Curriculum Vitae: Lion Hirth

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Short bio

Prof. Dr. Lion Hirth is founder and director of Neon, a boutique energy economics consulting firm; assistant professor at Hertie School, a Berlin-based public policy school; and research fellow at MCC, a climate think tank. He is an energy economist and expert in renewable energy, electricity market design, and energy policy. Lion has advised clients across the private and public sectors, including Germany's Ministry for Economic Affairs and Energy, the International Energy Agency, the European Commission, Agora Energiewende, as well as various European transmission system operators and utilities. Lion is founder of Strommarkttreffen, a 5000-member network of energy professionals in science, policy and industry. He has developed and maintains the open source power market model EMMA and coordinates Open Power System Data. Previously, Lion spent five years with the Swedish utility Vattenfall. Lion holds a Ph.D. and a Diploma in economics, and a Magister Artium in political science. His academic articles are published in the top energy economics and engineering journals, have won several awards and are among the most cited in the field.

Positions

2014 – present **Director of Neon**
Founder and director of Neon Neue Energieökonomik GmbH, a Berlin-based boutique consulting firm for energy economics, advising international clients from the public and private sector to design and navigate power systems and markets

2017 – present **Assistant professor at Hertie School**
Assistant Professor of Governance of Digitalization and Energy Policy at Hertie School, a public policy school, teaching classes on energy economics, power market modeling, climate change, and economic growth

2014 – 2016 **Post-doc researcher at MCC**
Post-doctoral researcher at Mercator Research-Institute for Global Commons and Climate Change, a think tank for climate economics

2009 – 2014 **Market analyst at Vattenfall**
Market analyst at Vattenfall Group Strategy, assessing renewable energy policy, long-term electricity prices and balancing energy

Education

2012 – 2014	**Economics (Ph.D.), Technical University of Berlin** Dissertation topic "The Economics of Wind and Solar Variability" (*summa cum laude*), supervisor Ottmar Edenhofer
2004 – 2009	**Economics (Diploma), University of Tübingen** GPA: 1.1 (corresponding to A+), best degree in economics
2005 – 2010	**Political Science (Magister Artium), University of Tübingen** GPA: "excellent" (A+)
2001 – 2009	**Study abroad and research visits** University of Massachusetts (USA), Universidad Católica (Chile), John Abbot College (Canada), Potsdam Institute for Climate Impact Research (Germany)
1994 – 2004	**Willi-Graf-Gymnasium, Munich** GPA: 1.2 (A+)

Teaching

2017 – present	Master-level lectures and seminars at Hertie School
2014 – present	Executive training seminars in power markets, energy economics, and modeling
2013 – 2018	Master-level courses at TU Berlin and HTW Berlin
2006 – 2012	Summer schools for Deutsche Schülerakademie, Teaching assistant at U Tübingen

Honors

2020	Top 40 under 40, Das Capital
2018	Excellence in Teaching Award, Hertie School
2017 – 2018	Fellow Freies Wissen, Wikimedia Deutschland
2017	Open Science Award of Schleswig-Holstein for OPSD
2015	Best paper award, INREC conference Essen
2014	Best working paper award, International Association for Energy Economics
2013	Selected paper, Solar Integration Workshop London
2013	Best paper award and Best poster award, IEWT conference Vienna
2011	Best degree in economics, University of Tübingen
2005 – 2010	Scholarship, Studienstiftung des Deutschen Volkes
2007 – 2009	Scholarships, Hertie-Stiftung, DAAD, University of Massachusetts

Service to the community

2009 – today	Founder, director of Strommarkttreffen, a network for professionals in energy
2014	Co-founder of the Openmod Initiative, a network for open-source energy modeling

Research interest

The economics of renewables: market value of wind and solar energy, system integration, (whole) system costs

Electricity market design: wholesale markets, flexibility, investment incentives, balancing systems and markets

Network pricing: redispatch and congestion management, locational incentives and pricing

Energy policy instruments: support schemes, carbon pricing

Modeling: numerical power market and energy system modeling

Open science: open-source software and open data in energy

Publications

Lion has published 32 articles in peer-reviewed economics and engineering journals, including single-author papers in the leading field outlets *Energy Economics*, *The Energy Journal*, and *Applied Energy*. His "Market Value" paper is the most cited article in *Energy Economics* in recent years (see ranking), as is "Optimal Share" in *The Energy Journal* (see ranking). Google Scholar lists a total of 4500 citations, yielding an h-index of 25. RePEc lists Lion among the top 5% energy economists and among the top 10 of all economists of the cohort 2014; FAZ lists him among the top 30 German research economists. Lion's publications have won several awards, including the best paper award of the International Association for Energy Economics.

