



BRIDGE: Building Resilience In a Dynamic Global Economy: Complexity across scales in the Brazilian Food-Water-Energy Nexus

The BRIDGE project aims to develop a framework of analysis and policy engagement to improve the resilience of the Brazilian Food-Water-Energy (FWE) nexus to global environmental and economic change, in close cooperation with the Brazilian academic community. It will combine established UK expertise and specifically developed, state-of-the-art analytical capacity in socio-economic and environmental modelling to build a robust environmental policy assessment methodology for the Brazilian FWE nexus in the context of global change. The modelling capacity, skills and knowledge will be transferred to relevant actors in Brazil to enable local academics to continue informing and engaging policymakers through a continued sustainability transition during and beyond the end of this project.

Brazilian society faces significant uncertainty due to two significant global contextual factors. On one hand, global environmental change, due to global unsustainable resource use and greenhouse gas emissions, is highly likely to change weather patterns, which will affect detrimentally the land cover and biodiversity in Brazil, with severe impacts on agriculture. On the other hand, without appropriate policies in place, the Brazilian economy and environment, relying heavily on exports of natural resources for prosperity, can be vulnerable to global economic change, where changes in demand for commodities could lead to either environmental degradation and large scale land-use change, or decreased wealth and employment. Both types of changes are likely to impact and create intricate complexities in the Brazilian FWE nexus. These transformations and forces must be understood in order to minimise detrimental impacts to welfare and the environment in Brazil.

Sustainability practices can be influenced by policy; however policy can have unexpected and unintended impacts. In order to effectively promote a sustainability transition, the policy process and cycle must be actively engaged with well-informed actors. This project will combine cutting-edge UK and Brazilian expertise in environmental policy and law with our state-of-the-art, detailed environmental policy modelling capacity to engage the Brazilian policy process in order to significantly improve policy-maker foresight and ultimately the resilience of Brazilian society to possible future global environmental and economic change through a sustainability transition.

Communities can be guided by sustainability projects that demonstrate best practice, exercises that can be scaled up and replicated, developing the local innovation system and the processes of the innovation chain. This project will also involve setting up small-scale sustainability demonstration and awareness-raising projects in order to experimentally demonstrate best practice in each case and engage with the public. Taking the approach of technology transfer from knowledge-based institutions to small and large businesses, in collaboration with local authorities, the BRIDGE project will involve developing implementable sustainability solutions.

This **BRIDGE Kick-off meeting** seeks to engage with the Brazilian academic community in order to anchor its research in the right context and build collaborative links for the length of the project and beyond.

The BRIDGE Kick-Off meeting: Workshop in Florianopolis, April 27-28, Jurê Beach Village, Florianopolis

Coordinated by **Jean-Francois Mercure, Pablo Salas, Baltazar Guerra, Jorge Vinuales**

Arrival – April 26th 18:00 – 21:00. Reception of participants, dinner at the hotel

Half Day 1. April 27th 9:00 – 13:00

**The BRIDGE project: Reaching out to Brazilian research
(chaired by Baltazar Andrade Guerra)**

- 9:00 – 9:30 **Prof Baltazar Andrade Guerra, João Marcelo Pereira Ribeiro and Issa Ibrahim Berchin** UNISUL, Brazil
Welcome message to UNISUL and Florianopolis, overview of the LINKS project and achievements
- 9:30 – 10:00 **Dr Jean-Francois Mercure**, Radboud University, Netherlands
Introduction to the BRIDGE project, overview of the WEF Nexus science
- 10:00 – 10:30 **Prof Jorge Viñuales**, University of Cambridge, UK
Overview of the policy, law and stakeholder engagement for Nexus management
- 10:30 – 11:00 **Coffee break**
- 11:00 – 11:30 **Profs Rafael Faraco and Celso Lopes Albuquerque Jr**, UNISUL, Brazil
Overview of the pilot action project and local engagement
- 11:30 – 12:00 **Dr Neil Edwards, Dr Belinda Wu**, Open University, UK
Introduction to the climate science and global environmental change as drivers of nexus uncertainty
- 12:00 – 12:30 **Hector Pollitt**, Cambridge Econometrics Ltd, UK
Introduction to global economic change as a potential driver of environmental transformation and nexus uncertainty
- 12:00 – 12:15 **Pablo Salas**, University of Cambridge, UK
The Nexus beyond traditional academia: linking researchers and innovators

