

Ricardo Jorge Gomes Sousa Bento Bessa

ADDRESS Rua Fernando Namora, Pedrouços *Mobile:* (+351) 910547001
n° 118, 1ºDir
4425-670 Maia Portugal *E-mail:* rjbessa@gmail.com

CITIZENSHIP Portuguese

DATE OF BIRTH 9 December 1983 (29 years old)

PROFESSIONAL EXPERIENCE

INESC TEC - INESC Technology and Science (formerly INESC Porto),
Porto, Portugal

Senior Researcher

September 2013 to present

Full participation in the following projects:

- European Project SuSTAINABLE: development of a renewable energy forecasting system for MV/LV distribution networks; smart grid architecture for MV/LV distribution networks;
- European Project evolvDSO: development of new management tools for distribution networks, including forecasts and demand-side management;
- BEST-CASE National Project: development of new forecasting algorithms for renewable energy under a smart grid paradigm.

Junior Researcher

September 2006 to July 2013

Full participation in the following projects:

- (five months) Two national projects about energy planning of two regions in Portugal: “Plano Regional de Ordenamento do Território do Norte - PROT Norte” and “Plano Regional de Ordenamento do Oeste e Vale do Tejo - PROT OVT”. My work consisted of characterizing and identifying future changes in the power and gas transmission networks, forecast the electrical energy consumption in each economic sector, study the quality of service of the distribution and transmission electricity networks;
- (one year) Development of a wind power forecasting system for wind farms developers in Portugal;
- (six months) Consulting work for the Hungarian Energy Office: technical evaluation of the wind power integration in the Hungarian transmission network and generation power system;
- (three months) Consulting work for the system operator of Madeira island (Empresa de Electricidade da Madeira, EEM): adequacy evaluation of the generation power system for a time horizon between 2008 and 2015;
- (3 years and 6 months) European Project ANEMOS.plus (*Advanced Tools for the Management of Electricity Grids with Large-Scale Wind Generation*): management of two workpackages (together with prof. Manuel Matos), development and operational demonstration of three software tools for systems with high penetration of wind power (setting the operating reserve; fuzzy power flow tool for detecting congestions in the transmission network; wind farm and hydro-pump coordination). The three tools were demonstrated for the Portuguese transmission system operator (REN) and for the North Ireland system operator (SONI);
- (three years) Development of wind power forecasting algorithms together with Argonne National Laboratory (ANL) in a project funded by the U.S. Department of Energy (DOE). These algorithms covered point and probabilistic forecasts. Decision-aid tools were also developed for system operators and electricity market traders;

- (one year) Consulting work about wind power forecasting for the system operator of Brazil (ONS);
- Support in the elaboration of proposals for EU Projects funding.
- (4 months): development of a renewable energy forecasting system for MV/LV distribution networks in the framework of the European Project SuSTAIN-ABLE.

Partial participation in the following projects:

- (two months) European Project RISE (*Renewables for Isolated Systems - Energy supply and Waste Water Treatment*): involved in two deliverables about economic and environmental aspects of future large-scale integration of RES in isolated regions of the West Baltic countries;
- (two months) European Project MoreMicrogrids: I was involved in two deliverables about *Definition of Ancillary Services and Short-Term Energy Markets* and *Economic, Technical and Environmental Benefits of Microgrids in Typical EU Electricity Systems*;
- (one month) InovGrid Project: functional specification of a load and distributed generation forecasting system to be installed in a distribution network with a smart-grid infrastructure;
- (one month) Consulting work for the integration of renewable energy into two islands of Cabo Verde: technical specification of a wind and solar power forecasting system to be installed in a renewable energy dispatch center.

