

Romulo N. Ely

Rutgers profile: <http://www.business.rutgers.edu/faculty/romulo-neves-ely>

Google Scholar: <https://scholar.google.com/citations?user=8L9s-YIAAAA&hl=en&oi=ao>

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SUMMARY

I have been working with energy, environment, built environment, planning and public policy subjects in general – basically modelling and assessing different socio-economic scenarios through Input-Output Analysis, Computable General Equilibrium Models, Econometrics, Process Analysis and Life-Cycle Assessment. I also have experience constructing new Input-Output, Supply-Use, Social Accounting Matrices and Economic Forecasting. Since 2017 I teach operations research, database management systems and statistics in the Management Science and Information Systems department at Rutgers Business School: including Large Classes (around 500 students are taking my courses each semester). I review papers for prestigious journals such as Energy Policy, Ecological Economics, Economic Systems Research, and The Energy Journal. I have been a member of International Input-Output Association (IIOA), International Society for Industrial Ecology (ISIE), International Association for Energy Economics (IAEE), The Institute for Operations Research and the Management Sciences (INFORMS), United States Association for Energy Economics (USAEE), and Rutgers Energy Institute (REI).

RESEARCH TOPICS (ALPHABETICAL ORDER)

- Computational General Equilibrium models;
- Energy and environmental bottom-up models;
- Energy and Environmental Economics;
- Energy and Environmental Planning;
- Industrial Ecology;
- Industrial Organization;
- Input-Output Analysis, Life-Cycle Assessment and Hybrid Analysis;
- New energy technologies;
- Operations Research;

EDUCATION

- Doctor of Science (D.Sc.) in Energy Planning at COPPE/UFRJ *

Thesis title: “Advanced input-output techniques for assessing direct and indirect economic impacts of sugar cane conversion technologies”

Link: http://www.ppe.ufrj.br/pppe/production/tesis/romulo_ely.pdf

Supervisor(s): Prof. Alexandre S. Szklo and Amaro O. Pereira Jr.

*From 2012 to 2013, I have worked during one year under the supervision of **Prof. Manfred Lenzen** in the Integrated Sustainability Analysis group at School of Physics, **The University of Sydney**.

- Master of Science (M.Sc.) in Energy Planning at COPPE/UFRJ

Dissertation title: “Prospective evaluation of biorefinery routes in Brazil, from sugar cane bagasse as a basic feedstock”

Link: http://www.ppe.ufrj.br/pppe/production/tesis/ely_neves.pdf

Supervisor: Prof. Alexandre S. Szklo

- Bachelor in Economic Science at UFRJ

Monograph title: “An analysis of sugarcane industry in Brazil”

Link: http://www.ie.ufrj.br/infosucro/estudos/Monografia_Romulo.pdf

Supervisor: Maria da Graça Derengowski Fonseca

PROFESSIONAL EXPERIENCE

- Assistant Professor of Professional Practice at the Management Science and Information Systems department, Rutgers Business School–Rutgers, The State University of New Jersey

September 2018 – current

Contractor: **Rutgers Business School**

Teaching three-four sections of Operations Management (including large classes) per semester and a Management of Information Systems (MIS) per academic year. Coordinating a team of Teaching Assistants (TA) – total number of students of around 500 per semester (coordinating around 5/8 TAs).

Faculty Directory link: <http://www.business.rutgers.edu/faculty/romulo-neves-ely>

- Lecturer (Assistant Professor) at the Management Science and Information Systems department, Rutgers Business School–Rutgers, The State University of New Jersey

September 2017 – August 2018

Contractor: **Rutgers Business School**

Teaching three sections of Operations Management during the Fall of 2017 and Spring of 2018 (including an honour class). Coordinating a team of Teaching Assistants (TA) – total classes with around 450 students (coordinating around 7/8 TAs). Operations Management basically covers: linear programming; integer programming; non-linear programming; probability; stochastic simulation, among other topics.

