

## Sabine Fuss

### Curriculum Vitae

### Employment History

### Education



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#### **Professor for “Nachhaltiges Ressourcenmanagement und Globaler Wandel”**

Humboldt-Universität zu Berlin, Mathematisch-Naturwissenschaftliche Fakultät,  
Geographisches Institut

July 2018 – current (2022/2023 maternity leave)

#### **Co-chair Mercator Research Institute on Global Commons and Climate Change**

Mercator Research Institute on Global Commons and Climate Change, Berlin

January 2024 – current

#### **Head of working group "Sustainable Resource Management & Global Change"**

Mercator Research Institute on Global Commons and Climate Change, Berlin

April 2013 – current (2017/2018 and 2022/2023 maternity leave)

#### **Jubilee Professor 2019**

Chalmers University of Technology, Physical Resource Theory, Gothenburg,  
Sweden.

2019

#### **Research Scholar at the Ecosystems Services and Management Program**

International Institute for Applied Systems Analysis, Laxenburg, Austria

September 2007 – April 2013

#### **Research Scholar at the Forestry Program**

International Institute for Applied Systems Analysis, Laxenburg, Austria

November 2006 – December 2006

#### **Junior Researcher (Assistant in Onderzoek) at the Economics Faculty**

University of Maastricht, Maastricht, The Netherlands

September 2003 – September 2007

### **PhD Defense**

University of Maastricht, Maastricht, The Netherlands  
April 2008

### **Young Scientist Summer Program**

International Institute for Applied Systems Analysis, Laxenburg, Austria  
June – August 2006

### **Ph.D. candidate**

*Thesis topic: 'Sustainable Energy Development under Uncertainty'*  
University of Maastricht /UNU-MERIT, The Netherlands  
September 2003 – September 2007

### **M.Sc. in Economics**

*Thesis topic: 'Technical Change in the Electricity Sector: Optimum Portfolios in a Vintage Framework'*  
University of Maastricht, The Netherlands  
August 2003

### **Education Abroad Program**

University of California, Santa Barbara  
Fall/winter 2002

### **Doctoral Education**

- 09/2003-09/2007 - NAKE diploma (Network of General and Quantitative Economics, see [www.nake.nl](http://www.nake.nl))
- 08/2005 - METEOR (Maastricht Research School of Economics of Technology and Organizations) PhD training with macroeconomics, microeconomics and econometrics courses (special courses in Bayesian modeling, overlapping generations models, economic growth, environmental economics and evolutionary economics).

**Abitur:** 1999 (grade: "sehr gut")

### **Languages**

- German (native)
- English (fluent)
- Dutch (good)
- French (good)
- Spanish (good)

### **Research Interests**

- Carbon Dioxide Removal, geography of net-zero emissions strategies
- Natural resource management, energy and agricultural economics (bioenergy, land use implications, water-food-GHG nexus, policy assessment and tradeoffs)
- Decision-making under uncertainty: portfolio selection, real options theory, stochastic optimization, robustness.
- Integrated assessment with focus on climate change mitigation (focus on the role of negative emission and interaction with other policy goals)
- Reconciling top-down and bottom-up assessments
- Mechanisms for carbon management, climate-compatible development, policy instruments (focus on emissions trading)
- Sustainable development (e.g., infrastructure investments and food

security)

## **Additional positions**

- Member of the European Academy of Sciences (EURASC), Earth and Environmental Sciences Division
- Guest research scholar at the [Biodiversity and Natural Resources Program](#) at the [International Institute for Applied Systems Analysis](#).
- Contributing author for IPCC AR6 WG1, chapter 5.
- Contributing author for IPCC AR6 WG2, chapter 16.
- Scientific Steering Committee member of the [Global Carbon Project](#) (until 2020)
- Lead author for [IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-industrial Levels and related Global Greenhouse Gas Emission Pathways](#).
- Member of the working group on ecological questions, Deutsche Bischofskonferenz
- Editorial Board Member Environmental Research Communications (IOP)
- Associate Editor for Negative Emission Technologies at *Frontiers in Climate*
- Scientific Council Member of Carbon Management Chair at IFP School, Paris.
- Advisory Board C180
- Guest Editor for [Focus issue on tropical landscape restoration](#) at *Environmental Research Letters*
- [Austrian Panel on Climate Change](#)
- Contributing author for the [Emissions Gap Report 2017](#), UN Environment.
- Member of the UNOSD Expert Group on Achieving the SDGs with Water-Food-Ecosystem Resilience in the Mid-Latitude Region (since 2016).

