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## RÉSUMÉ

### PROFILE

Dr. Sorentino is an engineering economist specialising in the analysis of capital decisions, the economic evaluation of business, the quantitative analysis of risk of existing and new ventures and complex economic and corporate studies.

### ACHIEVEMENTS

Over the last twenty years, Dr. Sorentino has researched and published a comprehensive set of risk analysis methodologies to quantify the uncertainties of investing in the resources and energy sectors. These advanced, state-of-the-art quantitative methodologies apply to

- The evaluation of stochastic business risks,
- The econometric modelling of capital decisions under uncertainty
- The benchmarking of business performance
- The operational analysis and optimisation of costs and revenues
- Business profitability analysis.
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### RECENT EMPLOYMENT HISTORY

*Jul 88 to the present, **PRINCIPAL**, Ekos Research Pty Limited.*

Ekos Research was a consulting company specialising in business economics, feasibility studies, risk analysis and strategic economic planning. Since 1988 Dr. Sorentino has completed a number of major economic consultancies for domestic and international government agencies as well public and private companies in Australia and elsewhere. Some examples of the work authored by Dr. Sorentino are:

- *Evaluation and business appraisal of projects* such as aluminium production (Mitsui), copper mining in PNG (United Nations Development Program), evaporitic deposits in the Andean region. (Secretaría de Minería, Argentina), forestry harvesting (PNG Government), gold ore stockpiles for ATO purposes (PriceWaterhouse), gold production (Newcrest), magnesium metal production (Latrobe Magnesium), mineral sands and marble production (Technical Assistance Group of the Commonwealth Secretariat, London, UK, and Southern Africa), copper mining (PNG Government), and uranium production (CRA, North and Denison),
- *Quantitative economic risk assessment* for project engineering (Minenco), iron ore markets (Hammersley Iron), gold projects (Placer Pacific), coal mining (Denison Mines, Ulan, Mitsui), and iron ore mining costs (Robe River Mines).
- *Business and development plans* for the development of a magnesium deposit (Devex), a pigment manufacturing facility (Northern Pigments, Canada), a sodium hypochlorite production plant (ElectroQuímica, Argentina), an electronic share-trading portal (EcomPlus) and a waste-to-energy project (Ecomat).

- *Complex economic studies* such as developing an appropriate mining taxation scheme for an emerging economy (Technical Assistance Group of the Commonwealth Secretariat, London, and Southern Africa), the economic assessment of an intrinsically safe nuclear reactor. (Comisión de Energía Atómica, Argentina), the evaluation of a mining royalties regime (Denison and Acacia), an integrated supply and demand model for steel raw materials production. (POSCO, Korea), a model of Australian iron ore production, (BHP Steel and Australian Bureau of Agriculture and Resource Economics) and the profiling of the uranium production costs (Denison and North).
- *Economic evaluation of environmental externalities* such as the cost and benefit analysis of tailings disposal from in oil shale production (Esso), and uranium mining (Ranger Uranium Mines, Koongarra), as well as economic evaluation of environmental compliance (Ward Environmental Engineering, Port Stephens Council)
- Dr. Sorentino has served as an expert witness on a number of cases including advice to the NT Department of Mines and Energy and the NT Solicitor General, the Port Stephens Council, and a large mediation case for the Cracow Joint Venture.

## **PART-TIME POSITIONS**

From 1988 to 1998, Dr. Sorentino was a *Visiting Professorial Fellow* at *Macquarie University* where he developed the first remote-delivery postgraduate Master program in Australia dedicated to the quantitative analysis of capital decisions, financial risks and optimisation of projects and resources enterprises.

From 1994 to 2001, Dr. Sorentino was a *Visiting Professor* at the *Western Australian School of Mines* (Curtin University) where he lectures in capital decision analysis and financial economics.

From 2004 to 2008 Dr. Sorentino lectured at the *Faculty of Engineering of Wollongong University*.

From Jan 1996 to Dec 2009, Dr. Sorentino was Vice President of *SurMinera S.A.*, and since Dec 2009, he has been the President of this Company. *SurMinera* is an Argentinean company that owns as is developing a number of mineral resources in Argentina and elsewhere in South America.

