

# Lion Hirth: Publications

Lion has published 38 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*. Google Scholar reports a total of 7600 citations, yielding an h-index of 36. Two of his papers are the most cited in recent times in leading field journals, “Optimal Share” in *The Energy Journal* and “Market Value” in *Energy Economics*.

RePEc lists Lion among the top 5% energy economists; 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](#) · [ORCID](#) · [Scopus](#)

## Journal Articles (Peer-Reviewed)

38. **Profile contracts for electricity retail customers**, *Energy Policy*, 2024 (w/ Christian Winzer, Ramírez-Molina & Ingmar Schlecht). [open access](#)
37. **How aggregate electricity demand responds to hourly wholesale price fluctuations**, *Energy Economics*, 2024 (w/ Oliver Ruhnau & Tarun Khanna). [open access](#)
36. **Financial Contracts for Differences**, *Energy Policy*, 2024 (w/ Ingmar Schlecht & Christoph Maurer). [open access](#)
35. **Natural gas savings in Germany during the 2022 energy crisis**, *Nature Energy*, 2023 (w/ Oliver Ruhnau, Clemens Stiewe, Jarusch Muessel). [pdf](#)
34. **Cost-Potential Curves of Onshore Wind Energy: the Role of Disamenity Costs**, *Environmental and Resource Economics*, 2022 (w/ Oliver Ruhnau, Anselm Eicke, Raffaele Sgarlato & Tim Tröndle). [open access](#)
33. **Blue hydrogen and industrial base products**, *Journal of Cleaner Production*, 2022 (w/ Schalk Cloete, Oliver Ruhnau & Jan Hendrik Cloete). [pdf](#)
32. **Carbon pricing in a model-comparison experiment**, *Renewable & Sustainable Energy Reviews*, 2021 (w/ Oliver Ruhnau & others). [open access](#)

31. **Electricity balancing as a market equilibrium**, *Energy Economics*, 2021 (w/ Anselm Eicke & Oliver Ruhnau). pdf
30. **Reducing carbon emissions of households through monetary incentives and behavioral interventions: a meta-analysis**, *Nature Energy*, 2021 (w/ Tarun Khanna and others) open access
29. **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
28. **On capital utilization in the hydrogen economy**, *International Journal of Hydrogen Energy*, 2021 (w/ Schalk Cloete & Oliver Ruhnau). pdf
27. **Open Data for Electricity Modeling: Legal Aspects**, *Energy Strategy Reviews*, 2020. open access
26. **Heating with Wind**, *Energy Economics*, 2020 (w/ Oliver Ruhnau & Aaron Praktiknjo). pdf
25. **Locational investment signals in electricity markets**, *The Energy Journal*, 2020 (w/ Anselm Eicke & Tarun Khanna). pdf
24. **Reforming the electric power industry in developing economies: Evidence on efficiency and electricity access outcomes**, *Energy Policy*, 2020 (w/ Andrea Dertinger). pdf
23. **Flexible power and hydrogen production: Finding synergy between CCS and variable renewables**, *Energy*, 2020 (w/ Schalk Cloete). open access
22. **Technology-neutral auctions for renewable energy: EU law vs. reality in Member States**, *Journal for European Environmental & Planning Law*, 2019 (w/ Lars Jerrentrup, Bastian Lotz & Silvana Tiedemann). pdf
21. **Time series of heat demand and heat pump efficiency for energy system modeling**, *Nature Scientific Data*, 2019. (w/ Oliver Ruhnau & Aaron Praktiknjo). open access
20. **Short-Term Electricity Trading for System Balancing**, *Renewable & Sustainable Energy Reviews*, 2019 (w/ Christopher Koch). pdf
19. **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
18. **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
17. **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
16. **What caused the drop of European electricity prices? A factor decomposition analysis**, *The Energy Journal*, 2018. open access

15. **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](#)
14. **The benefits of flexibility: The value of wind energy with hydropower**, *Applied Energy*, 2016. [pdf](#)
13. **The role of capital costs for decarbonizing the power sector**, *Environmental Research Letters*, 2016 (w/ Jan Steckel). [pdf](#)
12. **System-friendly Wind Power**, *Energy Economics*, 2016 (w/ Simon Müller). [pdf](#) | Best paper award INREC
11. **Why Wind is not Coal: On the Economics of Electricity Generation**, *The Energy Journal*, 2016 (w/ Falko Ueckerdt & Ottmar Edenhofer). [pdf](#)
10. **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](#)
9. **Balancing Power and Variable Renewables: Three Links**, *Renewable & Sustainable Energy Reviews*, 2015 (w/ Inka Ziegenhagen). [pdf](#)
8. **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
7. **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](#)
6. **The Market Value of Solar Power: Is Photovoltaics Cost-Competitive?**, *IET Renewable Power Generation*, 2015. [pdf](#) | Selected paper Solar Integration Workshop
5. **The Market Value of Variable Renewables: The effect of solar wind power variability on their relative price**, *Energy Economics*, 2013. [pdf](#)
4. **Redistribution Effects of Energy and Climate Policy: The electricity market**, *Energy Policy*, 2013 (w/ Falko Ueckerdt). [pdf](#)
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 Papers / Preprints

The (very) short-term price elasticity of German electricity demand, 2022 (w/ Oliver Ruhnau & Tarun Khanna)