Google scholar | RePEc | ResearchGate | SSRN | All papers (zip)

First-authored articles in peer-reviewed journals

32. Open Data for Electricity Modeling: Legal Aspects, *Energy Strategy Reviews*, 2020. open access

31. The ENTSO-E Transparency Platform. An assessment of Europe's most ambitious electricity data platform, *Applied Energy*, 2018 (w/ Jonathan Mühlenpfordt & Marisa Bulkeley). open access

30. What caused the drop of European electricity prices? A factor decomposition analysis, *The Energy Journal*, 2018. open access

29. The benefits of flexibility: The value of wind energy with hydropower, *Applied Energy*, 2016. pdf

28. The role of capital costs for decarbonizing the power sector, *Environmental Research Letters,* 2016 (w/ Jan Steckel). pdf

27. System-friendly Wind Power, *Energy Economics*, 2016 (w/ Simon Müller). pdf | Best paper award INREC

26. Why Wind is not Coal: On the Economics of Electricity Generation, *The Energy Journal*, 2016 (w/ Falko Ueckerdt & Ottmar Edenhofer). pdf

25. Balancing Power and Variable Renewables: Three Links, *Renewable & Sustainable Energy Reviews*, 2015 (w/ Inka Ziegenhagen). pdf

24. Integration Costs Revisited – An economic framework of wind and solar variability, *Renewable Energy*, 2015 (w/ Falko Ueckerdt & Ottmar Edenhofer). pdf | Best paper award IAEE | Best poster award IEWT | Best paper award IEWT

23. The Optimal Share of Variable Renewables: How the Variability of Wind and Solar Power affects their Welfare-optimal Deployment, *The Energy Journal*, 2015. pdf | review

22. The Market Value of Solar Power: Is Photovoltaics Cost-Competitive?, *IET Renewable Power Generation*, 2015. pdf | Selected paper Solar Integration Workshop

21. The Market Value of Variable Renewables: The effect of solar wind power variability on their relative price, *Energy Economics,* 2013. pdf

20. Redistribution Effects of Energy and Climate Policy: The electricity market, *Energy Policy,* 2013 (w/ Falko Ueckerdt). pdf

Co-authored articles in peer-reviewed journals

19. Carbon pricing in a model-comparison experiment, *Renewable & Sustainable Energy Reviews*, 2021 (w/ Oliver Ruhnau and others).

18. Electricity balancing as a market equilibrium, *Energy Economics* (w/ Anselm Eicke & Oliver Ruhnau). pdf

17. Reducing carbon emissions of households through monetary incentives and behavioral interventions: a meta-analysis, *Nature Energy*, 2021 (w/ Tarun Khanna and others)

16. Eyes on the Price: Which Power Generation Technologies Set the Market Price?, *Economics of Energy & Environmental Policy*, 2021 (w/ Eike Blume-Werry, Thomas Faber, Claus Huber & Martin Everts) pdf

15. On capital utilization in the hydrogen economy, *International Journal of Hydrogen Energy*, 2021 (w/ Schalk Cloete & Oliver Ruhnau). pdf

14. Heating with Wind, *Energy Economics*, 2020 (w/ Oliver Ruhnau & Aaron Praktiknjo). pdf

13. Locational investment signals in electricity markets, *The Energy Journal*, 2020 (w/ Anselm Eicke & Tarun Khanna). pdf

12. Reforming the electric power industry in developing economies: Evidence on efficiency and electricity access outcomes, *Energy Policy*, 2020 (w/ Andrea Dertinger). pdf

11. Flexible power and hydrogen production: Finding synergy between CCS and variable renewables, *Energy*, 2020 (w/ Schalk Cloete). open access

10. Technology-neutral auctions for renewable energy: EU law vs. reality in Member States, *Journal for European Enviromental & Planning Law*, 2019 (w/ Lars Jerrentrup, Bastian Lotz & Silvana Tiedemann). pdf

9. Time series of heat demand and heat pump efficiency for energy system modeling, *Nature Scientific Data*, 2019. (w/ Oliver Ruhnau & Aaron Praktiknjo). open access

