

PROGRAMME

TECHNOLOGIES, MARKETS AND POLICIES

BRINGING TOGETHER
ECONOMICS AND ENGINEERING



2 - 3 june

FEP

| SCHOOL OF ECONOMICS AND MANAGEMENT |
UNIVERSITY OF PORTO

5th edition of ICEE
Energy & Environment:
Bringing together Economics and Engineering



WELCOME MESSAGE FROM THE CONFERENCE CHAIR



Welcome to the 5th edition of ICEE – Energy & Environment: Bringing together Economics and Engineering to be held at the University of Porto, next 2-3 June 2022. As in previous editions, the conference is organized by FEP (School of Economics and Management, University of Porto), CEF.UP (Research Center on Economics and Finance, University of Porto) and the ALGORITMI Research Center of the School of Engineering, University of Minho.

Like in previous editions, ICEE main goal is to bring together leading academic scientists, researchers and scholars from the energy and environment science community to interchange knowledge, to discuss and to disseminate new ideas towards a low-carbon, sustainable future. However, scientific knowledge, public policies, the economy and society are now quite different from those in 2013, the year of our 1st ICEE. Both the theme of the Conference – TECHNOLOGIES, MARKETS AND POLICIES – and most particularly special topics intend to reflect this new reality and new challenges that society must face.

On behalf of the organizing committee, I wish you a pleasant stay in Porto and I hope that ICEE'2022 will be a rewarding and useful experience for all the participants!

Isabel Soares
CONFERENCE CHAIR

DAY 1, THURSDAY, June 02, 2022

09:00-10:00

Registration

Energy Efficiency I

Chair: Madalena Araújo
(University of Minho)
| room 609 |

Energy Markets I

Chair: Vitor Miguel Ribeiro
(University of Porto)
| room 613 |

Energy Transition I

Chair: António Cardoso Marques
(University of Beira Interior)
| room 626 |

Sustainable Development and Mobility I

Chair: Fernando de Llano Paz
(University of Coruña)
| room 642 |

10:00-11:30

18 - Assessing the multiple benefits of fostering energy efficiency technologies in Portugal

Marcos Tenente, Carla Henriques, Álvaro Gomes and Patrícia Silva

36 - Economic and environmental indicators: do they go hand in hand or back-to-back? A zoom into SDG7

Carla Teotónio, Rita Martins and Micaela Antunes

38 - Drivers of energy efficiency in the Portuguese water industry

António Amaral, Rita Martins and Luís Dias

52 - Crossing Non-parametric and Parametric Techniques for Measuring the Efficiency: Evidence from 65 European DSO1

Rui Rita, Diogo Bárbara, Inês Chaves, Vitor Marques, Victor Moutinho, Pedro Macedo and Mariana Pereira

54 - Analysis of resources utilization in oil refineries using DEA Window Analysis and Malmquist Productivity Index

Maiquiel Oliveira, Flavio Trojan, Gilson Oliveira and Paulo Afonso

61 - Regulatory challenges and constraints for shale gas development in South America

Andrea Gomes, Paula Ferreira, Luiz Borges and Lino Marujo

9 - Consumer willingness to participate in demand-side management: An agent-based modeling approach

Sara Golmaryami, Paula Ferreira and Manuel Lopes Nunes

73 - How different lockdown levels impact electricity demand – evidence from Portugal

Bernardo Franco, Patrícia Silva and Pedro Cerqueira

2 - Consumers' behavior after market liberalization: the case of the electricity market in Portugal

Débora Maravilha, Susana Silva and Erika Laranjeira

11 - Assessing the progressivity of energy payments in Portugal and its NUT II regions: an analysis based on the Portuguese Household Budget Survey 2015/2016

Carlota Quintal, Rita Martins and Micaela Antunes

21 - The role of energy storage at grid reliability and system reconfiguration: a systemic approach

Nivalde Castro, Caroline Ramos, Thereza Aquino and Luiz Gomes

22 - Surfing the oil hierarchy: a multi-scale assessment of decarbonization pathways for the EU oil sector

Michele Manfroni, Raúl Velasco-Fernández and Mario Giampietro

28 - Tariff setting and financial assessment of a district cooling system in Colombia

Yessenia Martínez Ruiz, Diego Fernando Monotas-Duque and Howard Ramírez-Malule

43 - Drivers of the Brazilian electricity sector transition - First findings from a Delphi-based study

Alex Feil, Carlos Antunes, Patrícia Silva and Nivalde de Castro

83 - Research on potential usage of residual biomass in marine ports

António Cardoso, Margarita Robaina and João Matias

31 - EU ETS effects on emissions of European Union industries

Mara Madaleno, Mónica Meireles and Margarita Robaina

42 - Impacts of extreme weather events on wind energy systems

Ana Gonçalves, Margarida Liberato and Raquel Nieto

7 - Strategic decision-making model for the implementation of biogas and biomethane projects in Brazil

