

## RESUME

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## EDUCATION

- Ph. D.** Heat Transfer, College of Technology (now UMIST),  
Manchester, England, (Scholarship). July 1954
- B.Sc. Honors** Mechanical Engineering, Alexandria University,  
Alexandria, Egypt, May 1950 (Steam Power Award). May 1950

## POSITIONS

- 1986-Present** Mechanical Engineering Consultant.  
President, Advanced Energy Analysis (AEA)
- 1966-1986** Professor of Mechanical Engineering
- Center for Advanced Engineering Study, MIT, USA. 1979-86
  - Tripoli University, Tripoli, Libya. 1972-79
  - Glasgow University, Glasgow, Scotland, UK. 1968-72
  - Assiut University, Assiut, Egypt. 1966-69
- 1954-1966** Lecturer, Associate Professor,  
Full Professor, Chair of Thermal Power Systems,  
Assiut University, Assiut, Egypt May 1966
- 1950-1954** Graduate Student and Teaching Assistant
- College of Technology, Manchester, England. 1951-54
  - Alexandria University, Alexandria, Egypt. 1950-51

## PROFESSIONAL HONORS

### Visiting Professor:

- Glasgow University, Scotland, UK. 9/1986 - 5/69
- Thayer School of Engineering, USA. 7/1967 - 9/68
- Kansas State University, USA. 11/1966 - 6/67
- Energy Institute, Moscow, and Boiler-Turbine Institute, Leningrad, Former USSR 2/1959 - 9/59

### Invited Member/Lecturer

- Associate editor, Energy, The International Journal 2004-2010
- Member of ASME Committee on Honors 2003-2008
- International Conference on Seawater Desalination, Kuwait 11/4-7/2000
- IWTC'2000, Alexandria, Egypt. 3/ 3- 5/2000
- University "Ovidius" of Consantza , Summer School, Romania. 7/26-31/1999
- ADST First Workshop on Desalination Technologies, Alexandria, Egypt. 7/24-25/1999
- The Gordon Research Conference, Modern Develop in Thermo, Italy 4/18-23/1999
- Istanbul Technical University, a short course on Thermoeconomics 4/13-15/1999
- IWTC'98, Alexandria, Egypt.
- Desalination Seminar, Cairo, Egypt 9/ 6- 8/1997
- Arabian Gulf Regional Water Desalination Symposium, UAE. 11/1992
- The Gordon Research Conference on Thermodynamic Analysis, USA 7/1981
- System Analysis Committee, ASME, USA. 5/1981

### Recognition

- American Association of Engineering Societies 1995
- Fellow of the American Society of Mechanical Engineers 1990
- Honorary member, Solar Energy Society of Canada. 1978

### Awards

- Best Paper Presentation Award, IDA/CEDEX, Madrid, Spain  
"The Thermoeconomics of Seawater Desalination Systems" Oct. 1997
- Edward Obert Award, ASME International WAM Atlanta GA  
"Repowering Second-Law-Based Optimization" Nov. 1996
- Edward Obert Award for the best paper ASME WAM  
"High Efficiency Steam Bottoming Cycles" Nov. 1989
- Steam Power Award, Alexandria University. May 1950

## COURSES TAUGHT

### Graduate Level

- Thermoeconomics, MIT, USA. 1979-82
- Advanced Thermodynamics and Technology of Desalination  
Glasgow University, Scotland, UK. 1968-72

### Undergraduate

- Mechanisms, Thermodynamics, Heat Transfer, Refrigeration,  
Air Conditioning, and Thermal Power Systems,  
Assiut University/Egypt and Tripoli University/Libya. 1954-78

## CONSULTATIONS

### 1986-Present

- Kuwait Institute for Scientific Research, Safat, Kuwait 2006-2007
- Kuwait Institute for Scientific Research, Safat, Kuwait 2002-2003
- International Center for Water and Energy Systems, Abu Dhabi, UAE 1998-2001
- Department of Mechanical Engineering, University of Rome, Italy 1997-98
- Bechtel Power Corporation, Gaithersberg, Maryland 1995-96
- Energy Center, Marquette University, Milwaukee, WI. 1992-93
- R&D Consultant, Exergy, Inc, Hayward CA. 1987-90
- Exergy, Inc, Houston TX. 1986-87
- Fayette Manufacturing Corporation, Tracy CA. 1985-86
- Water and Electricity Department, Abu Dhabi, UAE.