- Part-time Lecturer at the Department of Agriculture, Food and Resource Economics, School of Environmental and Biological Sciences, The State University of New Jersey

September 2017 – June 2018

Contractor: **School of Environmental and Biological Sciences**

Teaching an undergrad course, “Energy Economics and Policy”, during the Spring of 2018. Teaching a grad course, “Research Methods in Applied Economics”, during the Fall of 2017.

- Part-time Lecturer at the Management Science and Information Systems department, Rutgers Business School–Rutgers, The State University of New Jersey

January 2017 – August 2017

Contractor: **Rutgers Business School**

I’ve taught the course “Operations Management” during the Spring Semester at Rutgers University to undergrad students (2 classes of 50 students). During the summer, I also taught “Statistical Methods in Business” (2 classes of 30 students each), which basically covers: descriptive and inferential statistics, as well as econometrics (including time-series analysis).

- Postdoctoral Associate at R/ECON™

April 2016 – December 2016

Contractor: **Edward J. Bloustein School of Planning and Public Policy, Rutgers, The State University of New Jersey**

My work consisted in: developing a link between an econometric forecasting model and a computable general equilibrium model in order to assess impacts from big storms in the New York and New Jersey States; undertaking economic forecasting for the next 20 and 30 years of the State of New Jersey; contributing with the writing process of the respective reports periodically released to clients; writing grant proposals with colleagues; undertaking an econometric analysis of GHGs emissions from the States of US; and Teaching the undergraduate course (BYRNE Seminar), “Let the Games Begin” (we discussed and demonstrated how to measure the impact of big sport events, such as the Olympics and the World Cup, impacts – under econometrics, input-output analysis and computable general equilibrium modeling techniques). I have worked under the supervision of Prof. Michael L. Lahr, director of R/ECON™ (Rutgers Economic Advisory Service).

- Researcher

September 2015 – December 2015

Project: **Mitigation Action, Plans and Scenarios (MAPS)**

Contractor: **Energy Research Centre, University of Cape Town (through South-South-North)**

My work involved: hybridizing a time-series of South African Supply-Use tables; assisting the team in the linking methodology paper (focusing on the Social Accounting Matrices fuel reallocation); improving Social Accounting Matrices resolution, among other tasks related to the database used for the South African MAPS initiative and future applications. More detailed information about MAPS is available here: <http://www.mapsprogramme.org>.

- Researcher at Environmental Science Laboratory (a laboratory of COPPE/UFRJ)

September 2013 – December 2014

Project: **Social and Economic Implications – GHG Mitigation Scenarios (IES-Brasil)**

Period: **March 2014 – December 2014**

Contractor: **South-South-North**

I have worked in the development of a methodology for integrating the energy sector with the macroeconomic model. I have also designed a link, together with the research team, between a computable general equilibrium model (IMACLIM-BR) and a land-use model (BLUM), as well as with remaining bottom-up models, such as MESSAGE (Energy), LEAP (Transport, Households, Services, etc.) and others (Waste, Transformation Industries, etc.). I consolidated all outputs data from the bottom-up models in only one framework (a national energy matrix), in order to feed the IMACLIM-BR. The research team and I coded adjustments on IMACLIM-BR model (written in Scilab) when it was necessary. I have also assisted the research team on: analysing the technical notes from external macroeconomists, implementing them on the IMACLIM-BR and preparing reports related to macroeconomic modelling. We ran the model simulating scenarios according to requests by the Scenarios Building Teams – composed by a set of stakeholders from the government, private sector, academia and civil society. I have assisted four of these meetings, with 30-70 members of different working groups: Energy, Transport, AFOLU, Industry, Services, Household and Waste. IES-Brasil is a Brazilian MAPS initiative. I have also coordinated a team of researchers aiming to build a hybrid Brazilian Input-Output database for a next (current, by this date) IES-Brasil project. The description of this activity is in the CLIMA project. More details about the IES-Brasil are available at the following links: <http://www.mapsprogramme.org/wp-content/uploads/folder-ies-brasil-ingles.pdf> ; <http://www.mapsprogramme.org>.

