

# Lara Aleluia da Silva Reis

ENVIRONMENTAL ENGINEERING RESEARCHER  
Integrated Assessment Modeler

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Born in Lisbon, Portugal on the 06-10-1984; Married with 2 children

<https://laleluia.github.io/page/>

**Citizenship:** Portuguese

Main interests : Climate change policy, environmental economics, air pollution, impact assessment, energy policy, integrated assessment and environmental statistics

## EXPERIENCE

**RFF-CMCC  
European  
Institute on  
Economics and  
the  
Environment  
(EIEE),**

**MILAN, ITALY**  
September 2018 -  
present

**FEEM and  
CMCC  
Foundation,  
MILAN, ITALY**  
April 2013 -  
September 2020

**PUBLIC  
RESEARCH  
CENTRE HENRI  
TUDOR,  
LUXEMBOURG**  
September 2008 -  
March 2013

### SCIENTIST

Development and maintenance of the air pollution module of the WITCH model; Cost-Benefit Analysis, air pollution impacts and Implementation of short- (NDCs) and long- term climate policies.

### JUNIOR RESEARCHER

Development and maintenance of the air pollution module of the WITCH model; Assessment of the future costs of green technologies; Implementation of short and long term climate policies.

### R&D ENGINEER

Air quality and integrated assessment modeling.

## EDUCATION

**UNIVERSITY OF  
LUXEMBOURG**  
October 2008 -  
October 2012

### PH.D. IN ENGINEERING SCIENCES

Thesis title: "Development and application of an Asymptotic Level Transport Pollution Model for Luxembourg Energy and Air Quality Project"  
Faculty of Science, Technology and Communication, of the University of Luxembourg

**ARISTOTLE  
UNIVERSITY OF  
THESSALONIKI,  
GREECE**  
September 2010 -

### GUEST PH.D. STUDENT

Development of a fast photochemical module and an emission down-scaling model

February 2011

Laboratory of atmospheric physics of Aristotle university of Thessaloniki, Greece

**FFG and ESA,  
AUSTRIA  
2010**

**ALPBACH SUMMER SCHOOL**

New space missions for understanding climate change

Team project awarded by the school Jury Chairman's prize.

Aeronautics and Space Agency of the Austrian Research Promotion Agency (FFG), co-sponsored by ESA.

**NEW  
UNIVERSITY OF  
LISBON,  
PORTUGAL**

September 2006 -  
June 2008

**MSC IN ENVIRONMENTAL ENGINEERING  
management and environmental systems**

Master thesis on "Statistical models for ozone prediction in Lisbon and Tagus valley region.". Development of regression trees and multiple linear regression models.

Development of regression trees and multiple linear regression models.

Faculty of Science and Technology of The New University of Lisbon, Portugal.

**TECHNICAL  
UNIVERSITY OF  
DRESDEN,  
GERMANY**

February 2006 -  
August 2006

**ERASMUS**

Practical work on analysis of the behavior of chlorine in combustion processes. Extra ECTS for the accomplishment of Climate change course.

**NEW  
UNIVERSITY OF  
LISBON,  
PORTUGAL**

September 2002 -  
June 2006

**DEGREE IN ENVIRONMENTAL ENGINEERING**

Hydraulics II, as extra-curricular course.

Faculty of Science and Technology of The New University of Lisbon, Portugal.