In Dec 2004, Dr Sorentino funded *Ekeko S.A*, a mining company operating in Argentina. Dr Sorentino is the President of *Ekeko*. This company is actively engaged in Salar geology and exploration, lithium chemistry and in the extraction and commercial recovery of lithium from brines. In 2004 *Ekeko* was appointed Engineering and Development consultant to *Rincon Lithium Limited*, a fully owned subsidiary of the ASX listed *Admiralty Resources N.L.*, to develop the *Rincon Lithium Project*, now in production. For this project, *Ekeko* developed a novel extraction process using low lithium concentration crystallization process rather than the traditional saturated solution approach. In 2008, *Ekeko* was engaged by *Lithea Inc.* as Principal Consultant to carry out the exploration, engineering design, process simulation, basic engineering, and a full bankable feasibility study for the *Pozuelos Lithium Project*, work that was completed early in 2012. *Ekeko* owns a fully equipped state-of-the-art Pilot Plant capable of simulating the full process of lithium extraction from brines, The exploration and engineering studies are supported by a fully equipped laboratory that includes the latest generation of ICP and AAS spectrophotometers, auto titration equipment, advanced computer software and some of the most advanced analytical chemistry equipment in Latin America. *Ekeko* has been certified to ISO 9001 (Quality Control and Quality Assurance), ISO 14001 (Environmental Assurance) and ISO 17025

(Analytical Testing and Calibration). *Ekeko* has produced the benchmark environmental impact statement for lithium in Argentina against which other lithium companies are being benchmarked by the Government authorities.

## **QUALIFICATIONS**

Dr. Sorentino was granted his doctoral degree with a dissertation in mineral economics. He also holds a Master of Environmental Studies, a Diploma in Radioisotopes Technology and a Bachelor in Chemical Engineering:

- Doctor of Philosophy, Macquarie University (1990)
- Master of Environmental Studies, Macquarie University (1981)
- Diploma in Radioisotope Technology, Australian School of Nuclear Technology, Lucas Heights (1980)
- Bachelor of Engineering (Chemical), UNSW (1972)
- Técnico Químico, Universidad Nacional de Rosario, Santa Fe, Argentina (1966)
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## **MEMBERSHIP WITH PROFESSIONAL ASSOCIATIONS**

- Fellow, Australasian Institute of Mining and Metallurgy (FAusIMM, 1987)
- Member, Mineral Industry Consultants Association (MMICA, 1990)
- Chartered Professional (Management, 2000)
- Chartered Professional (Environment, 2000)
- Member, American Chemical Society (MACS, 2010)

Dr. Sorentino is active in a number of professional and educational associations where he performs in a voluntary capacity in the activities of these associations:

- Chairman, Mineral Industry Consultants Association Inc., 2000 to 2006.
- Vice Chairman, Mineral Industry Consultants Association Inc., 2007 to 2012.
- Foundation Chairman, Board of Chartered Professionals of the Australasian Institute of Mining and Metallurgy, 2000 to 2006.
- Member, Board of Chartered Professionals of the Australasian Institute of Mining and Metallurgy, 2006 to 2009.
- Member, Institute of Engineers Australia and Australasian Institute of Mining and Metallurgy Joint Board, 2005 to 2009.
- Member, Australasian Institute of Mining and Metallurgy Ethics Committee, 2000 to 2010.
- Member, Mining Department Planning Committee, Faculty of Engineering, University of Wollongong, 2005 to 2008.
- Honorary Associate, Department of Human Geography, Macquarie University., 1999

to the present.

## **PUBLICATIONS**

### **A) ARTICLES**

RODRÍGUEZ, E.D. (2011) *Aves de la Puna y los Altos Andes del Noroeste de Argentina. Presentación y Prefacio* por Dr. Carlos M.R. SORENTINO y Ricardo N. ALONSO. Fundación Copajira, ISBN 978-987-1618-47-7, 192 p., Mundo Editorial, Salta.

SORENTINO, C.M.R., y ALONSO, R.N. (2009-2010) *Quimismo de la yista para coqueo en Salta (Argentina)*. Revista Kallawayá, Nº 16-17, pp. 31-40. Instituto de Investigaciones en Antropología Médica y Nutricional. La Plata, Salta.

GIRALT, S., PUEYO, J.J., GIBERT, O., SORENTINO, C., ALONSO, R., TABERNER, C., FERNANDEZ-TURIEL, J.L., SAEZ, A., VALERO-GARCES, B., and MORENO, A. (2007) Sedimentological evolution of the salar del Rincon (Argentinean Puna, Argentina): *Paleoenvironmental and Paleoclimatic implications for the last 900 kyr BP*. 4th Internacional Limnogeology Congress, ILIC 2007, Barcelona.

