

# CURRICULUM VITAE

## of Dr. ANDREAS KORAS

### Personal Data

Date of Birth : 03.05.58

Marital Status : Married, 2 children

Residential Address : 21 Artemidos str, Helioupolis, 163 43, Greece

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### Professional Occupation

2017 – Today : Technical Director of A2Z Energy Solutions

Apr 2011 – Dec 2012: Technical Director of IDEA INVESTMEMTS SA.

Sep 2001 – 2016 : Free Lancer and Consultant for numerous companies and investors on the development of RES projects (e.g. TRITON ENERGY SA, GREENTOP ENERGY SA, etc.)

Aug 2000 – Today : Lecturer of Aerodynamics, Fluid Mechanics and Flight Mechanics in Greek Air-Force Academy.

Jun 2007 – Mar 2011 : Director of both the Project Development Dept, and the Wind Dept of the EOLFI WIND HELLAS SA, owned by the French company VEOLIA.

Sep 2001 – May 2007: Director of the Project Development, Sales and Public Relations in various Greek companies affiliated to REPOWER SYSTEMS AG. Vice president of the Board of Directors in one of the above companies, named REPOWER-DIEKAT SA, a joint venture of REPOWER SYSTEMS AG with the Greek construction company DIEKAT SA.

Apr 1990 – Aug 2001 : Researcher, Project Developer, Project Manager and Project Coordinator in the Centre for Renewable Energy Sources.

Sep 1990 – Jul 2000 : Adjunct Teacher of Aerodynamics and Fluid Mechanics in Greek Air-Force Academy.

Oct 1990 – Jul 1998 : Part Time Wind Energy Expert in DG XVII of the Commission of the EU

Sep 1988 – Mar 1990 : Part Time Technical Expert in ALCOGAS Ltd

## **Education**

1983 – 1988 : Ph.D. Degree in Theoretical Aerodynamics, Un. of Patras, Greece. (10.0/10.0)

1981 - 1982 : Certificate of Graduate Studies in Theoretical Physics, National Nuclear Research Center “Democritus”, Athens, Greece. (7.5/10.0)

1976 - 1981 : Bachelor of Physics, Un. of Athens, Greece. (7.27/10.00)

## **Graduate Specialization Courses**

June 1985 : Summer School on “Principles of Wind Energy Conversion”, Imperial College, London, U.K. This summer school included various lessons and laboratory exercises related to the theory, mathematical and experimental models of the aerodynamic performance of a wind turbine rotor and the measurement and determination of the wind potential.

August 1983 : Summer School on “Renewable Energy Sources”, Un. of Patras, Greece. This summer school included the economic and technical assessment of the various methods and techniques for the exploitation of Renewable Energy Sources. Also the Greek energy problem was analyzed and various solutions, methods and techniques were proposed and discussed.

July 1983 : Summer School on “Renewable Energy Sources for Developing Countries”, International Center for Theoretical Physics, Trieste, Italy. This summer school included various lessons and laboratory exercises related to methods and techniques for the exploitation of Renewable Energy Sources. Also the energy problem was analyzed and various solutions, methods and techniques were proposed and discussed.

## **Foreign Languages**

English (100%), French (50%)