### 1977-1985 USA (jointly with professor Myron Tribus)

- Celanese Corporation, Charlotte, NC. 1985
- ALCOA, ALCOA Center, PA. 1984
- Solar Energy Research Institute, Golden, CO 1981
- Proctor & Gamble, Cincinnati, OH 1980
- General Electric Research Corporation, Schenectady, NY. Jan. 1977

### 1972-1979 Libya (in the areas of setting specifications and project evaluation.)

- The National Consulting Office. 1978-79
- The Arab Development Institute. 1978-79
- The Modern Farm Complex Project. 1977-79
- The Water Resource Council. 1974-78
- Tripoli University Expansion Plan. 1972-74

### 1954-1966 Egypt (in the areas of education and industrial development programs.)

- Head of a variety of technical committees. 1954-66
- Member of the advisory committee to National Science Council. 1961-63
- Member of the committee of Assiut University Initiation Plan. 1957-61

## PROFESSIONAL AFFILIATIONS

- Member of the American Society of Mechanical Engineers (ASME) 1972-90
- Fellow of the American Society of Mechanical Engineers (ASME) 1990-present
- Member of the American society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 1977-present
- Member of International Desalination Association (IDA) 1994-present
- Program organizing, session chairing, and papers reviewing a number of scientific and engineering organizations 1981-present

## SOFTWARE DEVELOPMENT

### Compact Disc

- Energy Analysis Tools 2000

### Floppy Diskettes

- Power and Desalted Water Cogeneration Systems 1995
- An Energy Analysis Tool 1993
- Energy Systems Analyzer. 1991
- Heat Exchange Analyzer. 1989
- Thermodynamic Calculator. 1988
- Sea Water Properties and Desalting Processes. 1986

## PATENTS

- A radial Inflow Compressor for large volumetric flows (Submitted March 10 1995) Patent No.5 676 801 Oct. 14 1997

## PUBLICATIONS

- Over 60 publications in Energy System Analysis and Design, Thermal Sciences, Desalination Technology, and Education.

# PUBLICATIONS

## FROM 2001-PRESENT

Y. M. El-Sayed, 2009, “**Less Polluting and More Affordable Desalination**”, *Desalination and Water Treatment*, 12(2009), pp 169-184.

Y.M. El-Sayed, 2007, “**Fingerprinting the Malfunction of Devices**”, *International Journal of Thermodynamics*, Vol. 10 (No.2), pp 79-85.

Y.M. El-Sayed, 2007, “**The Rising Potential of Competitive Solar Desalination**”, *Desalination* 216 (2007), pp 314-324.

Y.M. EL-Sayed, 2003, “**The Mathematical Formulation of Inter-disciplinary Communication, a thermodynamic/design example**”, *International Journal of Thermodynamics* Vol. 6 (No.1), March 2003, pp1-11.

Y.M. El-Sayed, 2003, “**The Thermoconomics of Energy Conversions**”, Elsevier, Ltd., The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK.

*A book*

Y. M. El-Sayed. 2002, “**Application of Exergy to Design**”, *Energy Conversion and Management* 43 (2002) 1165-1185

K. S. Spiegler and Y. M. El-Sayed, “**The Energetics of Desalination Processes**”, *Desalination* 134 (2001) 109-128

Y. M. El-Sayed, 2001, “**Designing Desalination Systems for Higher Productivity**”, *Desalination* 134 (2001) 129-158

## FROM 1990 TO 2000

Y. M. El-Sayed, 2000, "**Designing Desalination Systems for Higher Productivity**", The International Conference on Seawater Desalination Technologies on the Threshold of the New Millennium, Kuwait November 4-7 2000.

Y. M. El-Sayed, 2000, "**The Present and the Future of Solar Desalination**", Proceedings of the Fifth International Water Technology Conference, Alexandria, Egypt IWTC, 2000, pp 331-343.

Y. M. El-Sayed, 1999, "**Thermoeconomics of Some Options of Large Mechanical Vapor Compression Units**", Desalination 125 (1999) 251-257.

Y. M. El-Sayed, 1999, "**Thermodynamics and Thermoeconomics**", International Journal of Applied Thermodynamics, Vol.2 (No.1),pp 5-18, March 1999.

Y. M. El-Sayed, 1999, "**Application of Exergy to Design**", ECOS'99, June 8-10 1999, Tokyo, Japan,  
**Keynote speaker**

Y. M. El-Sayed, 1999, "**Revealing The Cost-Efficiency Trends Of The Design Concepts Of Energy-Intensive Systems**", Energy Conversion and Management 40 (1999) 1599-1615, also ECOS'98, July 10-12 1998, Nancy, France.

