

# FALKO UECKERDT

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## CURRENT POSITION

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- Potsdam Institute for Climate Impact Research (PIK)
- Deputy Lead - Energy Transition Lab (newly founded in 2025)
- Co-Management of the energy research at PIK (35 scientists)
  - Shaping the research agenda and strategy
- Leading a team of researchers on hydrogen, electrification and industry transformation (since 2019)
- direct supervision of nine PhD candidates and postdocs
  - Acquisition of third-party funding and coordinating international research projects
  - Integrating the global scenario model REMIND with detailed analysis (techno-economics, technology diffusion, material flow analysis)

## RESEARCH

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Topics	Energy system transformation, hydrogen, e-fuels, sector coupling, renewable energy, industrial transformation, scenarios (global, EU, and Germany)
Methods	Modeling of energy and climate change mitigation scenarios (Integrated assessment modeling, e.g. REMIND model, and detailed energy system modeling, e.g. Pypsa model) techno-economic and competitiveness analysis, technology diffusion analysis, policy instrument analysis, material flow analysis, economic theory
Disciplines	Applied and theoretical economics, physics and engineering (electrical, energy, chemical processes), business administration and management, broader social science
Publications	About 50 publications (many in high impact journals: Nature Energy, Nature Climate Change) 6500 citations, h-Index 28 ( <a href="#">Google Scholar</a> , <a href="#">ORCID</a> )
IPCC (intergovernmental panel on climate change)	Contributing Author in two IPCC reports: 2022: Sixth assessment report (AR6) “Mitigation of Climate Change”, 2011: Special Report “Renewable Energy Sources and Climate Change Mitigation”

## TEACHING

Lectures (Full Courses)	SoSe 2025: <i>Technical University Berlin</i> . Lecture (4 SWS, 6 ECTS): Energy und Climate Change (together with Prof. Gunnar Luderer)
	SoSe 2024: <i>Ruhr University Bochum</i> . (teaching assignment / Lehrauftrag) Lecture (2 SWS, 5 ECTS): Energy system transformation, technology and scenarios
	WiSe 2023/24: <i>Ruhr University Bochum</i> , (teaching assignment / Lehrauftrag) Lecture (2 SWS, 5 ECTS): Energy system transformation, technology and scenarios
Individual and regular guest lectures	Global Climate Change Mitigation, in the course „Climate Change Economics“ taught by Prof. Dr. Ulrike Kornek, SoSe 2022, 2023, and 2024), Christian Albrecht University of Kiel
	Power system economics and hydrogen, in the course „Energy und Climate Change“ by Prof. Dr. Gunnar Luderer, SoSe 2022, 2023, and 2024), <i>Technical University Berlin</i>
	Hydrogen, Ringvorlesung "Zukunft der Technik - Technik der Zukunft" by Prof. Dr. Anja Hentschel, WiSe 2022/23, <i>Darmstadt University of Applied Sciences</i>
	Transformation of the EU energy system, in „Advanced Climate Policy“ by Prof. Dr. Christian Flachsland, WiSe 2021/22, <i>Hertie School of Governance in Berlin</i>
	Energy system modelling (in German), in "Modellierung erdsystemarer Prozesse" by Priv.-Doz. Dr. Kirsten Thonicke, SoSe2020 and SoSe2021, <i>Potsdam University</i>
	The role of renewables in global energy transition scenarios, SoSe 2018, <i>University of Oldenburg</i>
Lectures on energy and climate change as a guest lecturer at the University of Dayton (Ohio, USA), SoSe 201	

Official evaluation of Dr. Ueckerdt's most recent course (SoSe24, *Ruhr University Bochum*): very good (4.6 of 5.0), while the average economic course reached 4.3 (in blue).

