

Curriculum Vitae: Oliver Ruhnau

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Short bio

Being a Research Associate and PhD Candidate at the Hertie School in Berlin, my research focuses on the economics of flexible electricity demand in the context of sector coupling and variable renewable energy sources. In recent publications, I explore the role of heat pumps and hydrogen electrolyzers for the wholesale market value of wind and solar power, and the price responsiveness of the demand for balancing services. I am co-developing the open-source electricity market model EMMA and apply statistical methods for causal inference. Previously, I was Data Scientist with the energy service company Digital Energy Solutions. I studied Engineering and Economics at the RWTH Aachen University and the KTH Royal Institute of Technology, Stockholm.

Positions

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| 2019 – present | Research Associate, Hertie School, Berlin
Model comparison for impact analysis of policy instruments (MODEX-POLINS), funded by the German Federal Ministry of Economic Affairs and Energy |
| 2017 – 2019 | Data Scientist, Digital Energy Solutions, Munich and Berlin
Research and development, applied modelling of energy systems and markets, electricity storage and demand side management, electric heating and mobility |
| 2014 – 2017 | Student Assistant and Intern <ul style="list-style-type: none">• Institute for Future Energy Consumer Needs and Behavior, E.ON Energy Research Center, RWTH Aachen• BET Büro für Energiewirtschaft und technische Planung, a consultancy for energy economics and technology, Aachen• Grundgrün Energie, a renewable energy utility, Berlin |

Education

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| 2019 – present | Doctoral Programme in Governance, Hertie School, Berlin
Economics of flexible electricity demand, supervisor Lion Hirth |
| 2011 – 2017 | Economics and Engineering, Bachelor and Master of Science, RWTH Aachen
Focus: energy economics, energy systems, renewable energy
Grade: both excellent (1.3) |
| 2011 | Gymnasiums Siegburg Alleestraße, Secondary School
Grade: very good (1.0, best possible grade) |

Teaching

- 2020 – present **Teaching Assistant, [Hertie School, Berlin](#)**
Electricity Economics
- 2021 **Certificate, Introduction to Teaching in Higher Education, [Hertie School, Berlin](#)**
- 2020 **Guest Lecturer, [TU Berlin, Campus El Gouna, Egypt](#)**
Electricity Economics and Modeling
- 2012 – 2016 **Tutor, RWTH Aachen**
- Energy System Technology, Institute of Technical Thermodynamics (LTT)
 - Decision Theory, Chair of Decision Theory and Financial Services (EFI)

International

- 2013 **Study Abroad, [KTH Royal Institute of Technology, Stockholm](#)**
Focus: energy modeling, Swedish language and culture
- 2007, 2009 **International student exchanges**
France and Canada (Québec)

Honors

- 2020 – present **Stipend from the German Economy Foundation (Stiftung der Wirtschaft)**
Think Lab 2.0 – shaping transformation: stipend for energy transition projects
- 2021 **2nd-Best Student Paper Award, International Association for Energy Economics**
- 2017, 2019 **Finalist at awards of the German Association for Energy Economics**
- 2013 – 2017 **Stipend from the German Academic Scholarship Foundation (Studienstiftung)**
- 2013 – 2015 **Dean's List at RWTH Aachen (Top 5%)**
- 2013 **Stipend for Studies Abroad from the Dr. Jürgen und Irmgard Ulderup-Stiftung**

Initiatives

- 2021 – present **Founding member of the [d\carb – Future Economy Forum](#)**
Organizing public events on the transition toward a sustainable economy
- 2013 – 2017 **[Energie Forum Aachen e.V.](#)**
Organizing public events on energy topics
- 2012 – 2017 **Hêvî e.V. - Association for Education and Integration**
Member of the board
- 2007 – 2011 **Student Council**
President (one year)

Research interests

Energy economics, energy policy, electricity markets (wholesale, retail, balancing), market design, tariff design, market regulation, carbon pricing

Integrated energy systems, wind and solar energy, energy storage, flexible electricity demand (DR/DSM/ price elasticity), sector coupling, energy end-use electrification, electric vehicles, electric heat pumps, hydrogen, net-zero energy systems

Numerical and empirical methods, energy market modeling, linear optimization, partial equilibrium models, causal inference, instrumental variables

Publications

[Google Scholar](#)

Full peer-review

Ruhnau, O., Hirth, L., Praktiknjo, A., 2020. [Heating with wind: Economics of heat pumps and variable renewables](#). *Energy Economics*, Elsevier. (presented at YEEES 2019, INREC 2019)

Cloete, S., Ruhnau, O., Hirth, L., 2020. [On capital utilization in the hydrogen economy: The quest to minimize idle capacity in renewables-rich energy systems](#). *International Journal of Hydrogen Energy*, Elsevier.

Ruhnau, O., Hennig, P., Madlener, R., 2020. [Economic implications of forecasting electricity generation from variable renewable energy sources](#). *Renewable Energy*, Elsevier. (presented at OR2015)

Ruhnau, O., Hirth, L., Praktiknjo, A., 2019. [Time series of heat demand and heat pump efficiency for energy system modeling](#). *Scientific Data*, Nature.

Ruhnau, O., Bannik, S., Otten, S., Praktiknjo, A., Robinius, M., 2019. [Direct or Indirect Electrification? A review of heat generation and road transport decarbonisation scenarios for Germany 2050](#). *Energy*, Elsevier.

Working papers

Ruhnau, O., 2021. [How flexible electricity demand stabilizes wind and solar market values: the case of hydrogen electrolyzers](#). *Working paper*. (2nd-Best Student Paper at the IAEE 2021, presented at INREC 2020)

Eicke, A., Ruhnau, O., Hirth, L., 2021. [Electricity balancing as a market equilibrium: An instrument-based estimating supply and demand for imbalance energy](#). *Working paper*.

Pöstges, A., Bucksteeg, M., Ruhnau, O., et al., 2021. [Phasing out coal - An impact analysis comparing five large-scale electricity market models](#). *Working paper*.

Ruhnau, O., Bucksteeg, M., Ritter, D., et al., 2021. [Why electricity system models yield different results: carbon pricing in a model-comparison experiment](#). *Working paper*.

Cloete, S., Ruhnau, O., Cloete, J.H., Hirth, L., 2021. [Blue hydrogen and industrial base products: The future of fossil fuel exporters in a net-zero world](#). *Working paper*

Software and data

Hirth, L., Ruhnau, O., Sgarlato, R., 2021. [The European Electricity Market Model EMMA](#). *Open-source electricity market model, including input data*.

Ruhnau, O. 2019. [When2Heat Heating Profiles](#). *Contributed data package to the Open Power System Data Platform*

Reviewer

- Energy Policy
- German Advisory Council on the Environment (Sachverständigenrat für Umweltfragen)