CV - Professor Olav Bolland

Name: Olav Bolland
Date of birth: January 17th, 1962
Nationality: Norwegian
Present position: Dean for Faculty of Engineering, Norwegian University of Science and Technology (NTNU). Professor of Thermal Power Engineering

Academic degrees:

1986 Siv.Ing. (M.Sc.): Norwegian University of Science and Technology, Mech. Eng.
1990 Dr.ing., Energy and Process Engineering, Norwegian University of Science and Technology (NTNU)

Work experience:

1987 Visiting researcher at Siemens AG/UB KWU in Erlangen, Germany
1987-90 Graduate student (doctorate degree) at The Norwegian Institute of Technology (NTH)
1990-2002 Associate professor, Norwegian University of Science and Technology (NTNU)
1996-97 Visiting professor at Swiss Federal Institute of Technology – ETH, Switzerland
2002- Full professor, Department of Energy and Process Engineering, NTNU
2006-07 Visiting professor at the University of Calgary, Canada
2009-17 Head of the Department of Energy and Process Engineering, NTNU
2017- Dean for Faculty of Engineering, NTNU

Other positions and activities:

1987-96, 1998-2015 Scientific advisor for SINTEF Energy Research
1994-96, 1998-2000 Member of NTNU Mechanical Engineering Faculty Board
2000-03 Deputy Head of Department of Thermal Engineering and Hydropower, NTNU
2003-06 Head of NTNU Master program *Energy and the Environment*
2003-2007 Member of the executive team of the Gas Technology Centre NTNU-SINTEF
2004-05 Deputy Head of the Department of Energy and Process Engineering, NTNU
2006- Elected member of The Norwegian Academy of Technical Sciences (NTVA)
2008-09 Director of the Gas Technology Centre NTNU-SINTEF
2008-09 Member of a national expert group on Sustainable Development, appointed by the Norwegian government, report 'Norges Offentlige utredninger 2009:16 - *Globale miljøutfordringer–norsk politikk*' (Global challenges – Norwegian politics)
2011-13 Sintef Council – Proxy member from NTNU
2014-21 Sintef Council – member from NTNU
2014-2016, 2018-2022 Board member Sintef Energy AS
2017- SINTEF Community – council member for NTNU
2018-21 Head of the NTNU & SINTEF ZEB Laboratory steering committee
2019- Head of the Norwegian Ocean Technology Centre steering committee
2021- Chairman of the board for the ZEB Laboratory

Professional activities:

2003-05 Lead author for IPCC's Special Report on CO_2 Capture and Storage
2000- <u>Organizing international conferences</u>
Natural Gas Technology Workshop 2000 at NTNU
Member of Organising Committee of TCCS1-TCCS5 (Trondheim conference on Carbon dioxide Capture and Storage.
Member of Organising Committee of ECOS 2005.

Head of Program Committee of the GHGT-8, 2006, with 960 delegates and 450 papers.
Member of the Programme Committee of GHGT-9 (Nov 2008)
Member of the Programme Committee of GHGT-10 (Sept 2010) – responsible for Capture related papers (370).
Member of the Programme Committee of GHGT-11 (Nov 2012) – responsible for Capture related papers (400).
Member of the Programme Committee of GHGT-12 (Oct 2014) – responsible for Capture related papers (380).
Member of Scientific Committees in several other conferences

1997- Member of PhD thesis evaluation committees in Norway, Sweden, Singapore, and the Netherlands

2000- Member of professor evaluation committees in Sweden (3 times), Norway (3), Denmark (1) and Bahrain (1)

2000-03 Member of evaluation committees in the Norwegian Research Council – Klimatek Program

2005-15 Member of the Advisory Board for the international research projects CCP2 and CCP3 (Carbon Capture Project)

2006-13 Associate Editor – International Journal of Greenhouse Gas Control

2008-14 Member of the International Steering Committee for the IEAGHG International Interdisciplinary CCS Summer School Series

Awards:
2007 Nobel Peace Prize - As one of the IPCC scientists researching climate change
2011 Statoil Award for Outstanding Research
2013 Work Environment Award at NTNU (Norwegian University of Science and Technology)
2013 Certificate of Excellence in Reviewing, Int Journal of Greenhouse Gas Control

Publications: More than 250 refereed journal papers, conference publications, book-chapters and a book. Many restricted technical reports and international guest lectures. Holder of patent WO 95/21683, PCT/NO95/00033, 1995, Norway #940527, US-patent 5,832,712 - 1998

Research projects: Supervised (as main supervisor) 14 completed Dr.Ing./PhD degrees and 6 postdoctoral candidates, and supervised >100 MSc thesis candidates at Department of Energy and Process Engineering, NTNU.

