Sebastian Hendrik Sterl
Researcher Climate Services for Renewable Energy
Department of Hydrology and Hydraulic Engineering
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Qualifications

Science: Geography, PhD, Seasons of Power: Streamlining strategies for renewable electricity generation from sun, wind and water in sub-Saharan Africa, KU Leuven
Award Date: 15 Oct 2021

Engineering Science, PhD, Seasons of Power: Streamlining strategies for renewable electricity generation from sun, wind and water in sub-Saharan Africa, Vrije Universiteit Brussel
Award Date: 15 Oct 2021

Applied Physics, Master of Science, University of Twente
Award Date: 27 May 2015

Technische Natuurkunde, Bachelor of Science, University of Twente
Award Date: 15 Jan 2013

Employment

Lecturer
Water & Climate
Vrije Universiteit Brussel
Brussels, Belgium
1 Jan 2024 → 30 Sept 2028

Lecturer
Department of Water and Climate
Vrije Universiteit Brussel
Brussels, Belgium
1 Oct 2022 → 30 Sept 2028

Energy Analyst (DG ENER, Chief Economist)
European Commission
Brussels, Belgium
17 Jun 2024 → present

Senior Research Associate, Clean Energy Transitions - Africa
World Resources Institute
Washington DC, United States
4 Sept 2022 → 30 Jun 2024

Associate Programme Officer, Energy Planning and Modelling in Africa
International Renewable Energy Agency
United Arab Emirates
1 Jul 2020 → 30 Sept 2022

Energy and Climate Policy Analyst
NewClimate Institute
Cologne, Germany
1 Jul 2015 → 1 Dec 2017

Renewable Energy Consultant

African Energy & Consulting BV
Netherlands
1 Jan 2015 → 1 Jun 2015

Data Analyst
Tongji University
China
1 Feb 2014 → 1 Jul 2014

Energy Consultant &Field Researcher
Avani Bio Energy
India
1 Sept 2012 → 1 Dec 2012

Research output

Variable renewables fortify Ecuador's power system against recurrences of drought-driven energy crises
Sterl, S. H., Pineda, L. E., Mast, T., Rodríguez, Y., Munoz, P. & Thiery, W., 7 Apr 2026, In: Nature Water. 4, 5, p. 571-585 15 p.

Modelling the impacts of climate extremes on Africa's future power systems
Mast, T., Gupta, R. (Contributor), Thiery, W. (Contributor) & Sterl, S. H. (Contributor), 17 Mar 2026. 1 p.

A global water database for the energy transition
Sterl, S. H., Oct 2025, In: Nature Water. 3, 10, p. 1083-1084 2 p.

Transition's Harvest: The Economics of Green Hydrogen Use for Fertiliser Production in Kenya
Sawhney, R., Ireri, B. & Sterl, S. H., 21 Aug 2025, 28 p.

Building Resilient Power Systems in Africa: Adapting to Climate Extremes and Energy Transition Challenges
Mast, T., Gupta, R. (Contributor), Thiery, W. (Contributor) & Sterl, S. H. (Contributor), 27 Apr 2025. 1 p.

Building resilient power systems in Africa: Adapting to climate extremes and energy transition challenges
Mast, T., Gupta, R. (Contributor), Thiery, W. (Contributor) & Sterl, S. H. (Contributor), 25 Mar 2025. 1 p.

The map behind the roadmap—Introducing a geospatial energy model for utility-scale solar and wind power buildout in Kenya
Millot, A., Lubello, P., Tennyson, E., Mutembei, M., Akute, M., Mentis, D., Pye, S., Hawkes, A. & Sterl, S. H., 25 Oct 2024, In: Cell Reports Sustainability. 1, 10, 31 p., 100222.

Leapfrogging the darkness: contextualising the meaning of energy transitions for African countries
Sterl, S. H., Shirley, R., Githinji, M., Dortch, R., Guan, M. & Turner, A., 1 Apr 2024, In: Progress in Energy. 6, 2, 11 p., 023003.

Complementarity of wind and solar power in North Africa: Potential for alleviating energy droughts and impacts of the North Atlantic Oscillation
Jurasz, J., Guezgouz, M., Campana, P. E., Kaźmierczak, B., Kuriqi, A., Bloomfield, H., Hingray, B., Canales, F. A., Hunt, J. D., Sterl, S. & Elkadeem, M. R., Mar 2024, In: Renewable and Sustainable Energy Reviews. 191, p. 1-12 12 p., 114181.

