

Adriano Vinca

Energy, Climate and Environment Program

International Institute for Applied Systems Analysis (IIASA)

2361 Laxenburg, Austria

vinca@iiasa.ac.at

+43 2236 807 596

EDUCATION

2021 PhD in the Mechanical Engineering Department, University of Victoria, BC, Canada:

“Integrated Climate-Land-Energy-Water Solutions: Modelling and Assessment of Sustainability Policy Options”

2017 M.Sc. in Energy Engineering. Politecnico di Milano

2014 BA in Energy Engineering. Politecnico di Milano

PROFESSIONAL APPOINTMENTS

2017 – now Research Scholar (since 2021) and Research Assistant (2017-2021) at the [International Institute for Applied Systems Analysis](#) (IIASA, Vienna) in the “Energy Climate and Environment” Program; Current title, IIASA, Energy Program, Laxenburg, Austria

2016 – 2017 Research assistant at [Fondazione Eni Enrico Mattei](#) (Milan). I worked on my Master thesis, “The role of carbon capture and storage for climate stabilization: a numerical assessment”. Then I continued working within the WITCH IAM team, focusing on low temperature increase scenarios.

2016 Worked remotely for the International Energy Agency (IEA), contributing to the “Water-energy nexus” chapter in the “World Energy Outlook 2016” report, I worked on water management and desalination.

Others

2023 Affiliate Member of the Faculty of Graduate Studies at the Civil Engineering department of the University of Victoria, Canada.

DIGITAL COMPETENCES

Math & programming (R, Python, GAMS, MATLAB, LATEX); Office (MS Office);

Technical Graphics (AutoCad Inventor, SolidWorks);

Graphics and Media (Adobe Illustrator, Photoshop, Premiere Pro, Ableton);

Other tools (ARCGIS, QGIS, Microsoft Project).

LANGUAGES

Italian (native); English (fluent); German (B2-grade); Spanish (understanding).

PUBLICATIONS

Areas of Interest

Energy, Water, Land and Climate nexus. Multi-sectoral climate impacts. Interaction between sustainable development, climate mitigation and adaptation policies

Refereed Journal Articles

- 2022 Awais, M. , **Vinca, A.** , Parkinson, S., McPherson, M., Byers, E. , Willaarts, B. , Muhamma, A., & Riahi, K. Replenishing the Indus Delta through multi-sector transformation. *Frontiers in Environmental Science*. [doi](#)
- 2022 Falchetta, G. , Adeleke, A., Awais, M. , Byers, E. , Copinschi, P., Duby, S., Hughes, A., **Vinca A.**, et al. A renewable energy-centred research agenda for planning and financing Nexus development objectives in rural sub-Saharan Africa. *Energy Strategy Reviews*. [doi](#)
- 2022 Ilyas, A., Parkinson, S. , **Vinca, A.** , Byers, E. , Manzoor, T., Riahi, K. , Willaarts, B., Siddiqi, A., et al. Balancing smart irrigation and hydropower investments for sustainable water conservation in the Indus basin. *Environmental Science & Policy*. [doi](#)
- 2022 Zakeri, B. , Hunt, J. , Laldjebaev, M., Krey, V. , **Vinca, A.** , Parkinson, S. , & Riahi, K. Role of energy storage in energy and water security in Central Asia. *Journal of Energy Storage*. [doi](#)
- 2022 Khan, Z., Abraham, E., Aggarwal, S., Ahmad Khan, M., Arguello, R., Babbar-Sebens, M., Bereslawski, J.L., **Vinca A.**, et al. Emerging Themes and Future Directions of Multi-Sector Nexus Research and Implementation. *Frontiers in Environmental Science*. [doi](#)
- 2021 Kikstra, J. , **Vinca, A.** (both first authors), Lovat, F. , Boza-Kiss, B. , van Ruijven, B., Wilson, C., Rogelj, J., Zakeri, B. , et al.. Climate mitigation scenarios with persistent COVID-19-related energy demand changes. *Nature Energy*, [doi](#)
- 2021 Hunt J.D. , Falchetta G. , Parkinson S. , **Vinca A.** , Zakeri B. , et al. Hydropower and seasonal pumped hydropower storage in the Indus basin: pros and cons. *Journal of Energy Storage*, Volume 41, 102916, ISSN 2352-152X, [doi](#)
- 2021 **Vinca A.** , Riahi K. , Rowe A. and Djilali N. Climate-Land-Energy-Water Nexus Models Across Scales: Progress, Gaps and Best Accessibility Practices. *Front. Environ. Sci.* 9:691523. [doi](#)
- 2020 **Vinca, A.** , Parkinson, S., Riahi, K. , Byers, E. , Siddiqi, A., Muhammad, A., Ilyas, A., Yogeswaran, N., et al.. Transboundary cooperation a potential route to sustainable development in the Indus basin. *Nature Sustainability*. [doi](#)