## **Current PhD student supervision**

- Since 2022 Ruben Prütz (HU Berlin)
- Since 2022 Maria Quirina Rodriguez Mendez (HU Berlin, MCC)
- Since 2023 Tabea Dorndorf (HU Berlin, Potsdam Institut für Klimafolgenforschung, Co-supervision)
- Since 2024 Jia Fanqi (HU Berlin, International Institute for Applied Systems Analysis, Co-supervision)
- Since 2024 Stephanie La Hoyer-Toz (HU Berlin)

## **Recent teaching**

- Stadtwirtschaft, WiSe 2018/2019, 2019/2020, 2020/2021, 2021/2022, 2024/2025 HU-Berlin, Geographical Institute (Masters level)
- Wirtschaftsgeographie, Proseminar SoSe 2024
- Lecturer for the ENSYSTRAS 2019 PhD Student Workshop at Chalmers University, Gothenburg
- Urbanisierung und Nachhaltigkeit – die Stadt im Spannungsfeld des globalen Wandels, SoSe 2019, 2020 HU-Berlin, Geographical Institute (Masters level)
- Urban agriculture in Nairobi, Dar es Salaam and Berlin, SoSe 2021, SoSe 2022, HU Berlin, Geographical Institute (Masters level)
- Lecturer for the 18th Swiss Climate Summer School organized by Prof. Gruber et al.
- Lecturer for the EAERE Summer School 2021.
- Seminar leader at European Forum Alpbach: The “How” and “Who” of Europe’s Future of Energy, August 2021.
- Guest lectures (e.g. Stanford University 2021, ETH 2019, University Bern 2019, University Salzburg 2019, Universität Leoben 2022, etc.)

## Reviewing (selected)

- Expert for H2020, Horizon Europe and ERC grants (proposals and projects)
- Reviewer for journals such as ERL, Climatic Change, Nature Climate Change, Nature Energy, Science, Energy Economics, Journal of Environmental Economics and Management, Renewable and Sustainable Energy Reviews, Energy Policy, Applied Energy, Climate Policy, Journal of Environmental Management
- Reviewer for national projects and evaluations (e.g. UKERC, EPA Ireland, Research Council Norway)
- Review Editor Austrian Panel on Climate Change (APCC) 2014
- [Reviewer for the Convention on Biological Diversity \(CBD\)](#)

## Projects (ongoing)

- UPTAKE: Bridging current knowledge gaps to enable the UPTAKE of carbon dioxide removal methods (funding: Horizon Europe; partners: CMCC (lead), MCC, SWP, IIASA, PIK, Chalmers, PBL, E3M, Chalmers, UU, AU, IfW, UHAM, IKEM, REFORM, IOS, UB, ETH, PSI, USTARTH, UNIABDN) [until 2027]
- TRANSFORM: Research for evidence-based climate policy through agricultural and food systems transformation, financing preservation forest sink and a just transition of the economy (funding: BMZ; partners PIK RD2, RD5) [until 2027]
- CDR SynTra (funding: German Ministry of Education and Research; partners: LMU (lead), MCC, SWP, IASS, GEOMAR, PIK, [until 2024])
- PROVIDE: Paris Agreement Overshooting Reversibility, Climate Impacts and Adaptation Needs (funding: H2020, grant agreement no. 101003687, partners: HU (lead), Climate Analytics, CERFACS, ETH, ICL, CEA-LSCE, UBC, NRI, UEA, UIBK, UBERN, WCS, CICERO), [until 2024]
- GENIE: GeoEngineering and Negative Emissions Pathways in Europe (funding: ERC, grant agreement No 951542; partners: Univ. Aarhus, IIASA, Univ. Wisconsin; personal role: Task lead), [until 2025]