Worked with the following companies:

Redes Energéticas Nacionais (System Operator of Portugal, REN), SGPS, S.A.; Department of Energy (DOE); Argonne National Laboratory (ANL); Associação de Energias Renováveis (Portuguese Renewable Energy Association); Empresa de Electricidade da Madeira (System Operator of Madeira); Hungarian Energy Office; Comissão de Coordenação e Desenvolvimento da Região Norte (Commission for Coordination and Development of the Portuguese North Region); Comissão de Coordenação e Desenvolvimento da de Lisboa e Vale do Tejo (Commission for Coordination and Development of Lisbon and Vale do Tejo); Horizon Wind Energy; Martifer (GeSto Energia); SONI; EDP Distribution; Overspeed GmbH Co. KG.; ONS - Operador Nacional do Sistema Elétrico (Brazil).

Internship

February 2006 to July 2006

- *Optimizing the operation of small renewable energy systems*, final project for achieving the five years degree in Electrical and Computer Engineering. Supervision of Professor Cláudio Monteiro.

Co-founder of Prewind,Lda

September 2010 to Present

Spin-off company from three research institutes (INESC TEC, INEGI, ICAT) that sells forecasting services such as wind power forecasting.

EDUCATION

FEUP - Faculty of Engineering of the University of Porto, Porto, Portugal

PhD, Doctoral Program on Sustainable Energy Systems - MIT Portugal Program, from September 2009 to July 2013

- Thesis Title: *Methodologies for the participation of an electric vehicles' aggregator in the electricity market*
- Classification (1st year): 18 (in a scale between 0 and 20)
- Final Classification: approved with distinction
- Supervisor: Professor Manuel Matos (FEUP/INESC TEC)

Licenciatura (five years degree), Electrical and Computer Engineering, from September 2001 to July 2006

- Classification: 14 (in a scale between 0 and 20)
- Specialization in power systems
- Topics of Study: renewable energies; electrical installations; electrical projects design; optimization of power system operation; power system planning; electricity markets; energy efficiency; electricity generation, transmission and distribution; electrical machines; control theory; electrical circuits; management and economics; programming (C and C++)

FEP - Faculty of Economics of the University of Porto, Porto, Portugal

M.S., Data Analysis and Decision Support Systems, from September 2006 to July 2008

- Thesis Title: *Wind power forecasting with data streams techniques and information theoretic learning*
- Supervisors: Professors João Gama and Vladimiro Miranda
- Topics of Study: statistics; data mining; machine learning; optimization; computer science; decision-support systems
- Classification (1st year): 18 (in a scale between 0 and 20)
- Final Classification: very good (in a scale of *good*, *good with distinction* and *very good*)

AWARDS

MIT Portugal and Fundação para a Ciência e a Tecnologia

- (2009-2013) Doctoral Fellowship for the MIT Portugal Program, Portugal

ACADEMIC
EXPERIENCE

FEUP - Faculty of Engineering of the University of Porto, Porto, Portugal

Co-Supervision of MSc Students

- Mário Sousa (with prof. Cláudio Monteiro and João Sousa), *Neural networks applied to estimate wind farm active losses*, July 2007
- Rui Santos (with prof. Cláudio Monteiro and João Sousa), *Monitoring wind farm generation and performance using neural networks*, July 2007
- Rui Santos (with prof. Cláudio Monteiro), *Change detection of wind farms performance*, July 2008
- Nuno Lima (with prof. Manuel Matos), *Comparison of operational management strategies for charging electric vehicles*, July 2012.
- Miguel Lage (with prof. Manuel Matos), *Parametric representation of risk/reserve curves with a high penetration of wind power*, July 2012.

PARTICIPATION IN
THE FOLLOWING
CONFERENCES
AND WORKSHOPS

- Organization of a workshop about wind power forecasting for wind farms developers in Portugal, INESC TEC, 14 April 2008
- *Wind integration issues status update and wind forecast workshop*, Midwest ISO, Carmel, Indiana, USA, 15 July 2010
- *Science and Engineering Entrepreneurship, Workshop Learning by Doing*, FEUP, 18-22 July. The lecturer was Erik Sander (Director of Industry Programs, University of Florida College of Engineering, USA)

Participation and public presentation in the following conferences:

- The International Symposium on Forecasting - ISF 2008, Nice, France, 22-25 June, 2008
- IEEE PES PowerTech 09, Bucharest, Romania, 28 June-2 July, 2009
- WindPower 2010 Conference and Exhibition, Dallas, USA, 23-26 May, 2010

- IEEE World Congress on Computational Intelligence, Barcelona, Spain, 28-24 July, 2010
- 7th Mediterranean Conference and Exhibition on Power Generation, Transmission, Distribution and Energy Conversion, 7-10 November 2010, Agia Napa, Cyprus
- 17th Power Systems Computation Conference (PSCC), Stockholm, Sweden, Aug. 2011.
- EWEA Annual Event 2011, 14-17 March 2011, Brussels, Belgium
- IEEE PES PowerTech 11, Trondheim, Norway, June 19-23 2011
- 3th IEEE PES Innovative Smart Grid Technologies (ISGT) Europe Conference, 14-17 October 2012, Berlin, Germany

Participation in the following conferences:

- WindPower 2009 Conference and Exhibition, Chicago, USA, 4-7 May, 2009

SOCIAL SKILLS
AND
COMPETENCES

Capacity of adapting to new environments and ability to work in a multicultural environment, gained during my work at INESC TEC, as well as in international projects.

Participated in the following meetings of the European Project ANEMOS.plus:

- Copenhagen, Denmark, 1-5 July 2008 at the Denmark Technical University (DTU)
- Pamplona, Spain, 8-12 December 2008 at El Centro Nacional de Energías Renovables (CENER)
- Heraklion, Crete Island, Greece, 10-12 June 2009
- Lisbon, Portugal, 15-18 December 2009 at REN
- Dublin, Republic of Ireland, 15-18 June 2010 at University College Dublin (UCD)
- Nice, France, 8-10 December 2010 at Mines Paristech (ARMINES) in Sophia Antipolis
- Paris, France, 27-29 June 2010 at Ecole des Mines de Paris

Participated in the following meetings of the Argonne National Laboratory/INESC TEC joint project:

- Chicago, IL, 4-8 May 2009 at the Argonne National Laboratory (ANL)
- Chicago (IL) and Houston (TX), 25-30 January 2010 at ANL and Horizon Wind Energy
- Chicago, IL, 13-17 July 2010 at ANL
- Chicago, IL, 17-21 January 2011 at ANL

ORGANIZATIONAL
SKILLS AND
COMPETENCES

Experience in R&D project management at the international level; capacity to develop research and consulting work under contractual obligations for industrial partners; experience in elaborating project proposals for R&D projects at national and international level.

LANGUAGES

Portuguese: Native speaker
English: Fluent
Spanish: Basic
French: Basic

TECHNICAL SKILLS

Programming Languages: C, R, MySQL, MATLAB, Python, Java, C# (24 hours course).

Office Software: Microsoft Office (Word, Excel, Project, PowerPoint), LaTeX (reports and presentations).

Data Mining Software: SPSS, MiniTab, WEKA, SPAD, R.

Graphical and Design Software: GIMP, Gnuplot and AutoCAD.

Software for Power Systems Analysis: Power World, MatPower, PSS/E.

Geographical Information Systems: arcGIS.