## **Scientific Publications**

1. G. Politis, A. D. Koras, "A Performance Prediction Method for Ducted Medium Loaded Horizontal Axis Wind Turbines", J. Wind Engineering, Vol. 19, No5, 1995.
2. C. Georgalas, A. D. Koras, S. Raptis, "Parametrization of the Power Enhancement Calculated for Ducted Rotors with Large Tip-Clearance", J. Wind Engineering, Vol. 15, No. 3, 1991.
3. A. D. Koras, "Theoretical Study on Aerodynamic Performance of Annular Flow Augmentors", Ph.D. Thesis, Un. Of Patras, Patras, Greece, 1989.
4. A. D. Koras, C. Georgalas, "Calculation of the Influence of Annular Augmentors on the Performance of a Wind Rotor", J. Wind Engineering, Vol. 12, No. 4, 1988.
5. C. Georgalas, A. D. Koras, "Calculation of Wind Flow through Thin Annular Augmentors of Very High Aspect Ratio", J. Wind Engineering, Vol 11, No. 4, 1987.
6. A. D. Koras et All, "The Modelling and Development of Wall Fired Pulverized Coal Burners for Pollutant Emissions Control", JOUF0023, FP2-JOULE 1, CORDIS Database, Center for Renewable Energy Sources, 1990-1993.
7. A. D. Koras et All, "Energy Saving and Pollution Abatement in Glass-Melting Furnaces, Cement Kilns and Baking Ovens", JOUE0051, FP2-JOULE 1, CORDIS Database, Center for Renewable Energy Sources, 1990-1994.
8. A. D. Koras et All, "Improvement of Energy Efficiency in Glass-Melting Furnaces, Cement Kilns and Baking Ovens", JOU20107, FP3-JOULE 2, CORDIS Database, Center for Renewable Energy Sources, 1993-1996.
9. A. D. Koras et All, "Expert System for Energy Efficiency and Pollution Abatement in Industry", JOE3950040, FP4-NNE-JOULE C, CORDIS Database, Center for Renewable Energy Sources, 1996-1998.
- 10.C. Chourpouliadis, E. Ioannou, A. Koras, A. Kalfas, "Comparative Study of the Power Production and Noise Emissions Impact from two Wind Farms", Energy Conversion and Management, 60:233-242, Aug. 2012.
- 11.C. Efthymiou, M. Santamouris, D. Kolokotsa, A. Koras, "Development and Testing of Photovoltaic Pavement for Heat Island Mitigation", Solar Energy, Vol. 130, Jun 2016.
- 12.T. Lekas, A. D. Koras, "Ice Formation on a 3-D Wing Immersed in a Potential Flow", submitted for publication.

- 13.G. Politis, A. D. Koras, "Aerodynamic Design of a Stall Regulated Wind Rotor", under publication.
- 14.A. D. Koras, book on Wind Energy under publication.
15. A. D. Koras, G. Georgantopoulos, Incompressible Aerodynamics, ISBN 960-7888-70-7
16. A. D. Koras, G. Georgantopoulos, Compressible Aerodynamics, ISBN 960-7888-71-5
17. A. D. Koras, Aerodynamics for Low Speed Aircrafts, under publication

### **Presentations in Conferences**

1. A. D. Koras, "Effective Legislative and Political Measures for the Energy Sector in Greece", Kick-off Conference and Exhibition for the EU Renewable Energy Strategy, 26-27 May 1999, RAI Congress Forum, Amsterdam, The Netherlands. Presentation : A. D. Koras, Language : English.
2. A. Karagiannis, J. Panagopoulos, A. D. Koras " Prediction of the Air Flow over Urban Areas using CFD Techniques", 5<sup>th</sup> National Conference for the Renewable Energy Sources, Vol. A, pp. 68 -77, Democretaus Research Centre, Athens, 6-8 November 1996. Presentation : A. Karagiannis, Language : Greek.
3. A. D. Koras, "Energy Saving and Polution Abatement in a Cement Kiln", Energy and Environment, European Conference and Exhibition, 5-7 Dec. 95, Marseill, France. Presentation : A. D. Koras, Language : English.
4. T. Lekas, A. Koras, G.A. Georgantopoulos, "Hydromagnetic Flow through a 3-D Duct", XVIII International Congress of Theoretical and Applied Mechanics, Aug. 1992, Technion Israel Institute of Technology, Haifa, Israel. Presentation : A. Koras, Language : English.
5. C. Georgalas, G. Masouros, A. D. Koras, S. Troiannos, "A Locally Implementable Wind Rotor, Design, and Prototype Construction", 2nd European Symposium on "Soft Energy Sources and Systems at the Local Level", pp. 16-21, İct. 1989, Chania, Greece. Presentation : C. Georgalas, Language : English.
6. C. Georgalas, A. D. Koras, "Theoratical Study of Annular Flow Augmentors", Panellenic Conference with European Participation on "Applications of Solar Energy", Patra 1987. Presentation : A. D. Koras, Language : Greek.
7. C. Georgalas, A. D. Koras, S. Troiannos, "Construction and Performance Rating of a Bicycle Type Windturbine", Panellenic Conference with European Participation on "Applications of Solar Energy", Patra 1987. Presentation : A. D. Koras, Language : Greek.
8. C. Georgalas, A. D. Koras, S. Troiannos, Á. Gardikis, "Estimation of Wind Potential in a Rural Area", Panellenic Conference with European Participation on "Applications of Solar Energy", Patra 1987. Presentation : A. D. Koras, Language : Greek.

