

Ndaona Chokani

1. Current position

Wissenschaft Mitarbeitende II (permanent), ETH Zürich, Zürich, Switzerland

2. Education

- 1985 - 1988 **Ph.D.**, Engineering, Trinity College, Cambridge University. *Cambridge Livingstone Trust Scholar (1985-1988)*
Dissertation: "Passive control of transonic shockwave/boundary layer interaction on a porous surface"
- 1981 - 1984 **BA (Honours – First Class)**, Engineering Science, St. Catherine's College, Oxford University. *Junior Common Room Third World Scholar (1981-1984)*

3. Professional and academic experience

- 2006 – present Wissenschaft Mitarbeitende II (permanent)
Laboratory for Energy Conversion, ETH Zürich, Zürich, Switzerland
- 2005 – 2006 Contractor
Air Force Office of Scientific Research (AFOSR), Arlington VA, USA
- 2004 Professor
Mechanical Engineering and Materials Science Department, Duke University, Durham NC, USA
- 1999 – 2003 Professor
Department of Mechanical and Aerospace Engineering, NC State University, Raleigh NC, USA
- 1993 – 1999 Associate Professor
Department of Mechanical and Aerospace Engineering, NC State University, Raleigh NC, USA
- 1992 – 1993 Assistant Professor
Department of Mechanical and Aerospace Engineering, NC State University, Raleigh NC, USA
- 1988 – 1991 Visiting Assistant Professor
Department of Mechanical and Aerospace Engineering, NC State University, Raleigh NC, USA
- 1985 – 1988 Research Assistant
Department of Engineering, Cambridge University, England

4. Supervised PhD theses

- Jafari S., "Efficient Simulation of Wind and Wake Flows in Wind Farms Using a Preconditioned Multistage Solver," *Diss. ETH No. 21837*, 2014.
- Kocer G., "Full-Scale Wind Turbine Flow Field Measurements Using an Instrumented Uninhabited Aerial Vehicle," *Diss. ETH No. 20660*, 2012.
- Kress C., "Downwind Wind Turbine Performance, Loading and Design Considerations," *Diss. ETH No. 23329*, 2016.
- Singh, A., "GIS-based European Energy Systems Modelling to Assess Impact of Policy on Performance and Markets," *Diss. ETH No. 23593*, 2016.
- Subramanian B., "Drone Based Experimental Investigation of Flow around Multi-MW Wind Farms in Flat and Complex Terrains," *Diss. ETH No. 22901*, 2015.
- Zendeabad, M., "Full-scale Assessment of Impact of Unfavourable Upstream Conditions on the Performance and Loads of Wind Turbines," *Diss. ETH No. 24126*, 2017.

5. Prizes, fellowships, distinguished memberships

- Extraordinary Professor, Stellenbosch University, South Africa, since March 2017.
- Best Conference Paper, *IEEE Power & Energy Society*, General Meeting 2017.
- Technical Keynote Speaker, *Global Power & Propulsion Forum*, 2017.
- Keynote Lecturer, *North American Wind Energy Academy Symposium*, 2017.
- Best Poster Award, *European Offshore Wind Conference*, European Wind Energy Association Conference, 2015.
- Outstanding Service Award, *IGTI*, 2015.
- Best Paper Award, *IGTI Wind Turbine Committee*, 2013.

- Best Poster Award, *European Offshore Wind Conference*, European Wind Energy Association Conference, 2011.
- Best Poster Award, *European Wind Energy Association Conference*, 2011.
- Outstanding Fluid Mechanics Paper Award, *Measurement Science and Technology*, 2008
- Best Paper Award, *IGTI Controls, Diagnostics & Instrumentation Committee*, 2007.
- Associate Fellow, *American Institute of Aeronautics & Astronautics*, 2009.
- Abbott Distinguished Lecturer, *NASA Langley Research Center*, USA. 2006.