ARTICLES IN PEER-REVIEW JOURNALS

1. R.J. Bessa, V. Miranda, and J. Gama, "Entropy and correntropy against minimum square error in offline and online three-day ahead wind power forecasting," *IEEE Transactions on Power Systems*, vol. 24, no. 4, pp. 1657-1666, November 2009.
2. I. J. Ramirez-Rosado, L. A. Fernandez-Jimenez, C. Monteiro, J.N. Sousa, and R.J. Bessa, "Comparison of two new short-term wind power forecasting systems," *Renewable Energy*, vol. 34, no. 7, pp. 1848-1854, July 2009.
3. Manuel A. Matos, and R.J. Bessa, "Setting the operating reserve using probabilistic wind power forecasts," *IEEE Transactions on Power Systems*, vol. 26, no. 2, pp.594-603, May, 2011.
4. A. Botterud, J. Wang, R.J. Bessa, and V. Miranda, "Wind power forecasting in U.S. electricity markets," *Electricity Journal*, vol. 23, no. 3, pp. 71-82, April 2010.
5. R.J. Bessa, V. Miranda, A. Botterud, and J. Wang, "Good or bad wind power forecasts: a relative concept," *Wind Energy*, vol. 14, no. 5, pp. 625-636, July 2011.
6. R.J. Bessa and Manuel A. Matos, "Economic and technical management of an electric vehicles aggregation agent: a literature survey," *European Transactions on Electrical Power*, vol. 22, no. 3, pp. 334-350, April, 2012.
7. J. Wang, A. Botterud, R.J. Bessa, H. Keko, V. Miranda, J.S. Akilimali, L. Carvalho, and D. Issicaba, "Wind power forecasting uncertainty and unit commitment," *Applied Energy*, vol. 88, no. 11, pp.4014-4023, Nov. 2011.
8. R.J. Bessa, Manuel A. Matos, F.J. Soares, and J.A. Peças Lopes, "Optimized bidding of a EV aggregation agent in the electricity market," *IEEE Transactions on Smart Grid*, vol. 3, no. 1, pp.443-452, Mar. 2012.
9. R.J. Bessa, V. Miranda, A. Botterud, Z. Zhou, and J. Wang, "Time-adaptive quantile-copula for wind power probabilistic forecasting," *Renewable Energy*, vol. 40, no. 1, pp. 29-39, April 2012.

10. A. Botterud, J. Wang, Z. Zhou, R.J. Bessa, H. Keko, J.S. Akilimali, and V. Miranda, "Wind power trading under uncertainty in LMP markets," *IEEE Transactions on Power Systems*, vol. 27, no. 2, pp. 894-903, May 2012.
11. R.J. Bessa, M.A. Matos, I.C. Costa, L. Bremermann, I.G. Franchin, R. Pestana, N. Machado, H-P. Waldl, and C. Wichmann, "Reserve setting and steady-state security assessment using wind power uncertainty forecast: a case study," *IEEE Transactions on Sustainable Energy*, vol. 3, no. 4, pp. 827-837, Oct. 2012.
12. R.J. Bessa, V. Miranda, A. Botterud, J. Wang, and Emil M. Constantinescu, "Time adaptive conditional kernel density estimation for wind power forecasting," *IEEE Transactions on Sustainable Energy*, vol. 3, no. 4, pp. 660-669, Oct. 2012.
13. H. Holttinen, M. Milligan, E. Ela, N. Menemenlis, J. Dobschinski, B. Rawn, R.J. Bessa, D. Flynn, E.G. Lazaro, and N. Detlefsen, "Methodologies to determine operating reserves due to increased wind power," *IEEE Transactions on Sustainable Energy*, vol. 3, no. 4, pp. 713-723, Oct. 2012.
14. R.J. Bessa and M.A. Matos "Global against divided optimization for the participation of an EV aggregator in the day-ahead electricity market – Part I: theory," *Electric Power Systems Research*, vol. 95, pp. 309-318, Feb. 2013.
15. R.J. Bessa and M.A. Matos "Global against divided optimization for the participation of an EV aggregator in the day-ahead electricity market – Part II: numerical analysis," *Electric Power Systems Research*, vol. 95, pp. 319-329, 2013.
16. A. Botterud, Z. Zhou, J. Wang, J. Sumaili, H. Keko, J. Mendes, R.J. Bessa, and V. Miranda, "Demand response and probabilistic wind power forecasting in electricity markets: a case study of Illinois," *IEEE Transactions on Sustainable Energy*, vol. 4, no. 1, pp. 250-261, January 2013.
17. Z. Zhou, A. Botterud, J. Wang, R.J. Bessa, H. Keko, J. Sumaili, and V. Miranda, "Application of probabilistic wind power forecasting in electricity markets," *Wind Energy*, vol. 16, no. 3, pp. 321-477, April 2013.
18. R.J. Bessa and M.A. Matos, "Optimization models for EV aggregator participation in a manual reserve market," *IEEE Transactions on Power Systems*, vol. 28, no. 3, pp. 3085-3095, August 2013.
19. R.J. Bessa, C.L. Moreira, B. Silva, and M.A. Matos, "Handling renewable energy variability and uncertainty in power systems operation," *Wiley Interdisciplinary Reviews: Energy and Environment*, 2013, in press.
20. E.D. Castronuovo, J. Usaola, R.J. Bessa, M.A. Matos, I.C. Costa, L. Bremermann, J. Lugaro, and G. Kariniotakis "An integrated approach for optimal coordination between wind power and hydro pumping storage," *Wind Energy*, 2013, in press.
21. R.J. Bessa, M.A. Matos, "Optimization models for an EV aggregator selling secondary reserve in the electricity market," *Electric Power Systems Research*, vol.106, pp.36-50, January 2014.