9. C. Georgalas, A. D. Koras, S. Troiannos, "Prediction and Optimization of the Efficiency of the Rotor of a Horizontal Axis Windturbine", 2nd National Conference on "Renewable Energy Sources", Volume B, Pag. 515-522, Salonica 6-8 Nov. 1985. Presentation : A. D. Koras, Language : Greek.
- 10.A. D. Koras, "The Influence of an Augmentor on the Efficiency of a Wind Rotor", Wind Energy Conference of ISES, Athens, Greece, 1984. Presentation : A. D. Koras, Language : English.

### **Professional Activities**

His scientific and professional experience has been gained since 1983, (when he started working on his Ph.D. thesis), through a continuous involvement in various activities in universities, research centers and one private company. This experience is related to a) the development and/or transfer of both know-how and technology and b) the application and promotion of energy and environmental technology. His experience includes :

- Technical management of research, demonstration and investment projects. (Duration ~25 years)
- Technical management of energy policy projects, including the analysis of energy statistical data and the setting-up of energy strategies. (Duration ~12 years)
- Setting-up, writing and submission of proposals for funding from research, demonstration and investment European or national programs. (Duration ~12 years)
- Evaluation of proposals for funding from research, demonstration and investment European or national programs. (Duration ~8 years)
- Research aiming at modeling of subsonic, compressible, turbulent, one- or two-phase fluid flows using Euler or Navier-Stokes equations. (Duration ~8 years)
- Research aiming at modeling of subsonic, incompressible, one- or two-phase fluid flows around lifting or non-lifting bodies, using vortex theory. (Duration ~7 years)
- Development of numerical codes for the numerical simulation of the above fluid dynamics problems. (Duration ~15 years)

Since 1983 he has been involved in the projects and activities below, having the following role:

1. Energy Consultant in A2Z Energy Solutions, specialized in the Development of Energy Projects and Fixing of Energy Electronics, May 2017 - today

2. Energy Consultant in GREENTOP SA, specialized in the Development of Renewable Energy Projects, Sep 2011 – today
3. Energy Consultant in PAVLIDIS SA, specialized in the Development of Renewable Energy Projects, Jan 2012 - today
4. Technical Director of IDEA INVESTMENTS SA. Jan 2010 – Sep 2011
5. Project Manager and/or Technical Consultant for the Development and/or Evaluation of various wind farms in Greece of a total capacity more than 1300 MW for various enterprises and investors. 2001 - today
6. Project Manager and/or Technical Consultant for the Development and/or Evaluation of PV farms in a total capacity more than 180 MW. 2007 - today
7. Director of the Project Development Dept, and the Wind Dept of the EOLFI WIND HELLAS SA, owned by the French company VEOLIA. The main goal of this activity is the development of wind farms at a total capacity of 400 MW until the end of 2012. Jun 2007 – Mar 2011
8. Director of Project Development in AIOLIKI REPOWER SA and REPOWER DIEKAT SA (both subsidiaries of the German REPOWER SYSTEMS AG) for the development of 7 wind farms in Greece (49.5 MW in total). The commencement date of the projects was the 01.09.01. Vice President of the Board of Directors Directors in one of the above companies, named REPOWER-DIEKAT SA, a joint venture of REPOWER SYSTEMS AG with the Greek construction company DIEKAT SA.
9. Scientific responsible and technical manager of the project entitled «Estimation of the External Cost of the Energy Technologies in Greece», for the British company AMBIO Ltd. The project was funded by the Copelouzos Group. (2003-2004).
10. Participation to a vast number of National and European Committees, related to the interception of measures and the planning of energy policies for the promotion of the RES and Energy Saving both in Greece and European Union. In these committees he participated as representative of CRES. (1990 – 2001).
11. Technical Consultant of the Municipality of Evrostini for Energy and Environmental aspects. 2001 – 2003.
12. Technical Consultant of Ecologiki Ependytiki SA for the Energy aspects of the technologies represented by the company, including Waste Water Treatment Plants, Sludge Dryers, Municipal Solid Waste Gasifiers. 1994 – 2003.
13. Scientific Responsible and Project Manager for the Project entitled «Determination of the Energy Policy and Use of RES» for the PANAFON/VODAFON company. The project was realized in the Center for Renewable Energy Sources and its duration was 12 months (1999 - 2000). Setting-up, writing and submission of the proposal by A. D. Koras.