## Publications

- Prütz, R., Fuss, S., and Rogelj, J. (2024). Imputation of missing IPCC AR6 data on land carbon sequestration, *Earth System Science Data* [accepted].
- Schleussner, C.F., Ganti, G., Lejeune, Q. Zhu, B., Pfeleiderer, P., Prütz, R., Ciais, P., Frölicher, T.L., Fuss, S. *et al.* (2024). Overconfidence in climate overshoot. *Nature* **634**, 366–373. <https://doi.org/10.1038/s41586-024-08020-9>.
- Rodriguez Mendez, Q., Fuss, S., Lück, S., Creutzig, F. (2024). Assessing global urban CO2 removal. *Nature Cities* 1, 413–423. <https://doi.org/10.1038/s44284-024-00069-x>
- Schulte, I., Yowargana, P., Nielsen, J.Ø., Kraxner, F., Fuss, S. (2024). Towards integration? Considering social aspects with large-scale computational models for nature-based solutions. *Global Sustainability*; 7:e4. doi:10.1017/sus.2023.26
- Prütz, R., Fuss, S., Lück, S. et al. (2024). A taxonomy to map evidence on the co-benefits, challenges, and limits of carbon dioxide removal. *Communications Earth and Environment* 5, 197. <https://doi.org/10.1038/s43247-024-01365-z>
- Bustamante, M., Roy, J., Ospina, D., Achakulwisut, P., Aggarwal, A., Bastos, A., Broadgate, W., Canadell, J.G., Carr, E.R., Chen, D., Cleugh, H.A., Ebi, K.L., Edwards, C., Farbotko, C., Fernández-Martínez, M., Frölicher, T.L., Fuss, S., et al. (2023). Ten new insights in climate science 2023. *Global Sustainability*. 7:e19. doi:10.1017/sus.2023.25

