

CURRICULUM VITAE

NAME / STATUS: **Mads Pagh Nielsen** / Married to Heidi Venstrup Nielsen, teacher at Vesthimmerlands Gymnasium&HF in Aars in Mathematics, Chemistry and Biology) and have three sons aged 9 (Harald), 7 (Anders) and 4 (Peder) years.

POSITION: Associate Professor, Ph.D., Head of Section of Thermal Energy Systems

ADDRESS: Kærhavegårdvej 79, 9270 Klarup

PHONE: +45 99409259 (work direct) / +45 24255093 (mobile phone) / +45 98181823 (private phone)

E-MAIL: mpn@et.aau.dk

AGE: 42 years old, born April 24th 1974 in Brørup, Southern Denmark

EDUCATION:

Degrees:

- 1999 (June): 1999 (June): M.Sc. degree in mechanical engineering specialized in thermal systems, thesis: "Design of Combined Heat and Power Plants", AAU ET, Aalborg University
- 2005 (February): Ph.D. degree, Mech. Eng., thesis: "Modelling and optimization of PEM fuel cell systems", AAU ET, Aalborg University

Pedagogical Training and Management Courses:

- 2007 Completed the internal pedagogical training course for Assistant Professors at Aalborg University, guided by technical supervisor, Professor Lasse Rosendahl and pedagogical supervisor Søren Justesen (former headmaster at "Aalborg Tekniske Gymnasium").
- 2014 (February) Participated in AAU Info-visit and meetings in Brussels regarding H2020 project applications.
- 2015 (July) Completed a One Day Course for managers on how to perform Annual Performance and Development Reviews (MUS).
- 2015 (October) Completed the internal One Day Ph.D. Supervision Course at AAU-ET.
- 2016 (March) Completed the internal AAU course "Handling of complicated personal matters" (2 parts).

Other Educational Activities:

- 1993 Drivers License for Passenger Vehicles (Category B) / 1994 Certificate for driving and using fork lifts (AMU-center, Esbjerg).
- 1994 Served my Compulsory Service in the Royal Danish Airforce at Airbase Karup and Airbase Skrydstrup.
- 1999 (June-July) Summer School Course in Milling, Turning and CNC-machine programming. Aalborg University, Dept. of Mechanical Engineering.
- 1999 (February-June) completed the supplementary master level course in Business Economics III at Aalborg University.
- 1999 (February-June) completed the supplementary master level course "Normative Decision Theory and Bayesian Networks" at dept. of computer science, Aalborg University.
- 2000 (January) L-AUS certification for engineers (authorization to perform measurements on high voltage electrical equipment).
- 2000 (October). Completed Ph.D. course "Modelling and simulation of energy systems and process plants", DTU, Lyngby (2.5 ECTS).
- 2001 Completed the Ph.D. course "CO₂-emissioner från industrien", Chalmers, Sverige (2 ECTS).
- 2001 Completed the course in "Patenting of Inventions" at Patent- og varemærkestyrelsen, Tåstrup (2.5 ECTS).
- 2001 Completed the Ph.D. course "Energy integration between society and industry", advanced course in optimization of thermal energy systems using integer optimization (MINLP-programming). At Helsinki University of Technology (HUT), Finland (7 ECTS).
- 2002 Completed the Ph.D. course "Writing and reviewing of scientific papers" (3.75 ECTS) Aalborg University.
- 2002 Completed the Ph.D. course and NEFP seminar "Sustainable production of Synthesis gas", Copenhagen (2 ECTS).
- 2002 Completed the Ph.D. course and Summer School "Towards a Hydrogen-based Society", in Humlebæk arranged by DTU (3 ECTS).
- 2003 Completed the Ph.D. course "CFD modelling in Fluent", Aalborg University (3 ECTS).

PERSONAL PROFILE

Since 2006, I have been married to Heidi with whom I have 3 wonderful sons!

My educational background is within mechanical engineering specializing in modelling and optimization of thermal energy systems. My particular interests lie primarily within the topic modelling and optimization of fuel cell systems, heat- and power supply systems, refrigeration systems and various industrial energy systems or chemical processing plants.

As Head of the Section of Thermal Energy Systems at the Department of Energy Technology, I am responsible for the development and performance of the section employees as well as organising teaching and furthering our joint competencies in the field of thermal systems.

Through participation in several external development projects through my employment as researcher and working in industry, I have long experience with industrial collaboration.

In particular, I love teaching students through our PBL-model at AAU and see the very rewarding feeling of progress they get during their studies! I was fortunate enough to be allowed to teach quite a lot from the start of my academic career, so I have long experience within teaching and supervision.

An integral part of research at university level is to contribute to society and it is essential that the teaching of our students is based on the latest scientific findings in academia but also reflects our industrial research collaboration. I participate actively in several academic and industrial networks nationally and locally at AAU.

In my spare time, I am participating actively in the local community through my interest in dancing (for 4 years I was heading the board of "Aalborg Salsa Association" – a non-profit "umbrella organization" promoting Latin dance activities and private dancing related initiatives in Aalborg).

Music has always played a major role to me. During the past ten years, I have been singing in "Aalborg Koncertkor" (Aalborg Concerto Choir) as a tenor. For many years, I have been playing the piano, guitar and drums in various bands ranging from classical music to jazz and rock.

Among other favourite hobbies are Computer Programming, Mountain Biking, Chess, Genealogy, Badminton and Cross Country Skiing.

I am in the board of the national Cystic Fibrosis Association and the head of the board in the local Cystic Fibrosis Association in Northern Jutland. My eldest son, Harald, has this serious genetic disease requiring extensive medical and physiotherapeutic treatment.

In my spare time, I am a member of Aalborg City Rotary Club.