Project: **CLIMA**

Period: **August 2013 – December 2014** (some collaboration is still ongoing)

Contractor: **German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) through its International Climate Initiative (IKI)**

I have designed and built a suitable input-output database for supplying a new version of IMACLIM-BR (a computable general equilibrium model). To this aim, I have supervised two other researchers: a DSc. and a MSc. student from COPPE. The new IMACLIM-BR version will be linked with a land-use, climate, transport and energy models in order to verify possible impacts in the agriculture, bio-fuels and water in consequence of different climate change mitigation policies. We expanded the standard Brazilian Supply-Use Table (SUT) from “56 industries and 110 products” to “91 industries and 126 products” in order to reach a more suitable table in terms of Green House Gases emission to enable further climate change impact assessment. Then, we estimated two new Input-Output Tables (IOTs) with, respectively 91 and 49 industries. For the latter, I implemented with the team, a high detailed hybridization - computing not only the monetary units but also a set of product flows in physical terms of different types of units: Ktoe (11 sectors); t (14 sectors); t.km (4 sectors) and pass.km (4 sectors). I presented the paper describing the methodology and findings in the 23rd International Input-Output Conference that took place in Mexico City in 2015. The International Input-Output Association awarded this paper with a travel grant. Lastly, I collaborated with the meetings of the CLIMA project during this time. CLIMA is a research platform seeking to inform Brazilian and International stakeholders on the social and environmental impacts of biofuels expansion in Brazil. It comprises the Centre for Integrated Studies on Climate Change and Environment (Centro Clima), AGROICONE and the Centre for International Energy and Environmental Policy within the Jackson School of Geoscience of the University of Austin (UT-Austin). Currently, I am still part of the CLIMA team, remotely collaborating to the project – as it is possible to see through the following link: <http://clima.org.br/en/equipe>.

Project: **Development Progress**

Period: **August 2013 – December 2013**

Contractor: **Overseas Development Institute funded by Bill and Melinda Gates Foundation**

I provided technical assistance in the Brazilian energy context for the Overseas Development Institute (ODI) team in a study that was part of a series of reports looking at “Development Progress” – reviewing success stories and examples of rapid improvement in economic and social development across the world. Brazil was selected as an example of a country that has made rapid progress in the past 20-30 years in its energy policy, in terms of availability of energy for economic development, population access to electricity and high levels of environmental sustainability. The technical assistance appraised the document elaboration process, including data, graphs and references. We also arranged meetings with industry and government stakeholders (not only in Rio de Janeiro but also in Brasilia, São Paulo and

Rondonia States). A former colleague of mine, Fernanda Westin, and I provided the assistance for ODI's team during the interviews.

The report is available at the following link:

http://www.developmentprogress.org/sites/developmentprogress.org/files/case-study-report/brazil_full_report_-_final_small.pdf

- Partner at SETE-Energia

December 2011 – November 2012

I contributed to the strategic planning of the company - implementing energy planning consulting, such as the energy system of a hotel in the State of Acre with difficult access to an urban area (part of the Amazon forest) and isolated from the Grid. I worked in R&D proposals submitted for the Brazilian Electric Energy Agency and designed new products for the company with my partners. SETE-Energia was a start-up company founded by researchers from COPPE and PUC-Rio. Today, the company is not active but two of my ex-partners move forward with one of our products and created GreenAnt (http://www.greenant.com.br/en/home_en/), which is much more than a non-intrusive smart-meter (and a SETE-Energia's spin-off).

- Researcher at CENERGIA (a lab of COPPE/UFRJ)

January 2010 – August 2010

Project: **Carbon Capture and Storage of CO₂ from coal-fired thermal power plants**

Contractor: **MPX**

I participated in the first two parts of the project: i) building a roadmap of the available technologies, ii) selecting the existent industrial plants in Brazil worth to be retro-fitted for a carbon capture system, iii) mapping the potential sites to storage the extracted CO₂ and iv) simulating the economical and physical yields of the selected plants. I worked directly with i), ii) and iii), besides writing and reviewing not only the reports but also three congress papers. For the part iv), my work was during the designing of the simulation process as well as assisting the team when necessary. The project was aimed at evaluating the current and developing technologies used for capturing and storing the CO₂ released by coal-fired thermal power plants. A brief description of the project is in the following link:

<http://www.centrochinabrasil.coppe.ufrj.br/en/projects-and-research/captura-e-armazenamento-de-carbono/>

HONOURS & AWARDS

Excellence Award

December 2019

The Management Science & Information Systems department of the Rutgers Business School has graced me with this award in recognition for Teaching Services.