Y. M. El-Sayed, 1997, "**The Thermoeconomics of Sea-Water Desalination Systems**", IDA/SEDEX, Madrid, Spain Oct 6-9 1997, Volume IV, pp 149-166  
**Award Paper.**

Y. M. El-Sayed, 1997, "**Predicting Part-Load Performance of an Energy System Concept**", TAIES'97, International Conference on Thermodynamic Analysis and Improvement of Energy Systems, June 1997, Beijing, China

Y. M. El-Sayed, 1996, "**A Second-Law-Based Optimization**", Parts 1&2, Journal of Engineering for Gas Turbines and Power, Vol. 118, October 1996, pp 693-703.

Y. M. El-Sayed, 1996, "**On The Feasibility Of Large Vapor-Compression Distillation Units**", Desalination 107 (1996), pp 13-27.

Y. M. El-Sayed, 1995, "**Repowering Second-Law-Based Optimization**", AES-Vol. 35, ASME WAM, San Francisco 1995 pp 405-421.  
**Award Paper.**

Y. M. El-Sayed, 1995, "**The Integration of Thermodynamic Analysis and Design Analysis for Optimal Thermal Design**", presented at ECOS'95, July 11-14, 1995, Istanbul, Turkiye.

K. S. Spiegler, and Y. M. El-Sayed, 1994 "**A Desalination Primer**", Balaban Desalination Publications.  
**Book**

Y. M. El-Sayed, 1993, "**Advances in the Methodologies of Optimal Thermal Design**", Desalination, 92, 1993, pp 79-101.

Y. M. El-Sayed, and M. A. Saad, 1993, "**Compounding Positive Displacement and Turbomachines for High Efficiency**", presented at the 8th International Conference for Mechanical Power Engineering, Alexandria University, Alexandria, Egypt, April 27-29 1993.

Y. M. El-Sayed, 1992, Co-editor, "**Thermodynamics and the Design, Analysis, and Improvements of Energy Systems**", AES-Vol. 27, HTD-Vol. 228, 1992.

Y. M. El-Sayed, 1992, "**Targeting an Optimal Design of Heat Exchange in a Power System**", AES-Vol. 27, HTD-Vol. 228, 1992, Thermodynamics and the Design, Analysis, and Improvement of Energy Systems, pp 347-353.

Y. M. El-Sayed, 1992, "**Heat Pump Assisted Cogeneration in Process Industries**", AES-Vol. 27, HTD-Vol. 228, 1992, Thermodynamics and the Design, Analysis, and Improvement of Energy Systems, pp 231-237.

Y. M. El-Sayed, 1992, "**A Compounding Approach for Efficiency and Design Flexibility**", ECOS'92, Proceedings of the International Symposium on Efficiency, Costs, Optimization, and Simulation of Energy Systems, Zaragoza, Spain, June 15-18 1992, pp 223-229.

Y. M. El-Sayed, and M. A. Saad, 1991, "**Computer Assisted Optimal Design of Energy Systems**", Proceedings of the 1991, ASME International Computers in Engineering Conference, August 1991, Santa Clara, CA.

Y. M. El-Sayed, 1991, "**On the Thermoconomics of Heat Transfer**", International Journal of Energy, Environment and Economics, 1991, Vol.1, No.4, pp 257-266.

Y. M. El-Sayed, 1990, "**On the Thermoconomics of Heat Transfer**", Florence World energy Research Symposium FLOWERS, Florence, Italy, May 28 - June 1 1990, Pergamon Press, pp 757-770.

## FROM 1980 TO 1989

Y. M. El-Sayed, 1989, "**High Efficiency Steam Bottoming Cycles**", ASME WAM, December 10-15 1989, San Francisco, CA, AES-Vol. 10-1, pp 35-41.

*Award Paper.*

Y. M. El-Sayed, 1989, "**A Decomposition Strategy for Thermoeconomic Optimization**", Journal of Energy Resources Technology, ASME Transactions, September 1989, Vol. 111, pp 111-120.

Y. M. El-Sayed, and R. A. Gaggioli, 1989, "**A Guide to Structural Improvement of Energy Systems**", Proceedings of the International Symposium on Thermodynamic Analysis and Improvement of Energy Systems, June 5-8 1989, Beijing, China, pp 175-183.

Y. M. El-Sayed, 1989, "**The Cost Effectiveness of Improving the Thermodynamics of Heat Transfer**", Proceedings of the 1989 ASME International Computers in Engineering Conference, July 30 - August 3, Anaheim, CA, Vol. 2, pp 343-349.