Half Day 2. April 27th 14:00 – 18:00

**Academic engagement: how BRIDGE can serve Brazil's academia
(chaired by Jean-Francois Mercure)**

- 14:00 – 14:10 **Dr Jean-Francois Mercure**, Radboud University, Netherlands
Introduction to all participants
- 14:10 – 14:30 **Dr Aleix Altimiras Martin**, UNICAMP, Brazil
Using macroeconomic material flow accounting to understand the FWE nexus and its role in transitioning towards a bioeconomy
- 14:30 – 14:50 **Prof Amaro Pereira & Fernanda Tayt'sohn**, UFRJ, Brazil
Climate-Land-Energy-Water Strategies
- 14:50 – 15:10 **Prof Andreia Costa Veira**, UNISANTOS, Brazil
Introduction to the DEIMA Research on International Economic Law and

the Environment

- 15:10 – 15:30 **Prof Frederico Poley Martins Ferreira**, Fundação João Pinheiro, Brazil
Fundação João Pinheiro activities and some notes about Brazilian demographic scenarios
- 15:30 – 16:00 Coffee Break
- 16:00 – 16:20 **Prof Cristiane Derani**, FUSC, Brazil
Using modelling evidence for designing better law compliance: case study of the new Brazilian forestry law
- 16:20 – 16:40 **Marcus Seferin, Cassio Stein Moura, Odilon Francisco Pavón Duarte**
PUCRS, Brazil.
Bridging science and policy: the perspective of PUCRS in food-water-energy nexus
- 16:40 – 17:00 **Prof Leonardo Secchi**, UDESC, Brazil
Science and policy: The improvement of public decision-making in Brazil
- 16:40 – 17:00 **Dr Pierre Bocquillon**, University of Cambridge, UK
Issa Berchin, UNISUL, Brazil
Biofuels politics and policies: comparative insights from Europe and Brazil
- 17:00 – 18:00 Open discussion
Chaired by **Prof Jorge Viñuales**, University of Cambridge, UK
- 20:00 – 22:00 **Conference dinner**

Half Day 3. April 28 9:00 – 13:00

**Engagement with policy-making, technology transfer and entrepreneurial activity
(Chaired by Pablo Salas)**

- 9:00 – 9:20 **Prof Baltazar Andrade Guerra**, UNISUL, Brazil
Engaging with the community in Brazil: the successful case of UNISUL
- 9:20 – 9:40 **Pablo Salas**, University of Cambridge, UK
Building a knowledge-based economy: an international alliance for science, technology and innovation
- 9:40 – 10:00 **Prof Fabio Holthausen and Prof Geraldo Campos**, UNISUL, Brazil
Supporting sustainable innovation and technology development in Brazil: Introduction to the Innovation Agency of UNISUL
- 10:00 – 10:20 **Angelica Garcia**, FCO/UKTI, Brazil
- 10:20 – 10:50 Coffee Break
- 10:50 – 11:10 **Dr. Diego Jacob Kurtz**, CERTI Foundation, Brazil
30 years of innovation at the CERTI Foundation
- 11:10 – 11:30 **Prof. Marli Elizabeth Ritter dos Santos**, PUCRS, Brazil
TTO/PUCRS experience in turning science into business
- 11:30 – 11:50 **Prof. Milton Mori**, INOVA, UNICAMP, Brazil
Unicamp and innovation
- 11:50 – 12:30 Open discussion, Chaired by **Pablo Salas**, University of Cambridge

Speaker biographies and contact details

- **Jean-Francois Mercure** (Radboud University, Netherlands) – J.Mercure@science.ru.nl

Dr Jean-Francois Mercure is assistant professor in energy, climate and innovation at the Environmental Science department of Radboud University's Faculty of Science, Nijmegen, The Netherlands, and research fellow at the Cambridge Centre for Environment, Energy and Natural Resource Governance (C-EENRG), department of Land Economy, University of Cambridge. He is the UK Principal Investigator and coordinator of both the Newton Fund UK-Brazil BRIDGE project and the closing LINKS2015 project. Scientist in the areas of complexity sciences, energy, innovation, macroeconomics and climate change. Formerly deputy director of the Cambridge Centre for Climate Change Mitigation Research (4CMR), Specialises in theory and models for studying the diffusion of innovations, economics and complex cross-sectoral interactions in climate change and the energy-water-food nexus. These models have been used by various institutions, including for contributing to policy assessment at the European Commission.

- **Baltazar Andrade Guerra** (UNISUL, Brazil) -- Baltazar.Guerra@unisul.br

Head of the Research Group in Energy Efficiency and Sustainability. Professor in the University of Southern Santa Catarina (Unisul). In UNISUL, he coordinated two research projects: JELARE - Joint European-Latin American Universities Renewable Energies Project; REGSA - Promoting Renewable Electricity Generation in South America, both funded by the European Union (through the ALFA III program and the thematic program for the environment and sustainable management of natural resources including energy). Principal-Investigator of the Brazilian section of LINKS2015 and BRIDGE, funded by FAPESC and the Research Councils of the United Kingdom (RCUK).