6. Organisation of conferences

- Member, Scientific Committee
 - *Conference on European Energy Market*, 2018
 - *Conference on European Energy Market*, 2017
 - *Conference on European Energy Market*, 2016
 - *Science of Making Torque from Wind*, 2016
 - *Science of Making Torque from Wind*, 2012
- Session Organiser, Session Chair
 - *Global Power and Propulsion Forum 2017*
 - *ASME IGTI*, 2010-2015
 - *European Wind Energy Association Conference*, 2012-2013
 - *European Offshore Wind Conference*, 2009
- Reviewer
 - *ASME IGTI*, 2008-2014
 - *European Wind Energy Association Conference*, 2012-2013
 - *Conference on European Energy Market*, 2016-2018

7. Publications

7.1 Publications in international peer-reviewed scientific journals

1. Eser P., Chokani N., Abhari R.S., "Impacts of Battery Electric Vehicles on Renewable Integration within the 2030 European Power System," to appear *International Journal of Energy Research*, 2018.
2. Aurbach A., Schmid B., Liechti F., Chokani N., Abhari R.S., "Complex Behaviour in Complex Terrain - Modelling Bird Migration in a High Resolution Wind Field Across Mountainous Terrain to Simulate Observed Patterns," *Journal of Theoretical Biology*, **454**, 126-138, 2018.
3. Eser P., Chokani N., Abhari R.S., "Trade-Offs Between Integration and Isolation in Switzerland's Energy Policy," *Energy*, **150**, 19-27, 2018.
4. Gawlikowska A. P., Marini M., Chokani N., Abhari R. S., "Visualisation and Immersion Dome Experience for Inspired Participation," *Journal of Sustainable Development of Energy, Water and Environment Systems*, **6**, 67-77, 2018.
5. Eser P., Chokani N., Abhari R.S., "Operational and Financial Performance of Fossil Fuel Power Plants Within a High Renewable Energy Mix," *Journal of the Global Power and Propulsion Society*, **1**, 16-27, 2017.
6. Marini M., Gawlikowska A. P., Rossi A., Chokani N., Klumpner H., Abhari R.S., "Impact of Future Cities on Commuting Patterns: an Agent-Based Approach," *Environment and Planning B: Urban Analytics and City Science*, **0**, 1-18, 2017.
7. Zendeabad M., Kazda J., Chokani N., Abhari R.S., "Impact of Forest-Elevated Turbulence Levels on Wind Farm Performance," *International Journal of Gas Turbine, Propulsion and Power Systems*, **9**, 9-17, 2017.
8. Eser P., Chokani N., Abhari R.S., "Effect of Increased Renewables Generation on Operation of Thermal Power Plants," *Applied Energy*, **164**, 723-732, 2016.
9. Kazda J., M. Zendeabad M., Jafari S., Chokani N., Abhari R.S., "Mitigating Adverse Wake Effects in a Wind Farm Using Non-optimum Operational Conditions" *Journal of Wind Engineering & Industrial Aerodynamics*, **154**, 76-83, 2016.
10. Kress C., Chokani N., Abhari R.S., "Passive Minimization of Load Fluctuations on Downwind Turbines," *Renewable Energy*, **89**, 545–551, 2016.
11. Kress C., Chokani N., Abhari R.S., "Design Considerations of Rotor Cone Angle for Downwind Wind Turbines," *ASME Journal of Engineering for Gas Turbines and Power*, **138**, 052601, 2016.