Research Gate RG-score (includes journals and other types of scientific interaction as conference publications, endorsements, interest in publications etc.): **23.80** (Percentile: Higher than 77.5% of the RG-Members). See https://www.researchgate.net/profile/Mads_Nielsen4

SCOPUS H-index: 13 (primarily journal publications - lists 32 publications which have been cited 500 times by 370 publications).

I10-Index: 19 / H-index: 14 (81 pubs & 697 citat. – see https://scholar.google.com/citations?hl=en&user=cHX5DQ4AAAAJ&view_op=list_works)

The majority of the journal publications are published in high impact factor journals (IF>3; for instance Energy~4.9, Biomass and Bioenergy~3.4, Journal of Power Sources~5.2, International Journal of Hydrogen Energy~3.3, Applied Energy~5.6, Energy Conversion and Management~4.4).

Publications (including internal and industrial reports)

95. Performance Evaluation Of A Hp/Orc (Heat Pump/Organic Rankine Cycle) System With Optimal Control Of Sensible Thermal Storage / Carmo, Carolina; Dumont, Olivier; Nielsen, Mads P.; Elmegaard, Brian. Accepted for the 16th Int. Refrigeration and Air Cond. Conf. at Purdue, 2016.

94. Energy Performance and Economic Evaluation of a HP/ORC (heat pump/organic Rankine cycle) system with different hot water tank storage configurations. / Carmo, Carolina; Dumont, Olivier; Nielsen, Mads Pagh; Elmegaard, Brian. ECOS 2016 - 29th International conference.

93. Assessment of Emerging Renewable Energy-based Cogeneration Systems for nZEB Residential Buildings. / Carmo, Carolina; Dumont, Olivier; Nielsen, Mads Pagh; Elmegaard, Brian. CLIMA2016 : 12th REHVA World Congress. REHVA: Fed. of European Heating and Air-cond. Ass., 2016.

92. Modelling membrane hydration and water balance of a PEM fuel cell. Vincenzo Liso; Mads Pagh Nielsen. Conference paper for the EFC15 conference and oral presentation. European Fuel Cell - Piero Lunghi Conference & Exhibition - Naples, December 16th-18th, 2015.

91. Performance of a reversible heat pump / organic Rankine cycle unit coupled with a passive house to get a Positive Energy Building. Olivier Dumont, Carolina Carmo, Valentin Fontaine, François Randaxhe, Sylvain Quoilin, Vincent Lemort, Brian Elmegaard, Mads P. Nielsen. Journal Paper to be published in Journal of Building Performance Simulation (Taylor and Francis Publishers), 2015. (Submitted Journal Paper – In Review).

90. Modeling and experimental validation of water mass balance in a PEM fuel cell stack. / Liso, Vincenzo; Araya, Samuel Simon; Olesen, Anders Christian; Nielsen, Mads Pagh; Kær, Søren Knudsen. In: International Journal of Hydrogen Energy, 2015. (Accepted Journal Paper – In Press).

89. Empirical Platform Data Analysis to Investigate how Heat Pumps Operate in Real-Life Conditions. / Carmo, Carolina; Elmegaard, Brian; Nielsen, Mads Pagh; Detlefsen, N. Proc. of 24th IIR International Congress of Refrigeration (ICR2015). International Institute of Refrigeration IIR/IIR, 2015.

88. Modeling and experimental validation of water mass balance in a PEM fuel cell stack. / Liso, Vincenzo; Araya, Samuel Simon; Olesen, Anders Christian; Nielsen, Mads Pagh; Kær, Søren Knudsen. In: International Journal of Hydrogen Energy, 2015.

87. Modeling and optimization of a heat-pump-assisted high temperature proton exchange membrane fuel cell micro-combined-heat-and-power system for residential applications./Arsalis, Alexandros; Kær, Søren Knudsen; Nielsen, Mads Pagh. Applied Energy, Vol. 147, 06.2015, p. 569-581.

86. Modelling and Validation of Water Hydration of PEM Fuel Cell Membrane in Dynamic Operations. / Liso, V.; Nielsen, M. P. ECS Transact. 2015.

85. Modelling of a solid oxide fuel cell CHP system coupled with a hot water storage tank for a single household. / Liso, Vincenzo; Zhao, Yingru; Yang, Wenyuan; Nielsen, Mads Pagh. Energies, Vol. 8, No. 3, 20.03.2015, p. 2211-2229.

84. Solid oxide fuel cell performance comparison fuelled by methane, MeOH, EtOH and diesel surrogate C8H18. / Liso, Vincenzo; Cinti, Giovanni ; Nielsen, Mads Pagh; Desideri, Umberto . Applied Thermal Engineering, 2015. (Accepted Journal Paper – In Press).

83. MEGADRIVE "Fuel cells for large material handling vehicles". Report-3 – Design of 100kW-1MW Fuel Cell Systems. Final report for the EUDP project MEGADRIVE (proj. no. 64012-0130) / Mads Pagh Nielsen, Vincenzo Liso, Henrik Mortensen, Zhe Zhang. December 2014.

82. Energineutralt Byggeri – Tekniske løsninger. Editors: Søren Østergaard Jensen & Kim B. Wittchen. / C. Milan, M. P. Nielsen et al. Final technical report from the ZEB DSF-project, 2014 (http://www.zeb.aau.dk/digitalAssets/99/99238_web_110402-tekniske-l-sninger.pdf).

81. CEESA 100% Renewable Energy Transport Scenarios towards 2050 : Technical Background Report Part 2. / Mathiesen, Brian Vad; Connolly, David; Lund, Henrik; Nielsen, Mads Pagh; Schaltz, Erik; Wenzel, Henrik; Bentsen, Niclas Scott; Felby, Claus; Kaspersen, Per; Ridjan, Iva; Hansen, Kenneth. Department of Development and Planning, Aalborg University, 2014. 102 p. (report).