Subunit:	Fakultät für Wirtschaftswissenschaft
Name of the instructor:	Falko Ueckerdt
Name of the course: (Name of the survey)	V Energy system transformation, technology and scenarios
Comparative line:	Basis-Fragebogen Fak. f. Wirtschaftswissenschaft WS 2023/24 (50 LV   1270 FB)

Values used in the profile line: Mean

### Overall Assessment

My overall rating of the course:



n=19  
n=50

av.=4,6  
av.=4,3

md=5,0  
md=4,4

dev.=0,5  
dev.=0,7

## ACQUISITION OF RESEARCH FUNDING

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Dr. Ueckerdt has independently acquired a total of €3.2 million in third-party funding.

The below list also includes a selection of leadership roles in research projects.

Australian-German START Project (2017-2020)	Overall project lead (he acquired €2.1 million for the five German partner institutes of the Australian-German Energy Transition Hub).
Chinese-German INTEGRATE Project (2019-2023)	Project lead at PIK (€460k for PIK), Chinese-German research cooperation coordinated by Prof. Dr. Andreas Löschel (WWU/RUB)
Carbon Contracts for Differences (CCfDs) for Heavy Industry (2021-2024)	Project lead at PIK (€350k for PIK), research support for the German economic ministry in the development and design of CCfDs for German industry
ACEA Project (2022- 2023) for the European Automobile Manufacturers Association	Overall coordination (€180k for three partner institutes). Modeling transformation pathways for freight transport in the EU.
HyValue (2023- 2027)	Project lead at PIK (€120k for PIK). Hydrogen cooperation with Norway.
Ariadne Phase I 2020-2023	Not directly acquired by Dr. Ueckerdt, who was leading the hydrogen research in this large flagship project (with Benjamin Pfluger, Fraunhofer IEG)
Ariadne Phase II 2023-2026	Not directly acquired by Dr. Ueckerdt, who is currently co-leading the research on hydrogen, industry and green value chains in this large flagship project

## EDUCATION

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Doctorate 2010-2014	Degree: Dr. rer. nat. (interdisciplinary at the interface of economics, natural science and systems engineering)  Grade: <i>summa cum laude</i>  1 <sup>st</sup> supervisor: Prof. Dr. Ottmar Edenhofer (economist), 2 <sup>nd</sup> supervisor: Prof. Dr. Robert Brecha (physicist)  Title: „Integrating variable electricity supply from wind and solar PV into power systems”, Degree from the Technical University Berlin Main affiliation during PhD: Potsdam Institute for Climate Impact Research
Degree programme 2001-2008	Physics (diploma: Dipl.-Phys.) Mandatory elective minor: economics final grade: 1,1 Humboldt University of Berlin, Germany

## TRANSFER & COMMUNICATION

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**In the media**                      Approximately 100 interviews and background discussions with German and international media (e.g., German national radio [Deutschlandfunk Interview on hydrogen](#), [RBB/ARD Interview on e-fuels](#), [Deutschlandfunk Nova interview on hydrogen](#), [Tagesschau.de article](#), [Handelsblatt article](#), [The Guardian article](#), [Süddeutsche Zeitung](#), [FAZ](#), [ZEIT](#))

Two guest articles in *Focus online (German)*: „[Mut zum Klimaschutz](#)“ and „[E-Fuels](#)“

## PAST ROLES AND STAGES OF PROFESSIONAL CAREER

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July 2016 –                      Managing Director of the Australian-German  
Feb 2020                      Energy Transition Hub, a bilateral research network  
- employed at the Potsdam Institute for Climate Impact research (coordinating institution on the German side)  
- acquired funding for bilateral research projects  
- coordinating and conducting research in a network of 10 research institutes in Germany and Australia

May 2015 –                      International Renewable Energy Agency (IRENA)  
Feb 2016                      Bonn, Germany  
- coordinating and writing a report on energy planning with high shares of renewable energy

Feb 2016 –                      Hanley Sustainability Institute,  
June 2016                      University of Dayton, Ohio, USA.  
- Guest lecturer and scientist.