- Participant in and member of steering committee for *BIGCO2* (NTNU and SINTEF's national program on CO_2 capture and storage), 2005-2009, total 54 mill NOK
- Participant in and member of the board: *Process Systems Engineering: From Natural Gas to Energy Products*, 2002-2006, University program funded by the Norwegian Research Council, 22 mill NOK
- Task leader for NTNU in *ENCAP*, EU Integrated project FP6, 2004-2008, total 22.4 mill €, NTNU part 600 k€
- Task leader for NTNU in *DYNAMIS - Towards hydrogen with CO_2 managemen*t, EU Integrated project FP6, 2006-2008, total 13 mill €.
- Task leader for NTNU in *DECARBit – Decarbonise it!*, EU Integrated project FP7, 2008-2011, total 15.5 mill €.
- Task leader for NTNU in *iCap – Innovative CO_2 Capture*, EU Integrated project FP7, 2010-2013, total 6.3 mill €.
- Steering board member, general assembly member for NTNU, and task leader in *ECCSEL* – *European Carbon dioxide Capture and Storage Laboratory Infrastructure*, EU FP7 – Phase I & II, 2011-2014, total 4 mill €.

- Project leader for NTNU in *ECCSEL Norway CCS RI - Phase 2 - The Norwegian node of ECCSEL*, Project number 245822, Norwegian Research Council, 2016-2020, total 17 mill €.
- Administrative responsible for ECCSEL-INFRADEV-3 - European Carbon Dioxide Capture and Storage Laboratory Infrastructure, EU H2020, 2016-2017, total 3.3 mill €.

Publications statistics: (per August 2023): h-index; Scopus: 39, Google Scholar: 49
Scopus: Number of publications 131, number of citations 5241

Selected publications:

Nord, L., Bolland, O. (2020). Carbon Dioxide Emission Management in Power Generation, ISBN: 978-3-527-82665-0, 344 pages, Wiley-VCH Verlagsgesellschaft

Nazir, S.M., Cloete, S., Bolland, O., Amini, S., (2018). Techno-economic assessment of the novel gas switching reforming (GSR) concept for gas-fired power production with integrated CO2 capture, *International Journal of Hydrogen Energy*, 43(18), pp. 8754-8769

Riboldi, L., Bolland, O., (2017). Overview on Pressure Swing Adsorption (PSA) as CO2 Capture Technology: State-of-the-Art, Limits and Potentials, *Energy Procedia* 114, pp. 2390-2400

Dutta, R., Nord, L.O., Bolland, O., (2017). Selection and design of post-combustion CO2capture process for 600 MW natural gas fueled thermal power plant based on operability, *Energy*, 121, pp. 643-656

Riboldi, L., Bolland, O., (2016). Pressure swing adsorption for coproduction of power and ultrapure H_2 in an IGCC plant with CO_2 capture, *International Journal of Hydrogen Energy*, 41 (25), pp. 10646-10660.

Najmi, B., Bolland, O., Colombo, K.E. (2016). A systematic approach to the modeling and simulation of a Sorption Enhanced Water Gas Shift (SEWGS) process for CO_2 capture. *Separation and Purification Technology*, 157, pp. 80-92

Riboldi, L., Bolland, O. (2015). Document Evaluating Pressure Swing Adsorption as a CO2 separation technique in coal-fired power plants. *International Journal of Greenhouse Gas Control*, 39, pp. 1-16

Najmi, B., Bolland, O., Colombo, K.E. (2015). Document Load-following performance of IGCC with integrated CO2 capture using SEWGS pre-combustion technology. *International Journal of Greenhouse Gas Control*, 35, pp. 30-46

Razi, N., Svendsen, H. F., & Bolland, O. (2014). Assessment of mass transfer correlations in rate-based modeling of a large-scale CO_2 capture with MEA. *International Journal of Greenhouse Gas Control, 26*, 93-108.

Razi, N., Svendsen, H. F., & Bolland, O. (2013). Cost and energy sensitivity analysis of absorber design in CO_2 capture with MEA. *International Journal of Greenhouse Gas Control, 19*, 331-339.

Razi, N., Svendsen, H. F., & Bolland, O. (2013). Validation of mass transfer correlations for CO_2 absorption with MEA using pilot data. *International Journal of Greenhouse Gas Control, 19*, 478-491.

Nord, L. O., & Bolland, O. (2013). Design and off-design simulations of combined cycles for offshore oil and gas installations. *Applied Thermal Engineering, 54*(1), 85-91.