Best Business Analytics and Information Technology (BAIT) Professor

April 2018

Recognized as the outstanding professor from the BAIT Department, after a nomination process and an at-large vote by the student body at the annual Rutgers Business School Leadership Summit: an event that celebrates the achievements of student leaders, professors, and business organizations at the Rutgers Business School. It was hosted by the Rutgers Business Governing Association, the undergraduate student government for RBS New Brunswick.

SKILLS

Analytical Thinking; Creative Problem Solving; Data Analysis; EndNote; Mendeley; EViews; Excel; GIS; HOMER; Hybrid Analysis; LEAP; MATLAB; Python; Power Point; Prezi; R; Report Writing; Scilab; SQL; LaTeX; Scientific Writing; Self-taught enthusiastic; Stata; Team-worker; Team Management; Technical Writing;

INDEXED JOURNALS PAPERS

. SANTOS, Victória Emília Neves dos¹; ELY, Rômulo Neves¹; SZKLO, Alexandre Salem; MAGRINI, Alessandra. **Chemicals, electricity and fuels from biorefineries processing Brazil's sugar cane bagasse: production recipes and minimum selling prices.** Renewable and Sustainable Energy Reviews, v. 53, p. 1443-1458, 2016. (¹ co-first authorship)
DOI: <http://dx.doi.org/10.1016/j.rser.2015.09.069>

. MALIK, Arunima; LENZEN, Manfred; ELY, Rômulo Neves; DIETZENBACHER, Erik. **Simulating the impact of new industries on the economy: The case of biorefining in Australia.** Ecological Economics (Amsterdam), v. 107, p. 84-93, 2014. DOI: <http://dx.doi.org/10.1016/j.ecolecon.2014.07.022>

BOOK CHAPTERS

. ELY, Rômulo Neves; SZKLO, A. S. **Biorrefinarias com base em bagaço de cana no Brasil: análise de economias de escala e escopo.** In: Marco Aurélio dos Santos. (Org.). Fontes de energia nova e renovável. 1ed. Rio de Janeiro: LTC, 2013, v. 1, p. 1-192.

CONGRESS/CONFERENCE PAPERS AND PRESENTATIONS

. ELY, Rômulo N., TURKOZ, Mehmet. **“Zooming Out the Map”: Quality Manufacturing Applied to Input-output Analysis.** INFORMS Annual Meeting, 2019, Seattle.

. TURKOZ, Mehmet, ELY, Rômulo. **Weighted Bayesian Support Vector Data Description.** INFORMS Annual Meeting, 2019, Seattle.

. ELY, Rômulo N. **Modeling and Assessing Income, Labor and CO₂ Emissions Multipliers from Different Biorefinery Technological Routes in Brazil.** 25th International Input-Output Conference, 2017, Atlantic City. <this work resulted in a paper, which will be submitted in the next two months to an indexed energy journal>

. ELY, Rômulo N., FATHI, Nasim, and LAHR, Michael L.. **Paving a Path toward Sustainable Energy Security: Examining a Global Transition toward Ethanol Production.** 25th International Input-Output Conference, 2017, Atlantic City. <this work resulted in a paper, which will be submitted in the next two months to an indexed energy journal>

. ELY, Rômulo N., CARNEIRO, Diana, CHEN, Guangwu and WIEDMANN, Thomas. **Carbon Footprinting the Gold Coast City consumption of goods and built environment products.** 23rd International Input-Output Conference, 2015, Mexico City. Available here: http://www.iioa.org/conferences/23rd/papers/files/2172_20150601051_CarbonFootprintingGCC.pdf

- *this paper was awarded with a travel grant by the International Input-Output Association – Diana Carneiro presented the paper in the conference;*