14. Scientific Responsible in CRES for the Environment Project ENV4/CT97/597, entitled “Quantification and Control of Toxic Metals Enriched Sub-micron Particles and Selected Chlorinated Compound Emissions from Alternative Fuel-Fired Cement Kilns”, funded by D.G. XII of the Commission of the European Union in the framework of the program ENVIRONMENT. The project is realized in the Center for Renewable Energy Sources and its duration is 36 months (1998 - 2000). Setting-up, writing and submission of the proposal by A. D. Koras.
15. Scientific Responsible in CRES for the SAVE project SA/98-267/FR, entitled “End-Use Measurement Campaigns of Electricity Specific Uses in the Residential Sector”, funded by D.G. XVII of the Commission of the European Union in the framework of the program SAVE. The project is realized in the Center for Renewable Energy Sources and its duration is 24 months (1999 - 2000). Setting-up, writing and submission of the proposal by A. D. Koras.
16. Coordinator of three related to each other projects, entitled a) “Determination of the technically and economically exploitable wind potential in Greece”, b) “Determination of the technically and economically exploitable hydroelectric potential in Greece” and c) “Development of geographic information system for the determination of the technically and economically exploitable renewable sources potential in Greece”, all of them funded by the Ministry of Development in the framework of the second Community Framework of Support. The projects are realized in the Center for Renewable Energy Sources and their duration is 36 months (1998 - 2000).
17. Scientific Responsible in CRES for the research project PL973102, entitled “Transformations of Inorganic Constituents leading to Slagging and Fouling in a Cotton Ginning Residues Fired Combined Heat and Power Plant”, funded by D.G. XII of the Commission of the European Union in the framework of the program CRAFT-JOULE. The project was realized in the Center for Renewable Energy Sources and its duration was 5 months (1998). Setting-up, writing and submission of the proposal by A. D. Koras.
18. Scientific Responsible in CRES for the SAVE project SA/31/96/NL entitled “Implementation of Hot-Fill Equipment for Washing Machines and Dishwashers in Domestic Dwellings in The Netherlands, United Kingdom and Greece”, funded by D.G. XVII of the Commission of the European Union in the framework of the program SAVE. The project was realised in the Center for Renewable Energy Sources and its duration was 12 months (1996 - 1997). Setting-up, writing and submission of the proposal by A. D. Koras.
19. Scientific Responsible in CRES for the SAVE project SA/61/95/GR entitled “Greek Awareness of the Energy Labeling of Domestic Appliances and especially of Refrigerators and Freezers”, funded by D.G. XVII of the Commission of the European Union in the framework of the program SAVE. The project was realized in the Center for Renewable Energy Sources and its duration was 16 months (1996 - 1997). Setting-up, writing and submission of the proposal by A. D. Koras.

