PROF. DR. GUNNAR LUDERER

DIPL.-PHYS., M.S.

CURRENT FUNCTIONS

> Lab Leader of the Energy Transition Lab; Lead Scientist for the REMIND Integrated Energy Economy Climate Model and Deputy Chair of the Research Department 3 – Transformation Pathways at the Potsdam Institute for Climate Impact Research
> Professor of Global Energy Systems Analysis at the Technische Universität Berlin (TUB)
> Lead Author for the IPCC Special Report on Climate Change and Cities

RESEARCH FOCI

> Integrated energy-economy-climate modeling
> Energy transition pathways on the global, regional and national level
> Renewable energy sources, electrification and sector coupling
> Interrelation of near-term climate policies and long-term climate targets
> High mitigation ambition scenarios

CONTACT

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SHORT PROFILE

Gunnar Luderer leads the Energy Transition Lab at PIK, and is the Lead Scientist for the REMIND Integrated Energy Economy Climate Model, and serves as Deputy Chair of Research Department 3 - Transformation Pathways. He is also Professor of Global Energy Systems Analysis at the Technical University of Berlin. Gunnar Luderer also serves as deputy leader of the BMBF-funded Kopernikus-Projekt Ariadne. Gunnar Luderer led pioneering research on the achievability of high ambition climate change mitigation goals, such as the 1.5°C target or deep emission reduction goals for Germany and the EU. He was a lead author of the 2013 and 2018 UNEP Emissions Gap Reports and a contributing author to the Sixth Assessment Report, Fifth Assessment Report, the Special Report on Warming of 1.5°C as well as the Special Report on Renewable Energy Sources of the Intergovernmental Panel on Climate Change (IPCC). He was appointed to serve as a Lead Author for the upcoming IPCC Special Report on Climate Change and Cities. He studied Physics, Economics and Atmospheric Sciences at the University of Heidelberg and Oregon State University. He performed his doctoral studies at the Max Planck Institute for Chemistry in Mainz. Gunnar Luderer has published more than 100 papers in peer-reviewed scientific journals, and has been regularly recognized as one of the World's most Highly Cited Researchers by the Web of Science Group since 2019.

EDUCATION

01/2004—09/2007	**International Max Planck Research School on Atmospheric Chemistry and Physics, University of Mainz** Doctorate in Natural Sciences (Dr. rer. nat.; Advisor: Prof. Dr. M. O. Andreae) Research visits to University of Washington and Hebrew University, Jerusalem
10/1998—12/2003	**University of Heidelberg** Studies of Physics, with Economics as a minor. Specialization in Environmental Physics. Final grade (Diploma): excellent (1.0) on a scale from 1.0—5.0
09/2001—10/2003	**Oregon State University, Corvallis, USA** Graduate Student in Atmospheric Sciences Master of Science, GPA: 3.97/4.00; Advisor: Prof. Dr. J. A. Coakley
08/1988—06/1997	**Kepler Gymnasium, Tübingen** Abitur (general university qualification), Average grade: excellent (1.1) on a scale from 1.0—5.0

WORK EXPERIENCE

since 01/2025	**Leader of the Energy Transition Lab** Potsdam Institute for Climate Impact Research (PIK)
since 09/2019	**Professor of the Global Energy Systems** Technische Universität Berlin (TUB); joint appointment with Potsdam Institute for Climate Impact Research

since 12/2008	**Lead Scientist for the REMIND Energy-Economy-Climate Model** Potsdam Institute for Climate Impact Research (PIK)
12/2008—12/2024	**Group Leader, Global Energy Systems** Potsdam Institute for Climate Impact Research (PIK)
10/2007—11/2008	**Post-Doctoral Researcher - Research Domain III – Sustainable Solutions** Potsdam Institute for Climate Impact Research (PIK)
06/2006—09/2007	**Scientific Staff** Federal Environment Agency, Dessau Climate Change Unit and European Topic Centre on Air and Climate
01/2004—06/2006	**Research Assistant** Max Planck Institute for Chemistry
09/2005—10/2005	**Internship** Öko-Institut – Institute for Applied Ecology, Berlin
01/2002—09/2006	**Graduate Research Assistant** Oregon State University, Corvallis, USA
03/2000—08/2001	**Research Assistantship** University of Heidelberg, Institute for Environmental Physics (Supervisor: Prof. Dr. U. Platt)
05/2000—07/2001	**Teaching Assistant** University of Heidelberg
07/1997—07/1998	**Community Servant (Zivildienst)** Öko-Institut – Institute for Applied Ecology, Freiburg Energy Division