. ELY, Rômulo N., GROTTERA, Carolina, ABREU, Mariana Weiss de and WILLS, William. **Building a 2005 hybrid Brazilian input-output database**. 23rd International Input-Output Conference, 2015, Mexico City. Available here:

https://www.iioa.org/conferences/23rd/papers/files/2168_20150601041_Paper_Building2005hybridIO_T.pdf

- *this paper was awarded with a travel grant by the International Input-Output Association – I presented the paper in the conference;*

. ELY, Romulo N.; MALIK, Arunima; LENZEN, Manfred; **An Input-Output Analysis of a Future Australian Sugar-cane Biofuel Industry**. 21st International Input-Output Conference, 2013, Kitakyushu.

. ELY, Romulo N.; SANTOS, V. E. N.; SZKLO, A. S.; PEREIRA JR., A. O.; MAGRINI, A.; LENZEN, M.; GUILHOTO, J. J. M.; **Income, Labour and CO₂eq Emissions Multipliers from Sugarcane Bagasse derived-Biorefineries in Sao Paulo, Brazil**. WREC 2013 – International Conference on Renewable Energy for Sustainable Development and Decarbonisation.

. ELY, Rômulo Neves; SZKLO, Alexandre Salem. **Biorefinery Technological Routes Based in Sugarcane Bagasse**. Workshop: Biorefineries - Recent Advances and New Challenges, November, 10-12, 2010, Rio de Janeiro.

. MERSCHMANN, P. R. C.; ELY, R. N.; CASTELO BRANCO, D. A.; HOFFMANN, S; SZKLO, A. S; SCHAEFFER, R.; AROUCA, M.; ROSA, L. P.. **Roadmap das Tecnologias de Captura de CO₂ em UTE a Carvão por Meio de Sistemas de Oxi-Combustão**. In: XIII Congresso Brasileiro de Energia, 2010, Rio de Janeiro. Inovações Tecnológicas na Energia, 2010. v. II. p. 429-442.

. HOFFMANN, S; ELY, R. N.; CASTELO BRANCO, D. A.; MERSCHMANN, P. R. C.; SZKLO, A. S.; SCHAEFFER, R.; AROUCA, M.; ROSA, L. P.. **Roadmap das Tecnologias de Captura de CO₂ em UTE a Carvão por Meio de Sistemas de Pré-Combustão**. In: XIII Congresso Brasileiro de Energia, 2010, Rio de Janeiro. Inovações Tecnológicas na Energia, 2010. v. II. p. 443-456.

. CASTELO BRANCO, D. A.; ELY, R. N.; HOFFMANN, S; MERSCHMANN, P. R. C.; SZKLO, A. S; SCHAEFFER, R.; AROUCA, M.; ROSA, L. P.. **Roadmap das Tecnologias de Captura de CO₂ em UTE a Carvão por Meio de Sistemas de Pós-Combustão**. In: XIII Congresso Brasileiro de Energia, 2010, Rio de Janeiro. Meio Ambiente e Mudanças Climáticas, 2010. v. III.

. ELY, Rômulo Neves; SZKLO, Alexandre Salem. **Análise de Rotas Tecnológicas de Bio-refinarias a Partir do Bagaço de Cana de Açúcar**. In: Rio Oil and Gas Conference, 2010, Rio de Janeiro. Rio Oil and Gas Conference, 2010.

. ELY, Rômulo Neves. **Um Estudo sobre a Geração de Energia Elétrica em Fernando de Noronha, Brasil: É viável o aumento da Proporção das Fontes Alternativas em seu Sistema?** In: XII Congresso Brasileiro de Energia, 2008, Rio de Janeiro. Desafios do Setor Energético Brasileiro, 2008. v. 1. p. 439-452.

. FONSECA, Maria da Graça D.; ROSARIO, Francisco José Peixoto; COSTA, Chales Mênard; ELY, Rômulo Neves. **A dinâmica agroindustrial e tecnológica da agroindústria brasileira sob a ótica de Sistemas de Inovação: grãos e cana-de-açúcar**. In: Segundo Workshop Internacional do Projeto BRICS, 2007, Rio de Janeiro. SEGUNDO WORKSHOP INTERNACIONAL DO PROJETO BRICS 2, 2007, 2007.