- Zickfeld, K., Maclsaac, A.J., Canadell, J.G., Fuss, S. *et al.* Net-zero approaches must consider Earth system impacts to achieve climate goals. *Nat. Clim. Chang.* **13**, 1298–1305 (2023). <https://doi.org/10.1038/s41558-023-01862-7>
- Yang, J., Fuss, S., Johansson, D.J.A., Azar, C.A. (2023). Investment Dynamics in the Energy Sector under Carbon Price Uncertainty and Risk Aversion. *Energy and Climate Change* 4:100110
- Prütz, R., Strefler, J., Rogelj, J., Fuss, S. (2023). Understanding the carbon dioxide removal range in 1.5 °C compatible and high overshoot pathways. *Environmental Research Communications* 5(4):1-10.
- Renforth, P., Bellamy, R., Beerling, D., Boettcher, M., Bonalumi, D., Brandão, M., Fridahl, M., Fuss, S., Hansson, A., Heyward, C., Kolosz, B., Lamers, P., McLaren, D., Pomi, R., Sanchez, D.L., Shayegh, S., Sick, V., Van der Spek, M., Vishal, V. and Wilcox, J. (2023) Specialty grand challenge: renaming our section to “Carbon Dioxide Removal”. *Front. Clim.* 5:1279109. doi: 10.3389/fclim.2023.1279109
- Yuwono, B., Yowargana, P., Griscom, B., Smith, P., Fuss, S., Kraxner, F. (2022). Doing burden-sharing right to deliver natural climate solutions for carbon dioxide removal. *Nature-Based Solutions* 3:100048.
- Martin, M.A. et al. (2022). Ten new insights in climate science 2022. *Global Sustainability* 5, e20.
- Dockendorff, C., Fuss, S., Agra, R., Guye, V., Herrera, D., Kraxner, F. (2022). Committed to restoring tropical forests: an overview of Brazil's and Indonesia's restoration targets and policies. *Environmental Research Letters* 17(093002). doi: 10.1088/1748-9326/ac8ab2.
- Gruner, F., Fuss, S., Kalkuhl, M., Minx, J., Strefler, J., Merfort, A. (2022). Wie CO<sub>2</sub>-Entnahmen helfen können, die Klimaziele zu erreichen. *Klima und Recht* 1/2022, S. 18-21.
- Schulte, I., Eggers, J., Østergaard Nielsen, J., Fuss, S. (2021). What influences the implementation of natural climate solutions? A systematic map and review of the evidence. *Environmental Research Letters*. doi: 10.1088/1748-9326/ac4071.
- Fuss, S. & Johnsson, F. (2021). The BECCS Implementation Gap—A Swedish Case Study. *Front. Energy Res.* 8:553400. doi: 10.3389/fenrg.2020.553400
- Fuss, S., Golub, A., & Lubowski, R. (2021). The economic value of tropical forests in meeting global climate stabilization goals. *Global Sustainability*, 4, E1. doi:10.1017/sus.2020.34
- Jackson, R.B., Abernethy, S., Canadell, J.G., Cargnello, M., Davis, S.J., Féron, S., Fuss, S., Heyer, A.J., Hong, C., Jones, C.D., Damon, Matthews, H., O'Connor, F.M., Pisciotta, M., Rhoda, H.M., de Richter, R., Solomon, E.I., Wilcox, J.L., Zickfeld, K. (2021). Atmospheric methane removal: a research agenda. *Phil. Trans. R. Soc. A*.3792020045420200454, <http://doi.org/10.1098/rsta.2020.0454>.
- Kraus, S., Liu, J., Koch, N., Fuss, S. (2021). No aggregate deforestation reductions from rollout of community land titles in Indonesia yet. *Proceedings of the National Academy of Sciences* 118(43):e2100741118; <http://doi.org/10.1073/pnas.2100741118>.
- Martin, M., Sendra, O., Bastos, A., Bauer, N., Bertram, C., Blenckner, T., Fuss, S., ... Woodcock, J. (2021). Ten new insights in climate science 2021: A horizon scan. *Global Sustainability* 4:E25. <http://doi:10.1017/sus.2021.25>.
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gap in shared socioeconomic pathways. *Environ. Res. Lett.* 16:094053.

- Fuss, S., Canadell, J.G., Ciais, P., Jackson, R.B., Jones, C.D., Lyngfelt, A., Peters, G.P., van Vuuren, D.P. (2020). Moving toward Net-Zero Emissions Requires New Alliances for Carbon Dioxide Removal. *One Earth* 3(2):145-149.
- Ley, D., Corsair, H.J., Fuss, S., Singh, C. (2020). Evaluating the use of renewable energy and communal governance systems for climate change adaptation, *Central European Review of Economics and Management* 4(1):53-69.
- Hepburn, C., Adlen, E., Beddington, J., Carter, E.A., Fuss, S., MacDowell, N., Minx, J.C., Smith, P. and Williams, C.K. (2019). The technological and economic prospects for CO<sub>2</sub> utilization and removal, *Nature* 575 87–97 Online: <https://doi.org/10.1038/s41586-019-1681-6>
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- Minx, J.C. et al. (2018). Negative emissions: Part 1 – research landscape and synthesis. *Environmental Research Letters* 13 063001.
- Fuss, S. et al. (2018): Negative emissions - Part 2: Costs, potentials and side effects. *Environmental Research Letters* 13 063002.
- Nemet, G.F. et al. (2018). Negative emissions -Part 3: Innovation and upscaling. *Environmental Research Letters* 13 063003.
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- Knopf, B., Fuss, S., Hansen, G., Creutzig, F., Minx, J., Edenhofer, O. (2017). From Targets to Action: Rolling up our Sleeves after Paris. *Global Challenges* 1(2), <https://doi.org/10.1002/gch2.201600007>.
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