Ianaina Lofhagen, Matheus Hamerschmidt, Dewey Wollmann, Ubiratã Tortato and Gabriel Bandeira

40 - The potential of agro-industry wastes for green energy in Kurdistan

Balen Agha and Paula Ferreira

78 - Contribution of biomedical devices innovation to sustainable development goals (SDG)

Ahmed Fadlelmoula and Paula Ferreira

11:30-11:45

Coffee Break

11:45-12:00

WELCOME SESSION

Faculty of Economics Director

Isabel Soares, University of Porto, Portugal

Paula Varandas Ferreira, University of Minho, Portugal

| room 631 |

DAY 1, THURSDAY, June 02, 2022

12:00-12:45

PLENARY SESSION I

“Smart renewable energy systems and a fully decarbonized society”

Henrik Lund, University of Aalborg, Denmark (*Keynote Speaker*)

| room 631 |

12:45-14:15

Lunch

14:15-15:00

PLENARY SESSION II

“Environmental tax reform in the 21st century: main messages from the recent Spanish white book”

Xavier Labandeira, University of Vigo, Spain (*Keynote Speaker*)

| room 631 |

Energy Poverty
Chair: Susana Silva
(University of Porto)

| room 609 |

Energy Transition II
Chair: Margarita Robaina
(University of Aveiro)

| room 613 |

**Sustainable Development
and Mobility II**

Chair: Patrícia Pereira da Silva
(University of Coimbra)

| room 626 |

**Energy Power
Management**

Chair: Jacek Dach
(Poznań University of Life
Sciences)

| room 642 |

15:00-16:30

25 - Energy use-behaviour patterns of households in Hungary: Factors of possible energy vulnerability

Ágnes Gyóri

32 - A Framework for Policy Mix Analysis: exploring the Energy Poverty Case

Salomé Bessa and João Gouveia

59 - Energy communities in cooperative form as an ideal scenario in the fight against energy poverty

Deolinda Meira, Marta Mota and Ricardo Cunha

70 - Are dynamic tariffs effective on energy burden reduction? Empirical evidence of US energy poverty

Diogo Pereira and António Cardoso Marques

95 - Opportunities and obstacles for vulnerable consumers in implementing the Portuguese Carbon Neutrality Strategy: A participatory approach

Katherine Mahoney, João Pedro Gouveia and Rita Lopes

50 - Which energy users are hard-to-reach? Identification and characterization of key audiences to foster a just energy transition

Miguel Sequeira and João Gouveia

56 - Analysis and application of Modern Portfolio Theory to the German Electricity Mix

Javier Afonso, Fernando de Llano Paz and Guillermo Iglesias Gómez

57 - The Role of Financing in Green Hydrogen Projects: The German, Australian and Brazilian Cases

Thereza Aquino, Roberto Lima Filho, Vinicius Botelho and Ana Carolina Chaves

65 - A Systematic Review of Social Dynamics in Complex Energy System Models

Alaize Dall-Orsoletta, Géremi G. Dranka and Paula Ferreira

66 - A proposal for a new business model for Smart Grid

Roberto Lima Filho, Lino Marujo, Marcio D'Agosto, Ana Angelo, Leonardo Mangia, Luan Santos, Mariana Navega and Victor Hugo Abreu

27 - Contextual Analysis of New Product Development in Circular Economy: A natural language processing approach

Gabriel L. Bandeira, Andrea M. Chanquini, Marcos Perroni and Ubiratã Tortato

29 - Assessment of Efficacy of Potential Incentive in Lowering the Levelized Cost of Electricity of Concentrating Solar Power Plants in India

Tarun Kumar Aseri, Chandan Sharma and Tara Kandpal

33 - CO2 emissions on transportation: an external costs analysis

Wellington Alves, Ângela Silva and Ana Órfão

34 - A carbon market assessment of the Fischer-Tropsch Diesel in the European Maritime Sector

Vinicius Santos, Patrícia Silva and Luís Serrano

72 - Drivers and barriers of BEV and PHEV adoption in Europe

Sónia Almeida Neves and António Cardoso Marques

37 - Storage for promoting electricity generation from variable renewables: the problem of economics

Reinhard Haas, Marlene Sayer and Amela Ajanovic

23 - Deep Learning Attention Mechanisms: Application to Household Electric Power Consumption

Rui Gonçalves, Vitor Miguel Ribeiro and Fernando Lobo Pereira

49 - Theoretical and Experimental Assessment of Temperature-Controlled Thermoelectric Generators

Rui Carvalho, Jorge Martins, Nuno Pacheco, Hélder Puga, Joaquim Costa and Francisco Brito

67 - Designing Energy and Environmental Efficient Power portfolios for the European Union Energy Security Strategy