8. Short-Term Electricity Trading for System Balancing, *Renewable & Sustainable Energy Reviews*, 2019 (w/ Christopher Koch). pdf

7. Open Power System Data - Frictionless data for electricity system modelling, *Applied Energy*, 2019 (w/ Frauke Wiese, Ingmar Schlecht, Juliane Reimann, Clemens Gerbaulet, Martin Jahn, Jonathan Mühlenpfordt, Friedrich Kunz, Wolf-Peter Schill & Casimir Lorenz). pdf

6. Opening the black box of energy modelling: strategies and lessons learned, *Energy Strategy Reviews*, 2018 (w/ Stefan Pfenninger, Ingmar Schlecht, Eva Schmid, Frauke Wiese, Tom Brown, Chris Davis, Matthew Gidden, Heidi Heinrichs & Clara Heuberger). open access

5. The importance of open data and software: is energy research lagging behind?, *Energy Policy*, 2017 (w/ Stefan Pfenninger, Joseph DeCarolis, Sylvain Quoilin & Iain Staffell). open access

4. Carpe diem: A novel approach to select representative days for long-term power system models with high shares of renewable energy sources, *Energy*, 2016 (w/ Paul Nahmmacher, Eva Schmid & Brigitte Knopf). open access

3. On the Economics of Renewable Energy Sources, *Energy Economics*, 2013 (w/ Ottmar Edenhofer, Brigitte Knopf, Michael Pahle, Steffen Schloemer, Eva Schmid & Falko Ueckerdt). pdf

2. System LCOE: What are the costs of variable renewables?, *Energy*, 2013 (w/ Falko Ueckerdt, Gunnar Luderer & Ottmar Edenhofer). pdf

1. Carbon lock-out: Advancing renewable energy policy in Europe, *Energies*, 2012 (w/ Paul Lehmann, Felix Creutzig, Melf-Hinrich Ehlers, Nele Friedrichsen, Clemens Heuson & Robert Pietzcker). open access

Working paper / under review

Reducing carbon emissions of households through monetary incentives and behavioral interventions: a meta-analysis, *in review*, 2020 (w/ Tarun Khanna, Giovanni Baiocchi, Max Callaghan, Felix Creutzig, Horia Bogdan Guias, Neal Haddaway, Aneeque Javaid, Nicolas Koch, Sonja Laukemper, Andreas Loeschel, Maria Del Mar Zamora, Jan Minx)

Redispatch Markets in Zonal Electricity Markets, *EconStor*, 2020 (w/ Ingmar Schlecht)

Markets for Local Flexibility in Distribution Networks, *EconStor*, 2019 (w/ Julia Radecke & Joseph Hefele)

Congestion Management: From Physics to Regulatory Instruments, *EconStor*, 2018 (w/ Samuel Glismann)

Eyes on the price: Which power generation technologies set the market price?, *FEEM Working Paper,* 2018 (w/ Eike Blume-Werry, Thomas Faber, Claus Huber & Martin Everts)

The Market Value of Wind and Solar Power: An Analytical Approach, *IAEE Working Paper*, 2016 (w/ Alexander Radebach)

Minimal Thermal Generation in Power Systems, *IAEE Working Paper*, 2015

How much electricity do we consume? *FEEM Working Paper*, 2014 (w/ Maximilian Schumacher)

Dissertation

The Economics of Wind and Solar Variability, TU Berlin, 2014.

Other publications

The importance of open data and software for energy research and policy advise, *SETIS Magazine*, 2016 (w/ Stefan Pfenninger, Joseph DeCarolis, Sylvain Quoilin & Iain Staffell).

Übertragungsnetzbetreiber erwarten massiven Wertverlust für Solarstrom, *Phasenprüfer*, 7 January 2016 (with Jakob Schlandt)

Jenseits des Sündenbocks Erneuerbare: Was hat den Verfall des Börsenstrompreises wirklich verursacht? , *Phasenprüfer*, 13 August 2015 (with Christoph Weber).

Das Ende der Grundlast, *Phasenprüfer*, 26 May 2015.

Solarstrom - an der Börse immer weniger wert, *pv magazine*, 23 April 2015.

Die Ökonomie der Energiewende, *Phasenprüfer*, 9 March 2015.

