# Ali Darudi

## Personal Information:


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| **Contact** | ali.darudi@unibas.ch, +41754128297 |
| **Birth** | 08.12.1988 |
| **Nationality** | Iranian (CH: B-Permit since 2015) |
| **Website** | AliDarudi.ch |


## Research Interests

Energy economics, Market design, System adequacy, Electric mobility

## Education and Qualifications

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| Jan 2021–Present | Postdoctoral researcher at the University of Basel, Switzerland<br>Main topics: Market design for a decarbonized energy sector |
| Oct 2015–Dec 2020 | *University of Basel*, Switzerland -Faculty of Business and Economics<br>PhD candidate in **Energy Economics**<br>Supervisor: **Prof. Dr. Hannes Weigt**<br>Title: Renewable Energy Support Policies and Strategic Behavior |
| Jan 2016–Jan 2017 | Swiss program for beginning doctoral students at the Study Center Gerzensee, a foundation of the Swiss National Bank:<br>- 13 weeks of US-style PhD program with international lecturers<br>- Econometrics (statistical methods) and Micro/Macroeconomics |
| Sep 2011–Sep 2014 | *Ferdowsi* University of Mashhad<br>M.Sc. in **Electrical engineering – Power engineering**<br>Thesis: *Short-term supply functions forecasting using machine learning*<br>GPA: 18.12/20 (top 10%)<br>Selected courses:<br>- Power system planning/operation<br>- Numerical modeling of electricity market |
| Sep 2007–Sep 2011: | *Ferdowsi* University of Mashhad<br>B.Sc. in **Electrical Engineering – Power engineering**<br>GPA: 16.98/20 (top 10%) |

## Selected Publications

**Darudi, A.** and Weigt, H "Incumbent's Bane or Gain? Renewable Support and Strategic Behavior in Electricity Markets." *The Energy Journal* 41. Special Issue (2020).

**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.

**Darudi, A.**, Weigt, H., "Renewable support, intermittency and market power: An equilibrium investment approach". WWZ Working Papers, 2019 (06). Basel.

### Technical reports:

- Weigt, H., Demiray, T., Schlecht, I., Beccuti, G., Schilinger, 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** "Auctions for Renewables: Does the Choice of the Remuneration Scheme Matter?", Resubmitted to *The Energy Journal*
- **Darudi, A** and Weigt, H "Review of Assessments of Decarbonized Future Electricity Markets"

- 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 effects of electric vehicles on the grid and achieving goals of Energy Strategy 2050 in Switzerland (in progress)
  Responsibilities:
  - Designing a chain tool between several energy and mobility modeling tools (STEM from PSI, MATSim from ETHZ, and Beddem from HES-SO)
  - Defining future mobility scenarios in Switzerland
  - 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 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:
  - EU level data availability analysis and transmission grid modeling
  - Expanding Swissmod to include neighbors of Swiss neighbors
  - Developing scenarios for future of 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 bachelore students of Power Engineering - 2011
- Scholarship for the bachelore 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, French: Beginner, Persian: Native, Arabic: Basic

## Interests

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

## References

Professor Dr. **Hannes Weigt**
Faculty of Business and Economics
University of Basel, Switzerland
hannes.weigt@unibas.ch

Professor Dr. **Frank Krysiak**
Faculty of Business and Economics
University of Basel, Switzerland
frank.krysiak@unibas.ch