20. Scientific Responsible in CRES for the project entitled "Improvement of the Combustion Processes in the Lignite Power Stations of PPC", funded by PPC. The project was realized in the Center for Renewable Energy Sources and its duration was 14 months (1996 - 1997). Setting-up, writing and submission of the proposal by A. D. Koras.
21. Responsible in the Rational Use of Energy Sector of CRES for the managerial project CRAFT-JOULE. The aim of this project was the coordination between scientific and industrial partners throughout EU for a) the determination of common research targets and b) the submission of proposals for funding in the framework of the program CRAFT-JOULE. The project was funded by the D.G. XII of the Commission of the European Union and its duration was 16 months (1996-1997). He coordinated, wrote and submitted 4 proposals, in which 4 Greek and 5 European small and medium enterprises, 3 universities and 1 research center were involved.
22. Scientific Responsible in CRES for the JOULE project JOE3-CT95-0040 entitled "Expert System for Energy Efficiency and Pollution Abatement in Industry", funded by D.G. XII of the Commission of the European Union in the framework of the program JOULE. The project was realized in the Center for Renewable Energy Sources and its duration was 24 months (1996 - 1998). Setting-up, writing and submission of the proposal by A. D. Koras.
23. Evaluator of research and demonstration proposals in the framework of the National Programs PAVE and PENED (1996-1997).
24. Scientific Responsible in CRES for the THERMIE B 0788/96/GR entitled "Promotion of Energy Efficient Technologies in High Temperature Industries in the Central and Eastern European Countries", funded by D.G. XVII of the Commission of the European Union in the framework of the program THERMIE. The project was realized in the Center for Renewable Energy Sources and its duration was 18 months (1995 - 1997). Setting-up, writing and submission of the proposal by A. D. Koras.
25. Part time employment (40%) in the Center for Renewable Energy Sources as Technical Expert of demonstration projects in the framework of the program THERMIE Technical Management. The activity was funded by the D.G. XVII of the Commission of the European Union and its duration was about 6 years. (1994 - 1999).
26. Scientific Responsible in CRES for the JOULE project JOU2-CT92-0107 entitled "Improvement of Energy Efficiency in Glass Furnaces, Cement Kilns and Baking Ovens", funded by D.G. XII of the Commission of the European Union in the framework of the program JOULE. The project was realized in the Center for Renewable Energy Sources and its duration was 24 months (1993 - 1995). Setting-up, writing and submission of the proposal by A. D. Koras.
27. Scientific Responsible in CRES for the JOULE project JOUE-0051-C(SMA) entitled "Energy Efficiency and Pollution Abatement in Glass Furnaces, Cement Kilns and Baking Ovens", funded by D.G. XII of the Commission of the European Union in the framework of the program JOULE. The project was realized in the Center for Renewable Energy



Sources and its duration was 50 months (1990-1995). Setting-up, writing and submission of the proposal by A. D. Koras.

28. Scientific Responsible in CRES for the JOULE project JOUF-0023-C(EDF) entitled "Modelling of Pulverized Coal Burners for Power Plants", funded by D.G. XII of the Commission of the European Union in the framework of the program JOULE. The project was realized in the Center for Renewable Energy Sources and its duration was 36 months (1990-1993).
29. Part time (25%) employment in D.G.XVII of the Commission of the European Union as Technical Expert in Wind Energy sector. The responsibilities included evaluation and technical management of demonstration projects in the framework of the program THERMIE (1990-1994).
30. Technical responsible for the pay-roll of the army personnel of the Greek Air Force (13500 employees) in the Computer Center of the General Headquarters, during its military services (1988-1990).
31. Technical Expert in the private company ALCOGAS Ltd., which was activated in the promotion of industrial combustion systems and combined heat and power systems, fired on NG, LPG or town gas. (1988-1989)
32. Part time (50%) participation in the project "EOLOS", referred to the prediction of the Wind Potential in Greece. The project was funded by Public Power Corporation, was realized in Un. of Patras, Patras, Greece and had duration 16 months (1987-1988).
33. Full time participation in project referred to the design, control and installation of a Windturbine rated at 5 KW. The project was funded by the Agricultural Bank of Greece, was realized in the Un. of Patras, Patras, Greece, and had duration 2 years (1985-1987).

### **Teaching Experience**

1. "Aerodynamics and Fluid Mechanics" in Hellenic Air Force Academy as a lecturer (2000 - today)
2. "Aerodynamics and Fluid Mechanics" in Hellenic Air Force Academy as an adjunct professor (1990 - 2000).
3. "Introduction to Wind Energy" in various seminars organized by the Ministry of Education and the Hellenic Center of Productivity as a Wind Energy Expert (1985-1992).
4. "Energy Saving and Pollution Abatement in Industrial Furnaces" in seminars organized by the Center for Renewable Energy Sources as an Energy Efficiency Expert (1992 - today).
5. "Laboratory Exercises in General Physics and Fluid Mechanics" in the Dept. of Physics, Un. of Patras, Greece, as a Teaching Assistant (1985-1988 and 1990).