

Sabine Fuss

Curriculum Vitae



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Employment History

Professor for “Nachhaltiges Ressourcenmanagement und Globalen Wandel”

Humboldt-University of Berlin, Mathematisch-Naturwissenschaftliches Fakultät,
Geographisches Institut

July 2018 – current

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

Mercator Research Institute on Global Commons and Climate Change, Berlin

April 2013 – current

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

Education

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)
- 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")

Computer Skills

- MS Office, Matlab, GAMS, Mathematica, LATEX

Languages

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

Research Interests

- Natural resource management, energy and agricultural economics (bioenergy, land use implications, water-food-GHG nexus, ESS valuation 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 (focus so far on infrastructure investments and food security)

Additional positions

- Guest research scholar at the [Ecosystems Services and Management Program](#) at the [International Institute for Applied Systems Analysis](#).
- Scientific Steering Committee member of the [Global Carbon Project](#)
- Guest Editor for [Special Feature on negative emissions](#) at *Environmental Research Letters*
- 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](#).
- [Austrian Panel on Climate Change](#)
- Contributing author for the [Emissions Gap Report 2017](#), UN Environment.

Current PhD student supervision

- Since 2017 Sebastian Kraus (TU Berlin, MCC)
- Since 2019 Valentin Guye (co-supervision HU-Berlin and INRA, France)
- Since 2019 Ingrid Schulte (HU Berlin, MCC)

Teaching

- Stadtwirtschaft, WiSe 2018/2019, 2019/2020 HU-Berlin, Geographical Institute (Masters level)
- Urbanisierung und Nachhaltigkeit – die Stadt im Spannungsfeld des globalen Wandels, SoSe 2019, 2020 HU-Berlin, Geographical Institute (Masters level)

Reviewing (selected)

- Expert for H2020 and ERC grants (proposals and projects)
- Reviewer for journals such as ERL, Climatic Change, Nature Climate Change, Nature Energy, 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)

- Delivering Incentives to End Deforestation: Global Ambition, Private/Public Finance and Zero-Deforestation Supply Chains (funding: NORAD, Norway; partners: Environmental Defense Fund (lead), IIASA, London School of Economics) [until 2021]
- RESTORE+: Addressing Landscape Restoration on Degraded Land in Indonesia and Brazil (funding: International Climate Initiative 2016, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB); partners: IIASA (lead), International Centre for Research in Agroforestry; SELPER Brazil; UNEP-WCMC; WRI Indonesia; WWF Indonesia; LANDMAPP; EDF; LSE; Ministry of National Development Planning/National Development Planning Agency; Ministry of Energy and Mineral Resources; Ministry of Environment and Forestry, Agência Brasileira de Cooperação, Ministerio de Relações Exteriores; Ministério do Meio Ambiente. [until 2021]
- START: 'Strategic Scenario Analysis' (funding: German Ministry of Research and Education; partners: PIK (lead), Univ. of Melbourne, Canberra, ANU, etc.), Grant reference: 03EK3046B [until 2020]
- Comparative assessment and region-specific optimisation of GGR (funding NERC, UK; partners: Imperial College (lead), Oxford University, LSE, IIASA) [until 2021]

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- 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 CO₂ utilization and removal, *Nature* **575** 87–97 Online: <https://doi.org/10.1038/s41586-019-1681-6>
- Smith, P., Adams, J., Beerling, D.J., Beringer, T., Calvin, K.V., Fuss, S., Griscom, B., Hagemann, N., Kammann, C., Kraxner, F., Minx, J.C., Popp, A., Renforth, P., Vicente-Vicente, J.L. and Keesstra, S. (2019). Land-Management Options for Greenhouse Gas Removal and Their Impacts on Ecosystem Services and the Sustainable Development Goals. *Annu. Rev. Environ. Resour.* **44** 255–86 Online: <https://doi.org/10.1146/annurev-environ-101718-033129>
- Vicente-Vicente, J.L.; Fuss, S.; Song, C.; Lee, J.; Kim, M.; Lee, W.-K.; Son, Y. (2019). A Holistic View of Soils in Delivering Ecosystem Services in Forests: A Case Study in South Korea. *Forests* **10**, 487.
- Creutzig, F., Bren d'Amour, C., Weddige, U., Fuss, S., Beringer, T., Gläser, A., . . . Edenhofer, O. (2019). Assessing human and environmental pressures of global land-use change 2000–2010. *Global Sustainability* **2**, E1. doi:10.1017/sus.2018.15
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- Fuss, S., Flachsland, C., Koch, N., Kornek, U., Knopf, B., Edenhofer, O. (2018). An assessment framework for intertemporal economic performance of cap-and-trade systems: lessons from the EU-ETS, *Review of Environmental Economics and Policy* **12**(2): 220–241.
- Minx, J.C. et al. (2017). 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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- Golub, A.A., Fuss, S.; Lubowski, R.; Hiller, J.; Khabarov, N.; Koch, N.; ... Wehkamp, J. (2018). Escaping the climate policy uncertainty trap: options contracts for REDD+, *Climate Policy*, DOI: 10.1080/14693062.2017.1422478.
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- participatory and collaborative mapping. *Forest Policy and Economics* 83:10–18, doi:10.1016/j.forpol.2017.04.014.
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- bioenergy scenarios - Future forest development, land-use implications, and trade-offs. *Biomass and Bioenergy* 57: 86–96.
- Svadlenak-Gomez, K., Walzer, C., Badura, M., Kraxner, F., Fuss, S. (2013). Valuing Alpine ecosystems: the recharge.green project will help decision-makers to reconcile renewable energy production and biodiversity conservation in the Alps; *Journal on Protected Mountain Areas Research* 05/2013; DOI:10.1553/ecomont-5-1s59.
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- Fuss, S., Szolgayová, J., Obersteiner, M. (2008). A real options approach to satellite mission planning, *Space Policy* 24(4):199-207.
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Fuss, S., Szolgayová, J., Obersteiner, M., Gusti, M. (2008). Investment under market and climate policy uncertainty, *Applied Energy* 85(8):708-721.