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

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

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

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

Minimal Thermal Generation in Power Systems, 2015

How much electricity do we consume? 2014 (w/ Maximilian Schumacher)

## Dissertation

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

## Other Academic Publications

Strategisches Bieten in Flex-Märkten, *Energiewirtschaftliche Tagesfragen*, 1/2019 (w/ Christoph Maurer, Ingmar Schlecht & Bernd Tersteegen)

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 (w/ 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 (w/ 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 (w/ Falko Ueckerdt). pdf

## Comissioned Reports

Mehrwert dezentraler Flexibilität, *Kurzgutachten für ZVEI*, 2024

Cross-border forward markets, *Report for German TSOs*, 2024

Systemstützendes Bilanzkreismanagement, *Kurzgutachten*, 2023

Electricity market reform, *Report for European Parliament*, 2023

Stromtarife für Preissicherheit und Flexibilität, *Kurzgutachten für LichtBlick*, 2023

Zeitvariable Netzentgelte, *Kurzgutachten für LichtBlick*, 2023

Windstrom Nutzen statt Abregeln, *Kurzgutachten für Agora Energiewende*, 2022

Öffentliche Ladeinfrastruktur, *Kurzgutachten für Agora Energiewende*, 2022

Dispatch Hubs, *Report for Elia Group*, 2021

Handel auf Basis des Regelleistungs-Abrufs, *Kurzgutachten*, 2021

Evaluierungsbericht der Ausschreibungen für erneuerbare Energien, *Bericht für das Bundesministeriums für Wirtschaft und Energie*, 2019

Kosten- oder Marktbasiert? Zukünftige Redispatch-Beschaffung in Deutschland, *Bericht für das Bundesministeriums für Wirtschaft und Energie*, 2019

Cost- or market-based? Future redispatch procurement in Germany, *Report for the German Federal Ministry for Economic Affairs and Energy*, 2019

Open Data for Electricity Modeling, *Report for the German Federal Ministry for Economic Affairs and Energy*, 2018

Zusammenspiel von Markt und Netz im Stromsystem, *Bericht für das Bundesministeriums für Wirtschaft und Energie*, 2018

Nodale und zonale Strompreissysteme im Vergleich, *Bericht für das Bundesministeriums für Wirtschaft und Energie*, 2018

Study on the quality of electricity market data, *Report for the European Commission*, 2018

Electricity Market Design and RE Deployment, *Report for IEA-RETD*, 2016

The Integration Costs of Wind and Solar Power, *Report for Agora Energiewende*, 2015

## Op-Eds and Interviews

Protecting electricity consumers from (more) price shocks, Op-ed Euractive, 2023

Six flaws in the EU Electricity Emergency Tool and how to fix them, Op-ed Euractive, 2022

Putin hat sein Erpressungspotenzial praktisch erschöpft, Interview with NZZ, 2022

The Iberian electricity market intervention does not work for Europe, Op-Ed VoXEU/CEPR, 2022

The Greek market design proposal would be the end of electricity markets as we know them, Op-ed Euractive, 2022

Energiemarkt der Zukunft, Interview with Lage der Nation, 2022

Why Spanish-Portuguese proposal to intervene in wholesale energy markets is problematic, Op-ed Euractive, 2022

Wie wir richtig viel Gas sparen, Op-ed Spiegel Online, 2022

Wie Europa auf Putins Gaslieferstopp reagieren kann, Op-ed Handelsblatt, 2022

Putin hat Europa finanziell ausgepresst wie eine Zitrone, Interview with Tagesspiegel, 2022  
Alternative Gaslieferanten haben wir quasi ausgeschöpft, Interview with Cicero Online, 2022  
Panel discussion „Zur Diskussion“, Deutschlandfunk, 2022

## Media Coverage and Mentions (not updated)

Why a price cap on Russian oil is a bad idea, Financial Times, 2022  
Radio interview, dpa, 2022  
Was die Gaskrise für Verbraucher bedeutet, Capital online, 2022  
Germany dims the lights to cope with Russia gas supply crunch, Financial Times, 2022  
Interview, Deutschlandfunk Nova, 2022  
Was passieren könnte, falls Russland demnächst den Gashahn zulässt, piqd, 2022  
Studie belegt Spareffekt hoher Gaspreise, Tagesspiegel Background, 2022  
Industrie und Haushalte senken Gasverbrauch, energate Messenger, 2022  
Interview, rbb InfoRadio Berlin, 5 July 2022  
So schlimm könnte der Gasstopp werden, Zeit Online, 2022  
Die zweite Krise: Frankreichs Kernenergie, Tagesspiegel Background, 2022  
Zurück zur Kohle, Zeit Online, 2022  
LEAK: EU countries urged to prepare for Russian gas 'supply shock', Euractive, 2022  
Energiesicherheit in Deutschland, ZDF, 2022  
Energiesicherheit in Deutschland: Comeback der Kohle?, 3sat, 2022  
How did Germany come to be so dependent on Russian gas?, Investment Monitor, 2022  
Offener Brief: Handlungsoptionen angesichts des Angriffs Russlands auf die Ukraine, Tagesspiegel Background, 2022  
Nuclear power: Are energy price hikes prompting a German rethink?, Deutsche Welle, 2022  
Alternative Erlösquellen für Batteriespeicher, PV Magazin, 2022  
Direkte Energiepreis-Subventionen für die Industrie, Tagesspiegel Background, 2022  
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)