

15-17 May 2019

Riga, Latvia

Conference Programme

Conference Topics

- Sustainability of Technology Development Renewable Energy Green Transport Systems Biofuels and Alternative Fuels Smart Energy and Zero Carbon Technologies Pollution Prevention Resilience Heat and Power Generation, incl. District Heating and/or Cooling
- Energy and Carbon Markets
 Energy Management, Policy and
 Economics
 Bioeconomy and Low Carbon
 Development
 Energy and Environmental Modelling
 System Approach Integration in
 Energy Sector
 Energy Efficiency Improvement
 Resource Efficiency, Circular Economy
 and Ecodesign

Organised by:







About CONECT

CONECT – International Scientific Conference of Environmental and Climate Technologies – is organised by the Institute of Energy Systems and Environment, Riga Technical University.

Its main aim is to acquaint researchers with achievements in the area of energy systems and environmental engineering and to give the scientists, PhD students and professionals an opportunity to present and publish the results of their research.

The conference proceedings will be published in the international scientific journal **"Environmental and Climate Technologies"** and selected papers will be published as the special issue in the international scientific journal **"Environmental Development"** (ELSEVIER). Both Journals are indexed in Scopus and Web of Science.

Venue

The conference will take place in Riga, Latvia, at the Faculty of Power and Electrical Engineering of the Riga Technical University, from 15-17 May 2019.



Free Wi-fi Access is provided in all conference rooms.

Conference language

The official conference language is English.

Conference Registration

Registration at the lobby of the Faculty of Power and Electrical Engineering of the Riga Technical University, Azenes iela 12/1. Wi-Fi: Eduroam Login: viesis.viesis Password: Viesis2019MAI

Wednesday, 15 May from 9:30–10:00 Thursday, 16 May from 8:30–9:00

Guidelines

Oral presentations

All presenters are kindly asked to come to the Conference Rooms 10 minutes before the sessions in order to upload and check their presentations. A Technical Assistant and a Session Chair will be available at the Rooms to provide the assistance.

Duration of each oral presentation in plenary session is 15-25 minutes (as scheduled in the programme) and 5 minutes for questions and discussions. Duration of each oral presentation in other sessions is 12 minutes and 3 minutes for questions and discussions.

Poster presentations

There are two poster sessions scheduled:

- SESSION I on Wednesday, 15 May from 17:00 till 18:00
- SESSION II on Thursday, 16 May from 15:45 till 18:00

Suggested size of the posters is A1 (594 mm × 841 mm). Authors are requested to put their posters to the panels at least 2 hours before the poster sessions. Authors need to participate in the poster session to present their poster and answer questions.

Each poster presenter has 3 minutes to present the research (using microphone). The presentation is followed by several public questions.



Scientific Committee / Editorial Board of the CONECT 2019:

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TUESDAY, 14 MAY Faculty of Power and Electrical Engineering, Azenes iela 12/1

14.00–17.00 Pre-event: Workshop on system dynamics modelling with Professor Andra Blumberga

WEDNESDAY, 15 MAY Faculty of Power and Electrical Engineering, Azenes iela 12/1

- 9.30–10.00 Registration, morning coffee
- 10.00–10.10 Conference opening

Plenary Session I

Moderator: Gatis Bazbauers, Riga Technical University, Latvia

- 10.10-10.40Deep decarbonization pathways importance of framingPeter D. Lund, Aalto University, Finland
- 10.40–11.10Flexibility as enabler for a carbon neutral energy systemKlaus Skytte, Technical University of Denmark, Denmark
- 11.10–11.30 Sustainability analysis of bioenergy application according to bioeceonomy development **Dagnija Blumberga**, Riga Technical University, Latvia
- 11.30-11.45 Coffee break

Panel Session I: Energy Efficiency and Flexibility of Energy Systems Moderator: Dagnija Blumberga, Riga Technical University, Latvia