**PUBLICATIONS**

**SUBMITTED**

- Pietro Andreoni, Lara Aleluia Reis, Laurent Drouet, Olivier Dessens, Panagiotis Fragkos, Robert Pietzcker, Steve Pye, Renato Rodrigues, Massimo Tavoni, Fossil-extraction bans are not enough to achieve the Paris agreement but can facilitate it, NATURE, 2021, under review

**PEER-REVIEWED PUBLICATIONS**

- Laurent Drouet, Valentina Bosetti, Simone Padoan, **Lara Aleluia Reis**, Dr. Christoph Bertram, Dr. Francesco Dalla Longa, Dr. Jacques Després, Dr. Johannes Emmerling, Florian Fosse, Dr. Stefan Frank, Kostas Fragkiadakis, Mr. Oliver Fricko, Dr. Shinichiro Fujimori, Mathijs Harmsen, Dr. Volker Krey, Larissa P. Nogueira, Dr. Ken Oshiro, Leonidas Paroussos, Dr. Franziska Piontek, Prof. Roberto Schaeffer, Dr. Jun'ya Takakura, Dr. Keywan Riahi, Dr. Pedro Rochedo, Zoi Vrontisi, Prof. Detlef van Vuuren, Dr. Matthias Weitzel, Mr. Kaj-Ivar van der Wijst, Behnam Zakeri, Bob van der Zwaan, Prof. Massimo Tavoni; Net zero emission pathways reduce the physical and economic risks of climate change; Nature Climate change, 2021
- **Aleluia Reis, Lara**; Drouet, Laurent; Tavoni Massimo; Internalizing air pollution health-economic impacts into climate policy – a global modelling study; The Lancet Planetary Health, 2021

- van Soest, H.L., **Aleluia Reis, L.**, Baptista, L.B. *et al.* Global roll-out of comprehensive policy measures may aid in bridging emissions gap. *Nat Commun* **12**, 6419 (2021). <https://doi.org/10.1038/s41467-021-26595-z>
- Vandyck, T.; Rauner, S.; Lanzi, E.; Sampedro, J.; **Aleluia Reis, L.**; Springmann, M. & Dingenen, R. V. **Integrate health into decision-making to foster climate action**, *Environmental Research Letters*, IOP Publishing, 2021
- Rafaj, Peter; Kieseewetter, Gregor; Krey, Volker; Schöpp, Wolfgang; Bertram, Christoph; Drouet, Laurent; Fricko, Oliver; Shinichiro, Fujimori; Harmsen, Mathijs; Hilaire, Jerome; Huppmann, Daniel; Klimont, Zbigniew; Kolp, Peter; **Aleluia Reis, Lara**; van Vuuren, Detlef; **Air quality and health implications of 1.5-2°C climate pathways under considerations of ageing population: A multi-model scenario analysis** ; *Environmental Research Letters*, 2020
- Granella, Francesco; **Aleluia Reis, Lara**; Bosetti, Valentina; Tavoni, Massimo, **COVID-19 lockdown only partially alleviates health impacts of air pollution in Northern Italy**, submitted to *Environmental Research Letters* (2020)
- Roelfsema, M., van Soest, H.L., Harmsen, M. *et al.* **Taking stock of national climate policies to evaluate implementation of the Paris Agreement**. *Nat Commun* **11**, 2096 (2020). <https://doi.org/10.1038/s41467-020-15414-6>
