

Alessio Mastrucci

Energy, Climate, and Environment (ECE) Program
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EDUCATION

- 2013 Ph.D. in Buildings, Architecture and Structures, Università Politecnica delle Marche, Ancona, Italy
- 2009 M.Sc. (*with honors*) in Building Engineering – Architecture, Università Politecnica delle Marche, Ancona, Italy

PROFESSIONAL APPOINTMENTS

- 2016 – present Research Scholar, IIASA, Energy, Climate, and Environment (ECE) Program, Austria
- 2014 – 2016 Postdoctoral researcher. Luxembourg Institute of Science and Technology, Luxembourg.
Visiting researcher. Centre Observation Impacts Energy, MINES ParisTech, France.
- 2013 – 2014 Postdoctoral researcher. Università Politecnica delle Marche, Ancona, Italy
Visiting researcher. Luxembourg Institute of Science and Technology, Luxembourg.
- 2008-2013 Intern in architecture and engineering firms, Ancona, Italy

AREAS OF INTEREST

Energy Demand, Energy and Development, Sustainable Architecture, Integrated Assessment

PUBLICATIONS

Refereed Journal Articles

- 2021 Kamei, M., **Mastrucci, A.**, van Ruijven, B.J. A future outlook of narratives for the built environment in Japan. *Sustainability*, 13(4),1653,1-19 [doi](#)
- 2021 Hunt, J.D., Zakeri, B., Leal Filho, W., (...), Nascimento, A., **Mastrucci, A.** Swimming pool thermal energy storage, an alternative for distributed cooling energy storage. *Energy Conversion and Management*, 230,113796 [doi](#)
- 2020 **Mastrucci, A.**, Marvuglia, A., Benetto, E., Leopold, U. A spatio-temporal life cycle assessment framework for building renovation scenarios at the urban scale. *Renewable and Sustainable Energy Reviews*, 126,109834 [doi](#)
- 2020 **Mastrucci, A.**, Min, J., Usubiaga-Liaño, A., Rao, N.D. A Framework for Modelling Consumption-Based Energy Demand and Emission Pathways. *Environmental Science and Technology*, 54(3), 1799-1807 [doi](#)

- 2019 Rao N., **Mastrucci, A.**, Min J. Energy requirements for decent living in India, Brazil and South Africa. *Nature Energy*, 4, 1025–1032 [doi](#)
- 2019 **Mastrucci, A.**, Byers E., Pachauri S., Rao N. Improving the SDG energy poverty targets: Residential cooling needs in the Global South. *Energy and Buildings*, 186, 405-415. [doi](#)
- 2019 Huppmann, D., Gidden, M., Fricko, O., Kolp, P., Orthofer, C., Pimmer, M., Kushin, N., Vinca, A., **Mastrucci, A.**, Riahi, K., Krey, V. The MESSAGEix Integrated Assessment Model and the ix modeling platform (ixmp): An open framework for integrated and cross-cutting analysis of energy, climate, the environment, and sustainable development. *Environmental Modelling and Software*. [doi](#)
- 2019 **Mastrucci, A.**, Rao N. Bridging India’s housing gap: lowering costs and CO2 emissions. *Building Research and Information*, 47(1), pp. 8-23. [doi](#)
- 2017 **Mastrucci, A.**, Rao N. Decent housing in the developing world: Reducing life-cycle energy requirements. *Energy and Buildings*, 152, 629-642. [doi](#)
- 2017 **Mastrucci, A.**, Pérez-López, P., Benetto, E., Leopold, U., Blanc, I. Global sensitivity analysis as a support for the generation of simplified building stock energy models. *Energy and Buildings*, 149, pp. 368-383. [doi](#)
- 2017 Bertrand, A., **Mastrucci, A.**, Schüler, N., Aggoune, R., Maréchal, F. Characterisation of Domestic Hot Water End-Uses for Integrated Urban Thermal Energy Assessment and Optimisation. *Applied Energy*, 186, 152-166. [doi](#)
- 2017 **Mastrucci, A.**, Marvuglia, A., Leopold, U., Benetto, E. Life Cycle Assessment of building stocks from urban to transnational scales: A review. *Renewable and Sustainable Energy Reviews*, 74, 316-332. [doi](#)
- 2017 **Mastrucci, A.**, Marvuglia, A., Popovici, E., Leopold, U., Benetto, E. Geospatial characterization of building material stocks for the life cycle assessment of end-of-life scenarios at the urban scale. *Resources, Conservation and Recycling*, 123, 54-66. [doi](#)
- 2015 Nouvel R., **Mastrucci A.**, Leopold U., Baume O., Coors V., Eicker U. GIS-based statistical and engineering urban heat consumption modelling: Towards a new framework for multi-scale policy support. *Energy and Buildings*, 107, 204-212. [doi](#)
- 2015 Schüler N., **Mastrucci A.**, Bertrand A., Page J., Maréchal F. Heat demand estimation for different building types at regional scale considering building parameters and urban topography. *Energy Procedia*, 78, 3403-3409. [doi](#)
- 2014 **Mastrucci A.**, Baume, O., Stazi, F., Leopold, U. Estimating energy savings for the residential building stock of an entire city: A GIS-based statistical downscaling approach applied to Rotterdam. *Energy and Buildings*, 75, 358–367. [doi](#)
- 2012 Stazi F., **Mastrucci A.**, Munafò P. Life cycle assessment approach for the optimization of sustainable building envelopes: An application on solar wall systems. *Building and Environment*, 58, 278-288. [doi](#)
- 2012 Stazi F., **Mastrucci A.**, Di Perna C. Trombe wall management in summer conditions: An experimental study. *Solar Energy*, Volume 86, Issue 9, 2839-2851. [doi](#)
- 2012 Stazi F., **Mastrucci A.**, Di Perna C. The behaviour of solar walls in residential buildings with different insulation levels: an experimental and numerical study. *Energy and Buildings*, 47 217-229. [doi](#)

