1996)
23. G. Drayton “Competitive Electrical Power Dispatch Development” PhD Thesis (1996)
24. B. Ring “Short Term Pricing in Decentralised Power Systems” PhD Thesis (1996)
25. M. Yang “Dual Dynamic Programming for Reservoir Management with Correlated Inflows” PhD Thesis (1995)
26. K. Papps “Positioning Trans Power's Services” MBA Project (1994)
27. A. Kahn “Energy Efficiency Services For End-Users” MBA Project (1993)
28. N. Elms and C. Taylor “Efficient Use of Electricity for Firestone” MCom Project (1992)

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29. A. McGregor "Dual Dynamic Programming: A Computational Study" MSc Thesis (1991)
30. S. Ahrens "Analysing Forest Harvesting and Management Interaction with MCDM Techniques" PhD Thesis (1988-1989 incomplete)
31. P. Cosseboom "A Coal Stockpiling Model" MCom Project (1987)
32. M. Pickup "A Network Solution for Merit Order Ranking of Thermal Power Stations" MCom Project (1987)
33. A. Gaudin and N. Gourdie "An Economic Approach to Pump Scheduling in a Cascaded Municipal Water Storage System" MCom Project (1985)