80. Choosing the right technology: Optimized design of renewable supply systems for residential houses. Milan, C; Nielsen, M. Pagh; Bojesen, C. Progress in Sustainable Energy Technologies. ed. I. Dincer; A. Midilli; H. Kucuk. Springer Publishing Company, 2014. p. 227-245 (book chapter).

79. Local versus national: Designing supply systems for individual net zero energy buildings with flexible electricity prices. / Milan, Christian; Nielsen, Mads Pagh; Bojesen, Carsten. In: W I T Transactions on Ecology and the Environment, Vol. 190, No. 2, 04.2014, p. 763-776.

78. Proceedings of the 55th Conference on Simulation and Modelling (SIMS 55), Modelling, Simulation and Optimization, 21-22 October 2014, Aalborg, Denmark. Editors: Mads Pagh Nielsen, Kim Sørensen, Alireza Rezania Kolai. Publisher: Lindköping University Electronic Press.

77. Modeling of a membrane based humidifier for fuel cell applications subject to End-Of-Life conditions. Nielsen, Mads Pagh; Olesen, Anders Christian; Menard A. Presented conference paper for SIMS55 – the 55th International Conference on Simulation and Modeling at AAU, Oct. 2014.

76. Feasibility Study and Techno-economic optimization Model for Battery Thermal Management System. Khan, Rezwani; Nielsen, Mads Pagh; Kær, Søren Knudsen. Submitted conference paper for SIMS55 – the 55th International Conference on Simulation and Modeling at AAU, Oct. 2014.

75. Smart Grid enabled heat pumps: An empirical platform for investigating how residential heat pumps can support large-scale integration of intermittent renewables. Carmo, Carolina; Detlefsen, Nina; Nielsen, Mads Pagh. Presented at the ICAE2014 – the 6th International Conference on Applied Energy to be held May 2014 (was pick to be among the "best papers" and suggested for journal publication).

74. Influence of anodic gas recirculation on solid oxide fuel cells in a micro-combined heat and power system. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. Sustainable Energy Technologies and Assessments, 2014.

73. Thermal modeling and temperature control of a PEM fuel cell system for forklift applications. / Liso, V.; Nielsen, M. P.; M., H. H.; Kær, S. K.. International Journal of Hydrogen Energy, 2014.

72. Application of an improved operational strategy for a high temperature-proton exchange membrane fuel cell-based micro-combined heat and power system for Danish single-family households. Arsalis, A; Nielsen, M P; Kær, S K. In: App. Thermal Eng., Vol. 50, No. 1, 2013, p. 704-713.

71. Dynamic Thermal Model And Control Of A PEM Fuel Cell System. Liso, Vincenzo; Nielsen, Mads Pagh. Proceedings of EFC2013./Viviana Cigolotti; Chiara Barchiesi; Michela Chianella. Italian National Agency for New Tech., Energy&Sustainable Economic Development, 2013. EFC13138.

70. Influence of anodic gas recirculation on solid oxide fuel cells in a micro-combined heat and power system. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. In: International Journal of Energy Research, 2013.

69. Local versus National – Designing Supply Systems for Individual Net Zero Energy Buildings with flexible electricity prices. / Milan, Christian; Bojesen, Carsten; Nielsen, Mads Pagh. 2013. Paper presented at International Conference on Energy and Sustainability, Bucharest, Romania.