12. Kress C., Chokani N., Abhari R.S., Hashimoto T., Watanabe M., Sano T., Saeki M., "Impact of Flow Inclination on Downwind Turbine Loads and Power," *Journal of Physics: Conference Series "Science of Making Torque from Wind"*, **753**, 022011, 2016.
13. Singh, A., T. Frei, N. Chokani, and R. S. Abhari, "Impact of Unplanned Power Flows in Interconnected Transmission Systems - Case Study of Central Eastern European Region," *Energy Policy*, **91**, 287-303, 2016.
14. Subramanian B., Chokani N., Abhari R. S., "Aerodynamics of Wind Turbine Wakes in Flat and Complex Terrains," *Renewable Energy*, **85**, 454-463, 2016.
15. Zendeabad M., Chokani N., Abhari R.S., "Impact of Forested Fetch on Energy Yield and Maintenance of Wind Turbines," *Renewable Energy*, **91**, 548–558, 2016.
16. Dimitrova E., Vinklers J., Chokani N., Abhari R.S., "Integrated Biomass Assessment and Optimized Power Generation," *Energy Technology*, **3**, 265-278, 2015.
17. Frau E., Kress C., Chokani N., Abhari R.S., "Comparison of Performance and Unsteady Loads of Multimegawatt Downwind and Upwind Turbines," *ASME Journal of Solar Energy Engineering*, **137**, 041004, 2015.
18. Jafari S., A M Basol, Chokani N., Abhari R.S., "A Preconditioned Multigrid for Simulation of Atmospheric Flow and Wind Turbine Wakes," *Computers & Fluids*, **122**, 111-122, 2015.
19. Kress C., Chokani N., Abhari R.S., R. "Downwind Turbine Yaw Stability and Performance," *Renewable Energy*, **83**, 1157–1165, 2015.
20. Singh, A., D. Willi, N. Chokani, and R. S. Abhari, "Increasing On-Shore Wind Generated Electricity in Germany's Transmission Grid," *ASME Journal of Engineering for Gas Turbines and Power*, **137**, 021801, 2015.
21. Singh A, Eser P., Chokani N., Abhari R.S., "High Resolution Modelling of the Impacts of Exogenous Factors on Power Systems," *Energies*, **8**, 14168-14181, 2015.
22. Subramanian B., Chokani N., Abhari R. S., "Experimental Analysis of Wakes in a Utility Scale Wind Farm," *Journal of Wind Engineering And Industrial Aerodynamics*, **138**, 61-68, 2015.
23. Subramanian B., Chokani N., Abhari R. S., "Drone-Based Experimental Investigation of Three-Dimensional Flow Structure of a Multi-Megawatt Wind Turbine in Complex Terrain," *ASME Journal of Solar Energy Engineering*, **137**, 051007, 2015.
24. Zendeabad M., Chokani N., Abhari R.S., "Volumetric Three-Dimensional Wind Measurement Using a Single Mobile-Based LiDAR," *ASME Journal of Solar Energy Engineering*, **138**, 011003, 2015.
25. Jafari S., Chokani N., Abhari R.S., "Simulation of Wake Interactions in Wind Farms Using an Immersed Wind Turbine Model," *ASME Journal of Turbomachinery*, **136**, 061018, 2014.
26. Singh A, Willi D., Chokani N., Abhari R.S., "Optimal Power Flow Analysis of Switzerland's Transmission System for Long-Term Capacity Planning," *Renewable & Sustainable Energy Reviews*, **34**, 596-607, 2014
27. Tsalicoglou C., Barber S., Chokani N., Abhari R.S., "RANS Computations of MEXICO Rotor in Uniform and Yawed Inflow," *ASME Journal of Engineering for Gas Turbines and Power*, **136**, 011202, 2014.