PROJECT MANAGEMENT AND FUNDRAISING (SELECTION)

since 01/2026	Principal Investigator of the ERC Advanced Grant “Bridging scales for Integrated High-resolution modeling of the long-term Transition to sector-coupled net-zero energy systems (BRIGHT)” funded by the European Commission. Funding volume: 2.01 Mio. € for PIK.
since 09/2023	Deputy Project Manager of the „Verbundvorhaben ARIADNE2: Evidenzbasiertes Assessment für die Gestaltung der deutschen Energiewende – Teilvorhaben A0-2“ funded by BMBF. Funding volume: 8.5 Mio. € for PIK.
06/2020—05/2023	Deputy Project Manager, „Verbundvorhaben ARIADNE: Evidenzbasiertes Assessment für die Gestaltung der deutschen Energiewende – Teilvorhaben A“ funded by BMBF. Funding volume: 5.8 Mio. € for PIK.
06/2018—05/2020	Work package leader, “Transformation towards sustainable transport systems - The next generation policies” funded by Volkswagen AG. Funding volume: 150 k€ for PIK.
10/2017—09/2017	Module leader “Energy Systems Scenarios, Sectoral Bottlenecks and Options”, Strategic Scenario Analysis, German-Australian Research Collaboration funded by BMBF. Funding volume: 680 k€ for PIK.
10/2016—12/2019	Work package leader “Environmental Impacts”, ENavi Kopernikus Projekt für die Energiewende funded by BMBF. Funding volume: 1.600 k€ for PIK.
08/2015—08/2019	Work package leader and Coordination Board Member, “Linking Climate and Development Policies, Leveraging International Networks and Knowledge Sharing (CD-LINKS)”, www.cd-links.org, under EU Horizon2020. Funding volume: 613 k€ for PIK.
04/2015—08/2017	Project leader, UFOPLAN project “Globale Treibhausgasemissionspfade bis 2050” for the German Federal Environment Agency. Funding volume: 229 k€.
01/2013—12/2016	Project Director of the EU FP7 project ADVANCE www.fp7-advance.eu (involving 13 European research institutions, total funding volume 5.7 Mio. €, 1.05 Mio. for PIK)
01/2011—04/2013	Project leader, UFOPLAN Project “Scenarios on the feasibility of emissions reduction consistent with 2°C stabilization” for the German Federal Environment Agency. Funding volume: 183 k€.
04/2010—10/2013	Task Leader, cross-cut analysis on Renewable Energy Sources, Stanford Energy Modeling Forum 27 on the Role of Technologies for Climate Change Mitigation.
01/2008—12/2010	Scientific Coordinator, “Report on Energy and Climate Policy in Europe (RECIPE)”, Funder: WWF and Allianz. Funding volume: 500 k€.

PUBLICATIONS (SELECTION)

Prof. Dr. Gunnar Luderer has published more than 100 articles in peer-reviewed journals, and contribute to numerous book chapters and scientific reports. An up-to-date list of publications is available from his website at https://www.pik-potsdam.de/members/luderer/publications

Selected Top 10 Publications

Rodrigues, R., Pietzcker, R., Sitarz, J., Merfort, A., Hasse, R., Hoppe, J., Pehl, M., Ershad, A. M., Muessel, J., Schreyer, F., Baumstark, L., Luderer, G. (2026): 2040 greenhouse gas reduction targets and energy transitions in line with the EU Green Deal. Nature Communications, 17, doi: 10.1038/s41467-026-71159-8.

Schreyer, F., Ueckerdt, F., Pietzcker, R. C., Odenweller, A., Merfort, A., Rodrigues, R., Strefler, J., Lécuyer, F., Luderer, G. (2025): From net-zero to zero-fossil in transforming the EU energy system. Nature Communications, 16, doi: 10.1038/s41467-025-66682-z.

Luderer, G., Madeddu, S., Merfort, L., Ueckerdt, F., Pehl, M., Pietzcker, R. C., Rottoli, M., Schreyer, F., Bauer, N., Baumstark, L., Bertram, C., Dirnaichner, A., Humpenöder, F., Levesque, A., Popp, A., Rodrigues, R., Strefler, J., Kriegler, E. (2022): Impact of declining renewable energy costs on electrification in low-emission scenarios. Nature Energy, 7, 32—42, doi: 10.1038/s41560-021-00937-z.

Luderer, G., Madeddu, S., Merfort, L., Ueckerdt, F., Pehl, M., Pietzcker, R. C., Rottoli, M., Schreyer, F., Bauer, N., Baumstark, L., Bertram, C., Dirnaichner, A., Humpenöder, F., Levesque, A., Popp, A., Rodrigues, R., Strefler, J., Kriegler, E. (2022): Impact of declining renewable energy costs on electrification in low-emission scenarios. Nature Energy, 7, 32—42, doi: 10.1038/s41560-021-00937-z.

Odenweller, A., Ueckerdt, F., Nemet, G. F., Jensterle, M., Luderer, G. (2022): Probabilistic feasibility space of scaling up green hydrogen supply. Nature Energy, 7, 854—865, doi: 10.1038/s41560-022-01097-4.

Sacchi, R., Terlouw, T., Siala, K., Dirnaichner, A., Bauer, C., Cox, B., Mutel, C., Daioglou, V., Luderer, G. (2022): PRospective EnvironMental Impact asSEment (premise): A streamlined approach to producing databases for prospective life cycle assessment using integrated assessment models. Renewable and Sustainable Energy Reviews, Vol. 160, doi: 10.1016/j.rser.2022.112311.