68. Optimization of a high temperature PEMFC-based micro-CHP system by formulation and application of a process integration methodology. / Arsalis, Alexandros; Nielsen, Mads Pagh; Kær, Søren Knudsen. In: Fuel Cells, 2013.
67. Technology data for high temperature solid oxide electrolyser cells, alkali and PEM electrolyzers. / Mathiesen, Brian Vad; Ridjan, Iva; Connolly, David; Nielsen, Mads Pagh; Vang Hendriksen, Peter; Bjerg Mogensen, Mogens; Højgaard Jensen, Søren; Dalgaard Ebbesen, Sune. Department of Development and Planning, Aalborg University, 2013. 16 p.
66. A cost optimization model for 100% renewable residential energy supply systems./Milan, C.; Bojesen, C.; Nielsen, M. P. Energy, 2012.
65. Biomasse til transportsektoren. / Mathiesen, Brian Vad; Connolly, David; Lund, Henrik; Nielsen, Mads Pagh; Schaltz, Erik; Wenzel, Henrik; Bentsen, Niclas Scott; Felby, Claus; Kaspersen, Per; Hansen, K. Robust og bæredygtig bioenergi. red. / Torben Skøtt. Biopress Ltd, 2012. s. 32-33.
64. Choosing the Right Technology - Optimized Design of Renewable Supply Systems For Residential Houses. / Milan, Christian; Bojesen, Carsten; Nielsen, Mads Pagh. Proceedings of the 11th International Conference on Sustainable Energy Technologies 2012. Vancouver, 2012.
63. Continuous production of bio-oil by catalytic liquefaction from wet distiller's grain with solubles (WDGS) from bioethanol production. / Toor, Saqib; Rosendahl, Lasse; Nielsen, Mads Pagh; Glasius, Marianne; Rudolf, Andreas ; Iversen, Steen Brummerstedt. Biomass & Bioenergy.
62. Ejector design for recirculation of anode gas in a micro Combined Heat and Power system based on Solid Oxide. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. Applied Thermal Engineering, 2012.
61. Influence of anodic gas recirculation on solid oxide fuel cells in a micro-combined heat and power system. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. International Journal of Energy Research, 2012.
60. Modeling and optimization of a 1 kWe HT-PEMFC-based micro-CHP residential system. / Arsalis, Alexandros; Nielsen, Mads Pagh; Kær, Søren Knudsen. International Journal of Hydrogen Energy, Vol. 37, Nr. 3, 01.02.2012, s. 2470-2481.
59. Optimization of a high temperature PEMFC-based micro-CHP system by formulation and application of a process integration methodology. / Arsalis, Alexandros; Nielsen, Mads Pagh; Kær, Søren Knudsen. Energy Conversion and Management, 2012.
58. An optimization methodology for the design of renewable energy systems for residential net zero energy buildings with on-site heat production. / Milan, Christian; Bojesen, Carsten; Nielsen, Mads Pagh. Proceedings of the 6th Dubrovnik Conference on Sustainable Development of Energy Water and Environmental Systems (SDEWES 2011). Dubrovnik, 2011.
57. Analysis of the impact of Heat-to-Power Ratio for a SOFC-based mCHP system for residential application under different climate regions in Europe. / Liso, V; Zhao, Y; Brandon, N; Nielsen, M P; Kær, S K. Int. Jour. of Hydrogen Energy, Vol. 36, Nr. 21, 2011, s. 13715-13726.
56. Modeling and off-design performance of a 1 kWe HT-PEMFC (high temperature-proton exchange membrane fuel cell)-based residential micro-CHP system for Danish single-family households./Arsalis, A.; Nielsen, M. P.; Kær, S. K.. Energy, Vol. 36, Nr. 2, 02.2011, s. 993-1002.
55. Modeling and parametric study of a 1 kWe HT-PEMFC-based residential micro-CHP system. / Arsalis, Alexandros; Nielsen, Mads Pagh; Kær, Søren Knudsen. International Journal of Hydrogen Energy, Vol. 36, Nr. 8, 04.2011, s. 5010-5020.
54. Performance comparison between partial oxidation and methane steam for SOFC micro-CHP systems. / Liso, Vincenzo; Olesen, Anders Christian; Nielsen, Mads Pagh; Kær, Søren Knudsen. Energy, Vol. 36, Nr. 7, 07.2011, s. 4216-4226.
53. Modeling of the stratified hot water tank. Industrial project report made for the SOFC-project with Dantherm Power A/S & Haldor Topsøe on the numerical & analytical modeling of an advanced multi-input-output stratified hot-water storage tank for a SOFC system, March 2011.
52. Integrated HT-PEMFC and multi-fuel reformer for micro CHP. Final report of ForskEL project (ID 010104). Sigurdsson, H., Kær, S. K., Arsalis, A., Nielsen, M. P. and Korsgaard, A.
51. Fundamental modeling of the plate heat exchanger multi fuel reformer to assess maldistribution – Appendix Report related to the multi-fuel-reformer development project assessing maldistribution in a catalyst coated plate heat exchanger with catalytic afterburner, January 2010.
50. Designing and optimization of a micro CHP system based on Solid Oxide Fuel Cell with different fuel processing technologies. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. Proceedings of the 3rd European Fuel Cell Technology & Applications Conference. ASME, 2009.
49. Evaluation of different system configurations for solid oxide fuel cell-based micro-CHP generators in residential applications. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. 2009. Paper and poster presented at European Fuel Cell Forum 2009, Lucerne, Schweiz.
48. Experimental study and modeling of degradation phenomena in HTPEM fuel cell stacks for use in CHP systems. / Nielsen, Mads Pagh; Andreasen, Søren Juhl; Rasmussen, Peder Lund; Kær, Søren Knudsen. Proceedings of the Hydrogen and Fuel Cells Conference (HFC) in Vancouver. Canadian Hydrogen and Fuel Cell Association, 2009.
47. Modeling and simulation of a residential micro-CHP system based on HT-PEMFC technology. / Arsalis, Alexandros; Nielsen, Mads Pagh; Kær, Søren Knudsen. Proceedings of the third European fuel cell technology&applications conference. American Soc. of Mechanical Engineers, 2009.
46. Operation strategy for solid oxide fuel cell systems for small-scale stationary applications. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. Proceedings of the Hydrogen + Fuel Cell 2009. 2009.
45. Operation strategy for solid oxide fuel cell systems for small-scale stationary applications. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. International Journal of Green Energy, Vol. 6, Nr. 6, 2009, s. 583-593.
44. Fremtidens Energi i Region Nordjylland (baggrundsrapport). Riise, J. C., Rosendahl, L., Nielsen, M. P., Wormslev, E., m.fl. Nordjysk Innovations og Kompetencecenter for Vedvarende Energi. November 2009.
43. Energivisioner for Region Nordjylland. Riise, J. C., Rosendahl, L., Nielsen, M. P., Pedersen, J. K., Jensen, B. J., Kær, S. K., Wormslev, E., Lund, H., Korsgaard, A., m.fl. Nordjysk Innovations og Kompetencecenter for Vedvarende Energi. November 2009.
42. Proceedings of SIMS 50: 50. International Conference of Scandinavian Simulation Society. Modeling of Energy Technology. Elmegaard, B., Veje, C., Nielsen, M. P., & Mølbak, T. (Eds.) (2009). Published Kgs.Lyngby: DTU Mekanik.
41. Reforming processes for micro combined heat and powersystem based on solid oxide fuel cell. / Liso, Vincenzo; Nielsen, Mads Pagh; Kær, Søren Knudsen. Proceedings of SIMS 50. Scandinavian Simulation Society, 2009.
40. Experimental Evaluation of a Pt-based Heat Exchanger Methanol Reformer for a HTPEM Fuel Cell Stack. / Andreasen, Søren Juhl; Kær, Søren Knudsen; Nielsen, Mads Pagh. ECS Transactions, Vol. 12, Nr. 1, 2008, s. 571-578.
39. Modeling and Implementation of a 1 kW, Air Cooled HTPEM Fuel Cell in a Hybrid Electrical Vehicle. / Andreasen, Søren Juhl; Ashworth, Leanne; Remón, Ian Natanael; Rasmussen, Peder Lund; Nielsen, Mads Pagh. ECS Transactions, Vol. 12, Nr. 1, 2008, s. 639-650.
38. Part one: a novel model of HTPEM-based micro-combined heat and power fuel cell system. / Nielsen, Mads Pagh; Kær, Søren Knudsen; Korsgaard, Anders. International Journal of Hydrogen Energy, Vol. 33, Nr. 7, 2008, s. 1909-1920.