- Mathijs Harmsen, Oliver Fricko, Jerome Hilaire, Detlef P. van Vuuren, Laurent Drouet, Olivier Durand-Lasserve, Shinichiro Fujimori, Kimon Keramididas, Zbigniew Klimont, Gunnar Luderer, **Lara Aleluia Reis**, Keywan Riahi, Fuminori Sano, and Steven J. Smith, **Taking some heat off the NDCs? the limited potential of additional short-lived climate forcers' mitigation**, *Climatic Change* (2019)
- Krey V., Guo F., Kolp P., Zhou W., Schaeffer R., **Aleluia Reis L.**, Awasthy A., Bertram C., Drouet L., Fragkos P., Fujimori S., Garg A., Gernaat D., He G., Iyer G., Jiang K., Keramidask J., Kitousk A., Koberle A., Kriegler E., Luderer G., Mathur R., Oshiro K., Sano F., Shoai-Tehrani B., Vishwanathan S., van Vuuren D., (2019), **Looking under the hood: A comparison of techno-economic assumptions across national and global integrated assessment models Full length article** , *Energy*
- **Aleluia Reis L.**, Drouet L., Van Dingenen R., Emmerling J., (2018), **Future Global Air Quality indices under different socioeconomic and climate assumptions**, *Sustainability*, 2018, 10, 3645
- Vrontisi Z., Luderer G., Saveyna B., Keramididas K., **Aleluia Reis L.**, Baumstark L., Bertram C., Sytze de Boerc H., Drouet L., Fragkiadakis K., Fricko O., Fujimori S., Guivarch C., Kitous A., Krey V., Kriegler E., Ó Broini E., Paroussos L., van Vuuren D., (2018), **Enhancing global climate policy ambition towards a 1.5 °C stabilization: a short-term multi-model assessment**, *Environmental Research Letters* **13** (2018), no. 4, 044039.
- Verdolini E., Diaz Anadon L., Baker E., Bosetti V. and **Aleluia Reis L.**, **Future prospects for energy technologies: Insights from expert elicitations**, *Review of Environmental Economics and Policy* **12** (2018), no. 1, 133--153.
- Rao S., Klimont z., Smith SJ, Van Dingenen R., Dentener F., Bouwman L., Riahi K., Amann M., Leon Bodirsky B., van Vuuren P., **Aleluia Reis L.**, Calvin K., Drouet L., Fricko O., Fujimori S., Gernaat D., Havlik P., Harmsen M., Hasegawa T., Heyes C., Hilaire J., Luderer G., Masui T., Stehfest E., Strefler J., van der Sluis S. and Tavoni M., **Future air pollution in the shared socio-economic pathways**, *Global Environmental Change* **42** (2017), 346 --358.
- Riahi K., van Vuuren D., Kriegler E., Edmonds J., C. Oneill B., Fujimori S., Bauer N., Calvin K., Dellink R., Fricko O, Lutz W., Popp A., Crespo Cuaresma J., KC S., Leimbach M., Jiang L., Kram T., Rao S., Emmerling J., Ebi K., Hasegawa T., Havlik P., Humpender F., **Aleluia Da Silva L.**, Steve Smith, Elke Stehfest, Valentina Bosetti, Jiyong Eom, David Gernaat, Toshihiko Masui, Joeri Rogelj, Jessica Stre er, Laurent Drouet, Volker Krey, Gunnar Luderer, Mathijs Harmsen, Kiyoshi Takahashi, Lavinia Baumstark, Jonathan C. Doelman, Mikiko Kainuma, Zbigniew

