

16th Trans-Atlantic Infraday Conference

October 31 - November 1, 2024

Rio de Janeiro, Brazil



Managing Energy and Other Infrastructure in Times of Transition and Uncertainty

CONFERENCE AGENDA

Thursday 31 October	
8:30-9:00	Coffee & Registration
9:00-9:15	Welcome to TAI 2024 Prof. Steven Gabriel University of Maryland
9:15-10:00	Keynote Session 1 Prof. Alexandre Szklo UFRJ
10:00-10:30	Coffee Break**
10:30-12:00	Parallel Sessions 1A & 1B
12:00-13:45	Lunch**
13:45-15:15	Parallel Sessions 2A & 2B
15:15-15:45	Coffee Break**
15:45-16:30	Keynote Session 2 Prof. Alexandre Street PUC-Rio
19:00-21:00	Conference Dinner* Rubaiyat

Friday 1 November	
8:30-9:00	Coffee & Reception
9:00-9:45	Keynote Session 3 Dr. Mario Pereira PSR
9:45-10:15	Coffee Break**
10:15-12:15	Session 3
12:15-13:30	Lunch**
13:30-15:30	Parallel Sessions 4A & 4B
15:30-15:45	Closing Session & Farwell Prof. Steven Gabriel University of Maryland

Parallel session talks will be 30 minutes each, including Q&A.

*Conference dinner is optional, and participants will be responsible for paying on their own. However, we hope you will join us in this opportunity to meet new colleagues and reconnect with old friends.

**Coffee and lunch will be served at a nearby café on the campus of PUC-Rio. Participants will be responsible for paying on their own.

Venue: Institute of Administration and Management (IAG), Pontifical Catholic University of Rio de Janeiro

Address: Rua Marquês de São Vicente, 225, Gávea – Rio de Janeiro, RJ – Brasil

CONFERENCE PROGRAM

(as of October 29, 2024)

THURSDAY, October 31, 2024

Institute of Administration and Management (IAG)

8h30-9h00 | **Coffee & Registration** (*Reception Hall*)

9h00-9h15 | **Welcome to TAI 2024** (*Auditorium*)

Prof. Steven Gabriel
University of Maryland

9h15-10h00 | **Keynote Session 1** (*Auditorium*)

*“Global and national integrated assessment models
- experiences and challenges”*

Prof. Alexandre Szklo
Federal University of Rio de Janeiro (UFRJ)



10h00-10h30 | **Coffee Break** (*Reception Hall*)

10h30-12h00 | **Parallel Sessions 1A & 1B**

Session 1A – Renewable Technologies (*Auditorium*)

Session 1B – Electricity Markets (*Room I-014*)

12h00-13h45 | **Lunch**

13h45-15h15 | **Parallel Sessions 2A & 2B**

Session 2A – Hydropower and Water (*Auditorium*)

Session 2B – Optimization Algorithms & Software (1) (*Room I-014*)

15h15-15h45 | **Coffee Break** (*Reception Hall*)

15h45-16h30 | **Keynote Session 2** (*Auditorium*)
“The model externality in the Brazilian power system:
a call for a new data and model governance”
Prof. Alexandre Street
Pontifical Catholic University of Rio de Janeiro (PUC-Rio)



19h00-21h00 | **Conference Dinner**
Rubaiyat
Address: Rua Jardim Botânico, 971 – Jardim Botânico

FRIDAY, November 1, 2024

Institute of Administration and Management (IAG)

8h30-9h00 | **Coffee & Registration** (*Reception Hall*)

9h00-9h45 | **Keynote Session 3** (*Auditorium*)
“Incorporation of AI-generated weather ensembles
to stochastic scheduling and capacity planning models”
Dr. Mario Pereira
PSR Energy Consulting and Analytics



9h45-10h15 | **Coffee Break** (*Reception Hall*)

10h15-12h15 | **Session 3 – Brazilian Electricity Markets**

12h15-13h30 | **Lunch**

13h30-15h30 | **Parallel Sessions 4A & 4B**

Session 4A – Optimization Algorithms & Software (2) (*Auditorium*)

Session 4B – Oil, Gas & Hydrogen (*Room I-014*)

15h30-15h45 | **Closing Remarks & Farewell** (*Auditorium*)
Prof. Steven Gabriel
University of Maryland

PARALLEL SESSION TALKS

(as of October 18, 2024)

Session 1A – Renewable Technologies (Auditorium)

10h30-12h00 Thursday, October 31, 2024

Chair: Paula Maçaira, PUC-Rio

Talk 1 – An Investment Planning Methodology for the Sugarcane Production Chain with a Focus on Biofuels

Authors: Carolina Monteiro, Joaquim Dias Garcia, Bruno Fânzeres, Raphael Sampaio, Luana Gaspar, Rafael Kelman

Talk 2 – Reinforcement Learning Applied to Hydrothermal Dispatch

Authors: Gabriel Vidigal, Joaquim Garcia, Raphael Sampaio, Alexandre Street

Talk 3 – An End-to-End Framework for Renewable Portfolio Selection and Contracting Strategies for the Brazilian Electricity Market

Authors: Gustavo Melo, Carolina Blank, Rafael Couto, Rafaela Ribeiro, Tuany Barcellos, Fernando Crescêncio, Thiago Vieira, Bruno Fânzeres, Paula Maçaira, Fernando Cyrino, Reinaldo Castro

Session 1B – Electricity Markets (Room I-014)

10h30-12h00 Thursday, October 31, 2024

Chair: Alexandre Street, PUC-Rio

Talk 1 - Proposal of Methodology for ELCC Calculation: An Aumann-Shapley Procedure