37. Part two: control of a novel HTPeM-based micro combined heat and power fuel cell system. / Nielsen, Mads Pagh; Kær, Søren Knudsen; Korsgaard, Anders. *International Journal of Hydrogen Energy*, Vol. 33, Nr. 7, 2008, s. 1921-1931.
36. Structural analysis of Catliq® bio-oil produced by catalytic liquid conversion of biomass. / Toor, Saqib Sohail; Rosendahl, Lasse; Nielsen, Mads Pagh; Rudolf, Andreas. 2008. Poster session presented at 4th Int. Conf. on Renewable Resources and Biorefineries (RRB4), Rotterdam, Holland.
35. Experimental evaluation of a Pt based heat exchanger methanol reformer for a HTPeM fuel cell. / Andreasen, Søren Juhl; Nielsen, Mads Pagh; Kær, Søren Knudsen. *Proceedings of the Fuel Cell Seminar 2007*.
34. Detailed experimental characterization of a reformat fuelled PEM stack. / Korsgaard, Anders; Nielsen, Mads Pagh; Kær, Søren Knudsen. *Proceedings of the Nordic PEM Fuel Cell Conference in Stockholm, 2006. Nordic PEMFC, 2006*.
33. Development and validation of a CFD-based steam reformer model. / Kær, Søren Knudsen; Dahlqvist, Mathis; Saksager, Anders; Bang, Mads; Nielsen, Mads Pagh; Korsgaard, Anders. *Proceedings of the Fuel Cell Seminar 2006 Conference. Fuel Cell Seminar, 2006*.
32. Development and validation of a CFD-based steam reformer model. / Kær, Søren Knudsen; Dahlqvist, Mathis; Saksager, Anders; Bang, Mads; Nielsen, Mads Pagh; Korsgaard, Anders. 2006. Poster session presented at Fuel Cell Seminar 2006 Conference, Honolulu, Hawaii, USA.
31. Development of a 400 W High Temperature PEM Fuel Cell Power Pack: Fuel Cell Stack Test. / Andreasen, Søren Juhl; Bang, Mads; Korsgaard, Anders; Nielsen, Mads Pagh; Kær, Søren Knudsen. *Proceedings of the Fuel Cell Seminar 2006 Conference. Fuel Cell Seminar, 2006*.
30. Development of a 400 W High Temperature PEM Fuel Cell Power Pack - Modelling and System Control. / Andreasen, Søren Juhl; Bang, Mads; Korsgaard, Anders; Nielsen, Mads Pagh; Kær, Søren Knudsen. 2006. Poster session presented at Fuel Cell Seminar 2006 Conf., Honolulu, Hawaii.
29. Experimental characterization and modeling of an ethanol steam reformer. / Mandø, Matthias; Bovo, Mirko; Nielsen, Mads Pagh; Kær, Søren Knudsen; Korsgaard, Anders. *Proceedings of the Fuel Cell Seminar 2006 Conference. 2006*.
28. Experimental characterization and modeling of an ethanol steam reformer. / Mandø, Matthias; Bovo, Mirko; Nielsen, Mads Pagh; Kær, Søren Knudsen; Korsgaard, Anders; Bang, Mads. 2006. Poster session presented at Fuel Cell Seminar 2006 Conference, Honolulu, Hawaii, USA.
27. Experimental characterization and modeling of commercial polybenzimidazole-based MEA performance. / Korsgaard, Anders; Refshauge, R. H.; Nielsen, Mads Pagh; Bang, Mads; Kær, Søren Knudsen. *Journal of Power Sources*, Vol. 162, Nr. 1, 2006, s. 239-245.
26. Markedsscreening af naturgasreformere. (PSO) / Thomsen, J.; Nielsen, Mads Pagh; Kær, Søren Knudsen. 2006.
25. Modeling of CO influence in PBI electrolyte PEM fuel cells. / Korsgaard, Anders Risum; Nielsen, Mads Pagh; Bang, Mads; Kær, Søren Knudsen. *Proceedings of the 4th International ASME Conference on Fuel Cell Science, Engineering & Technology. American Soc. of Mech. Eng., 2006*.
24. Brint og fremtidens energiteknologier. / Nielsen, Mads Pagh. *Foreningen for energi og miljø - orientering*, Nr. 46, 2005.
23. Brintpillen og andre energibærere. / Nielsen, Mads Pagh; Bang, Mads. Dokument publiceret i "Ingeniøren", September 2005.
22. Modeling of CO poisoning in a PEM Fuel Cell Anode. / Martín-Peirá, Angel; Nielsen, Mads Pagh; Herguido, Javier. 2005. Poster session presented at EHEC 2005 "2nd European Hydrogen Energy Conference", Zaragoza, Spanien.
21. Modeling Of Proton Exchange Membrane Fuel Cell Systems. (Ph.D. Thesis) / Nielsen, M P. Dept. of Eng. Tech., AAU, 2005. 237 pages.
20. Modelling and Optimization of Reforming Systems for use in PEM Fuel Cell./Berry,M.;Korsgaard,A.;Nielsen,M.P. HFC Conference, 2004.
19. Optimizing the Heat Exchanger Network of a Steam Reforming System. / Nielsen, Mads Pagh; Korsgaard, Anders Risum; Kær, Søren Knudsen. *Proceedings of the SIMS 2004 Conference, 2004. s. 181-188*.