Klimont, Giacomo Marangoni, Hermann Lotze-Campen, Michael Obersteiner, Andrzej Tabeau, and Massimo Tavoni, **The shared socioeconomic pathways and their energy, land use, and greenhouse gas emissions implications: An overview**, *Global Environmental Change* 42 (2017), 153 -- 168.

- Heleen L. van Soest, **Lara Aleluia Reis**, Laurent Drouet, Detlef P. van Vuuren, Michel G. J. den Elzen, Massimo Tavoni, Keigo Akimoto, Katherine V. Calvin, Panagiotis Fragkos, Alban Kitous, Gunnar Luderer, and Keywan Riahi, **Low-emission pathways in 11 major economies: comparison of cost-optimal pathways and Paris climate proposals**, *Climatic Change* 142 (2017), no. 3, 491--504.
- J Aldy, W Pizer, M Tavoni, **L Aleluia Reis**, K Akimoto, G Blanford, C Carraro, L E Clarke, J Edmonds, G C Iyer, H C McJeon, R Richels, S Rose, and F Sano, **Economic tools to promote transparency and comparability in the paris agreement**, *Nature Climate Change* (2016), no. 6, 1000|1004.
- Laura Diaz Anadon, Erin Baker, Valentina Bosetti, and **Lara Aleluia Reis**, **Expert views - and disagreements - about the potential of energy technology r&d**, *Climatic Change* 136 (2016), no. 3, 677--691.
- Shilpa Rao, Zbigniew Klimont, Joana Leitao, Keywan Riahi, Rita van Dingenen, **Lara Aleluia Reis**, Katherine Calvin, Frank Dentener, Laurent Drouet, Shinichiro Fujimori, Mathijs Harmen, Gunnar Luderer, Chris Heyes, Jessica Stre er, Massimo Tavoni, and Detlef P van Vuuren, **A multi-model assessment of the co benefits of climate mitigation for global air quality**, *Environmental Research Letters* 11 (2016), no. 12, 124013.
- Erin Baker, Valentina Bosetti, Laura Diaz Anadon, Max Henrion, and **Lara Aleluia Reis**, **Future costs of key low-carbon energy technologies: Harmonization and aggregation of energy technology expert elicitation data**, *Energy Policy* 80 (2015), 219 - 232.
- Erin Baker, Olaitan Olaleye, and **Lara Aleluia Reis**, **Decision frameworks and the investment in r&d**, *Energy Policy* 80 (2015), 275 --285.
- **L Aleluia Reis**, D Melas, B Peters, and D S Zachary, **Developing a fast photochemical calculator for an integrated assessment model**, *International Journal of Environment and Pollution (IJEP)* 50 (2012), no. 1/2/3/4.
- D S Zachary, L Drouet, U Leopold, and **L Aleluia Reis**, **Trade-offs between energy cost and health impact in a regional coupled energy air quality model: the leaq model**, *Environmental Research Letters* 6 (2011), no. 2, 024021.

## **PUBLISHED REPORTS**

- Contributor to the:
  - European Commission Directorate-General for Research and Innovation, **Final Report of the High-Level Panel of the European Decarbonisation, Publications Office of the European Union**, 2018 (chapters 2 and 3 ).
- **L Aleluia Reis**, J Emmerling, M Tavoni, and D Raitzer, **The economics of greenhouse gas mitigation in developing asia**, ADB ECONOMICS WORKING PAPER SERIES 504, ADB ECONOMICS WORKING PAPER SERIES, Development Bank ADB Avenue, Mandaluyong City, Metro Manila, Philippines, December 2016.
- V Bosetti, L D Anadn, E Baker, **L Aleluia Reis**, and E Verdolini, **The future of energy technologies: An overview of expert elicitations**, GGKP Working Paper 01|2016, GGKP Research Committee on Technology and Innovation, 2016.

## **CHAPTER IN BOOK**

- **L. Aleluia**, V. Bosetti, M. Bunn, M. Catenacci, L.A. Diaz, G. Fiorese, A. Lee, and E. Verdolini, **Innovation under uncertainty the future of carbon-free energy technologies**, Edward Elgar Publishing, 2013.