- 2020 **Vinca, A.**, Parkinson, S., Byers, E., Burek, P., Khan, Z., Krey, V., Diuana, F. A., Wang, Y., et al. The NExus Solutions Tool (NEST) v1.0: an open platform for optimizing multi-scale energy – water – land system transformations, *Geosci. Model Dev.* 13, 1095 – 1121, [doi](#)
- 2019 Wada, Y. , **Vinca, A.** , Parkinson, S., Willaarts, B. , Magnuszewski, P., Mochizuki, J., Mayor, B., Wang, Y., et al. Co-designing Indus Water-Energy-Land Futures. *One Earth.* [doi](#)
- 2019 Huppmann D, Gidden M, Fricko O, Kolp P, Orthofer C, Pimmer M, Kushin N, **Vinca A**, et al. The MESSAGEix Integrated Assessment Model and the ix modeling platform (ixmp). *Environmental Modelling & Software.* [doi](#)
- 2018 **Vinca A.**, Rottoli M., Marangoni G., Tavoni M. The role of Carbon Capture and Storage electricity in attaining 1.5 and 2 degree C, *International Journal of Greenhouse Gas Control.* [doi](#)
- 2018 **Vinca A.**, Emmerling J., Tavoni M. Bearing the cost of stored carbon leakage. *Frontiers Energy Research.* [doi](#)

Policy briefs & reports, thesis

- 2021 **Vinca A.** Integrated Climate-Land-Energy-Water Solutions: Modelling and Assessment of Sustainability Policy Options". Doctoral Thesis, University of Victoria, Mechanical Engineering Department. [link](#)
- 2021 Willaarts, B. , **Vinca, A.** , Parkinson, S., Riahi, K. , Byers, E. , Heyl, A. Cooperation and joint investments are key to sustainable development in the Indus basin. IIASA Policy Brief. Laxenburg, Austria: PB-28. [link](#)
- 2018 Willaarts B, Langan S , Balkovic J , Burek P , Byers E , Deppermann A, Frank S , Gidden M, **Vinca A**, et al. Integrated Solutions for Water, Energy and Land Progress report 3". United Nations Industrial Development Organization (UNIDO) and International Institute for Applied Systems Analysis (IIASA) , Laxenburg, Austria. [link](#)
- 2017 Rottoli M, **Vinca A.** The role of carbon capture and storage for climate stabilization : a numerical assessment", Master Thesis, Politecnico di Milano, Energy Engineering Department. [link](#)

PEER-REVIEW FOR SCIENTIFIC JOURNALS

Nature Climate Change, Nature sustainability, Nature Scientific Data, Environmental Research Letters, One Earth, Science of the Total Environment, Climatic Change, Futures, Energy Efficiency, Frontiers in Environmental Science, Journal of Hydrology Mitigation and Adaptation Strategies for Global Change, Sustainability

