# Salvador Pineda Morente

Contact Information	Department of Electrical Engineering University of Málaga Málaga, Spain	phone: +34 681600943 e-mail: spinedamorente@gmail.com homepage: https://goo.gl/tMG6Jx
Research Interests	Power system operations and economics, renewable integration, reliability, capacity expansion plan- ning, convex optimization, stochastic programming, electricity markets and equilibrium models.	
Education	<b>University of Málaga</b> , Málaga, Spain	
	<ul> <li>B.Sc. Degree and M.Sc. Degree in Electrical Engineering (European diploma) September 2006</li> <li>Master's Thesis Title: Calculation Methods of Available Transfer Capability in Power Systems.</li> </ul>	
	University of Castilla-La Mancha, Ciudad Real, Spain	
	Ph.D. Degree in Electrical Engineering	May 2011
	<ul> <li>Title: Medium-term Electricity Trading for Risk-averse Power Producers via Stochastic Programming.</li> <li>Supervisor: Professor Antonio J. Conejo.</li> <li>Jury: Dr. Juan J. Rubio, Dr. Julian Barquin, Dr. Stein-Erik Fleten, Dr. Fernando Oliveira, and Dr. Miguel Carrión.</li> </ul>	
Professional Experience	<b>University of Málaga</b> , Málaga, Spain Associate professor	${\rm October} {\bf 2016-present}$
	<b>University of Copenhagen</b> , Copenhagen, Denmark Associate professor	September 2014 – September 2016
	<b>University of Copenhagen</b> , Copenhagen, Denmark Assistant professor	$May \ 2013 - August \ 2014$
	<b>Technical University of Denmark</b> , Lyngby, Denmark Assistant professor	June 2012 – April 2013
	<b>Technical University of Denmark</b> , Lyngby, Denmark <i>Postdoctoral researcher</i>	June 2011 – May 2012
	<b>University of Castilla-La Mancha</b> , Ciudad Real, Spain <i>Ph.D. student</i>	$July \ 2007 - May \ 2011$
	<b>University of Castilla-La Mancha</b> , Ciudad Real, Spain Research assistant	March 2007 – June 2007
Selected Publications	<ol> <li>S. Pineda, A. J. Conejo and M. Carrión, "Impact of unit failure on forward contracting", in <i>IEEE Transactions on Power Systems</i>, vol. 23, no. 4, pp. 1768–1775, November 2008. (published)</li> </ol>	
	<ol> <li>J. M. Morales, S. Pineda, A. J. Conejo and M. Carrión, "Scenario reduction for futures market trading in electricity market", in <i>IEEE Transactions on Power Systems</i>, vol. 24, no. 2, pp. 878–888, May 2009. (published)</li> </ol>	
	<ol> <li>S. Pineda and A. J. Conejo, "Scenario Reduction for Risk-Averse Electricity Trading", in <i>IET Generation, Transmission &amp; Distribution</i>, vol. 4, no. 6, pp. 694–705, June 2010. (published)</li> </ol>	
	<ol> <li>S. Pineda, A. J. Conejo and M. Carrión, "Insuring unit failures in electricity markets", in <i>Energy Economics</i>, vol. 32, no. 6, pp. 1268–1276, November 2010. (published)</li> </ol>	
	<ol> <li>Y. Lee, J. Hur, R. Baldick, and S. Pineda, "New Indices of Market Power in Transmission- Constrained Electricity Markets", in <i>IEEE Transactions on Power Systems</i>, vol. 26, no. 2, pp. 681–689, May 2011. (published)</li> </ol>	
	<ol> <li>S. Pineda and A. J. Conejo, "Managing the financial risks of electricity producers using options", in <i>Energy Economics</i>, vol. 34, no. 6, pp. 2216–2227, November 2012. (published)</li> </ol>	
	<ol> <li>S. Pineda and A. J. Conejo, "Using Electricity Options to Hedge Against the Financial Risks of Power Producers", in <i>Journal of Modern Power Systems and Clean Energy</i>, vol. 1, no. 2, pp. 101–109, 2013. (published)</li> </ol>	