SORENTINO, C. (2005) *Ecología vs. Ecolatría*. Mitos y Fraudes, Fundación Argentina de Ecología Científica, retrieved from <http://www.mitosyfraudes.org/Polit/ecolatria.html>

SORENTINO, C (2005) *Evaporites of the Argentinean Puna. A Rich Endowment of Industrial Minerals*. Australian Institute of Geoscientists Bulletin No. 41.

SORENTINO, C. (2004) *Certification and accreditation for mining professionals - The Australian experience*. Indonesian Mining Association. Jakarta, Indonesia.

SORENTINO, C. and OSMAN, A.H. (2003) *Certification and accreditation for mining professionals. The Australian experience for the Era of Regional Autonomy*. Mining Indonesia 2003 Conference, Indonesian Mining Association. Jakarta, Indonesia.

SORENTINO, C (2002) *Joint Venture Terms Method in Mineral Property Valuation*. The Bulletin of the Australasian Institute of Mining and Metallurgy, April 2002

SORENTINO, C.M.R AND GALLI, D.E. (2001) *Statistical methodology for the simulation of inferred and indicated sodium sulphate resources in the Salar del Rio Grande, Salta, Argentina*. VII Congreso Argentino de Geología Economica, Salta, 2001.

SORENTINO, C (2001) *Formal Mineral Assets Valuation Methods: DCF/NPV and Option Theory Methods*, Proceedings of VALMIN 01, Mineral assets valuation issues for the next millennium, The Australasian Institute of Mining and Metallurgy, Carlton, Australia; ISBN 1 875 776 869.

SORENTINO, C. (2000) *Valuation Methodology for VALMIN*, in MICA, The Codes Forum, Sydney, 2000.

SORENTINO C AND WESTON S; (1996) *The VALMIN valuation methodologies*; Centre for Minerals and Energy Economics, Occasional Papers, Macquarie University, Sydney.

SORENTINO C ET AL; (1994) *Financial Risk and Probability Analysis in Mineral Valuation*; Proceedings of VALMIN 94; The Australasian Institute of Mining and Metallurgy, Carlton, Australia; ISBN 1 875776 036.

SORENTINO C. AND BARNETT D.W. (1994) *The methodology of discounted cash flow analysis of*

*mining projects*. Proceedings of VALMIN 94; The Australasian Institute of Mining and Metallurgy, Carlton, Australia; ISBN 1 875776 036.

SORENTINO C. (1994) *Market failures in uranium prices*. Resources Policy.

LAWRENCE M.J. and SORENTINO C. (1994) *A bibliography of the valuation of Resource Assets*. ValMin 94, Australasian Institute of Mining and Metallurgy. Sydney.

BARNETT D.W and SORENTINO C. (1994) *Discounted Cash flow Methods and the Capital Assets Pricing Model*. VALMIN 94, Australasian Institute of Mining and Metallurgy. Sydney.

TAN HOCK ENG and SORENTINO, C. (1991) *Iron and steel*. Agriculture and Resources Quarterly, Vol 3 (3), 341-2, September 1991.

SORENTINO C. (1991) *Nuclear energy: its development and prospects*. 4th World Coal Outlook Conference. Macquarie University. November 1991.

1991 SORENTINO C. (1991) *Metallurgical coal: the outlook to 2010*. 4th World Coal Outlook Conference. Macquarie University. November 1991.

SORENTINO C.M.R AND BARNETT, D.W. (1990) *No new insights: Uranium in Australia, 1970-1987: An Annotated Bibliography*. O'Faircheallaigh, A. Webb and D. Wade-Marshall Australian National University, North Australian Research Unit, Casuarina, NT, Australia, 1989, 306 pp. Resources Policy, Vol 16 (2), 154-155, 1990.

SORENTINO C. (1990) *Uranium mining policy in Australia: one step forward and two steps backwards*. Resources Policy, Vol 16 (1), 3-21.

SORENTINO C. (1990) *A comedy of errors: uranium policy in Australia*. Proceedings of the Pacific Rim Congress 90. Australasian Institute of Mining and Metallurgy. Melbourne.

SORENTINO C. (1985) *Copper resistance in Hormidium fluitans (Gay-Heering) Ulotrichales, Chlorophyceae* Phycologia, Vol 2 (3).

SORENTINO C. (1979) *Mercury in marine and freshwater fish of Papua New Guinea*. Australian Journal of Marine and Freshwater Research, Vol 30, 617-23.

SORENTINO C. (1978) *The effects of heavy metals on phytoplankton - A review*. Phykos, Vol 18 (1 & 2), 149-161.