Book Chapters

- 2018 Rao N., **Mastrucci A.**, & Min J. Applying LCA to Estimate Development Energy Needs: The Cases of India and Brazil. In: Benetto, E., Gericke, K. & Guiton, M., (eds) *Designing Sustainable Technologies, Products and Policies*. Cham, Switzerland: Springer, pp. 397-406.
- 2017 **Mastrucci A.**, Leopold U., Benetto E. How to spatialize the inventory? Coupling LCA and GIS for the environmental analysis of buildings at the urban scale. In Ayssani, L. (ed) *Spatialization in LCA - Interests, feasibility and limits of eco-design. EcoSD annual workshop 2017*. Presses de l'Ecole des Mines.
- 2015 **Mastrucci, A.**, Braun, C., Baume, O., Stazi, F., Leopold U., Towards a comprehensive approach to sustainable urban planning: integrated estimation of housing electricity consumption and photovoltaic generation potential using the web-based framework iGUESS. In *Renewable Energy in the Service of Mankind: Selected Topics from the World Renewable Energy Congress WREC 2014*. Vol I, Chapter 71, Springer.

Other Publications

- 2017 Willaarts B., et al. Integrated Solutions for Water, Energy and Land Progress report 2. United Nations Industrial Development Organization (UNIDO) and International Institute for Applied Systems Analysis (IIASA)
- 2015 Igos E., **Mastrucci A.**, Benetto E. Intérêt et mise en œuvre d'un couplage entre ACV et SIG (Interest and implementation of coupling LCA and GIS) Final Report of the study ScoreLCA 2014-05 (in French)
- 2014 Sasso, M. Synthesis Report on the Viability of Micro-Generation Systems in Different Operational Contexts – A Report of Annex 54 “Integration of Micro-Generation and Related Energy Technologies in Buildings”, International Energy Agency - Energy Conservation in Buildings and Community Systems Programme.

AWARDS AND HONORS

- 2019 Staff Association Recognition Award, IIASA, Austria

CONFERENCE ACTIVITY (SELECTED)

- 2020 Carbon neutrality in global residential space heating. Presented at Integrated Assessment Modeling Consortium IAMC2020, online meeting.
- 2019 Improving the SDG energy poverty targets: Residential cooling needs in the Global South. Invited oral presentation at UN Climate Change Conference COP 25 – Side event: Green Cooling, Madrid, Spain.
- 2019 Service-driven recast of industrial energy demand for decarbonization pathways. Presented at European Society for Ecological Economics Conference ESEE 2019, Turku, Finland.
- 2019 Lack of thermal comfort as a dimension of energy poverty: Towards an SDG for space cooling? (poster presentation) OEAW Symposium 2019 - Global Sustainable Development Goals in a Mediatized World, Vienna, Austria.
- 2019 Future urban vulnerability to heat stress under the SSP scenarios. Presented at the Scenarios Forum 2019, Denver, CO.

- 2017 A life cycle approach to support decent housing development in India (poster presentation); Applying LCA to estimate development energy needs: The cases of India and Brazil (oral presentation) at the Life Cycle Management Conference LCM2017, Luxembourg.
- 2016 A GIS-based approach for the energy analysis and life cycle assessment of urban housing stocks. Presented at the Sustainable Built Environment (SBE) Conference, Zurich, Switzerland.
- 2015 GIS-based Life Cycle Assessment of urban building stocks retrofitting. A bottom-up framework applied to Luxembourg. Presented at the EnviroInfo Conference, Copenhagen, Denmark.
- 2015 Life cycle assessment of urban housing stocks: development of a GIS-based framework. In: Life Cycle Management Conference LCM 2015 - Mainstreaming Life Cycle Management for sustainable value creation. Bordeaux, France.
- 2015 Characterization of urban building stocks in a life cycle assessment framework: a case study in Luxembourg. Presented at the Society and Materials International Conference (SAM9), Luxembourg.
- 2014 A GIS-based approach to estimate energy savings and indoor thermal comfort for urban housing stock retrofitting, Proceedings of BauSIM 2014: 5th German-Austrian Conference of IBPSA, Aachen, Germany
- 2014 Towards a comprehensive approach to sustainable urban planning: integrated estimation of housing electricity consumption and photovoltaic generation potential using the web-based framework iGUESS. Presented at the World Renewable Energy Congress WREC 2014, Kingston, UK.
- 2011 Experimental and numerical study on the energy performance of Trombe walls in Mediterranean climates, Presented at the World Renewable Energy Congress 2011, Linköping, Sweden

REVIEW ACTIVITIES

Journal reviews: *Buildings*; *Energy*; *Energy and Buildings*; *Environment and Planning B: Urban Analytics and City Science*; *Environmental Science & Technology*; *Journal of Cleaner Production*; *Journal of Industrial Ecology*; *Nature Communications*; *Renewable and Sustainable Energy Reviews*; *Resources, Conservation and Recycling*; *Sustainability*; *Sustainable Cities and Society*.

Reviewer of book proposals for Elsevier.

INSTITUTIONAL SERVICE

- 2017 – present Member, Awards Selection Committee for the Young Scientists Summer Program (YSSP), IIASA, Austria
- 2017 Member, Staff Association Committee, IIASA, Austria

MEDIA COVERAGE

- 2019 Developing countries need access to cool living spaces. SciDev.Net (UK). [link](#)
- 2019 Addressing cooling needs and energy poverty targets in the Global South. PhysOrg.com (USA). [link](#)