Bischi, A., Langørgen, T., & Bolland, O. (2013). Double loop circulating fluidized bed reactor system for two reaction processes, based on pneumatically controlled divided loop-seals and bottom extraction/lift. *Powder Technology, 246*, 51-62.

Lakew, A. A., & Bolland, O. (2010). Working fluids for low-temperature heat source. *Applied Thermal Engineering, 30*(10), 1262-1268.

Nord, L. O., Anantharaman, R., & Bolland, O. (2009). Design and off-design analyses of a pre-combustion CO_2 capture process in a natural gas combined cycle power plant. *International Journal of Greenhouse Gas Control, 3*(4), 385-392.

Pipitone, G., & Bolland, O. (2009). Power generation with CO_2 capture: Technology for CO_2 purification. *International Journal of Greenhouse Gas Control, 3*(5), 528-534.

Kandepu, R., Imsland, L., Foss, B. A., Stiller, C., Thorud, B., & Bolland, O. (2007). Modeling and control of a SOFC-GT-based autonomous power system. *Energy, 32*(4), 406-417.
Kvamsdal, H. M., Jordal, K., & Bolland, O. (2007). A quantitative comparison of gas turbine cycles with CO_2 capture. *Energy, 32*(1), 10-24.
Naqvi, R., & Bolland, O. (2007). Multi-stage chemical looping combustion (CLC) for combined cycles with CO_2 capture. *International Journal of Greenhouse Gas Control, 1*(1), 19-30.
Naqvi, R., Wolf, J., & Bolland, O. (2007). Part-load analysis of a chemical looping combustion (CLC) combined cycle with CO_2 capture. *Energy, 32*(4), 360-370.
Nasrifar, K., & Bolland, O. (2006). Prediction of thermodynamic properties of natural gas mixtures using 10 equations of state including a new cubic two-constant equation of state. *Journal of Petroleum Science and Engineering, 51*(3-4), 253-266.
Stiller, C., Thorud, B., Bolland, O., Kandepu, R., & Imsland, L. (2006). Control strategy for a solid oxide fuel cell and gas turbine hybrid system. *Journal of Power Sources, 158*(1), 303-315.
Nakajo, A., Stiller, C., Härkegård, G., & Bolland, O. (2006). Modeling of thermal stresses and probability of survival of tubular SOFC. *Journal of Power Sources, 158*(1), 287-294.
Stiller, C., Thorud, B., Seljebø, S., Mathisen, O., Karoliussen, H., & Bolland, O. (2005). Finite-volume modeling and hybrid-cycle performance of planar and tubular solid oxide fuel cells. *Journal of Power Sources, 141*(2), 227-240.
Ertesvåg, I. S., Kvamsdal, H. M., & Bolland, O. (2005). Exergy analysis of a gas-turbine combined-cycle power plant with precombustion CO_2 capture. *Energy, 30*(1), 5-39.
Brandvoll, Ø., & Bolland, O. (2004). Inherent CO_2 capture using chemical looping combustion in a natural gas fired power cycle. *Journal of Engineering for Gas Turbines and Power, 126*(2), 316-321.
Bredesen, R., Jordal, K., & Bolland, O. (2004). High-temperature membranes in power generation with CO_2 capture. *Chemical Engineering and Processing: Process Intensification, 43*(9), 1129-1158.
Jordal, K., Bredesen, R., Kvamsdal, H. M., & Bolland, O. (2004). Integration of H2-separating membrane technology in gas turbine processes for CO_2 capture. *Energy, 29*(9-10), 1269-1278.
Bolland, O., & Undrum, H. (2003). A novel methodology for comparing CO_2 capture options for natural gas-fired combined cycle plants. *Advances in Environmental Research, 7*(4), 901-911.
Bolland, O., & Mathieu, P. (1998). Comparison of two CO_2 removal options in combined cycle power plants. *Energy Conversion and Management, 39*(16-18), 1653-1663.
Bolland, O., & Stadaas, J. F. (1995). Comparative evaluation of combined cycles and gas turbine systems with water injection, steam injection, and recuperation. *Journal of Engineering for Gas Turbines and Power, 117*(1), 138-145.
Bolland, O., & Sæther, S. (1992). New concepts for natural gas fired power plants which simplify the recovery of carbon dioxide. *Energy Conversion and Management, 33*(5-8), 467-475.
Bolland, O. (1991). Comparative evaluation of advanced combined cycle alternatives. *Journal of Engineering for Gas Turbines and Power, 113*(2), 190-197.