## **B) RESEARCH DISSERTATIONS**

SORENTINO C. (1991) *The economics of uranium mining in Australia*. Doctoral Thesis. Macquarie University. 1991.

SORENTINO C. (1981) *The effects of heavy metals on selected autotrophic organisms*. Master of Environmental Studies, Graduate School of the Environment, Macquarie University, 1981.

## **C) LONG ARTICLES AND BOOKS**

SORENTINO, C. (2012) *La crueldad diabólica de Lautremont*. Mundo Editorial, ISBN 978-987-1618-71-2, Salta, Argentina.

SORENTINO, C.M.R. y ALONSO, R.N. (2009) *Propiedades de las piedras, alquimia y recetas médicas en un manuscrito del siglo XIX. Quebrada de Humahuaca, Jujuy*. Instituto de

Investigaciones en Antropología Médica y Nutricional (La Plata-Salta). Mundo Gráfico Salta Editorial, ISBN 978-987-1618-01-9, 116 p. Salta.

SORENTINO C. (Editor, 2000); *Proceedings of the Minerals to 2000 Seminar*. Macquarie University Mineral and Energy Economics Centre. 1992

SORENTINO C. (Editor, 2000) *The Codes Forum: The VALMIN and JORC Codes*. Mineral Industry Consultants Association, Sydney, 2000.

SORENTINO C. (Editor, 1995) *The Supply and Demand for Iron Ore*. MUMEE, 1995.

SORENTINO C. (Editor, 1995) *Raw Materials for Steel Making: The SRM model*. MUMEE, 1995.

SORENTINO C. (1993) *Mine and property evaluation: Risk analysis*. Notes for a graduate course. Master of Minerals and Energy Economics. Macquarie University. 1993

SORENTINO C. (Editor, 1993) *Mabo and Native Titles: a new paradigm*. Macquarie University Press. Sydney. 1993.

SORENTINO C. (1993) *Analytical methods in mineral economics*. Notes for a graduate course. Master of Minerals and Energy Economics. Macquarie University. 1993

SORENTINO C. (1991) *Uranium production economics in Australia*. Multiclient Report published by Robertson Australia in association with Ekos Research. Sydney. First Edition: 1990. Second Edition: 1991.

#### **D) SOME REPRESENTATIVE CLIENT STUDIES.**

SORENTINO et al. (2012) *Fairness Opinion Report on the value of the Salares of Incahuasi and Pular*. Rock Tech Ltd., Vancouver.

SORENTINO et al. (2011) *Feasibility Study for the Salar de Pozuelos Lithium Project*. Lithea Inc, BVI.

SORENTINO et al. (2008) *Feasibility Study for the Salar de Rincón Lithium Project*. Admiralty Resources N.L., Melbourne.

SORENTINO, C. (2006) *Feasibility Study for the La Japonesita Iron Ore Project. Copiapo Chile*. Admiralty Resources N.L.

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SORENTINO, C. and STAGG, R.N. (2002) *Economic Assessment of the Latrobe Magnesium Project*. Rambora Technologies Ltd.

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SORENTINO C. (1998) *Environmental Impact Statement, Salar del Rio Grande Sodium*

*Sulphate deposit. Salta, Argentina.* SurNatron S.A. Sydney.

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SORENTINO, C. (1992) *Gold mining royalties in the Northern Territory. Expert Witness submission to the Supreme Court of the Northern Territory.* Northern Territory Solicitor General.

SORENTINO C. (1991) *The Congolone heavy mineral sands projects: Economic assessment.* Commonwealth Secretariat. London.

SORENTINO C. (1990) *Mineral taxation policy in Mozambique.* Commonwealth Secretariat. London.

SORENTINO C. (1989) *The mining potential of the Southern Andes.* SurMinera SA. Buenos Aires.

SORENTINO C. and TORPEY K. (1988) *Feasibility Study for the Koongarra project.* Denison Australia. Sydney.

SORENTINO C. (1987) *The Koongarra project: evaluation of its gold reserves.* Denison Australia. Sydney.

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SORENTINO C. (1985) *Mineral royalties in Australia.* Department of Mines and Energy. Darwin.

SORENTINO C. (1985) *Economic assessment of the Thuddungra magnesite mine.* Denison Australia Limited. Sydney.

SORENTINO C. (1983) *Koongarra Project Preliminary Feasibility Assessment (Mineral Lease Area).* Koongarra Mines Limited. Sydney.

SORENTINO C. et al (1982) *Koongarra Project. Feasibility Study. Economic Evaluation.* Koongarra Limited. Sydney.