- **Jorge Vinales** (Cambridge University, UK) – jev32@cam.ac.uk

Jorge E. Vinales is the Harold Samuel Professor of Law and Environmental Policy at the University of Cambridge and the Director of the Centre for Environment, Energy and Natural Resource Governance (C-EENRG). He is co-investigator on the BRIDGE project.

- **Hector Pollitt** (Cambridge Econometrics, UK) – hp@camecon.com

Hector Pollitt is a director and head of International Modelling at Cambridge Econometrics, with extensive experience in the development and application of macroeconomic modelling tools for impact analysis. He holds overall responsibility for maintenance and application of the global E3ME model. Using E3ME, Hector contributed to the EU's official Impact Assessment of the 2030 climate and energy package and has carried out extensive research in estimating the macroeconomic impacts of implementing carbon pricing, renewables development, energy efficiency measures and other climate policy. He was co-editor of the recent book Low Carbon, Sustainable Future in East Asia: How to improve the energy system, taxation and policy cooperation and last year worked with the Ministry of Finance in Brazil to develop a model to assess future environmental tax reform. Hector plays a key role in the BRIDGE project.

- **Neil Edwards** (on skype) neil.edwards@open.ac.uk
and Belinda Wu (Open University, UK) -- belinda.wu@open.ac.uk

Belinda holds a PhD in Geography and specialises in quantitative spatial analysis and modelling to facilitate substantive research and decision making. Her interest in the BRIDGE project is the impact of climate change on complex social systems within the energy-water-food context. Adopting a Complexity Science approach, she would like to better-understand and assess the impact and interactions between the human societies and the environmental changes, with a focus

on Inclusive Innovations in Development. Neil Edwards is a statistician and climate scientist. He coordinated the FP7 consortium ERMITAGE, and is co-investigator of the BRIDGE project.

- **Pablo Salas** (Cambridge University, UK) – pas80@cam.ac.uk

Pablo Salas is an Economist and Electrical Engineer by background currently pursuing a PhD at Cambridge. He is also a member of the Cambridge Centre for Environment, Energy and Natural Resource Governance (C-EENRG) at the Land Economy Department of the University of Cambridge. Pablo's research examines the interactions among energy, environmental and economic systems as these can be used to improve global strategies for climate change risk reduction and sustainable economic development. Working with the International Outreach Programme of Cambridge Enterprise (the commercialisation arm of the University of Cambridge), Pablo has been supporting institutions engaged in sustainable innovation and tech transfer. With Dr Mercure he played a key role in designing both the LINKS and BRIDGE projects.

- **Rafael Faraco** (UNISUL, Brazil) -- rafael.faraco@unisul.br

Computer Science Bachelor at Universidade Federal de Santa Catarina, Master in Production Engineering at Universidade Federal de Santa Catarina and Doctor in Production Engineering at Universidade Federal de Santa Catarina (2003). Experience in Informatics, acting on the following subjects: Software Requirements Modeling, Technology Innovation, Entrepreneurship and Research Project Management. Researching in the Informatics Applied in the Environment area. Co-Investigator in the Newton Fund LINKS 2015 and BRIDGE, funded by FAPESC and the Research Councils of the United Kingdom (RCUK).

- **Celso Lopes de Albuquerque Júnior**, (UNISUL, Brazil) Celso.Albuquerque@unisul.br

Graduate at Engenharia da Horticultura from Universidade do Contestado and Master's at Agronomy from Universidade Federal de Santa Catarina. Focusing on Genetics, acting on the following subjects: fruticultura, malus domestica, videira, porta-enxerto and micropropagação. Co-Investigator of projects Links 2015 and BRIDGE, funded by FAPESC and the Research Council of United Kingdom (RCUK) through the Newton Fund.

- **Issa Ibrahim Berchin** (UNISUL, Brazil) issaberchim@gmail.com

Master's student in Administration at University of Southern Santa Catarina, Brazil. Bachelor in International Relations at the University of Southern Santa Catarina, Brazil. In Unisul he is a junior researcher at the Research Group on Energy Efficiency and Sustainability - GREENS. He also participates in the projects: LINKS 2015 and BRIDGE, funded by FAPESC and the Research Council of United Kingdom (RCUK) through the Newton Fund. At Unisul, he was a junior research in the REGSA Project - Promoting Renewable Electricity Generation in South America.