- Y. Ding, S. Pineda, P. Nyeng, J. Østergard, E. Larsen and Q. Wu, "Real-time Market Concept Architecture for EcoGrid EU - A Prototype for European Smart Grids", in *IEEE Transactions* on Smart Grids, vol. 4, no. 4, pp. 2006-2016, 2013. (published)
- J. M. Morales, M. Zugno, S. Pineda and P. Pinson "Electricity Market Clearing With Improved Scheduling of Stochastic Production", in *European Journal of Operational Research*, vol. 235, no. 3, 2014. (published)
- J. M. Morales, M. Zugno, S. Pineda and P. Pinson, "Redefining the Merit Order of Stochastic Generation in Forward Markets", accepted in *IEEE Transactions on Power Systems*, vol.29, no.2, pp. 992-993, March 2014. (published)
- S. Pineda, J.M. Morales, Y. Ding and J. Østergard, "Impact of Equipment Failures and Wind Correlation on Capacity Expansion Planning", in *Electric Power System Research*, vol. 116, pp. 451-458, November 2014. (published)
- Y. Hu, J. M. Morales, S. Pineda, M. J. Sánchez, P. Solana, "Dynamic multi-stage dispatch of isolated wind-diesel power systems", *Energy Conversion and Management*, vol. 103, pp. 605-615, October 2015. (published)
- S. Pineda, J.M. Morales and T.K. Boomsma, "Impact of Forecast Errors on Expansion Planning of Power Systems with a Renewables Target", in *European Journal of Operations Research*, vol. 548, no. 3, pp. 1113-1122, February 2016. (published)
- S. Pineda and J. M. Morales, "Modeling the Impact of Imbalance Costs on Generating Expansion of Stochastic Units", accepted in *Computers & Operations Research*, vol. 70, pp. 101-114, 2016. (published)
- 15. S. Pineda and A. Bock, "Renewable-based generation expansion under a green certificate market", in *Renewable Energy*, vol. 91, pp. 53-63, 2016. (published)
- J. M. Morales and S. Pineda, "On the Inefficiency of the Merit Order in Forward Electricity Markets with Uncertain Supply", in *European Journal of Operational Research*, vol. 261, no. 2, pp. 789-799, 2017. (published)
- S. Pineda, T.K. Boomsma and S. Wogrin, "Renewable generation expansion under different support schemes: A stochastic equilibrium approach" in *European Journal of Operational Research*, vol. 266, no. 3, pp. 1086-1099, 2018. (published)
- 18. S. Pineda, H. Bylling and J. M. Morales, "Efficiently solving linear bilevel programming problems using off-the-shelf optimization software", accepted in *Optimization and engineering*.

Teaching Experience

- **2016/2017:** Master course *Electrical technology* at the University of Málaga.
  - **2016/2017:** Master course *Railway technology* at the University of Málaga.
    - 2016/2017: Bachelor course *Electrical network analysis* at the University of Málaga.
    - **2016**/2017: Bachelor course *Basics of Electrical Engineering* at the University of Málaga.

**2015/2016:** Master course Operations Research 3: Hierarchical Optimization and Equilibrium at the University of Copenhagen.

**2013/2014:** PhD course Advanced mathematical programming: hierarchical optimization and equilibrium at the University of Copenhagen.

2013/2014: Master course Optimization and convexity at the University of Copenhagen.

**2011/2012:** Special course *Decision making under uncertainty in electricity markets* at the Technical University of Denmark.

**2011:** Participation and organization of the Summer course Electricity market design and operation: An in-depth introduction, hosted by the Center for Electric Technology (CET) of the Technical University of Denmark - Lecture on Financial Market for Restructured Power Systems.

**2010**/**2011:** Course Introduction to operation of power systems within the B.Sc. Degree of Industrial Engineering at the University of Castilla-La Mancha.

**2009/2010:** Course Introduction to operation of power systems within the B.Sc. Degree of Industrial Engineering at the University of Castilla-La Mancha.

### PhD students

- Henrik Bylling (with Trine Boomsma): Mathematical modeling of renewable-based energy systems (2018).
- Ditte Heide-Jørgensen (with Trine Boomsma and Pierre Pinson): Operations management in short-term power markets (2016).
- Qi Wang(with Trine Boomsma and Pierre Pinson): Real-time trading strategies for proactive distribution company with distributed generation and demand response (Sept, 2016).