Wind, Sonne und Regelleistung, *energiewirtschaftliche tagesfragen*, 2013 (with Inka Ziegenhagen). pdf | Mandarin

The Decreasing Market Value of Variable Renewables: Integration Options and Deadlocks, in: Detlef Stolten & Viktor Scherer (eds.): Transition to Renewable Energy Systems: Energy Process Engineering, Wiley, 2013 (with Falko Ueckerdt). pdf

Press coverage

Die versteckten Kosten der Erneuerbaren, *NZZ*, 2019

Europe risks costly mistake with redispatch markets, *Montel News*, 2018

Wind and Solar Power Advance, but Carbon Refuses to Retreat, *New York Times, 2017*

Vattenkraft förbättrar vindkraftens lönsamhet, *Second Opinion*, 2016 (Swedish)

3 Ways Wind and Solar Can Continue To Grow In a 21st-Century Grid, *Rocky Mountain Institute Outlet,* 2015

Renewable energy sector runs the risk of overpowering market, *Financial Times*, 2015. pdf

No business case for lots of wind and solar, *Energy Transition*, 2015

Strom aus Erneuerbaren kannibalisiert sich selbst, *Handelsblatt,* 2015 (German)

A Look at Wind and Solar, Part 2: Is There An Upper Limit To Variable Renewables?, *TheEnergyCollective*, 2015

The Optimal Share of Intermittent Renewables, *TheEnergyCollective,* 2014

Doe windenergie niet af als kostenpost van miljarden euro's, *NRC*, 2014 (Dutch)

Peer review

Lion has served as referee for various journals and funding bodies, including:

Energy Economics
The Energy Journal
IEEE Transactions on Power Systems
IEEE Transactions on Renewable Energy
Energy Policy
Economics of Energy and Environmental Policy
Research Council of Norway

Research grants

START. Project funded by BMBF and headed by Potsdam Institute of Climate Impact Research (Hertie share EUR 42,000). Within the large and diverse START project, we empirically researched locational investment signals in electricity systems. (2017-20)

MODELX-Polins. Project funded by BMWi and headed by University of Duisburg-Essen (Hertie share EUR 82,000). In this model comparison exercise, we test and validate various energy system models with respect to policy instruments such as carbon pricing. (2019-21)

SENTINEL. Project funded by the European Commission under the Horizon 2020 program headed by ETH Zürich (Hertie share EUR 312,000). SENTINEL fosters the quality and transparency of energy system models through open modeling. (2019-22)

ARIADNE. Kopernikus project funded by BMBF headed by Potsdam Institute of Climate Impact Research (Lion's share EUR 291,000). Lion's team contributes research on locational incentives in power markets to the project. (2020-23)

Consulting projects

The following list summarizes consulting projects conducted by Neon. An overview of projects that Lion conducted in previous positions as well as letters of reference from clients are available on request.

Flex-in-market (TSO). For a European TSO, we assessed the incentives implied in multiple variants of their flexibility market proposals, in particular incentives for inc-dec gaming. 2020.

Redispatch for loads (BMWi). Outline of a market-based, i.e. voluntary, participation of electricity consumers in Germany's redispatch system based on capacity payments. Key design parameters such as contract duration and auction design are assessed with respect to incentive compatibility, economic efficiency, and incentives for gaming. Study for the Federal Ministry of Economic Affairs and Energy, Berlin. 2020.

Italy's PUN (BMWi). The Italian electricity market has six different bidding zones, but consumers pay a uniform *prezzio nationale unico* (PUN). For Germany's Federal Ministry of Economic Affairs and Energy, we assessed the pro's and con's of such an arrangement. 2020.

System imbalances (Trading company). During three episodes in June 2019, Germany's power system was heavily out of balance. For a European trading house, we provided expertise and analysis on the reasons and regulatory implications. 2019-20.

Procurement of ancillary services (BMWi). Assessment of market-based procurement of non-frequency ancillary services such as inertia, black start capability and voltage support. The study for the Federal Ministry of Economic Affairs and Energy, Berlin, provides the analytical basis for Germany's implementation of this aspect of the EU Clean Energy Package. Neon supports the project coordinated by EF.Ruhr and serves as work package leader. 2019-21.

Future market design (Utility). Neon supported an internal strategy process to assess alternative scenarios of future European power market designs. 2019

Nodal pricing (Forum Energii). Workshops on nodal pricing in Poland for the think tank Forum Energii and transmission system operator PSE. 2018.

UK wind value (RE project developer). We assessed the capture price of UK onshore and offshore wind, identifying drivers and singling out differences to other European markets. 2018.