CONFERENCE ACTIVITY

- 2022 “Interaction of Mitigation vs Adaptation Pathways with Environmental Boundaries, Natural Hazards, and Sustainability Objectives Across the Energy, Water and Land Sectors” . AGU 2022, online. 12/12/2022
- “Including water, energy and land climate impacts and adaptation strategies in IAM scenarios, updated” . IAMC 2022. 1/12/2022
- “Including water, energy and land climate impacts and adaptation strategies in IAM scenarios” . Scenarios Forum 2023, Laxenburg, Austria. 21/06/2022
- “The role of multi-sector climate impacts in achieving water, energy, and land SDGs” . EGU 2022, Vienna, Austria. 23/05/2022
- “MESSAGEix-GLOBIOM and NEST: modelling land-use, water and energy systems to assess SDGs and climate impacts at the global, national and basin scales” . ETSAP Webinar: Integrating Sustainable Development Goals Into Energy Systems Modelling. 20/1/2022
- 2021 “COVID-19, energy demand, and climate mitigation.” 90th IIASA committee meeting Austrian Academy of Science, Vienna, Austria. 10/06/2021
- “Climate Land Energy Water nexus models reviewed across scales: progress, gaps and best accessibility practices”. European Geosciences Union (EGU) General Assembly 2021, Vienna, Austria. 19-30/04/2021
- “Impacts of COVID-19 induced energy demand changes on emissions and mitigation challenges”. European Geosciences Union (EGU) General Assembly 2021, Vienna, Austria. 19-30/04/2021
- 2020 “Multisector Dynamics: Energy – Water – Land Interactions at Multiple Scales”, American Geophysical Union Fall Meeting 2020, Washington D.C., US (online) 10/12/2020
- Poster: “A Green Energy Recovery After COVID-19 Pandemic Can Reduce Costs Of Climate Change Mitigation”, American Geophysical Union Fall Meeting 2020, Washington D.C., US (online) 9/12/2020
- “A green energy recovery after COVID-19 pandemic can reduce costs of climate change mitigation”. Thirteenth IAMC Annual Meeting 2020, online. 03/12/2020
- “Benefits of Cross-Border Cooperation for Achieving Water-Energy-Land Sustainable Development Goals in the Indus Basin”. European Geosciences Union (EGU) General Assembly 2020, Vienna, Austria. 4-8/05/2020
- 2019 “Achieving Climate-land-energy-water Sustainable Development Goals in the Indus Basin and the Role of Cross-border Cooperation”. INFORMS Annual Meeting 2019, Seattle, US, 20/10/2019

“An Open Platform or Optimizing Energy-water-land System Transformations Towards Sustainable Development”. INFORMS Annual Meeting 2019, Seattle, US, 20/10/2019

Presented at ISWEL project results at: “Capacity development and stakeholder workshop on water – energy – land nexus scenarios for the Indus basin: Consultation and joint learning”. ICIMOD, Kathmandu, Nepal, 21-22/08/2019

“Achieving Climate-Land-Energy-Water Sustainable Development Goals in the Indus Basin”. European Geosciences Union (EGU) General Assembly, Vienna, Austria, 10/04/2019

“A framework for charting water-energy-land nexus solutions for the Indus basin”, United Nations Industrial Development Organization 16/04/2019. And International Atomic Energy Agency delegation at IIASA 10/04/2019

2018 “A framework for charting water-energy-land nexus solutions for the Indus basin”, American Geophysical Union Fall Meeting 2018, Washington D.C., 14/12/2018

Poster “Quantifying interactions between smart irrigation technologies and energy transformation in the Indus Basin”. (on behalf of Ansir Ilyas), American Geophysical Union Fall Meeting, Washington D.C., 14/12/2018

“A Framework for Water-Energy-Land Nexus Solutions: Case study of the Indus River Basin”, 2nd U.S.-EU Workshop on Understanding the Water-Energy Nexus, US Department of Energy, 7/12/2018

“Integrated assessment of water-energy-land nexus solutions for the Indus River Basin”, Mechanical Engineering Seminars, University of Victoria, 28/11/2018

“MESSAGE-basin Model applied to Indus”, Indus Basin Knowledge Forum (IBKF), Laxenburg, 2/06/2018

2017 “The role of CCS in achieving low carbon targets : a numerical assessment”, International Summer School CIRED, Paris, 5/07/2017

TEACHING EXPERIENCE

2022-2023 [Introductory Topics in Economics and Politics](#) , Provided two lessons. Cross-Disciplinary Strategies , Die Angewandte University, Vienna, Austria.

NON ACADEMIC RELEVANT ACTIVITIES

2022-present Co-founder of the association “Science meets Art” , which promotes public-oriented exchanges and collaborations between scientists and artists.