Stakeholder-guided, model-based scenarios for a climate- and water-smart electricity transition in Ghana and Burkina Faso
Hoff, H., Ogeya, M., de Condappa, D., Brecha, R., Larsen, M. A. D., Halsnæs, K., Salack, S., Sanfo, S., Sterl, S. H. & Liersch, S., Sept 2023, In: Energy Strategy Reviews. 49, 101149, p. 1-14 14 p., 101149.

Declining cost of renewables and climate change curb the need for African hydropower expansion
Carlino, A., Wildemeersch, M., Chawanda, C. J., Giuliani, M., Sterl, S. H., Thiery, W., Van Griensven, A. & Castelletti, A., 11 Aug 2023, In: Science. 381, 6658, 8 p., eadf5848.

Highly renewable energy systems in Africa: Rationale, research, and recommendations
Oyewo, A. S., Sterl, S. H., Khalili, S. & Breyer, C., 19 Jul 2023, In: Joule. 7, 7, p. 1437-1470 34 p.

Climate-combined energy modelling approach for power system planning towards optimized integration of renewables under potential climate change - The Small Island Developing State perspective
Donk, P., Sterl, S. H., Thiery, W. & Willems, P., Jun 2023, In: Energy Policy. 177, 113526.

Africa needs context-relevant evidence to shape its clean energy future
Mulugetta, Y., Sokona, Y., Trotter, P. A., Fankhauser, S., Omukuti, J., Somavilla Croxatto, L., Steffen, B., Tesfamichael, M., Abraham, E., Adam, J.-P., Agbemabiese, L., Agutu, C., Paulos Aklilu, M., Alao, O., Batidzirai, B., Bekele, G., Dagnachew, A. G., Davidson, O., Denton, F. & Diemuodeke, E. O. & 34 others, Egli, F., Gebrekidan Gebresilassie, E., Gebreslassie, M., Goundiam, M., Kachalla Gujba, H., Hailu, Y., Hawkes, A. D., Hirmer, S., Hoka, H., Howells, M., Isah, A., Kammen, D., Kemausuor, F., Khennas, I., Kruger, W., Malo, I., Mofor, L., Nago, M., Nock, D., Okereke, C., Ouedraogo, S. N., Probst, B., Schmidt, M., Schmidt, T. S., Shenga, C., Sokona, M., Steckel, J. C., Sterl, S. H., Tembo, B., Tomei, J., Twesigye, P., Watson, J., Winkler, H. & Yussuff, A., Nov 2022, In: Nature Energy. 7, 11, p. 1015-1022 8 p.

An all-Africa dataset of energy model “supply regions” for solar photovoltaic and wind power
Sterl, S., Hussain, B., Miketa, A., Li, Y., Merven, B., Ben Ticha, M. B., Elabbas, M. A. E., Thiery, W. & Russo, D., 31 Oct 2022, In: Scientific Data. 9, 1, 12 p., 664.

La faisabilité du solaire PV pour remplacer la centrale hydroélectrique de Koukoutamba en Guinée: Étude quantitative
Sterl, S. H. & Thiery, W., 31 Jul 2022, Vrije Universiteit Brussel. 24 p.

Pieces of a puzzle: solar-wind power synergies on seasonal and diurnal timescales tend to be excellent worldwide
Nyenah, E., Sterl, S. & Thiery, W., 1 May 2022, In: Environmental Research Communications. 4, 5, 15 p., 055011.

Agricultural management effects on mean and extreme temperature trends
Gormley-Gallagher, A. M., Sterl, S., Hirsch, A. L., Seneviratne, S. I., Davin, E. L. & Thiery, W., 23 Feb 2022, In: Earth System Dynamics. 13, 1, p. 419-438 20 p.

A spatiotemporal atlas of hydropower in Africa for energy modelling purposes
Sterl, S., Devillers, A., Chawanda, C. J., van Griensven, A., Thiery, W. & Russo, D., 2022, In: Open Research Europe. 1, 29, 12 p., 29.

A Grid for all Seasons: Enhancing the Integration of Variable Solar and Wind Power in Electricity Systems Across Africa
Sterl, S. H., 31 Aug 2021, In: Current Sustainable/Renewable Energy Reports. 8, 4, p. 274-281 8 p.