#### MSc students

- Jonas Johansen Næsby: Solving the kidney exchange problem using integer programming (2015).
- Lars-Erik Høiler Kanstrup: Flexible Demand to Facilitate the Integration of Renewables into Power Systems Using k-means Clustering (2015).
- Henrik Bylling: Comparison of Methods to solve Linear Bilevel Optimization Problems (2015).
- Sara Mohamad El-Wali: Decomposition methods for mutistage stochastic linear problems (2015).
- Pavol Hronsky: Strategic Behavior of Power Producers in Two Stage Electricity Markets (2015).
- Niamh O'Connell (with Pr. J. Østergard and Asst. Prof. Q. Wu): Congestion management of electricity distribution networks operating under a real time market (2012).
- Dario Sacchetti (with Assoc. Prof. C. N. Rasmussen): Modeling of power system containing demand response (2012).
- Yang Li (with Assoc. Prof. Y. Ding): Studies of electricity network tariff (2012).
- A. J. Conejo, R. Garca-Bertrand, M. Carrin and S. Pineda, *Futures Market Trading for Electricity* Producers and Retailers. Chapter of book: S. Rebennack, P. M. Pardalos, M. V. F. Pereira and N. A. Iliadis, *Handbook of Power Systems*. Springer-Verlag, Heidelberg, 2010. ISBN: 978-3-642-02492-4.
  - Y. Ding, J. Østergard, S. Pineda and Q. Wu, The Smart Grid as a Response to Spread the Concept of Distributed Generation. Chapter of book: V. Piemonte, M. De Falco and A. Basile, Sustainable Development in Chemical Engineering Innovative Technologies. John Wiley & Sons, Ltd, Chichester, UK, 2013. ISBN: 978-1-119-95352-4.
  - J. M. Morales, S. Pineda and M. Zugno, Market design for future clean electricity systems: Advances based on optimization under uncertainty. Chapter of book: Handbook of Clean Energy Systems, Vol. 4: Intelligent Energy Systems, John Wiley & Sons, Chichester, UK. ISBN: 9781118991978.
- Conferences Contributions
- S. Pineda, A. J. Conejo and M. Carrión, "Impact of unit failure on forward contracting", IN-FORMS Annual Meeting 2007, Seattle, Washington, USA, 4–7 November 2007.
  - J. M. Morales, S. Pineda, A. J. Conejo and M. Carrión, "Scenario reduction for futures market trading in electricity market", *INFORMS Annual Meeting 2008*, Washington D.C., USA, 12–15 October 2008.
  - J. M. Morales, S. Pineda, A. J. Conejo and M. Carrión, "Scenario reduction for futures market trading in electricity market", 23rd European Conference on Operational Research, Bonn, Germany, 5–8 July 2009.
  - S. Pineda, A. J. Conejo and M. Carrión, "Insuring unit failures in electricity markets", *INFORMS Annual Meeting 2009*, San Diego, California, USA, 11–14 October 2009.
  - 5. S. Pineda and A. J. Conejo, "Options to hedge against producer risks in electricity markets", *INFORMS Annual Meeting 2010*, Austin, Texas, USA, 7–10 November 2010.
  - S. Pineda, J. M. Morales, A. J. Conejo and M. Carrión, "Scenario reduction for futures market trading in electricity market", *Conference on Management Science 2011*, Neuchâtel, Switzerland, 28–30 April 2011.
  - Y. Ding, Y. Li, S. Pineda, J. Østergaard and T. Jin, "The Impact of Dynamic Electricity Tariff on Long-run Incremental Cost", *IEEE PES 2012 General Meeting*, San Diego, California, USA, 22–26 July 2012.
  - S. Pineda and J. M. Morales, "Optimal Location of Wind Power Capacity: A Point-estimate Solution Approach", *INFORMS Annual Meeting 2012*, Phoenix, Arizona, USA, 14–17 Octuber 2012.

Books

- Y. Ding, P. Nyeng, J. Ostergaard, M. Dang, S. Pineda, K. Kok, G. Huitema, O. Grande, "Ecogrid EU - a large scale smart grids demonstration of real time market-based integration of numerous small DER and DR", *Innovative Smart Grid Technologies* (ISGT Europe), Berlin, 14–17 Oct. 2012.
- J. M. Morales, M. Zugno, S. Pineda, P. Pinson, "Clearing Forward Markets Based on Forecasts of Stochastic Production", *EURO-INFORMS 2013*, Rome, Italy, 1–4 July 2013.
- S. Pineda, J. M. Morales, M. Zugno, P. Pinson, "Electricity Market Clearing With Improved Scheduling of Stochastic Production", *International Conference in Stochastic Programming*, Bergamo, Italy, 8–12 July 2013.
- S. Pineda "Electricity Markets and Stochastic Producers", tutorial in Innovative Smart Grid Technologies Conference, ISGT, Copenhagen, Denmark, 6–9 October 2013.
- 13. P. Nyeng, K. Kok, S. Pineda, O. Grande, J. Sprooten, B. Hebb, F. Nieuwenhout, "Enabling demand response by extending the European electricity markets with a real-time market," *Innovative Smart Grid Technologies Europe (ISGT EUROPE)*, 6-9 Oct. 2013.
- 14. S. Pineda, J.M. Morales, "Impact of imbalance costs on stochastic unit investments," Workshop on Modelling Investment in Power Systems, Copenhagen, 27 March 2014.
- S. Pineda, J.M. Morales, "Modeling the impact of imbalance costs and market design on generating expansion of stochastic units," 20th Conference of the International Federation of Operational Research Societies, IFORS 2014, Barcelona, Spain, 13-18 July 2014.
- S. Pineda, J.M. Morales, T. Boomsma, "Impact of Forecast errors on Generation and Transmission Expansion Planning", Workshop on Mathematical Models and Methods for Energy Optimization within COST Action TD1207, Budapest, Hungary, 25-26 Sept. 2014.
- S. Pineda, J.M. Morales, T. Boomsma, "Impact of Forecast Errors on Expansion Planning of Power Systems with a Renewables Target," *INFORMS Annual Meeting*, San Francisco, USA, 9-12 Nov. 2014.
- 18. S. Pineda, A. Bock, "Renewable-based generation expansion under a green certificate market", Nordic Environmental Social Science Conference (NESS), Trondheim (Norway), 9-11 Jun. 2015.
- 19. S. Pineda, A. Bock "Renewable-based generation expansion under a green certificate market", *INFORMS Annual Meeting*, Philadelphia, USA, 1-4 Nov. 2015.
- 20. J.M. Morales, S. Pineda, M. Zugno "On the Inefficiency of the Merit Order in Forward Electricity Markets with Uncertain Supply", *INFORMS Annual Meeting*, Philadelphia, USA, 1-4 Nov. 2015.
- D. M. Heide-Jorgensen, S. Pineda, T. K. Boomsma, "An equilibrium model for two-stage electricity markets", emphComputational Management Science Conference, Salamanca, Spain, 31May-2Jun, 2016.
- H. Bylling, S. Pineda, T. K. Boomsma, "Impact Of Short-term Variability And Uncertainty On Long-term Planning Problems", *INFORMS Annual Meeting*, Nashville, USA, 13-16 Nov. 2016.
- S. Pineda, J.M. Morales, "Capacity Expansion of Stochastic Power Generation under Two-Stage Electricity Markets", Symposium on Mathematical Techniques Applied to Data Analysis and Processing (SMATAD), Fuengirola, Spain, 18-21 May 2017.