18. Universitet lukker brændselscellesystemer ud af laboratoriet. / Nielsen, Mads Pagh. *Elteknik : elektronik, automation og energi*, 2004.
17. A Transient 2D-Model of a Natural Gas Steam Reformer. / Nielsen, Mads Pagh; Kær, Søren Knudsen. 2003. Poster session presented at Hydrogen and Fuel Cells 2003 Conference and Trade Show, Vancouver, BC, Canada.
16. 3 kW Direkte Methanol brændselscellegenerator. Nielsen, P., Odgaard, M., Nielsen, M. P., Bang, M., Moth, K. Vonsild, A. Report, 2003.
15. Hydrogen Production For Fuel Cell Applications, Internal AAU report and course-note material (can be sent upon request), 2003.
14. Global Modeling of the AEV. Mads Pagh Nielsen. Classified ECN (Energieonderzoek Centrum Nederland) report written related to the development of an »All Electrical Vehicle«, industrial project. ECN, Clean Fossil Fuels Div., ECN, Holland, 2002. Document Ref.: ECN-SF 72475 02-P001.
13. Modeling of the Thermal Properties of Military Grade F76 Diesel. Mads Pagh Nielsen. Internal ECN report (can be sent upon request). Energieonderzoek Centrum Nederland, Petten, Holland, 2002. Document Reference: ECN-I-02-004.
12. Usage of the NASA – Lewis Code for the calculation of the chemical equilibrium of Diesel reforming. Mads Pagh Nielsen. Internal ECN report (can be sent upon request). Energieonderzoek Centrum Nederland, Petten, Holland, 2002. Document Reference: ECN-I--02-003.
11. Development of a general transient reformer model – application to modelling a catalytic partial oxidation reformer. Mads Pagh Nielsen. Internal ECN report (can be sent upon request). Energieonderzoek Centrum Nederland, Petten, Holland, 2002. Document Reference: ECN-I--02-002.
10. Modelling a PEM Fuel Cell Natural Gas Reforming System. / Nielsen, M. P.; Kær, S. K. *Proceedings of the ECOS conference 2003, DTU*.
9. Evaluation of a combined PEM fuel cell and absorption air-conditioning system. J. Andersen and M.P. Nielsen and M. Bang. *Proceedings of the International Sorption Heat Pump Conference; Shanghai, Jiao Tong University, Beijing, China; 2002*.
8. Modelling of Thermodynamic Fuel Cell Systems. / Nielsen, Mads Pagh; Bang, Mads; Bach, Inger Palsgaard. *Proceedings of SIMS'2001, the 2001 Conference of the Scandinavian Simulation Society, Porsgrunn, Norway, Oct. 2001. 2001. s. 223-240*.
7. The General Non-Linear Problem. Lecture notes made for the thermal energy specialization at Department of Energy Technology, 2000.
6. Modelling of Thermal Energy Systems (using the multi-gate approach). Lecture notes for the thermal energy M.Sc. at AAU ET, 2000.
5. Optimal Operation in CHP-Systems - using Mathematical Programming and Heuristic Rules. / Iversen, Frank Krogh; Nielsen, Mads Pagh; Grue, Jeppe; Nielsen, Anders Busk; Andersen, Jens Møller; Bach, Inger Palsgaard. *Proceedings of the ASME Advanced Energy Systems Division, 2000: AES. Vol. 40. udg. American Society of Mechanical Engineers, 2000. s. 405-412*.
4. Teknisk/økonomisk udredning i forbindelse med Aalborg Kommunes Spildevandspumpestationer. Mads Pagh Nielsen. Industrial report and spreadsheet made for the municipality in Aalborg to clarify tax-payment for comfort heating in waste-water stations near Aalborg, Intecon A/S, 2000.
3. Energieffektivt spånsugningsanlæg i træindustrien. Informationsprojekt ("information project") public funded project (by ENS - the Danish Energy Authorities). Mads Pagh Nielsen. Several documents, spreadsheets & presentations, Intecon A/S, 1999-2000.
2. Dimensionering og driftsoptimering af industrielt kraftvarmeværk. Mads Pagh Nielsen. Industrial report including more than 10 other documents with technical documentation written while I was advisory engineer related to the implementation of a wood-fired CHP system, Intecon A/S, 1999.
1. Driftsoptimering af kraftvarmeværker. / Iversen, Frank Krogh; Nielsen, Anders Busk; Nielsen, Mads Pagh; Supervised by Andersen, Jens Møller and Bach, Inger Palsgaard. M.Sc. Thesis, Aalborg University, 1999.