CONFERENCES
WITH
PEER-REVIEW
PROCESS

1. R.J. Bessa, V. Miranda, and J. Gama, "Wind power forecasting with entropy-based criteria algorithms," in *Proc. of PMAPS 2008 - 10th International Conference on Probabilistic Methods Applied to Power Systems*, Puerto Rico, May 2008.

2. R.J. Bessa, V. Miranda, and J. Gama, "Improvement in wind power forecasting based on information entropy-related concepts," in *Proc. of IEEE PES General Meeting*, Pittsburgh, USA, July 2008.
3. M.A. Matos and R.J. Bessa, "Operating reserve adequacy evaluation using uncertainties of wind power forecast," in *Proc. of IEEE PowerTech 09*, Bucharest, Romania, 28 June-2 July 2009.
4. R.J. Bessa and M.A. Matos, "Dealing with wind power forecast uncertainty," in *Proc. of 25th Mini-EURO Conference Uncertainty and Robustness in Planning and Decision Making*, Coimbra, Portugal, 15-17 April 2010.
5. A. Botterud, J. Wang, R.J. Bessa, H. Keko, and V. Miranda, "Risk management and optimal bidding for a wind power producer," in *Proc. of IEEE PES General Meeting*, Minneapolis, Minnesota, USA, 25-29 July 2010.
6. R.J. Bessa, V. Miranda, J.C. Principe, A. Botterud, and J. Wang, "Information theoretic learning applied to wind power modeling," in *Proc. of IEEE World Congress on Computational Intelligence, special session of IJCNN - Machine Learning for Renewable Energy Applications*, Barcelona, Spain, USA, 18-23 July 2010.
7. A. Botterud, J. Wang, J. Valenzuela, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Unit commitment and operating reserves with probabilistic wind power forecasts," in *Proc. of IEEE PowerTech 11*, Trondheim, Norway, 19-23 June 2011.
8. R.J. Bessa, J. Mendes, V. Miranda, A. Botterud, J. Wang, and Z. Zhou, "Quantile-copula density forecast for wind power uncertainty modeling," in *Proc. of IEEE PowerTech 11*, Trondheim, Norway, 19-23 June 2011.
9. R.J. Bessa, F.J. Soares, J.A. Peças Lopes, and M.A. Matos, "Models for the EV aggregation agent business," in *Proc. of IEEE PowerTech 11*, Trondheim, Norway, 19-23 June 2011.
10. R.J. Bessa, J. Sumaili, V. Miranda, A. Botterud, J. Wang, and E. Constantinescu, "Time-adaptive kernel density forecast: a new method for wind power uncertainty modeling," in *Proc. of the 17th Power Systems Computation Conference (PSCC'11)*, Stockholm, Sweden, 22-26 Aug. 2011.
11. R.J. Bessa and M.A. Matos, "Forecasting issues for managing a portfolio of electric vehicles under a smart grid paradigm," in *Proc. of the Third IEEE PES Innovative Smart Grid Technologies (ISGT 2012)*, Berlin, Germany, 14-17 Oct. 2012.