. ROSARIO, Francisco José Peixoto; FONSECA, Maria da Graça D.; COSTA, Chales Mênard; ELY, Rômulo Neves. **Dinâmica Agroindustrial y Tecnológica de la agroindustria brasileña en el marco del Sistema de óptica de la innovación: un análisis del sistema de producción de cereales, caña**

de azúcar y alcohol. (XI Seminario Latino-Iberoamericano de Gestión Tecnológica -ALTEC), 2007, Buenos Aires. ALTEC, 2007.

A SELECTION OF RECENT REPORTS

. LAHR, Michael L.; ELY, Romulo N. and IRVING, William; **New Jersey: Prospects for the Long Term (R/ECON™ Forecast, November, 2016)**; Executive summary of the quarterly economic forecast: <http://recon.rutgers.edu/wp-content/uploads/2014/03/RECON-execsum-Nov16.pdf>.

. MANTELL, Nancy; ELY, Romulo N. and LAHR, Michael L; **New Jersey: Prospects for the Long Term. (R/ECON™ Forecast, July, 2016)**; Executive summary of the quarterly economic forecast: <http://recon.rutgers.edu/wp-content/uploads/2014/03/RECONsummaryJuly2016.pdf>.

. IES-BRASIL. **IES-BRASIL: Economic and Social Implications of GHG Mitigation Scenarios in Brazil until 2030, summary for decision makers.** 2015. Executive summary (English version): http://www.centroclima.coppe.ufrj.br/images/Noticias/documentos/ies-brasil-2030/2_sumario-executivo-ingles.pdf - More reports (in which I am part of the research team) related to this project can be found through this following link: <http://www.centroclima.coppe.ufrj.br/index.php/br/estudos-e-projetos/encerrados/94-ies-brasil-implicacoes-economicas-e-sociais-cenarios-de-mitigacao-de-gee-2030>

INTERNATIONAL CONFERENCE'S CHAIR

. **INFORMS Annual Meeting, 2019, Seattle**; Session “**Data Mining for quality: improving processes, businesses, communities, and the globe**”; Conference Program: <https://www.iioa.org/conferences/25th/download/25th-conference-program.pdf>.

. **25th International Input-Output Conference, 2017, Atlantic City**; Session “**Impact Analysis: Multipliers (2)**”; Conference Program: <https://www.iioa.org/conferences/25th/download/25th-conference-program.pdf>.

LANGUAGES

Portuguese – Native

English – Fluent

Spanish – Basic

EXTRACURRICULAR COURSES

Subnational MRIO: The How and Why of Subnational Multiregional Input-Output Accounting
International School of Input-Output Analysis (Mexico City, Mexico)

Writing in the Sciences

Stanford – OpenEDX (32h – 48h)

Environmental Input-Output Analysis

International School of Input-Output Analysis (Kitakyushu, Japan) – final assignment delivered

VBA for Excel (30h)

CCE/ PUC-Rio

Intensive Course in Applied Mathematics and Computation in Engineering

At Coppe / UFRJ (2008):

Independent Component Analysis (6h)

MATLAB: programming and practicing for business and science (24 hours)

At Electrical Engineering Department in Pontificia Universidade Católica-Rio de Janeiro (PUC-Rio).

University Programming Course – C language (30 hours)

At COTI Informática

LEAP - Política Energética para el Desarrollo Sustentable (70 hours)

At Fundación Bariloche (Argentina), supported by Stockholm Environment Institute (SEI) – 2010 and individual scholarship granted from the same Institute (SEI)

Intensive Course in Applied Mathematics and Computation in Engineering

At Coppe / UFRJ (2008):

Computationally Intensive Statistical Methods: An Introduction to WinBUGS (6h);

Set and Fuzzy Logic (6h);

Introduction to Neural Networks (6h);

REFEREES

Upon Request

New Brunswick, NJ, January 2022