Book chapters

Fuss, S. (2019). Implications of deep decarbonization pathways for sustainable development, In: *What Next for Sustainable Development? Our Common Future at Thirty*, eds. G Meadowcroft, J., Banister, D., Holden, E., Langhelle, O., Linnerud, K., Gilpin, Edward Elgar Publishing: 76–95.

Patrizio, P., Leduc, S., Kraxner, F., Fuss, S., Kindermann, G., Spokas, K., Wetterlund, E., Lundgren, J., Yowargana, P. and Obersteiner, M. (2019) Chapter 11 - Killing two birds with one stone: a negative emissions strategy for a soft landing of the US coal sector. In: J.C. Magalhães Pires et al. (eds.) (Academic Press) pp 219–36. Online: <http://www.sciencedirect.com/science/article/pii/B9780128162293000119>

Kraxner, F., Fuss, S., Verkerk, H. (2017). Is there enough forest biomass available to meet the demands of the forest-based bioeconomy? In book: *Towards a sustainable European forest-based bioeconomy – assessment and the way forward*, Chapter: 3.1, Publisher: European Forest Institute, Editors: Winkel G., pp.53-66.

Obersteiner, M., Balkovič, J., Böttcher, H., Bouma, J.A., Fritz, S., Fuss, S., Havlik, P., Heumesser, C., Hochrainer-Stigler, S., Jantke, K., Khabarov, N., Koch, B., Kraxner, F., Kuik, O., Leduc, S., Liu, J. Lucht, W., MacCallum, I., Mechler, R., Moltchanova, E., Reyers, B., Rydzak, F., Schill, C., Schleupner, C., Schmid, E., Schneider, U.A., Scholes, R.J., See, L.M., Skalsky, R., Smirnov, A., Szolgayova, J., Tarasovicova, Z., Yang, H. (2017). The Value of Global Earth Observations. In book: *Satellite Earth Observations and Their Impact on Society and Policy*, pp.137-142; DOI10.1007/978-981-10-3713-9_12.

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Schepaschenko, D., Kraxner, F., See, L., Fuss, S., McCallum, I., Fritz, S., Perger, C., Shvidenko, A., Kindermann, G., Frank, S., Tum, M., Schmid, E., Balkovic, J., Günther, K. Global biomass information: from data generation to application. Vol. 1. Pp. 11-33. In: Yan J (Ed) 2015, *The Handbook of Clean Energy Systems*. John Wiley & Sons, Ltd.

See, L., Kraxner, F., Fuss, S., Perger, C., Schill, C., Aoki, K., Leduc, S., McCallum, I., Forsell, N., Fritz, S. The potential of crowdsourcing for the renewable energy sector. V.1. P. 721-735. In: Yan J (Ed) 2015, *The Handbook of Clean Energy Systems*. John Wiley & Sons, Ltd.

Grubler, A. and Fuss, S. (2013). Technology portfolios: modeling technological uncertainty and innovation risks. Chapter 7 (pp. 89-102) In: Grubler, A. and C. Wilson (eds), *Energy Technology Innovation: Learning from Historical Successes and Failures*, Cambridge University Press.

Fritz, S., Fuss, S., Havlík, P., Szolgayová, J., McCallum, I., Obersteiner, M., See, L. (2012). The value of determining global land cover for assessing climate

- change mitigation options, In: *The Value of Information: Methodological Frontiers and New Applications in Environment and Health*, R Laxminarayan, MK Macauley (eds) Springer, Dordrecht, Netherlands pp.193-230.
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