OTHER
CONFERENCE
PUBLICATIONS
(SELECTION)

1. A. Rodrigues, J.A. Peças Lopes, P. Miranda, L. Palma, C. Monteiro, R.J. Bessa, J. Sousa, C. Rodrigues, and J. Matos, "EPREV - a wind forecasting tool for Portugal," in *Proceedings of EWEC 2007 - European Wind Energy Conference and Exhibition*, Italy, 7-10 May 2007.
2. R.J. Bessa, V. Miranda, and J. Gama, "Wind power forecasting using streaming techniques," in *Proceedings of ISF 2008 - The International Symposium on Forecasting*, Nice, France, 22-25 June 2008.
3. V. Miranda, R.J. Bessa, J. Gama, G. Conzelmann, and A. Botterud, "New concepts in wind power forecasting models," in *Proc. of the WindPower 2009 Conference and Exhibition*, Chicago, USA, 4-7 May 2009.
4. R.J. Bessa, V. Miranda, A. Botterud, and J. Wang, "Good or bad wind power forecasts: a relative concept," in *Proc. of the WindPower 2010 Conference and Exhibition*, Dallas, USA, 23-26 May 2010.

5. R.J. Bessa, M.A. Matos, "Comparison of probabilistic and deterministic approaches for setting operating reserve in systems with high penetration of wind power," in *Proc. of MedPower 2010*, Agia Napa, Cyprus, 07-10 Nov. 2010.
6. R.J. Bessa and M.A. Matos, "The role of an aggregator agent for EV in the electricity market," in *Proc. of MedPower 2010*, Agia Napa, Cyprus, 07-10 Nov. 2010.
7. A. Botterud, J. Wang, V. Miranda, R.J. Bessa, H. Keko, and J.S. Akilimali, "Wind power forecasting and electricity market operations," in *Proc. of the 32nd IAEE Int. Conference*, San Francisco, CA - USA, Jun. 2009.
8. A. Botterud, J. Wang, R.J. Bessa, H. Keko, J. Sumaili, and V. Miranda, "Wind power forecasting, unit commitment, and electricity market operations," in *Proc. of IEEE PES General Meeting*, Detroit, Michigan, USA, 24-29 July 2011.
9. A. Botterud, Z. Zhou, J. Wang, R.J. Bessa, H. Keko, J. Sumaili, and V. Miranda, "Application of probabilistic wind power forecasting in electricity markets," in *Proc. of the Windpower 2011 Conference and Exhibition*, Anaheim, USA, 22-25 May 2011.
10. P. Miranda, A. Rodrigues, J.A. Peças Lopes, J.L. Palma, R. Tome, J. Sousa, R.J. Bessa, and J. Matos, "An integrated system for wind energy forecast using meteorological models and statistical post-processing," *American Geophysical Union, Fall Meeting 2009*, San Francisco, California, USA, 14-18 December 2009. (oral presentation)
11. G. Conzelmann, A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and Jean S. Akilimali, "Wind power forecasting and stochastic unit commitment," *IWWG Advancing Wind Power in Illinois - Fourth Annual Conference*, Peoria Civic Center, Peoria, IL July 14-15, 2010. (oral presentation)
12. A. Botterud, J. Wang, R.J. Bessa, and V. Miranda, "Improved statistical methods for wind power forecasting," *INFORMS Annual Meeting*, Austin, Texas, USA, 7-10 Nov. 2010. (oral presentation)
13. A. Botterud, J. Wang, R.J. Bessa, and H. Keko, "Optimal wind power bidding in electricity markets," *INFORMS Annual Meeting*, Austin, Texas, USA, 7-10 Nov. 2010. (oral presentation)
14. R.J. Bessa, L. Bremermann, M.A. Matos, R. Pestana, N. Machado, H-P Waldl, and C. Wichmann, "Reserve and congestion management using wind power probabilistic forecasting: a real case-study," *European Wind Energy Association Annual Event (EWEA 2011)*, Brussels, Belgium, March 2011. (oral presentation).
15. R.J. Bessa, I.C. Costa, L. Bremermann, and M.A. Matos, "Operational strategies for the optimized coordination of wind farms and hydro-pump units," in *Proc. of MedPower 2012*, Cagliari, Italy, 1-3 Oct. 2012.
16. R.J. Bessa, N. Lima, and M.A. Matos, "Operational management algorithms for an EV aggregator," in *Proc. of MedPower 2012*, Cagliari, Italy, 1-3 Oct. 2012.
17. R.J. Bessa, "Non-Gaussian modeling of wind power forecasts," *International Conference and Advanced School Planet Earth, Mathematics of Energy and Climate Change (MECC 2013)*, Portugal, 21-28 March 2013. (oral presentation)

