

Ali Darudi



Personal Information:

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Address Murtenstrasse 53, 2502 Biel/Bienne, Switzerland
Birth 08.12.1988
Nationality Iranian (CH: B-Permit since 2015)
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Research Interests

Energy economics, Energy modeling, Policy design, Electric mobility, System adequacy

Education and Qualifications

- Oct 2015–present *University of Basel, Switzerland -Faculty of Business and Economics*
(*expected: 2020*)
PhD candidate in **Energy Economics**
Supervisor: **Prof. Dr. Hannes Weigt**
Main topics:
- Support policies and investors' preferences (in [SCCER CREST](#))
- Electric mobility and its effects on Swiss grid (in [JA Mobility](#))
- System adequacy studies for Switzerland (for Bundesamt für Energie)
- Jan 2016–Jan 2017 Swiss program for beginning doctoral students at the Study Center [Gerzensee](#), a foundation of the Swiss National Bank:
- 13 weeks of US-style PhD program with international lecturers
- Econometrics (statistical methods) and Micro/Macroeconomics
- Sep 2011–Sep 2014 *Ferdowsi University of Mashhad*
M.Sc. in **Electrical engineering – Power engineering**
Thesis: *Short-term supply functions forecasting using machine learning*
GPA: 18.12/20 (top 10%)
Selected courses:
- Power system planning/operation
- Numerical modeling of electricity market
- Sep 2007–Sep 2011: *Ferdowsi University of Mashhad*
B.Sc. in **Electrical Engineering – Power engineering**
GPA: 16.98/20 (top 10%)

Publications

Darudi, A., Bashari, M., Javidi, M.H. "Electricity price forecasting using a new data fusion" IET Generation, Transmission & Distribution, Vol:9, Issue: 12, pp:1382-1390, 2015.

Working papers:

- **Darudi, A.**, Weigt, H., "Renewable support, intermittency and market power: An equilibrium investment approach" WWZ Working Papers, 2019 (06). Basel.
- **Darudi, A.**, Weigt, H., "Incumbent's bane or gain? Renewable support and strategic behavior in electricity markets". Revised and resubmitted to The Energy Journal

Technical reports:

- Weigt, H., Demiray, T., Schlecht, I., Beccuti, G., Schillinger, M., **Darudi, A.** "Modellierung der Erzeugungs- und Systemkapazität (System Adequacy) in der Schweiz im Bereich Strom 2019" Bundesamt für Energie, Schweiz, 2020.

Work in progress:

- **Darudi, A.**, Schlecht, I., "Winning to delay? Incumbents incentives in German auctions for offshore wind."

Selected conference papers:

- **Darudi, A.**, Mendes Tavares, C., Weigt, H. "Electric mobility in Switzerland: how many Teslas can the system deal with?" 12th Workshop of Student initiative of the Swiss Association for Energy Economics (SAEE), Zurich, Switzerland, 2019.
- **Darudi, A.**, "Auctions for renewables: does the choice of payment scheme matter?" 25th Annual Conference of the European Association of Environmental and Resource Economists, Berlin, 2020.
- **Darudi A.**, Zomorodi A, Javidi M.H., "Effects of bidding data disclosure on unilateral exercise of market power," The International Conference on Control, Electronics, Communication and Smart Grids (ICCECSG), Mashhad, Iran, 2014.
- **Darudi A**, Yektay N, Zarif M, Javidi M.H., "Analyzing bidding behavior of generating companies in Iran's electricity market," International power system conference (PSC 2012), Tehran, Iran, 2012 (**Best paper award**)
- **Darudi, A.**, Rezaifar, S., Javidi, M.H., "Partial mutual information based algorithm for input variable selection for time series forecasting," 13th International Conference on Environment and Electrical Engineering (EEEIC13), Wroclaw, Poland, 2013.
- Bashari, M., **Darudi, A.**, Raeyatdoost, N., "Kalman fusion algorithm in electricity price forecasting." 14th International Conference on Environment and Electrical Engineering. IEEE, 2014.

Research Experience

- 2016 – present Research assistant at Energy Economics Chair, University of Basel:
- **Electric mobility:** Analyzing the effects of electric vehicles on the grid and achieving goals of Energy Strategy 2050 in Switzerland (in progress)
Responsibilities:
 - o Designing a chain tool between several energy and mobility modeling tools (STEM from PSI, MATSim from ETHZ, and Beddem from HES-SO)
 - o Defining future mobility scenarios in Switzerland
 - o Extending Swissmod (model of electricity network of Switzerland and neighboring countries) to analyze the effects of mobility driving pattern and charging behavior on the Swiss grid (in python and GAMS)
 - **System adequacy:** Analyzing the security of electricity supply in Switzerland up to 2040 considering future European electricity market developments.
Results: no supply shortages observed within the expected political developments
Responsibilities:
 - o EU level data availability analysis and transmission grid modeling
 - o Expanding Swissmod to include neighbors of Swiss neighbors
 - o Developing scenarios for the future of the Swiss electricity sector
 - **Renewable support policy design:** Game-theoretical analysis of the long-term effects of various renewable support policies on investments.
Results: while a feed-in premium policy leads to lower CO2 emissions, a feed-in tariff policy ensures a lower market price. In auctions, while a payment based on a fixed rate achieves true-cost bidding and allocative efficiency, premium-based payment leads to higher social welfare if market prices are too low relative to the social cost of carbon for the marginal conventional technology.
- 2014 – 2015 R&D research assistant in Toos Fuse Company
- Smart metering and Advanced metering infrastructure (AMI) solutions
 - Designing test equipment (micro-controllers programming and software design in MATLAB)
- 2012 Research assistant at NAPCO:
- Consultancy on designing financial derivatives markets for energy (critically analyzing experiences in several Asian markets)

Summer 2010 Research assistant at Khorasan Regional Electricity Company (regional TSO)
- Medium-term transmission line planning (internship), Mashhad, Iran.

Teaching/Academic Experience

- Mentor in MOOC course: "Exploring Possible Futures, Modeling in Environmental and Energy Economics," by Frank Krysiak and Hannes Weigt, *University of Basel*, 2017-2019
- Assistance in supervising final projects of bachelor students in engineering (4 students)
- Teaching assistant for Power system analysis I and II, Engineering economics, Electrical machinery, and Logic circuit design
- Ad hoc reviewer of Energy Economics and IEEE Transactions on Power Systems

Skills

Programming:

- Proficient in MATLAB, Python, and GAMS, cloud computing (Amazon Web Services, AWS)
- Familiar with Stata, Mathematica, and Office Excel

Methods:

- Classical regression analysis (parametric and non-parametric)
- Clustering: K- means and C-means
- Machine learning: Artificial neural networks and adaptive neuro-fuzzy inference system
- Feature selection: Mutual information and principal component analysis (PCA)
- Soft computing: Genetic algorithm and particle swarm optimization

Honors and Awards

- Scholarship for "PhD program in Applied Economics" from University of Basel – 2015
- Scholarship for the master program - Ranked in top 10% among bachelor students of Power Engineering - 2011
- Scholarship for the bachelor program - Ranked in the top 1% of nation-wide college entrance exam in mathematics & physics group - 2007

Languages

English: Full professional proficiency, German: Upper intermediate, Persian: Native, Arabic: Basic

Interests

Football, Reading, Volleyball, Stand up paddling, and Skiing

References

Professor Dr. **Hannes Weigt**
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Professor Dr. **Frank Krysiak**
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University of Basel, Switzerland
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