7.2 Peer-reviewed conference proceedings

28. Joubert C.J., Chokani N., Abhari R.S., "Impact of Large Scale Battery Energy Storage on the 2030 Central European Transmission Grid," *2018 15th International Conference on the European Energy Market*, Lodz, Poland, 2018.
29. Pagani M., Korosec W., Chokani N., Abhari R.S., "Techno-Economic Optimization of EV Charging Infrastructure Incorporating Customer Behavior," *2018 15th International Conference on the European Energy Market*, Lodz, Poland, 2018.
30. Plagowski P., Chokani N., Abhari R.S., "Energy Transition on the Korean Peninsula: Role of Thermal Plants in a Future Smart Grid," *2018 IEEE International Conference on Innovative Smart Grid Technologies Asia*, Singapore, 2018.
31. Dimitrova E., Chokani N., Abhari R.S., "Managing Energy Risk – A Case Study of Bulgaria With No Nuclear Power," *2017 14th International Conference on the European Energy Market*, Dresden, Germany, 2017.
32. Eser P., Chokani N., Abhari R.S., "Optimal RES Portfolio to Achieve 45% Renewable Electricity in Central Europe by 2030," *2017 IEEE Power Energy and Society General Meeting*, Chicago, USA, 2017.
33. Aurbach A., Schmid B., Liechti F., Chokani N., Abhari R.S., "Complex Behaviour In Complex Terrain. Modelling Bird Migration in High Resolution Wind Field To Explain

- Observed Behaviour In The Jura Mountains,” *European Ornithologists' Union 2017 Conference*, Turku, Finland, 2017.
34. Eser P., Chokani N., Abhari R.S., “Impacts of Battery Electric Vehicles on the Central European Power System in 2030” *2016 13th International Conference on the European Energy Market*, Porto, Portugal, 2016.
 35. Eser P., Chokani N., Abhari R.S., “Impacts of Carbon Taxes on the Interconnected Central European Power System in 2030” *2016 13th International Conference on the European Energy Market*, Porto, Portugal, 2016.
 36. Vinklers J., Chokani N., Abhari R.S., “Improved Integration of European Renewables Using Dynamic Line Rating in Switzerland” *2016 13th International Conference on the European Energy Market*, Porto, Portugal, 2016.
 37. Eser P., Singh A, Chokani N., Abhari R.S., “High Resolution Simulations of Increased Renewable Penetration on Central European Transmission Grid,” *2015 IEEE Power Energy and Society General Meeting*, Denver, USA, 2015.
 38. Kress C., Chokani N., Abhari R.S., “Design Considerations of Rotor Cone Angle for Downwind Wind Turbines,” *ASME Turbo Expo 2015*, GT2015-42335, 2015.
 39. Singh A, Eser P., Chokani N., Abhari R.S., “Improved Modelling of Demand and Generation in High Resolution Simulations of Interconnected Power Systems,” *12th International Conference on the European Energy Market*, Lisbon, Portugal, 2015.
 40. Zendeabad M., Kazda J., Chokani N., Abhari R.S., “Impact of Forest-Elevated Turbulence Levels on Wind Farm Performance,” *Proc. International Gas Turbine Congress 2015*, Tokyo, Japan, 2015.
 41. Zendeabad M., Chokani N., Abhari R.S., “Multi-Scale Measurements in Wind Farms in Complex and Flat Terrain,” *ASME Turbo Expo 2015*, GT2015-42583, 2015.

7.3 Invited contributions to international conferences

42. Chokani N., “Power System Operation with High Penetration of Renewables (Invited Technical Keynote),” *Global Power & Propulsion Forum*, 2017.
43. Chokani N., “Integration of High Penetration Renewable Energy Into Future Power Systems (Invited Keynote Lecture),” *2017 Symposium of the North American Academy of Wind Energy*, 2017.

7.4 Other publications

- Zendeabad M., Chokani N., Abhari R.S., “Wind Farm Scale Measurements Using a Mobile Scanning LIDAR,” *Wind Europe Summit 2016*, 2016.
44. Zendeabad M., Chokani N., Abhari R.S., “Mobile LiDAR_Mapping of Utility-Scale Wind Farms,” *German Wind Energy Conference (DEWEK)*, 2015.
 45. Kress, C., Chokani N., Abhari R.S., Hashimoto T., Watanabe M., Sano T., Saeki M., “Economical and Operational Merits of Offshore Multi-Megawatt Downwind Turbines,” *Proc. European Offshore Wind Conference*, 2015.