NATIONAL
CONFERENCES

1. R.J. Bessa and M.A. Matos, "Ajuda à fixação da reserva operacional a partir de previsões probabilísticas de potência eólica," presentation in the *14^o Congresso Nacional da Associação Portuguesa de Investigação Operacional*, Lisbon, Portugal, 7-9 September, 2009.
2. R.J. Bessa and M.A. Matos, "Alguns problemas de optimização para um agente agregador de veículos eléctricos," presentation in the *15^o Congresso Nacional da Associação Portuguesa de Investigação Operacional*, Coimbra, Portugal, 18-20 April, 2011.
3. R.J. Bessa, I.C. Costa, and M.A. Matos, "Fixação da reserva do sistema eléctrico com recurso a previsões probabilísticas da energia eólica," *Encontro Nacional de Riscos, Segurança e Fiabilidade*, Lisbon, Portugal, 15-17 May, 2012.
4. R.J. Bessa and M.A. Matos, "Two alternative approaches for modelling a portfolio of electric vehicles," *1st PhD. Students Conference in Electrical and Computer Engineering*, Faculty of Engineering, University of Porto, Portugal, 28-29 June, 2012.
5. R.J. Bessa and M.A. Matos, "Integração da produção eólica na operação do sistema eléctrico," *Conferência sobre Energia Elétrica de Fontes Renováveis (EEFoR 2013)*, Faculty of Engineering, University of Porto, Portugal, 8-9 May, 2013.
6. R.J. Bessa and M.A. Matos, "Problemas de otimização para auxiliar a participação de um agregador de veículos eléctricos no mercado de reserva secundária," presentation in the *15^o 6^o Congresso Nacional da Associação Portuguesa de Investigação Operacional*, Bragança, Portugal, 3-5 June, 2013.

POSTERS IN
CONFERENCES

1. J. Wang, A. Botterud, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Representing wind power forecasting uncertainty in unit commitment," *WindPower 2010 Conference and Exhibition*, Dallas, TX, May 23-26, 2010.
2. A. Botterud, J. Wang, V. Miranda, and R.J. Bessa, "Designing electricity markets with large shares of wind power," *WindPower 2010 Conference and Exhibition*, Dallas, TX, May 23-26, 2010.
3. R.J. Bessa, V. Miranda, J. Sumaili, A. Botterud, J. Wang, and Z. Zhou, "Wind power forecast with probability density estimation: a tool for the business," *WindPower 2011 Conference and Exhibition*, Anaheim, USA, 22-25 May 2011.

WORKSHOPS
PAPERS AND
COMMUNICATIONS

1. A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Wind power forecasting and stochastic unit commitment," *UWIG Forecasting Workshop*, Albuquerque, NM, February 10-11, 2010.
2. A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Stochastic unit commitment modeling: implementation and market implications," *Enhanced ISO and RTO unit-commitment models*, Federal Energy Regulatory Commission, Washington, DC, June 3, 2010.
3. A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Wind power forecasting in electricity market operations," *Enhanced ISO and RTO unit-commitment models*, Federal Energy Regulatory Commission, Washington, DC, June 3, 2010.