Authors: Rafael Klauser, Joaquim Garcia, Bernardo Freitas, Alexandre Street

Talk 2 – The Program of Electricity Demand Response in Brazil: State-of-the-Art, Challenges, Opportunities, and Market Equilibrium

Authors: Gabriel Longhi, Bruno Fânzeres

Talk 3 – A Holistic Methodology to Identify Cost-Effective Smooth Routes for Power Transmission Lines

Authors: João Vilela, Bruno Fânzeres, Rafael Martinelli, and Rodrigo Moreno

Session 2A – Hydropower and Water *(Auditorium)*

13h45-15h15 Thursday, October 31, 2024

Chair: Nathan Boyd, University of Maryland

Talk 1 – Equilibrium Modeling in Natural Gas Markets: A Theoretical Analysis & a Case Study for Brazil, A Method for Solving Gas Market & Water Market Equilibrium Problems

Authors: Steven A. Gabriel, Nathan T. Boyd, Dominic C. Flocco

Talk 2 – Understanding the Role of Technological Complexity in Sustainability Transitions using Stochastic, Bi-level Optimization

Authors: Nathan Boyd, Steven A. Gabriel

Talk 3 – Market-based solutions for hydro cascade externalities

Authors: Gabriel Cunha, Luiz Barroso, Marcelo Resende

Session 2B – Optimization Algorithms & Software (1) *(Room I-014)*

13h45-15h15 Thursday, October 31, 2024

Chair: Joaquim Garcia, PSR

Talk 1 – BileveUuMP.jl: Modeling and Solving Bilevel Optimization in Julia

Authors: Guilherme Bodin, Joaquim Garcia, Alexandre Street

Talk 2 – ApplicationDrivenLearning.jl: A High-Performance Library for Training Predictive Models in the Context of Decision Making

Authors: Giovanni Amorim, Joaquim Garcia, Alexandre Street

Talk 3 – Uncertainty and scenario reduction in material resources allocation of offshore rigs: a machine learning approach

Authors: Rachel Martins Ventriglia, Leonardo dos Santos Lourenço Bastos, Silvio Hamacher

Session 3 – Brazilian Electricity Markets *(Auditorium)*

10h15-12h15 Friday, November 1, 2024

Chairs: Guilherme Ramalho, CCEE; Alexandre Street, PUC-Rio

Talk 1 – A discussion on the challenges of computational models used for the power prices formation in Brazil.

Authors: Guilherme Ramalho, Rodrigo Sacchi, Fernanda Kazama, Mariana Iizuka e Rafael Lobato

Talk 2 – Effects of optimistic bias on the Brazilian power systems operation planning

Authors: Arthur Brigatto, Alexandre Street, Cristiano Fernandes, Davi M. Valladão, Guilherme Bodin, Joaquim Dias Garcia

Talk 3 – Model feedback: how to bring simulation closer to operational reality – EPE (Retroalimentação de modelos: como aproximar a simulação da realidade operativa – EPE)

Authors: Caio Monteiro Leocadio, Bernardo Folly de Aguiar, Pamella Elleng Rosa Sangy, Renato Haddad Simões Machado

Talk 4 – Challenges in Energy Planning by National System Operator

Authors: Alessandra Mattos Ramos de Oliveira, Carlos Alberto Araújo Junior, Débora Dias Jardim Penna, Lucas Meirelles Pires Deotti, Lucas de Souza Khenayfis, Mariana Simões Noel da Silva, Rogério José Menezes Alves e Tatiana Frade Gonçalves Mundstock

Session 4A – Optimization Algorithms & Software (2) *(Auditorium)*

13h30-15h30 Friday, November 1, 2024

Chair: David Sotelo, Petrobras

Talk 1 – Long-term Hydrothermal Bid-based Market Simulator

Authors: Joaquim Dias Garcia, Alexandre Street, Mario Veiga Pereira

Talk 2 – A linear time randomized algorithm for finding a Nash equilibrium in perfect competition markets with elastic demands

Authors: David Sotelo, Mario Levorato

Talk 3 – Difference-of-Convex Function Algorithms for Energy Equilibrium Models

Authors: Dominic Flocco, Steve Gabriel, Trine Boomsma, Martin Schmidt, Miguel Lejuene

Talk 4 – Ambiguities and nonmonotonocities under prosumer power: Optimal distributed energy resource investment in a deregulated electricity industry

Authors: Sauleh Siddiqui, Afzal Siddiqui

Session 4B – Oil, Gas & Hydrogen *(Room I-014)*

13h30-15h30 Friday, November 1, 2024

Chair: Luana Gaspar, PUC-Rio

Talk 1 – Optimization Model for Liquified Natural Gas Load Allocation Under Uncertainties in Thermal Power Plants Integrated with Regasification Terminals

Authors: Vinícius Justen Pinto, Guilherme Bodin, Joaquim Dias Garcia

Talk 2 – Designing Green Hydrogen Supply Chains: a Study for the Chilean Case

Authors: Tito Homem-de-Mello, Francisca Jalil-Vega, Nicolás Allendes, Rocio Orcaistegui

Talk 3 – Optimal risk-averse design of green hydrogen projects in Brazil: a stochastic optimization approach

Authors: Luana Gaspar, Alexandre Street, Rafael Kelman

Talk 4 – Optimization of vessel loading planning: an application to the oil supply chain

Authors: Raphael Domingues de Lacerda Bittencourt, Luciana de Souza Pessôa, Silvio Hamacher