R. F. Boehm, and Y. M. El-Sayed, editors, 1989, "**Simulation of Thermal Energy Systems**", AES-Vol. 6, HTD-Vol. 124, ASME WAM, Dec. 1989, San Francisco, CA.

R. A. Gaggioli, and Y. M. El-Sayed, 1989, "**A Critical Review of Second Law Costing Methods**", Part 1 "Background and Algebraic Procedures", Part 2, "Calculus Procedures", Journal of Energy Resources Technology, ASME Transactions, March 1989, Vol. 111, pp 1-14.

Y. M. El-Sayed, 1988, "**On Exergy and Surface Requirements of Heat Transfer Processes Involving Binary Mixtures**", ASME WAM, Nov. 27 - Dec. 2 1988, Chicago, IL, AES Vol. 6, HTD Vol. 97, pp 19-24.

Y. M. El-Sayed, 1988, "**The Exergy Concept Beyond the Academic Environment**", Proceedings of the 10th Annual Industrial Energy Technology Conference, Sept. 13-15 1988, Houston Texas, pp 414-420.

Y. M. El-Sayed, 1988, "**Second Law Analysis Subprograms for the Simulators of Thermal Systems**", Proceeding of the 1988 ASME International Computers in Engineering Conference, July 31 - August 4 1988, San Francisco, CA, Vol. 3, pp 245-249.

R. A. Gaggioli, Y. M. El-Sayed, A. M. El-Nashar, and B. Kamaliddin, 1988, "**Second Law Efficiency and Costing Analysis of a Combined Power and Desalination Plant**", Journal of Energy Resources Technology, ASME Transactions, Vol. 110, June 1988, pp 114-118.

Y. M. El-Sayed, and R. A. Gaggioli, 1988, "**The Integration of Synthesis and Optimization for the Conceptual Design of Energy Systems**", Journal of Energy Resources Technology, ASME Transactions, Vol. 110, June 1988, pp 109-113.

Y. M. El-Sayed, 1987, "**An Approach to the Optimal Synthesis of Energy Intensive Systems**", paper 87-JPGC-Pwr-6, The Joint ASME/IEEE Power Generation Conference, Miami Beach, Florida, Oct 4-8, 1987.

Y. M. El-Sayed, 1987, "**Flow Diagram Optimization of an Energy System, A two-Level Approach**", Proceedings of the 1987 ASME International Computers in Engineering Conference, August 9-13 1987, New York, NY, Vol.3, pp 35-39.

A. Kalina, M. Tribus, and Y. El-Sayed, 1986, "**A Theoretical Approach to the Thermo-physical Properties of Two-Miscible-Component Mixtures for the Purpose of Power cycles Analysis**", ASME WAM, Anaheim, CA, December 7-12 1986, paper 86-WA/HT-54.

Y. M. El-Sayed, and M. Tribus, 1985, "**Thermodynamic Properties of Water-Ammonia Mixtures; Theoretical Implementation for Power Cycles Analysis**", ASME WAM, Miami Beach, Florida, November 17-22 1985, AES-Vol. 1, Analysis of Energy Systems Design and Operation, pp 89-95.

Y. M. El-Sayed, and M. Tribus, 1985, "**A Theoretical Comparison of Rankine and Kalina Cycles**", ASME WAM, Miami Beach, Florida, November 17-22 1985, AES-Vol. 1, Analysis of Energy Systems Design and Operation, pp 97-102.

Y. M. El-Sayed, 1983, "**Redesigning Energy Intensive Systems for a Dual Purpose**", 18th IECEC, August 1983, Vol. 5, pp 2085-2091.

Y. M. El-Sayed, and M. Tribus, 1983, "**Strategic Use of Thermoconomics for System Improvement**", Chapter 11, Efficiency and Costing, R. Gaggioli, Editor, ACS Series Symposium Series No. 235, 1983.

M.M. Fikry and Y.M. El-Sayed, 1982, "**Towards Improved Evaluation of Industrial Projects in a Developing Country**", Journal of Engineering and Applied Sciences, Pergamon Press, Vol.1, No. 4, 1982, pp 273-282.

Y. M. El-Sayed, and M. Tribus, 1981, "**Specific Strategy for the Improvement of Process Economics Through Thermo-economic Analysis**", Second World Congress of Chemical Engineering, Montreal, Canada, October 9-14 1981, Vol. 2, Paper 6.8.5, pp 278-281.

Y. M. El-Sayed, and M. Tribus, 1981, "**The Strategic Use of Thermo-economic Analysis for Process Improvement**", AIChE National Meeting, Detroit, Michigan, August 1981.