Electricity supply contract (Industrial company). Expert evaluation of a long-term electricity supply contract for a large-scale energy-intensive industrial consumer as part of a litigation case. 2018.

RE auction design (BMWi). Evaluation of Germany's renewable energy auctions and assessment of reform options on behalf of Germany's Federal Ministry of Economic Affairs and Energy, Berlin. Navigant served as project lead. Neon contributed analyses of system-friendly wind power and locational signals. 2018-20. Report

Open modeling (BMWi). Study on open source energy system modeling and open data in the energy sector for BMWi. Neon lead a consortium of DIW Berlin, TU Berlin and ETH Zurich. 2018-20. OPSD | Report | Paper

Market-based redispatch (BMWi). Comprehensive assessment of alternative options to source redispatch resources, including redispatch markets and local markets for flexibility. After concluding that market-based redispatch results in problematic gaming incentives, alternative locational incentives were assessed. The client was Germany's Federal Ministry of Economic Affairs and Energy, Berlin. Neon served as project coordinator for a consortium of Consentec, Connect Energy Economics, Fraunhofer ISI, Ecofys, and SUER and was responsible for two work packages. 2017-20. Intermediate report (DE) | Final Report (DE | EN)

Grid benefits of offshore wind (RE project developer). Neon delivered input to a policy paper, assessing the grid and system benefits of offshore wind, driver by high capacity factors.

EU electricity market design (BMWi). Policy advice on wholesale market and balancing market design in the context of the EC Clean Energy for all Europeans package. Neon was member of a consortium with Connect Energy Economics, Consentec, and others. 2016-19.

ENTSO-E Transparency Platform (European Commission). Quality assessment of the data provided by European Transmission System Operators for DG Energy, Brussels. 2017. An article based on this study appeared in *Applied Energy*. Report | Article

Wind value lift (RE project developer). Evaluation of design options and operation strategies to improve the economics of wind power under market conditions. 2016-17.

Trading benchmark (Trading company). Regulatory assessment and quantitative cost benchmarks for portfolio management costs of renewable energy for the trading department of a major European utility. 2017.

Nodal vs. zonal pricing (BMWi). Consulting on locational price signals in wholesale markets. Along with Consentec, Neon was responsible to organize a series of workshop and develop a project report. 2016-17. Report (DE)

Open Power System Data (BMWi). Construction of an online platform for European power system data. Neon coordinated a team of three research institutes. 2015-17. Platform

RE time series (Utility). Neon provided in-feed time series of wind and solar power from re-analysis models. 2016.

Electricity market design (IEA-RETD). Assessment of long-term wholesale and retail power market design under very high shares of variable renewables in cooperation with FTI CL Energy. 2015-16. Report

Benefits of hydro flexibility (Utility). Model-based assessment of capture prices for a European utility. Neon provided a model-based assessment of the market value of wind energy and hydroelectricity. 2016.

Price drop (Swedish Energy). Swedish wholesale power prices declined by two thirds from 2010 to 2015. Neon conducted a model-based assessment of the reasons for this price drop. 2016. Report

Wind value in the Nordics (Energiforsk). Model-based assessment of the market value of wind energy in the hydro-dominated power system of the Nordic region. Neon designed the study, developed the model, and wrote the report, which appeared in *Applied Energy.* 2016. More

Model development (Trading company). Neon supported the trading department of a major European utility in power market model development. 2015.

Whole system costs (DECC). Neon reviewed a report on whole system costs of wind and solar power for the UK Department of Energy and Climate Change, London. 2015. Report

RE integration cost (Agora Energiewende). Qualitative study for Agora Energiewende. Neon advised Agora and helped implement workshops in Berlin and Paris. 2015. Report

System-friendly wind and solar power (IEA). Model-based study for the International Energy Agency. Neon assessed the market and system benefits of low-wind speed wind turbines and east- and west-oriented PV. 2014-16. A summary is published in *Energy Economics*. Paper

Teaching

Lion regularly teaches five graduate-level courses:

Electricity Economics, an introduction to power systems and markets
Renewable Energy Policies, an introduction to support schemes, auctions, and RE governance
Electricity System Modeling, an advanced course in Excel- and GAMS-based numerical modeling
Emissions Pricing, an advanced course on carbon taxation and emissions trading scheme
Economic Growth & Climate Change, on the theory and empirics of sustainable long-term growth

Evaluation results are available on request.