Alongside solar and wind power, GERD is not a zero-sum game: Operating GERD in synergy with other renewables leads to win-win situations for Ethiopia, Sudan and Egypt
Sterl, S. H., Fadly, D., Liersch, S., Koch, H. & Thiery, W., 8 Apr 2021, Vrije Universiteit Brussel. 5 p.

Linking solar and wind power in eastern Africa with operation of the Grand Ethiopian Renaissance Dam
Sterl, S. H., Fadly, D., Liersch, S., Koch, H. & Thiery, W., 8 Apr 2021, In: Nature Energy. 6, 4, p. 407-418 12 p.

REVUB-Light: A parsimonious model to assess power system balancing and flexibility for optimal intermittent renewable energy integration – A study of Suriname
Donk, P., Sterl, S., Thiery, W. & Willems, P., 7 Apr 2021, In: Renewable Energy. 173, p. 57-75 19 p.

A review of successful climate change mitigation policies in major emitting economies and the potential of global replication
Fekete, H., Kuramochi, T., Roelfsema, M., den Elzen, M., Forssell, N., Höhne, N., Luna, L., Hans, F., Sterl, S. H., Olivier, J., van Soest, H., Frank, S. & Gusti, M., Mar 2021, In: Renewable and Sustainable Energy Reviews. 137, 18 p., 110602.

Seasons of Power - Streamlining strategies for renewable electricity generation from sun, wind and water in sub-Saharan Africa
Sterl, S. H., 2021, Brussels: Vrije Unviersiteit Brussel. 283 p.

Turbines of the Caribbean: Decarbonising Suriname's electricity mix through hydro-supported integration of wind power
Sterl, S. H., Donk, P., Willems, P. & Thiery, W., Dec 2020, In: Renewable and Sustainable Energy Reviews. 134, 110352.

Correcting course: the emission reduction potential of international cooperative initiatives
Lui, S., Kuramochi, T., Smit, S., Roelfsema, M., Hsu, A., Weinfurter, A., Chan, S., Hale, T., Fekete, H., Lütkehermöller, K., Jose de Villafranca Casas, M., Nascimento, L., Sterl, S. & Höhne, N., 25 Aug 2020, In: Climate Policy. 21, 2, p. 232-250 19 p.

Smart renewable electricity portfolios in West Africa
Sterl, S. H., Vanderkelen, I., Chawanda, C. J., Russo, D., Brecha, R., Van Griensven, A., van Lipzig, N. & Thiery, W., 25 May 2020, In: Nature sustainability. 3, 9, p. 710-719 10 p.

Winter is leaving: Reduced occurrence of extremely cold days in Belgium and implications for power system planning
Yao, Y., Thiery, W. & Sterl, S. H., 18 Mar 2020, Vrije Universiteit Brussel. 33 p.

Hydropower dependency and climate change in sub-Saharan Africa: A nexus framework and evidence-based review
Falchetta, G., Gernaat, D., Hunt, J. & Sterl, S. H., 10 Sept 2019, In: Journal of Cleaner Production. 231, p. 1399-1417 19 p.

A new approach for assessing synergies of solar and wind power: implications for West Africa
Sterl, S. H., Liersch, S., Koch, H., van Lipzig, N. & Thiery, W., 3 Sept 2018, In: Environmental Research Letters. 13, 9, 11 p., 094009.

Short term policies to keep the door open for Paris climate goals
Kriegler, E., Bertram, C., Kuramochi, T., Jakob, M., Pehl, M., Stevanović, M., Höhne, N., Luderer, G., Minx, J. C., Fekete, H., Hilaire, J., Luna, L., Popp, A., Steckel, J. C., Sterl, S., Yalew, A. W., Dietrich, J. P. & Edenhofer, O., 6 Jul 2018, In: Environmental Research Letters. 13, 7, p. 074022 1 p., 074022.

Climate services for renewable electricity planning in West Africa
Sterl, S., Lipzig, N. V. & Thiery, W., Apr 2018

Ten key short-term sectoral benchmarks to limit warming to 1.5°C
Kuramochi, T., Höhne, N., Schaeffer, M., Cantzler, J., Hare, B., Deng, Y., Sterl, S. H., Hagemann, M., Rocha, M., Yanguas-Parra, P. A., Mir, G.-U.-R., Wong, L., El-Laboudy, T., Wouters, K., Deryng, D. & Blok, K., 16 Mar 2018, In: Climate Policy. 18, 3, p. 287-305 19 p.