4. A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Advances in probabilistic forecasting with application to wind power trading," *Fourth Workshop on Best Practice in the Use of Short-term Forecasting of Wind Power*, Québec City, Canada, 16 October 2010.
5. Z. Zhou, A. Botterud, J. Wang, R.J. Bessa, H. Keko, V. Miranda, and J.S. Akilimali, "Probabilistic wind power forecasting in electricity market operations: a case study of Illinois," *FERC Technical Conference on Increasing Real-Time and Day-Ahead Market Efficiency Through Improved Software*, Federal Energy Regulatory Commission, Washington, DC, June 28-30 2011.
6. A. Botterud, J. Wang, Z. Zhou, R.J. Bessa, H. Keko, J. Sumaili, and V. Miranda, "Probabilistic forecasting applications," *UWIG Forecasting Workshop*, Tucson, AZ, Feb 8-9, 2012.

BROADER
READERSHIP

1. A. Botterud, J. Wang, R.J. Bessa, and V. Miranda, "Selling the wind: designing electricity markets with large shares of wind power," *Windtech International*, pp. 29-33, March 2011.

INVITED TALKS

1. *On the use of probabilistic forecasts in power system operations: a demonstration for REN*, IEA Wind Task 25 - Design and Operation of Power Systems with Large Amounts of Wind Power, Lisbon, 20-21 of September 2011.
2. *Wind power forecasting algorithms and application*, Statistics Seminar, Toulouse School of Economics, Toulouse, December 13, 2011.
3. *Robust reserve setting tool, Fuzzy power flow for power system security assessment, Wind-hydro coordination for participating the electricity market*, workshop about wind power forecasting and decision-aid tools for managing the power system. This workshop presented the main results of the ANEMOS.plus project, REN, Lisbon, 23 March 2011.
4. *Solutions for reserves estimation, Demonstration at REN, Congestion and voltage violation detection using localized wind power forecasts (Demonstration at REN)*, Anemos.plus workshop, Towards Smart Integration of Wind Generation, 29 June 2011, Paris, France.
5. *Electric vehicles aggregation agents: a business opportunity*, E3 Forum - Education, Employment and Entrepreneurship (International Conference of the MIT Portugal Doctoral Program), Lisbon, Portugal, 28 June 2012.

OFFICIAL
REPORTS

1. C. Monteiro, R.J. Bessa, V. Miranda, A. Botterud, J. Wang, and G. Conzelmann, "Wind power forecasting: state-of-the-art 2009" Report ANL/DIS-10-1, Argonne National Laboratory, Nov. 2009.
2. C. Monteiro, R.J. Bessa, H. Keko, V. Miranda, A. Botterud, J. Wang, and G. Conzelmann, "A quick guide to wind power forecasting: state-of-the-art 2009," Report ANL/DIS-10-2, Argonne National Laboratory, Nov. 2009.
3. A. Botterud, J. Wang, Z. Zhou, R.J. Bessa, H. Keko, J. Mendes, Jean S. Akilimali, and V. Miranda, "Use of wind power forecasting in operational decisions," Report ANL/DIS-11-8, Argonne National Laboratory, Sept. 2011.

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| JOURNALS REFEREE | IEEE Transactions on Power Systems; IEEE Transactions on Smart Grid; IEEE Transactions on Sustainable Energy; Wind Energy; Electric Power Systems Research; Applied Energy; European Transactions on Electrical Power; Journal of Hydroinformatics; IET Generation, Transmission & Distribution; Renewable Energy; Energies; Engineering Applications of Artificial Intelligence. |
| SCIENTIFIC INTERESTS | Renewable Energy; forecasting; optimization; decision-making under uncertainty; power systems operation; electricity markets; data mining; electric vehicles; demand-side management. |
| PERSONAL INTERESTS | Movies; Football; Music; Nature; Traveling (Europe, USA, South America). |
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