- **João Marcelo Pereira Ribeiro** (UNISUL, Brazil) joaomarceloprdk@gmail.com

Master's student in Administration at University of Southern Santa Catarina, Brazil. Bachelor in International Relations at the University of Southern Santa Catarina, Brazil. In Unisul he is a junior researcher at the Research Group on Energy Efficiency and Sustainability - GREENS. He also participates in the projects: LINKS 2015 and BRIDGE, funded by FAPESC and the Research Council of United Kingdom (RCUK) through the Newton Fund. At Unisul, he was a junior research in the REGSA Project - Promoting Renewable Electricity Generation in South America.

Leonardo Secchi (UDESC, Brazil) leonardo.secchi@udesc.br

PhD in Political Studies from University of Milan (Italy) and postdoctoral position in public Policies by the University of Wisconsin-Madison (USA). Was researcher at: Harvard Kennedy School (Harvard University), the Boston Municipal Research Bureau (BMRB - USA) and Instituto de Gobierno y Políticas Public (Autonomous University Barcelona - Spain). He was founder and

director of the Brazilian Society of Public Administration (SBAP), the PVBICA - Institute Public Policy and associate editor of the Journal of Public Administration (RAP / FGV). He is currently professor of undergraduate, master's and the University Ph.D. courses of UDESC, where he teaches political science, policy advocacy and the analysis of public policy.

- **Pierre Bocquillon** (Cambridge University) – pmvb2@cam.ac.uk

Dr Pierre Bocquillon is post-doctoral researcher at the Cambridge Centre for Environment, Energy and Natural Resource Governance (C-EENRG), University of Cambridge. He holds Masters degrees in Geography (University Paris I Panthéon-Sorbonne) and Political Science (Sciences Po Paris), and a PhD in Politics and International Studies from the University of Cambridge. He has published on energy and climate change policies in Europe, as well as on European politics. His current research interests include European energy and climate policy-making, the politics of renewable energy promotion (electricity, biofuels), and the democratic governance of energy and climate change.

- **Aleix Altimiras** (UNICAMP) -- aleix@ige.unicamp.br

Aleix is interested in understanding how economies extract, transform, use and discard materials from and to the environment (i.e. their physical metabolism) and their relationship with socio-economic variables (e.g. GDP, employment). In particular, Aleix is trying to characterise possible physical and technological structures of a bio-based economy so that a transition towards such economy can be informed. For that purpose, he is developing new methods in Input-Output Analysis and new structural indicators to use them to inform technological change. He is starting to apply these methods to the Brazilian sugarcane ethanol case, which is also one of the core issues in the FWE nexus.

- **Cristiane Derani** (FUSC, Brazil) cd599@hermes.cam.ac.uk

Cristiane is a Professor at the Federal University of Santa Catarina (UFSC), Brasil, where she teaches Public International Law, International Economic Law and International Environmental Law. She is also Research Coordinator and Head of the research group on 'Advanced Studies of Economics and Environment in International Law'(EMAE), as well as a Researcher of the Brazilian National Research Agency (CNPq). She has published two single authored monographs: 'Environmental Economic Law' (Direito Ambiental Econômico) and 'Privatisation and Public Service' (Privatização e Serviços Públicos). She has also edited several volumes and published numerous articles on environmental law, economic law, biodiversity, climate change, and sustainable development law. Her main research areas are in environmental international law, globalisation and sustainable development, climate change and energy governance, food security and trade law.

- **Andréia Costa Vieira**, (UNISANTOS, Brasil) andrea.vieira@unisantos.br

Andreia Costa Vieira is Professor of International Economic Law and the Environment at the Masters and PhD Program of the Catholic University of Santos – São Paulo, Brazil. She is leader of the Group DEIMA - Direito Econômico Internacional e Meio Ambiente, a registered group of post-graduate researchers whose researches have been developed on the fields of International Environmental Law related to Economic Matters - such as water, oil and gas, alternative energy sources, shipping and the environment, international liability of multinationals for environmental damages and international environmental tax law. She holds a PhD in International Law and the Environment (USP, Brazil), Visiting Fellow at the Lauterpacht Centre for International Law (2013, University of Cambridge, UK), Masters on International Commercial Law (University of Nottingham, UK). She has mainly published, inter alia, on International Trade of Water (privatization of water services, trade of bottled water, trade of bulk water and trade of virtual water and correlated issues), International Trade Law (WTO, IMF, World Bank) and International Environmental Tax

Law. Since 2014, she is also representative of the group University of Cambridge Alumni in Brazil, in charge of organizing academic and social events on behalf of the University of Cambridge.