Fast Dynamics of Water Droplets Freezing from the Outside In
Wildeman, S., Sterl, S. H., Sun, C. & Lohse, D., 23 Feb 2017, In: Physical Review Letters. 118, 8, 084101.

Dynamical and statistical phenomena of circulation and heat transfer in periodically forced rotating turbulent Rayleigh-Bénard convection
Sterl, S. H., Li, H.-M. & Zhong, J.-Q., 27 Dec 2016, In: Physical Review Fluids. 1, 084401

The Paris Agreement: resolving the inconsistency between global goals and national contributions
Höhne, N., Kuramochi, T., Warnecke, C., Röser, F., Fekete, H., Hagemann, M., Day, T., Tewari, R., Kurdziel, M., Sterl, S. H. & Gonzales, S., 2 Nov 2016, In: Climate Policy. 17, 1

Dynamics of the large-scale circulation in turbulent Rayleigh-Bénard convection with modulated rotation
Zhong, J.-Q., Sterl, S. H. & Li, H.-M., 10 Sept 2015, In: Journal of Fluid Mechanics. 778, R4

Activities

A change of seasons: Spatiotemporal impacts of climate change on renewable energy
Sterl, S. H. (Speaker)
12 Dec 2019

Green Office Amsterdam colleges: Energie
Sterl, S. H. (Speaker)
14 May 2019

Klimaatlesmarathon
Cornelis, G. (Organiser), Thiery, W. (Participant), Van Griensven, A. (Participant), Macharis, C. (Participant), Sterl, S. H. (Participant), Tys, D. (Participant), Surmont, J. (Participant), Mazijn, B. (Participant), De Smet, A. (Participant) & Depauw, M. (Participant)
20 Mar 2019

Luchtvaart en luchtvervuiling, snelle trein of korte vlucht?
Sterl, S. H. (Speaker)
25 Feb 2019

De Klimaatcrisis en haar Oplossingen (Wetenschapsfestival Brussel 2018)
Sterl, S. H. (Speaker)
25 Nov 2018

Prizes

Among the Top 100 of Best Young Professionals 2016 in the Netherlands
Sterl, S. H. (Recipient), 2016

Physica Aanmoedigingsprijs voor Jong Talent in de discipline Natuurkunde en Technische Natuurkunde
Sterl, S. H. (Recipient), 2010

Prizewinner (Technical Sciences) of the Belgian Royal Academy for Overseas Sciences
Sterl, S. H. (Recipient), 2022

Press / Media

Africa's energy sector will need to transform radically - these are the five biggest challenges
Sterl, S. H.
10/04/23
1 Media contribution

Climate Services for a Renewable Future in West Africa
Sterl, S. H.
11/12/19
1 Media contribution

Groene daken tegen de opwarming
Sterl, S. H.
18/08/18

1 Media contribution

Hoe de klimaatverandering onze energievoorziening beïnvloedt
Sterl, S. H.
30/01/20
1 Media contribution

How West Africa can expand power supply and meet climate goals
Sterl, S. H. & Brecha, R.
5/06/20
1 Media contribution

Is vliegen binnen Europa niet slecht voor het klimaat?
Sterl, S. H.
13/01/20
1 Media contribution

Ja, vliegen heeft een negatieve impact op het klimaat. Maar toch kan u mee het verschil maken
Sterl, S. H.
18/05/19
1 Media contribution

Je klimaatimpact op een bierviltje: Wat kunnen we als individu veranderen?
Sterl, S. H. & Vanderkelen, I.
20/11/18
1 Media contribution

Klimaat en Luchtvaart
Sterl, S. H.
18/09/18
1 Media contribution

Krachten bundelen: De energievoorziening van de toekomst
Sterl, S. H.
27/03/19
1 Media contribution

Qua klimaatbeleid mag Vlaanderen best ambitieuzer zijn
Sterl, S. H.
27/07/18
1 Media contribution

Quelle solution énergétique pour l'Afrique de l'Ouest ?
Sterl, S. H.
14/07/20
1 item of Media coverage

Solar and wind power could break the Grand Ethiopian Renaissance Dam deadlock
Sterl, S. H.
16/04/21
1 Media contribution

The Climate Pocketbook: An Example of Educational Outreach from Experts
Sterl, S. H.
26/08/19
1 Media contribution

The Climate Projections
Sterl, S. H.
8/03/18
1 Media contribution

[Tribune] Énergies solaire et éolienne, une complémentarité à repenser
Sterl, S. H.
19/09/18
1 Media contribution