### Smaller roles in advisory groups

2024-2025                      OECD International Transport Forum (ITF) – expert group

2019-2022                      Member of the International Energy Agency's (IEA) Expert advisory group "Projected Costs of Generating Electricity"

2014-2017                      Member of the International Energy Agency's (IEA) Expert advisory group "Grid integration of variable renewables (GIVAR)"

## PUBLICATIONS (TOP10 SELECTED)

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### Selected publications

**Ueckerdt**, F. et al. Potential and risks of hydrogen-based e-fuels in climate change mitigation. *Nature Climate Change* 11, 384–393 (2021).

Verpoort, P. C., Gast, L., Hofmann, A. & **Ueckerdt**, F. Impact of global heterogeneity of renewable energy supply on heavy industrial production and green value chains. *Nature Energy* 9, 491–503 (2024).

**Ueckerdt**, F., Hirth, L., Luderer, G. & Edenhofer, O. System LCOE: What are the costs of variable renewables? *Energy* 63, 61–75 (2013).

Hirth, L., **Ueckerdt**, F. & Edenhofer, O. Integration costs revisited – An economic framework for wind and solar variability. *Renewable Energy* 74, 925–939 (2015).

Odenweller, A. & **Ueckerdt**, F. The green hydrogen ambition and implementation gap. *Nature Energy* 1–14 (2025) doi:10.1038/s41560-024-01684-7.

Odenweller, A., **Ueckerdt**, F., Nemet, G. F., Jensterle, M. & Luderer, G. Probabilistic feasibility space of scaling up green hydrogen supply. *Nature Energy* 7, 854–865 (2022).

**Ueckerdt**, F. et al. On the cost competitiveness of blue and green hydrogen. *Joule* 8, 104–128 (2024).

Luderer, G., Madeddu, S., Merfort, L., **Ueckerdt**, F., et al. Impact of declining renewable energy costs on electrification in low-emission scenarios. *Nature Energy* 7, 32–42 (2022).

Schreyer, F., **Ueckerdt**, F., et al. Distinct roles of direct and indirect electrification in pathways to a renewables-dominated European energy system. *One Earth* 7, 226–241 (2024).

Madeddu, S., **Ueckerdt**, F., et al. The CO<sub>2</sub> reduction potential for the European industry via direct electrification of heat supply (power-to-heat). *Environ. Res. Lett.* 15, 124004 (2020).

### Comment on relevance and impact

*Highly cited (~571) paper providing a framework to determine the most valuable end-use applications for hydrogen and hydrogen-based e-fuels*

*Innovative recent work, opening a new research direction and connecting to the current debate around heavy industry competitiveness. Dr. Ueckerdt closely supervised Dr. Verpoort and contributed the research design and working hypotheses.*

*1<sup>st</sup> paper by Dr. Ueckerdt. Highly cited (~800), conceptually innovative, impactful also with non-scientific stakeholders and institutions (this new metric has been adopted by the International Energy Agency).*

*Close joint work with Lion Hirth. Innovative and both theoretical and empirical. Highly cited (~560), impactful also with non-scientific stakeholders.*

*Very recent work on hydrogen (selected to be a research highlight by Nature Energy and Nature Chemical Engineering). Dr. Ueckerdt closely supervised PhD candidate Adrian Odenweller and added mostly through the research design and working hypotheses.*

*Highly cited work on hydrogen (~300). Dr. Ueckerdt serves as the corresponding author, closely supervised PhD candidate Adrian Odenweller, and added mostly through the research design and working hypotheses.*

*Conceptually and numerically innovative work on the competition of green and blue hydrogen. Dr. Ueckerdt led a research team from different backgrounds and institutes.*

*Highly cited (~410) global scenario modeling that was selected as one of five Illustrative Mitigation Pathways (IMPs) by the IPCC for their most recent AR6 report.*

*Dr. Ueckerdt supervised PhD candidate Felix Schreyer, deriving plausible ranges for hydrogen and direct electrification in EU net-zero 2050 scenarios with the REMIND model.*

*Dr. Ueckerdt supervised Postdoc Silvia Madeddu in this highly cited (~250) pioneering paper on how deep the direct electrification of process heat for energy-intensive industries in the EU could go.*

*For a full list of ~50 publications please visit my [Google Scholar profile](#).*