Ueckerdt, F., Bauer, C., Dirnaichner, A., Everall, J., Sacchi, R., Luderer, G. (2021): Potential and risks of hydrogen-based e-fuels in climate change mitigation. Nature Climate Change, doi: 10.1038/s41558-021-01032-7.

Luderer, G., Pehl, M., Arvesen, A., Gibon, T., Bodirsky, B. L., Sytze de Boer, H., Fricko, O., Hejazi, M., Humpenöder, F., Iyer, G., Mima, S., Mouratiadou, I., Pietzcker, R. C., Popp, A., van den Berg, M., van Vuuren, D. P., Hertwich, E. G. (2019): Environmental co-benefits and adverse side-effects of alternative power sector decarbonization strategies. Nature Communications, 10, 5229, doi: 10.1038/s41467-019-13067-8.

Luderer, G., Vrontisi, Z., Bertram, C., Edelenbosch, O. Y., Pietzcker, R. C., Rogelj, J., Sytze de Boer, H., Drouet, L., Emmerling, J., Fricko, O., Fujimori, S., Havlík, P., Iyer, G., Keramidas, K., Kitous, A., Pehl, M., Krey, V., Riahi, K., Saveyn, B., Tavoni, M., van Vuuren, D. P., Kriegler, E. (2018): Residual fossil CO2 emissions in 1.5—2 °C pathways. Nature Climate Change, 8, 7, 626—633, doi: 10.1038/s41558-018-0198-6.

Rogelj, J., Luderer, G., Pietzcker, R. C., Kriegler, E., Schaeffer, M., Krey, V., Riahi, K. (2015): Energy system transformations for limiting end-of-century warming to below 1.5 °C. Nature Climate Change, 5, 6, 519—527, doi: 10.1038/nclimate2572.

Luderer, G., Pietzcker, R. C, Bertram, C., Kriegler, E., Meinshausen, M., Edenhofer, O. (2013): Economic mitigation challenges: how further delay closes the door for achieving climate targets. Environmental Research Letters, 8, 34033, doi: 10.1088/1748-9326/8/3/034033.

CONTRIBUTIONS TO INTERNATIONAL ASSESSMENTS

since 2025	Lead Author, Chapter 3 “Actions and Solutions to Reduce Urban Risks and Emissions”, Special Report on Climate Change and Cities of the Intergovernmental Panel on Climate Change.
2022	Contributing Author, Chapter 2 “Emissions Trends and Drivers”, Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Working Group III.
2022	Contributing Author, Chapter 6 “Energy Systems”, Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Working Group III.
2021—2024	Working Group Member of the “Integrated Energy Supply” at Energy Systems of the Future (ESYS)
2020	Contributing Author, Chapter 3 “The emissions gap” for the Emissions Gap Report 2020 (UNEP)
2018	Lead author, Chapter 3 “The emissions gap” for the Emissions Gap Report 2018 (UNEP)
2018	Contributing Author, Chapter 2 “Mitigation pathways compatible with 1.5°C” for the IPCC Special Report “Global Warming of 1.5°C”
2017	Contribution author, Chapter 5 “Bridging the gap – Phasing out coal” for the Emissions Gap Report 2017 – A UN Environment Synthesis Report (UNEP)
2014	Contributing Author, Chapter 3 “Social, Economic, and Ethical Concepts and Methods” to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), Working Group III
2014	Contributing Author, Chapter 6 “Assessing Transformation Pathways” to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), Working Group III
2013	Lead author, Chapter 3 “The emissions gap and its implications” for the Emissions Gap Report 2013 – A UNEP Synthesis Report
2011	Contributing Author, Chapter 10 “Mitigation Potential and Costs” for the IPCC Special Report on Renewable Energy

SCIENCE-POLICY INTERFACE, EDITORSHIPS AND OTHER SCIENTIFIC FUNCTIONS

since 2025	Appointed member to the Forum *Energy Systems of the Future (ESYS)* of the German Academies of Sciences for a sustainable, secure and affordable energy supply
since 2024	Member of the expert council on climate change to the city of Potsdam
since 2021	Editorial Board, Geoscientific Model Development
2021—2024	Member of the Working Group “Integrated Energy Supply” at Energy Systems of the Future (ESYS)
2016—2018	Guest Editor, Energy Economics, Special Section on "Assessment of wind and solar power in global low-carbon energy scenarios"
2013—2020	Member of the Scientific Steering Committee of the Stanford Energy Modeling Forum Project 30 on non-Kyoto forcing

AWARDS, SCHOLARSHIPS AND HONOURS

2026	Recipient of an Advanced Grant by the European Research Council (ERC)
2021	Included in the Top 50 of *Reuters Hot List* of the World’s Leading Climate Scientists
since 2019	Recognized as *Highly Cited Researcher* by the Web of Science Group
2004–2007	Research Scholarship, Max Planck Society
2001–2002	Fulbright Travel Grant
2000–2003	Scholarship for university studies, Friedrich Ebert Foundation