Fernando De Llano Paz, Juan Cartelle Barros and Paulino Martínez Fernández

85 - Consumer Behavior in the Intentions to Change between Electricity Suppliers in Portugal: A Push-Pull-Mooring Framework

Mónica Meireles, Graça Trindade and Fábio Vieira

16:30-16:45

Coffee Break

DAY 1, THURSDAY, June 02, 2022

16:45-18:30

APEEN SPECIAL SESSION

“New flexibility market models in Europe”

Tomás Gomez, University of Pontificia Comillas, Spain (APEEN *Keynote Speaker*)

Chair: Jorge Sousa and Margarita Robaina (University of Aveiro)
(ISEL, Lisbon Polytechnic Institute)

| room 631 |

103 - Planning and flexibility: a regulatory perspective

Jorge Esteves, ERSE

98 - Integrating flexibility and energy local markets with wholesale balancing responsibilities in the context of renewable energy communities

[João Mello](#) and José Villar

99 - Grid flexibility services from local energy markets: a three-stage model

Rogério Rocha, Fábio Retorta, João Mello, Ricardo Silva, Clara Gouveia and José Villar

100 - Valuating Flexibility as a Service to Electrical Distribution System Operators

[Ricardo Messias](#), Pedro Carvalho and Jorge Sousa

20:00

Dinner

DAY 2, FRIDAY, June 03, 2022

Energy Transition III

Chair: Susana Silva
(University of Porto)

| room 609 |

Sustainable Development and Mobility III

Chair: Marta Guerra-Mota
(ISMAI - Maia University)

| room 613 |

Energy Markets II

Chair: Wojciech Czekala
(Poznań University of Life Sciences)

| room 626 |

Energy Systems Modelling

Chair: Reinhard Haas
(TU Wien)

| room 642 |

10:00-11:15

76 - Assessment of North Africa renewable energy sources and targets for decarbonized energy system: Barriers and challenges
Yasmine Ayed, Patrícia Fortes and Rafat Al Afif

77 - An Islanded Microgrid to Increase Quality of Life and Support Agricultural Activities of Rural Communities in Marracuene, Maputo: Challenges, Design, and Validation
Sérgio Coelho, Vitor Monteiro, J. Pinto, A. Monteiro, Uranio Mahanjane, Rosa Chilundo, Júlio Martins, C. Fernandes, João Sepúlveda, João Afonso and Carlos Couto

91 - How does social innovation contribute to the energy transition? A SWOT analysis
Jorge Cunha and Carla Ferreira

45 - Has the impact of Foreign Direct Investment on CO2 emissions and Green GDP been influenced by energy consumption and transition?
Rafaela Caetano, António Cardoso Marques and Tiago Lopes Afonso

30 - Potential Assessment for Cost Reduction of Solar Thermal Electricity in India towards Financial Competitiveness with Photovoltaic Electricity

Tarun Kumar Aseri, Chandan Sharma and Tara Kandpal

35 - Assessing policy interventions to stimulate the transition of electric vehicle technology in the EU
Carla Henriques, Henrique Martins, José Figueira, Carlos Silva and Ana Costa

1 - Clean energy policies and electricity sector: the case of European Union
María Teresa García-Álvarez, Gustavo Pineiro-Villaverde and Isabel Soares

92 - Evaluation of improvement proposals in a non-profit association in the construction sector
Bárbara Santos, Paula Ferreira and Anabela Alves

4 - Impacts of the Covid-19 context on the European Union energy markets: Interrelationships with sustainability
Vitor Martinho

10 - Global liquidity and the profitability of energy firms
Orlando Barandica, Diego Manotas-Duque and Jorge Uribe

12 - Insights into drivers of energy affordability in Portugal
Rita Martins, Micaela Antunes and Carlota Quintal

14 - Evaluating Directional Spillovers Between Electricity and Fossil Fuel Prices in a Hydrothermal Power Generation Market
Andrés Oviedo-Gómez, Sandra Londoño-Hernández and Diego Manotas-Duque

20 - The future of an emissions-neutral European power generation portfolio analysed through MPT: EU Green Deal Scenarios
Paulino Martinez Fernández, Fernando De Llano Paz and Anxo Calvo Silvosa

48 - Electricity Price Prediction for Hospitals Using ANFIS-FIS Model
Dimitrios Panagiotou and Anastasios Dounis

81 - How do electricity prices behave in insular electricity systems with the integration of renewable energy sources? The case of New Zealand
Daniela Macedo, António Cardoso Marques and Olivier Damette

82 - A simulation tool to evaluate energy transition targets with application to the Portuguese power system
Jorge Sousa, João Lagarto, Ezequiel Carvalho and Ana Martins