## PROJECTS European projects

• EcoGrid EU (http://www.eu-ecogrid.net/), 2011-2015 (48 months).

#### Danish projects

- IPower (http://www.ipower-net.dk/), 2011-2015 (48 months).
- Ensymora (http://www.ensymora.dk/), 2011-2014 (48 months).
- FEMs (http://www.futureelmarket.dk/), 2013-2017 (60 months).
- SAVE-E (http://www.save-e.dk/), 2015-2018 (48 months).

## Spanish projects

- Distribution expansion planning considering renewable energies, storage, electric vehicles and demand response, Reference ENE2015-63879-R, 2015-2017 (36 months).
- Optimal investment in renewable non-dispatchable sources, transmission network, and regulation sources, 2011 (12 months).
- Risk Management in Electricity Markets, 2010-2012 (36 months). Reference DPI2009-09573.
- Integration of Renewable Electric Energy Sources in a Power System: Technical and Economical Assessment., 2008-2010 (36 months). Reference: PCI08-0102.

	• Production, Procurement and Trading Strategies in Electricity Markets Via Stochastic Program- ming, 2007-2009 (36 months). Reference DPI2006-08001.	
	• Setting up a Research and Development Knowhow for the Power System of Castilla-La Mancha, 2007 (12 months). Reference: PCI06-0155.	
Scientific Visits	University of Texas, Department of Electrical and Computer Engineering, Austin, Texas, US (February-April 2009). New Indices of Market Power in Transmission-Constrained Electricity Markets (with Prof. Ross Baldick).	
	Nowegian University of Science and Technology, Department of Industrial Economic and Technology Management, Trondheim, Norway (February-April 2010). <i>Risk Premium in</i> <i>European Electricity Markets</i> (with Prof. Stein-Erik Fleten).	
Grants	<ul> <li>Four Research Grants awarded by the University of Castilla-La Mancha (2008, 2009, 2010, and 2011).</li> <li>Grant awarded by the Spanish Ministry of Education and Science for visiting the University of Science, Trondheim, Norway. February-April 2010 (3 months).</li> <li>Grant awarded by the Spanish Ministry of Science for visiting the University of Texas at Austin Austin, Texas, United States. February-April 2009 (3 months).</li> <li>PhD Grant awarded by the Spanish Ministry of Science, July 2007 - June 2011 (48 months).</li> <li>Undergraduate Grant awarded by the Spanish Ministry of Science to research into the Department of Electrical Engineering at the University of Málaga, Málaga, Spain. 2005/2006 (9 months).</li> </ul>	
Other Information	<ul> <li>Journal referee of the following journals indexes in the SCI:</li> <li>IEEE Transactions on Power Systems</li> <li>IEEE Transactions on Smart Grids</li> <li>IEEE Transactions on Sustainable Energy</li> <li>IET Generation Transmission and Distribution</li> <li>Applied Energy</li> <li>European Journal of Operations Research</li> <li>Electric Power System Research</li> <li>Energy Economics</li> </ul>	

• Computers and Operations Research