PROFESSIONAL EXPERIENCE:

- 1999: Energy Advisor at the specialist advisory engineering company Intecon A/S in Aalborg employed as project responsible for several industrial projects within optimization of various industrial energy systems including industrial heat, power and cooling supply systems as well as various HVAC-systems. Have carried out both theoretical and practical work (measurements) related to industrial energy systems.
- 2000 (October)-2003 (October): Ph.D. student at Aalborg University, Dept. of Energy Technology (LTPEM fuel cell system modelling).
- 2002: Employed as stagier at ECN (Energieonderzoek Centrum Nederland), Holland. Div. of Clean Fossil Fuels (modelling of reforming systems at LTPEM systems including auxiliary equipment – for instance detailed modeling of water management, heat exchangers, humidifiers, reforming etc.).
- 2003 (October) – 2006 (October): Assistant Professor at Aalborg University, Dept. of Energy Technology.
- 2006 (October)-present: Associate Professor at Aalborg University, Dept. of Energy Technology. Head of Section of Thermal Energy Systems. Specialist in thermal systems, heat pumps, refrigeration technology, fuel cell systems and general synthesis, optimization and modelling of thermal/chemical systems.

PROFESSIONAL ACTIVITIES:

Current internal administrative duties at ET and AAU:

- Head of section of thermal energy systems at Aalborg University, Department of Energy Technology (since 2003 responsible for the section budget and assignment of teaching obligations – from 2015 now including management responsibility for the development and performance of the employees in the section of thermal energy systems at Department of Energy Technology, AAU).
- Member of the Energy Study Board at AAU-ET (has been a member as long as the N-study board has existed and was very active in the shaping of the study programmes in energy technology). I have also been involved in the recent accreditation process at AAU.
- Department-appointed member of the safety committee at AAU ET (since 2003).
- Coordinator and Co-founder of the HYTEC (Fuel Cells and Hydrogen Technology) M.Sc. Specialisation at AAU.
- Have until recently been involved in the study revision board related to the education in Techno-Anthropology at AAU (TAN). The aim has been to increase the technical content of the education. This has resulted in increased supervision activities from ET at the TAN education (1st-9th semester), some examiner duties at TAN and a specific technical course on "Energy Systems" which has been taught at TAN3, TAN5 and TAN6.
- Member of the "Solution Hub" interdisciplinary coordination group at Aalborg University (since September 2013 – currently these activities are on "standby").

Professional external scientific activities:

- In the editorial board of the open access journal "Frontiers in Energy Research" as Review Editor in the field of Fuel Cells.
- Member of the board of DKSIM – the Danish Simulation Society which is a part of the international SIMS.
- Acting member in the board of SIMS (the international simulation and modelling society). Have participated in two board meetings in 2015 representing Denmark.
- In the international scientific committee of the international Clima 2016 conference to be held in Aalborg in May 2016.
- Co-organizer of the 50th annual International SIMS-conference on modelling and Simulation in Denmark in 2009 (50 years SIMS anniversary), the 55th SIMS-conference in October 2014 which was hosted by AAU-ET and held in Aalborg (see <http://sims55.aau.dk>) and in the International Program Committee of the 56th SIMS conference in Lindköping, Sweden, 2015.
- Has been in the scientific committee of several international conferences on modelling of thermal and chemical energy systems. Among others ECOS, SIMS and various Fuel Cell & Hydrogen conferences.
- Frequent reviewer for several international scientific journals within thermal and chemical energy systems such as: International Journal of Hydrogen Energy, Applied Energy, Journal of Power Sources, Energy, SIMPRA Journal and Energies.

Teaching, Student Supervision and Presentations:

(See Teaching Portfolio for details: http://vbn.aau.dk/services/cv/export/Mads%20Pagh%20Nielsen%20Undervisningsportfolio.pdf?id=223569842&locale=en_GB)

Ph.D. level:

- Have taught and co-organized several Ph.D. courses. Most recently "Engineering Economics and Techno-Economics Optimization and Modelling" (on the use of linear and non-linear continuous/discrete mathematical programming in design of thermal energy systems), AAU, March 2014 and "Modelling and Optimization of Thermal Process Systems" in 2011 (heat exchanger network synthesis in thermal systems).
- I am currently supervising 1 industrial Ph.D. student and have supervised/co-supervised 6 completed Ph.D. studies at AAU-ET. From primo 2016 I will supervise a recently employed Ph.D. student related to the SYNFUEL project in collaboration with DTU and Haldor Topsøe.
- Have been opponent at 8 public Ph.D. defences (4 at DTU/RISØ and 4 at AAU-ET – 4 as chairman of the assessment committee) and moderator at 7 defences at AAU.

M.Sc./B.Sc. level:

- Have supervised 112 students in M.Sc. projects and more than 200 B.Sc. students. Mainly at Dept. of Energy Technology but also at department of Mechanical and Manufacturing Engineering and the recently initiated education in Techno-Anthropology under School of Eng. and Sci.
- Have taught in several courses in mechanical/thermal engineering topics at AAU since 1999 including subjects as Thermodynamics, Modelling and optimization of thermal cycles, Refrigeration & Heating Technology, Heat- and Mass transfer, Chemical Reactors and Mixing, Fuel Processing Technology, Dynamic Modelling of Thermal Systems, Optimization of Thermal Systems, Biomass Conversion, Fuel Cell Modelling, Hydrogen Technology, Energy Economics, Sustainable Energy Technology etc. A detailed list of the courses can be found in my Teaching Portfolio.

Other Teaching Activities:

- Have since 2001 three times participated as lecturer in "Livslang Uddannelse" giving lectures on the energy technologies of the future.
- Have since 2009 participated in "Elevuniversitetet" SKUB teaching primary school pupils with the intention to enhance their interest in science.
- Have participated in "Brobygning" and "Studiepraktik" several times as lecturer, coordinator or arranging experiments for the visiting pupils.
- External supervisor of several high-school-level projects (tværfaglige studieretningsopgaver) in the fields of various energy systems.
- Have given lectures and lab-tours to numerous high-school-classes and students from other Danish universities almost every year since 2000.
- Have given presentations related to for instance organisations and networks like Dansk Industri, IDA, CEES, FFE&M and other private and governmental organisations operating in the field of energy technology.
- Have written and participated in several articles to Danish technical magazines and newspapers as well as radio interviews.
- Have frequently represented the Department of Energy Technology in relation to external visits.