## **RESEARCH PAPERS**

- van Soest H., McCollum D., Bertram C., Harmsen M., van Vuuren D., Kriegler E., Roelfsema M., Fragkos P., den Elzen M., **Aleluia Reis L.**, Riahi K., Krey V., Kejun J., Schaeffer R., Mathur R., Fujimori S., **Opportunities for Enhanced Action to Keep Paris Goals within Reach - Contribution to the Talanoa Dialogue by the COMMIT and CD-LINKS projects** , DOI:10.13140/RG.2.2.26589.26080, <https://unfccc.int/documents/184187>, 2018.
- Aldy J.E., Pizer W.P., Akimoto K., **Aleluia Reis L.**, Carraro C., and Tavoni M., **Learning from nationally determined contributions** , Research Papers Issue RP0286, CMCC, 2018.
- L D Anadon, E Baker, V Bosetti, and **L Aleluia Reis**, **Too early to pick winners: Disagreement across experts implies the need to diversify r&d investment**, Working Paper 22.2016, Fondazione Eni Enrico Mattei, 2016.
- Johannes Emmerling, Laurent Drouet, **Lara Aleluia Reis**, Michela Bevione, Loic Berger, Valentina Bosetti, Samuel Carrara, Enrica De Cian, Gauthier De Maere D'Aertrycke, Tom Longden, Maurizio Malpede, Giacomo Marangoni, Fabio Sferra, Massimo Tavoni, Jan Witajewski-Baltvilks, and Petr Havlik, **The WITCH 2016 Model - Documentation and Implementation of the Shared Socioeconomic Pathways**, Working Paper 2016.42, Fondazione Eni Enrico Mattei, 2016.
- H van Soest, **L Aleluia Reis**, D van Vuuren, C Bertram, L Drouet, J Jewell, E Kriegler, G Luderer, K Riahi, J Rogelj, M Tavoni, M den Elzen A Awasthy, K Calvin, P Capros, L Clarke, M Colombier, T Fei, A Garg, F Guedes, M Imperio, M Kainuma, J Kejun, A C Kberle, V Krey P Kolp, A Kitous, P Leonidas, A Lucena, T Masui, L Nogueira, R Pierfederici, B Saveyn, R Schae er, F Sha, B Shoai, P R Shukla, T Spencer, A Szklo, H Waisman, and et al, **Regional low - emission pathways from global models**, Working Paper 110.2015, Fondazione Eni Enrico Mattei, 2015.

## CONFERENCE PROCEEDINGS

- **L Aleluia Reis**, L Drouet, and M Tavoni, **Future mortality due to air pollution under climate policies**, Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purpose (S Di Sabatino, S Trini Castelli, and E Brattich, eds.), 2017, pp. 185-189.
- **L Aleluia Reis**, D S Zachary, B Peters, and L Drouet, **A fast air quality model using look-up tables to address integrated environmental assessment model requirements**, International Environmental Modelling and Software Society (iEMSs) 2012 International Congress on Environmental Modelling and Software Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig, Germany (R Seppelt, A A Voinov, S Lange, and D Bankamp, eds.), iemss, 2012 (peer reviewed).
- L Drouet, **L Aleluia Reis**, U Leopold, and D S Zachary, **Implementing the oracle-based optimisation for an integrated assessment model for air pollution: the Luxembourg energy air quality model**, International Environmental Modelling and Software Society (iEMSs) 2012 International Congress on Environmental Modelling and Software Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig, Germany (R Seppelt, A A Voinov, S Lange, and D Bankamp, eds.), iemss, 2012 (peer reviewed).
- **L Aleluia Reis**, D Melas, B Peters, and D S Zachary, **Developing a fast photochemical calculator for an integrated assessment model**, 14th Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes (J G Bartzis, A Syrakos, and S Andronopoulos, eds.), Environmental Technology Laboratory, Department of Mechanical Engineering, University of West Macedonia, Greece, 2011, pp. 225-229.
- **L Aleluia Reis**, D S Zachary, U Leopold, and B Peters, **Selecting a fast air quality calculator for an optimization meta-model**, Air Pollution XVII (C A Brebbia and V POPOV, eds.), vol. 123, WIT Press, 2009, pp. 39 -- 49.
- D S Zachary, U Leopold, **L Aleluia Reis**, C Braun, G Kneip, and O ONagy, **An energy and environmental meta-model for strategic sustainable planning**, Energy and Sustainability II, vol. 121, WIT Press, 2009.