2020 Electricity Economics. Hertie School, Master-level. Power systems, electricity markets, merit order model, scarcity pricing, market value of renewables, electricity grids.

Electricity System Modeling. Hertie School, Master-level. Power market modeling based on Excel and GAMS.

2019 Electricity Economics. Hertie School, Master-level. Power systems, electricity markets, merit order model, scarcity pricing, market value of renewables, electricity grids.

Renewable Energy Policies. Hertie School, Master-level. Support schemes for renewable energy, auction design, risk and finance, net metering and prosumers.

Emissions Pricing. Hertie School, Master-level (w/ Christian Flachsland). Taxes vs. quantities, EU Emission Trading Scheme, global cap and trade systems.

Economic Growth & Climate Change. Hertie School, Master-level. Empirics of growth, Solow and Ramsey model, economics of ideas, poverty and inequality, climate change, sustainability.

Electricity System Modeling. Hertie School, Master-level. Power market modeling based on Excel and GAMS.

2018 Electricity Systems & Markets. Hertie School, Master-level. Power systems, electricity markets, merit order model, scarcity pricing, market value of renewables, electricity grids.

Renewable Energy Policies. Hertie School, Master-level. Support schemes for renewable energy, auction design, risk and finance, net metering and prosumers.

Emissions Pricing. Hertie School, Master-level (w/ Christian Flachsland). Taxes vs. quantities, EU Emission Trading Scheme, global cap and trade systems.

Economic Growth & Climate Change. Hertie School, Master-level. Empirics of growth, Solow and Ramsey model, economics of ideas, poverty and inequality, climate change, sustainability.

Electricity Economics & Modeling. Hertie School, Master-level. Power market modeling based on Excel and GAMS.

Electricity Economics & Modeling. TU Berlin, Master-level. Power market modeling based on Excel and GAMS.

Power Markets & Energy Economics. Neon, professional training seminar. Power systems, electricity markets, merit order model, scarcity pricing, market value of renewables, electricity grids.

Electricity system modeling. Neon, professional training seminar. Power market modeling based on Excel and GAMS.

2017 Electricity Economics & Technology. Hertie School, Master-level. Power systems, electricity markets, merit order model, scarcity pricing, market value of renewables, electricity grids.

Renewable Energy Policies. Hertie School, Master-level. Support schemes for renewable energy, auction design, risk and finance, net metering and prosumers.

Sustainable Energy & Climate Change. Hertie School, executive Master (w/ Claudia Kemfert).

Economic Growth & Climate Change. Hertie School, Master-level. Empirics of growth, Solow and Ramsey model, economics of ideas, poverty and inequality, climate change, sustainability.

Power market modeling. Neon, professional training seminar. Power market modeling based on Excel and GAMS.

2016 The Economics of Climate Change. TU Berlin, Master-level (w/ Ottmar Edenhofer). Climate physics, cost-benefit analysis of climate change, welfare theory, discounting.

2015 The Economics of Climate Policy. TU Berlin, Master-level (w/ Edenhofer). Market failures, internalization instruments, carbon pricing, international negotiations and game theory.

The Economics of Climate Change. TU Berlin, Master-level (w/ Edenhofer). Climate physics, cost-benefit analysis of climate change, welfare theory, discounting.

2014 Climate Change, Land Use & Infrastructure. TU Berlin, Master-level (w/ Edenhofer). Land use and bioenergy, urban economics, land rent taxation.

Electricity Economics. HTW Berlin, Master-level (w/ Andreas Raab).

'07-'13 Electricity Economics. HTW Berlin, Master-level (w/ Raab).

The Economics of Everything. Summer school "Deutsche Schülerakademie". Two weeks full-time undergraduate-level course (w/ Marie-Therese von Schickfus).

Electricity. Summer school "Deutsche Schülerakademie". Two weeks full-time undergraduate-level course (w/ Jonas Peters)

Energy Revolution. Summer school "JGW Nachhaltigkeitsakademie". Ten days full-time undergraduate-level course (w/ Valentin Schwamberger).

Global Warming. Summer school "JGW Nachhaltigkeitsakademie". Ten days full-time undergraduate-level course (w/ Schwamberger).

Public Finance, Macroeconomics I, Marcoeconomics II. Teaching assistant at University of Tübingen and Technical University of Berlin.

Supervision

PhD Tarun Khanna
Anselm Eicke
Oliver Ruhnau
Raffaele Sgarlato
Silvana Tiedemann

Master About 30 students