CURRENT AND PAST PARTICIPATION IN RESEARCH PROJECTS AND INDUSTRIAL R&D COLLABORATIONS

I am currently project leader or have been project leader at AAU-ET of the following external projects:

- "Bop-OP" EUDP project in collaboration with Dantherm Power developing thermal systems for fuel cells. Initiated in 2015 (ends primo 2017).
- "HyFlexDrive" EUDP project in collaboration with Dantherm Power, CEMTEC and M-Field (Taiwan/Denmark). Development of efficient and durable fuel cell systems for the substitution of batteries in Forklifts (several Danish companies participate as end-consumers of the technology).
- "SYNFUEL" Innovation Foundation project in collaboration with DTU, Haldor Topsøe, Danish Energy and AVL in Graz, Austria. Production of Synthetic Fuels using Power-To-Gas Technology to Boost the Biomass Potential. To be initiated Autumn 2015. Project ends 30th Jun. 2019.
- "MEGADRIVE" EUDP project (LTPEM automotive systems), with H2Logic, EnergiMidt Infrastruktur A/S and DTU Electro, 2012-2015 (finalized).

I participate or have participated in the following external projects:

- "USDan, Fuel Flexible μ CHP" – With Ballard (USA) and Dantherm Power A/S – participation from 2013. To be ended in 2016.
- ADDpower, 20kW generator platform based on HTPEM combined with a methanol reformer, EUDP-project with Serenergy A/S (ends 2018).
- "ZEB" Strategic Research Centre on development of supply systems for Net Zero Energy Buildings - initiated in 2009 (ended in 2014).
- "SOFC System for household micro-CHP" (SOFC systems) – EUDP project with Dantherm Power A/S, 2009-2012.
- "CEESA - Coherent Energy and Environmental System Analysis" – (See <http://www.ceesa.plan.aau.dk>). Ended in 2011.
- "CanDan UPS and NT Fuel Cell System Development and Pilot Testing" – EFP-project, 2010.
- "NIK-VE" Nordjysk Innovations- og Kompetencecenter for Vedvarende Energi. Energivisioner for Region Nordjylland, 2009-2010.
- "Integrated HTPEMFC and multi fuel reformer for micro CHP" – an industrial project carried out to support "Dansk Mikrokraftvarme" together with Dantherm Power A/S and SerEnergy A/S, 2008-2010.
- "Udvikling af brændselscellesystem". Industrial project in collaboration with APC Denmark in Kolding, 2005-2006.
- "Markedsscreening af Naturgasreformere", EFP-projekt, 2005.
- "Udvikling af 2 kW naturgasreformere for høj- og lavtemperatur PEM-brændselsceller". Industrial development project in collaboration with Dantherm in Skive 2004-2005.
- "3 kW Direkte Methanol brændselscellegenerator". Fuel Cell System Development with APC Denmark (American Power Conversion in Kolding, DK) and IRD Fuel Cell A/S, 2005-2006.
- "Simulering og test af PEM fuel Cell / Simulation and Test of PEM Fuel Cell". Industrial project in collaboration with Sauer Danfoss, 2003.
- "Modelling and Optimization of Proton Exchange Membrane Fuel Cell Systems". Ph.D. project in collaboration with APC Denmark, 2000-2003.

For detailed information on current at past research projects please see my personal profile at AAU <http://personprofil.aau.dk/106838>

Future Project Focus:

- Participation in a project application for Sino-Danish Energy Call.
- Participation in projects (H2020, EUDP etc.) on intelligent energy use involving both electrical and thermal storage aspects (SmartGrid).
- Participation and continuation of the activities in Fuel Cell Systems in collaboration with our industrial partners (Serenergy, Dantherm Power, Ballard, Danfoss, H2Logic, LeanEco etc.) – Primarily focus on EUDP-partnerships but also H2020 projects.
- Direct agreements doing contract research between universities and industry. We have a long track-record doing such collaborations.

AWARDS AND NOMINATIONS:

Awards:

- Awarded the prize of "lecturer of the year" 2008/2009 at the Energy Study Board at Aalborg University, 2009 (teaching Thermodynamics 3rd sem.).
- Awarded the prize of "lecturer of the year" 2014/2015 at the Energy Study Board at Aalborg University, 2015 (teaching Thermal Systems and Machines 1 at 5th sem. In the Autumn 2014).
- Awarded the prize for co-authoring the best poster entitled: "Empirical Platform Data Analysis to investigate how Heat Pumps Operate in Real-Life Conditions" out of 102 posters for the 24th IIR International Congress of Refrigeration in Japan (ICR 2015) arranged by the International Institute of Refrigeration IIR&IIR September 2015.

Nominations:

- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn 2008 (teaching Thermodynamics 3rd sem.).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn 2011 (two courses were nominated: Teaching Thermodynamics 3rd sem and Modeling of Thermal Systems 5th sem. as well as a nomination for the supervision of study groups at TE5).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, spring, 2012 (teaching Chemical Reactors and Mixing, 8th sem.).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn, 2012 (teaching Modeling of Thermal Systems 5th sem.).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, spring 2013 (teaching Design of Thermal Systems and Fuel Processing Technology, 8th sem. – nominated in two courses at different semesters).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn, 2013 (teaching Combustion Technology and Chemical Reactors, 7th sem.).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn 2014 (teaching Thermal Systems and Machines 1, 5th sem. and supervising at TE5).
- Nominated as "lecturer of the year" at the Energy Study Board at Aalborg University, autumn 2015 (teaching Thermal Systems and Machines 1, 5th sem. and supervising at TE5).

FOREIGN LANGUAGES:

English: Fluent in written and spoken English.

German: Proficient in written and spoken German.

Dutch: Basic skills in conversation. Fundamental skills in writing. Had Dutch lessons and worked/stayed in Holland for a longer period.

French: Basic skills. Had two years of basic French lessons after completing my M.Sc.

PROGRAMMING LANGUAGES AND SOFTWARE:

Programming languages mastered: C, C++, Turbo Pascal, FORTRAN, Delphi, Z80 Assembler, VB, Pearl Script, Javascript, x86 Assembly Language.

Software mastered: GAMS, EES, MATLAB/Simulink, Fluent, Open Modelica, Aspen Pro, HYSYS and several other minor tools in thermal eng.