11:15-11:30

Coffee Break

DAY 2, FRIDAY, June 03, 2022

Energy Transition IV Chair: Isabel Soares (University of Porto) room 609	Sustainable Development and Mobility IV Chair: Susana Silva (University of Porto) room 613	Technologies For Economic Efficiency Chair: Thereza Aquino (Federal University of Rio de Janeiro) room 626	Energy Markets III Chair: Vitor Miguel Ribeiro (University of Porto) room 642
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11:30-13:00

89 - An overview of the literature on the evaluation methodologies of publicly funded socio-development projects

Thomaz Fagá, Jorge Cunha and Moara Tuane Costa

90 - Energy efficiency and decarbonization in Europe: a long-term view on the role of electrification

Sofia Henriques, Laura Felício, Zeus Guevara, Ricardo Pinto and Tânia Sousa

93 - Waste-to-energy: Biogas efficiency of waste from the coffee production and consumption

Wojciech Czekala, Aleksandra Łukomska, Wiktor Bojarski, Jacek Dach, Patrycja Pochwatka, Alina Kowalczyk-Juško and Jakub Pulka

64 - Economic evaluation of perovskite solar cells

António Martins, Xerman Figueroa, Luísa Andrade, Teresa Mata and Joana Príncipe

96 - Predictive maintenance for wind turbines

Beatriz Pereira, João Gama and Bruno Veloso

53 - Sustainable Power Grids: A Path based on the Solid-State Transformer and Hybrid AC/DC Grids

Vitor Monteiro, Sérgio Coelho and João Afonso

55 - Is climate finance flow for developing economies promoting climate change mitigation?

Patrícia Leal and António Marques

63 - Climate change perception, behaviour, and willingness to purchase AFVs: the missing dots

Ana Paula Jesus, Marta Dias and Margarida Coelho

79 - Users' preferences towards sustainable railway system

Paula Ferreira, Fátima Lima and Madalena Araújo

6 - Investigating CO2 emissions from aviation in oil producing countries using a two-stage maximum entropy approach

Zeinab Zanjani, Isabel Soares and Pedro Macedo

94 - Parameterization and implementation of energy efficiency measures in municipal swimming pools – case study of Fontelo, Viseu

Paulo Silva, Nídia Caetano and Manuel Felgueiras

102 - The energetic and economic effect of demand-driven biogas plant investment in medium scale dairy farm

Patrycja Pochwatka, Alina Kowalczyk-Juško, Wojciech Czekala, Damian Janczak, Jakub Mazurkiewicz, Andrzej Mazur, Jacek Dach

75 - Getting biomethane out of the shadow – a framework analysis in Portugal and Brazil

Marta Guerra-Mota and Thereza Aquino

74 - Economic feasibility of compressed air energy storage: Portuguese pre-selected case studies

Catarina Matos, Patrícia Silva and Júlio Carneiro

62 - Linking sustainable development goals to electricity generation externalities

Carlos Sousa Costa and Paula Ferreira

68 - Is greenwashing a common practice in energy markets?

Wellington Alves, Jorge Garcia, Manuel Fonseca and Paula Ferreira

5 - Implications of rising energy prices on the performance of the European Union's agricultural sector: Insights for policy rethinking

Vitor Martinho

39 - Demand Response on Electricity Markets: A literature review about benefits and barriers concerning the entire power system chain

Joana Sousa and Isabel Soares

15 - Energy affordability: what is happening across and within European countries?

Micaela Antunes, Rita Martins and Carlota Quintal

101 - The importance of creating sustainable habitats towards ensuring a smooth transition to a sustainable city – Rio de Janeiro case study

Marcela Jorio, António Amaral and Teresa Silva

13:00-14:30

Lunch

DAY 2, FRIDAY, June 03, 2022

14:30-15:00

PLENARY SESSION III

“Challenges for sustainable development of the transport sector”

Amela Ajanovic, Vienna University of Technology, Austria (*Keynote Speaker*)

| room 631 |

Technology and Economic Challenges

Chair: Isabel Soares
(University of Porto)

15:00-16:30

97 - Technical and Economical Evaluation of Modular Multilevel Converters for the Electrical Power Grid Interface
Nuno Rodrigues, José Cunha, Vítor Monteiro and João Afonso

3 - Life Cycle Impact Assessment and Economic Evaluation of Material Cutting Technologies
Elif Ozturk and Zeynep Ayturan

69 - Issues on environmental externalities costs: Brazilian energy sector expansion
Gisela Mello, Marta Ferreira Dias and Margarita Robaina

19 - Quo Vadis? Technological trajectories of the automotive industry towards decarbonization goals
Roberto Lima Filho, Bernardo Motta, Thereza Aquino and Anderson Reis

87 - Comparative Analysis of Building's Sustainable Assessment Systems: An overview
Marcela Jorio, António Amaral and Teresa Neto

End of ICEE 2022