- **Amaro Pereira**, (COPPE/UFRJ) -- amaro@ppe.ufrj.br

Economist from the Universidade Federal Fluminense, a master's degree in Energy Planning from the Federal University of Rio de Janeiro and PhD in Energy Planning from the Federal University of Rio de Janeiro. He served as technical advisor of the Energy Research Company (EPE) and as a Visiting Professor at the University of Grenoble in France. He is currently Adjunct Professor of Energy Planning Program of COPPE / UFRJ, researcher CentroClima / COPPE / UFRJ and director of Strategic Development Institute of Power Industry ILUMINA. Experience in energy and environmental modeling, in addition to acting in the areas of energy regulation, in the introduction of new energy technologies and sources and in the issues related to climate change analysis.

- **Fernanda Tayt'sohn**, (COPPE/UFRJ) -- fernanda@lamma.ufrj.br

Meteorologist, graduate of the Federal University of Rio de Janeiro (UFRJ), MSc in energy and environmental planning at COPPE/UFRJ, and PhD candidate in energy and environmental planning at COPPE/UFRJ. Carried out consultancy for review and development of a regional study on the water energy food nexus in Latin America. Integrated modeling of the impacts on land use, water resources and energy nexus of the expansion of biofuels on climate change scenarios. Projections that indicate the increase of sugarcane production for ethanol generation in Brazil, assessment of the sugarcane agriculture area expansion in the Central – West of Brazil by using crop modeling taking in consideration the possible impacts on food security, land use, hydrological factors, for the IPCC 's projections and climatological scenarios.

- **Frederico Poley Martins Ferreira** (Fundação João Pinheiro, Brazil), frederico.poley@fjp.mg.gov.br

Doctorate in demography (CEDEPLAR/ Federal University of Minas Gerais – UFMG), Master in urban planning (University of Brasília - UnB). degree in Economics. Post-doctoral studies at the University of Sheffield (UK) in public policy. Acting on the following subjects: population, households, families and demands for services, space, urbanization and development, planning and evaluation of public policies.

- **Marli Elizabeth Ritter dos Santos** (PUCRS, Brazil) elizabeth.ritter@pucrs.br

PhD in Administration Sciences (2005) by the National Autonomous University of Mexico, she has been working on innovation and technology transfer management for more than 15 years. From 1997 to 2005, she coordinated the Interaction and Technology Transfer Office of the Federal University of Rio Grande do Sul, Brazil. Since March 2005, she has been coordinating the Technology Transfer Office, at the Pontifical Catholic University of Rio Grande do Sul. Teaches about intellectual property and academic technology transfer management, with many publications on the subject. From May 2006 to April 2010, she was President of the Brazilian Forum of Innovation and Technology Transfer Managers (FORTEC), an association that put academic technology transfer managers together. Since 2011, she has a position on the Board of Directors of the Brazilian Association of Innovative Enterprises (ANPEI). In February 2015, she was assigned to the Innovation Management Committee of the Ministry of Science, Technology and Innovation of the Brazilian government.

- **Milton Mori**, (UNICAMP, Brazil) mimenes@inova.unicamp.br

Milton Mori is Professor at the University of Campinas (Unicamp) (1999 - Present), and the executive director of Inova Unicamp Innovation Agency since July 2013. Prof. Mori is an engineer by training, with a B.Sc. from the Federal University of Paraná (Brazil, 1972), a Special Masters Degree from the Instituto Militar de Engenharia, Rio de Janeiro (Brazil, 1974), a MSc. in Nuclear

Engineering from the University of Michigan (USA, 1979) and a PhD in Nuclear Engineering from North Carolina State University, NCSU, (USA, 1983). Received the Fifth Petrobras Award, Refining Process Category, G.C Lopes (PhD Student,) M. Mori (supervisor), 2011.

- **Diego Jacob Kurtz** (CERTI, Brazil) djk@certi.org.br

CERTI – The Foundation Centers of Reference in Innovative Technologies – was created on October 31, 1984, in Florianópolis, the capital of Santa Catarina state. It began from the activities of Labmetro – the Metrology Laboratory of the Department of Mechanical Engineering of the Federal University at Santa Catarina (UFSC). Since 1990, the Foundation operates at its own facilities on the UFSC campus, Florianópolis. To better serve the needs of the national market, CERTI also established Technology Institutes in Manaus and Brasília. In the first two decades of its existence, the Foundation expanded its action to other lines of technological activity, becoming a national and international reference for its vanguard projects, services and undertakings. Today, the CERTI Foundation is composed of eight Reference Centers, which operate with a focus on recognized competency that generates innovative technological solutions for Brazilian society and markets.