M. Tribus, and Y. M. El-Sayed, 1980, "**Thermo-economic Analysis of an Industrial Process**", ILP Publication, M.I.T., December 1980.

Y. M. El-Sayed, and R. S. Silver, 1980, "**Fundamentals of Distillation**", Chapter 2, Part A, Principles of Desalination, K. S. Spiegler and A. D. Laird, Editors, Academic Press, 1980.  
*Book*

## FROM 1959-1979

Y. M. El-Sayed, 1978, "**Thermoeconomic Optimization of Dual-Purpose Power-Desalting Plants**", Proceedings of the 6th International Symposium on Fresh Water from the Sea, Las Palmas, Grand Canaria, Vol. 1, 1978, pp 357-367.

Y. M. El-Sayed, 1977, "**On the Optimization of Systems with Water Re-use**", Desalination 23, 1977, pp 515-525.

S. K. Shakshooki, and Y. M. El-Sayed, 1977, A Note: "**A Recipient View of Rational Technology Transfer**", Transfer of Nuclear Technology Conference, April 1977, Shiraz, Iran.

S. Abughres, and Y. M. El-Sayed, 1977, "**Engineering Education for a Developing Country**", First Engineering Conference, Tripoli University, February 1977.

S. K. Shakshooki, J. Jawad, Y. Matar, and Y. M. El-Sayed, 1976, "**Desalting Saline Water for Agriculture**", First Desalination Conference of the American Continent, October 25-29 1976, Mexico City, Mexico, paper II-7.

Y. M. El-Sayed, and S. K. Shakshooki, 1976, "**Integrated Complexes and Developing Countries**", 5th International Symposium on Fresh Water from the Sea, Algero, May 16-20 1976, Vol. 1, pp 131-140.

Y. M. El-Sayed, and A. Bawani, 1976, "**The Concept of Reynolds Flux in Reverse Osmosis Passages**", 5th International Symposium on Fresh Water from the Sea, Algero, May 16-20 1976, Vol. 4, pp 239-248.

Y. M. El-Sayed, 1973, "**On the Transfer of Mass and Momentum in Reverse Osmosis Separation Processes**", Bulletin of the Faculty of Engineering, Tripoli University, 1973, Vol. 2, No. 1, pp 30-42.

R. Muncaster, R. S. Silver, and Y. M. El-Sayed, 1973, "**Irreversible Thermodynamics in Relation to Desalination**", 4th International Symposium on Fresh Water from the Sea, Heidelberg, Former West Germany, September 9-14 1973, Vol. 1, pp 381-389.

Y. M. El-Sayed, 1973, "**An Information Theory Approach to Non-Equilibrium Thermodynamics**", Journal of Applied Mechanics, Transactions ASME, Vol. 40, Series E, No. 4, January 1973, pp 868-872.

R. S. Silver, Y. M. El-Sayed, and W. T. Hanbury, 1971, "**Education for Desalination**", Pan Arab Symposium on Desalination, November 6-9 1971, Cairo, Egypt.

Y. M. El-Sayed, and R. B. Evans, 1970, "**Thermoeconomics and the Design of Heat Systems**", Journal of Engineering for Power, Transactions ASME, Vol. 92, Series A, No. 1, 1970, pp 27-35.

Y. M. El-Sayed, and A. J. Aplenc, 1970, "**Application of the Thermo-economic Approach to the Analysis and Optimization of a Vapor Compression Desalting System**", Journal of Engineering for Power, Transactions ASME, Vol. 92, Series A, No. 1, 1970, pp 17-26

Y. M. El-Sayed, 1968, "**On the Use of Exergy and Thermo-economics in the Design of Desalination Plants**", Report, Thayer School of Engineering, Dartmouth College, Hanover, NH, January 1968.

Y. M. El-Sayed, 1966, "**Energy Requirements for Thermal Desalting Processes**", Egyptian Society of Engineers Technical Bulletin, Cairo, 1966.

Y. M. El-Sayed, 1965, "**Introduction to Saline Water Conversion**", Assiut University Publication, 1965, Assiut, Egypt.

Y. M. El-Sayed, 1964, "**Thermal Engineering Data Book for Students, Metric System**", Assiut University Publication 1964, Assiut, Egypt.

Y. M. El-Sayed, 1960, "**Engineering Education in USSR**", A Report, National Research Council, Cairo, Egypt, 1960.

Y. M. El-Sayed, 1959, "**Coefficients of Heat Transfer in Condensation**", Assiut University Bulletin 1959, Assiut, Egypt.

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