## ON LINE TOOLS/WORKS

[HTTPS://DATASHOWB.SHINYAPPS.IO/CLAOC/](https://datashowb.shinyapps.io/claoc/)

[HTTPS://DATASHOWB.SHINYAPPS.IO/WEB\\_SHINY/](https://datashowb.shinyapps.io/web_shiny/)

[HTTPS://RPUBS.COM/LALELUIA/DEEDSWP1DB](https://rpubs.com/laleluia/deedswp1db)  
[HTTPS://DATASHOWB.SHINYAPPS.IO/AQIVIS/](https://datashowb.shinyapps.io/aqivis/)  
[HTTPS://RPUBS.COM/LALELUIA/RFFELPATS](https://rpubs.com/laleluia/rffelpats)

## SKILLS

<b>MODELS</b>	FASST and FASST(R), WITCH, AUSTAL2000, OZIPR, OpenFOAM
<b>PROGRAMING</b>	R, C, IDL, Matlab, Python, bash script, GAMS, LateX, tikz, R markdown, R Shiny
<b>SOFTWARE</b>	<u>Statistics</u> : R, SPSS, Systat; <u>GIS</u> : Idrisi, GRASS, QuantumGIS; <u>OS</u> : windows, linux
<b>LANGUAGES</b>	Portuguese (Native), English (Proficient), French (Proficient), Italian (Fluent), Spanish (Intermediate), German (Basic user) and Greek (Basic user)
<b>AIR QUALITY MONITORING</b>	Station monitoring air quality: Snif Air Lab, in Almada, Portugal

## REFEREEING

Often reviews for MDPI journals: C | Energies | Atmosphere | International Journal of Environmental Research and Public Health | Economies and Applied Sciences

Sporadically reviews articles for the journals: Environmental Modeling and Software | Nature communications | Nature Climate Change | Climatic Change | Renewable & Sustainable Energy Reviews | International Journal of Environmental Pollution | Journal of Cleaner Production | The Lancet Planetary Health | Geophysical Research Letters | The Lancet Public Health

She was part of the theses evaluation committee of the PhD candidate Mariana Império of the COPPE/UFRJ entitled “Atmospheric pollutant emissions in stringent climate scenarios for Brazil”

Guest co-editor of the special issue Model and Data Driven Policy Support to Tackle the Air Pollution Crisis of Atmosphere  
([https://www.mdpi.com/journal/atmosphere/special\\_issues/pollution\\_crisis](https://www.mdpi.com/journal/atmosphere/special_issues/pollution_crisis))

## PROJECTS

Currently participating in several EU funded projects: INHALE (Cariplo Foundation) | NAVIGATE (H2020) | ENGAGE (H2020)

Participated in the past Projects: ICARUS (ERC) | LIMITS (FP7) | ADVANCE (FP7) | MILES (EuropeAid) | CD-Links (H2020) | DEEDS (H2020) | COMMIT (EuropeAid) | INOPATHS (H2020)

## TEACHING

Lecturer and co-project leader of the ‘Climate change: Design activism for sustainability’ Envisioning workshop at the Domus Academy, November-December 2018

Co-supervision of the the Master Theses of Stefania Renna from Università degli Studi di Milano on Consumer behavior change driven by air pollution.

Co-supervision of the the Master Theses of Pietro Andreoni from Politecnico di Milano on Supply-side policies.

## FUND RAISING

Participated in the writing and preparation of two EC funded projects, the DEEDS and the COMMIT projects. Coordinated the Cariplo's Foundation INHALE project.

## INTERNATIONAL COLLABORATIONS

- Participation to the **Energy Modeling Forum** (Multi-model intercomparison projects coordinated by Stanford University), on the Working Group EMF 30 "Short Lived Climate Forcers / Air Quality"
- Participation to the development of the **Shared-Socioeconomic Pathways**, building the air pollution scenarios for the WITCH model.
- Presented at the COP22-Marrakesh in the side event '**NDC Policy Choices and Levels of Effort**'
- Presenter at Workshop on Long-term strategies COMMIT berlin
- Presenter at Festival dello Sviluppo Sostenibile (AsviS), **Workshop on "Urban Road Pricing and the Environment. Lessons from Milano and London"**.
- Worked as a consultant for the **world bank** on hemispheric air pollution in 2020/21
- Contributing author** of the Chapter 16 of the **AR6 IPCC report WGIII**.