- 11.45–12.00 Modelling transmission systems in energy system analysis: a comparative study
 Philipp Andreas Gunkel, Hans Ravn, Stefan Petrovic, Felipe Junqueira Fausto, Technical University of Denmark, Denmark
 Hardi Koduvere, Tallin University of Technology, Estonia
 Jon Gustav Kirkerud, Norwegian University of Life Sciences, Norway
- 12.00-12.15 The role of cross-border power transmission in a renewable-rich power system a model analysis for Northwestern Europe
 Yi-kuang Chen, Jon Gustav Kirkerud, Torjus Folsland Bolkesjø, Norwegian University of Life Sciences, Norway
 Hardi Koduvere, Tallin University of Technology, Estonia
 Philipp Andreas Gunkel, Klaus Skytte, Technical University of Denmark, Denmark
 Hans Ravn, RAM-løse, Denmark
- 12.15-12.30 The role of demand response in the future renewable Northern European energy system Jon Gustav Kirkerud, Niels Oliver Nagel, Torjus Folsland Bolkesjø, Norwegian University of Life Sciences, Norway
- 12.30-12.45 Comparative analysis of cross-border and cross-sector approaches for flexibility in the Nordic countries
 Claire Marie Bergaentzle, Klaus Skytte, Philipp Andreas Gunkel, Technical University of Denmark, Denmark



- 12.45–13.00 Transition pathways to a flexible and carbon-neutral energy system in the Nordic-Baltic region: Coupling techno-economic modelling and socio-technical analyses
 Simon Bolwig, Claire Marie Bergaentzle, Klaus Skytte, Ole Jess Olsen, Philip Andreas Gunkel, Kristian Borch, Technical University of Denmark, Denmark
 Torjus Folsland Bolkesjø, Jon Gustav Kirkerud, Norwegian University of Life Sciences, Norway Antje Klitkou, Nordic Institute for Studies in Innovation, Research and Education, Norway Peter D. Lund, Aalto University, Finland
- 13.00-14.00 Lunch

Panel Session II: Energy Systems for Sustainable Future

Moderator: Anna Volkova, Tallinn University of Technology, Estonia

- 14.00-14.15Power sector flexibility through power-to-heat and power-to-gas applicationGatis Bazbauers, Riga Technical University, Latvia
- 14.15-14.30 Deep decarbonization of urban energy systems through renewable energy and sectorcoupling flexibility strategies
 Peter D. Lund, Vahid Arabzadeh, Jani Mikkola, Justinas Jasiunas, Aalto University, Finland
- 14.30-14.45 Resilience of European countries: an application to natural gas supply cuts Anca Costescu, European Commission
- 14.45-15.00 Pyrolysis of biomass towards valuable products
 Andres Siirde, Meelis Elderman, Tallinn University of Technology, Estonia
 Julija Gusca, Riga Technical University, Latvia
- 15.00-15.15Assessing the potential of low carbon technologies in German energy systemsSubhash Kumar, Reinhard Madlener, RWTH Aachen University, Germany
- 15.15-15.30 Coffee break

Panel Session III: Energy Systems. Generation. End User

Moderator: Agris Kamenders, Riga Technical University, Latvia

- 15.30-15.45 Analysis of regulatory instruments promoting building energy efficiency Claudio Rochas, Riga Technical University, Latvia
- 15.45-16.00 On the road to 4th generation (low temperature) district heating: experience from LowTEMP project
 Adam Cenian, Polish Academy of Sciences, Poland
- 16.00-16.15 Differentiation of primary energy factors for district heating and cooling with respect to Energy Efficiency Directive
 - Eduard Latosov, Anna Volkova, Andres Siirde, Tallinn University of Technology, Estonia
- 16.15-16.30Mechanical behavior of polylactic acid foam as insulation under increasing temperatureLucia Doyle, Ingo Weidlich, HafenCity University, Germany



- 16.30–16.45 District heating in Kragujevac (Serbia): future development perspectives
 Anna Volkova, Eduard Latosov, Tallinn University of Technology, Estonia
 Nebojsa Lukic, Novak Nikolic, University of Kragujevac, Serbia
- 16.45–17.00Influence of individual household heating on Vilnius city ambient air qualityRaimondas Grubliauskas, Vilnius Gediminas Technical University, Lithuania
- 17.00-18.00Poster session I and coffee breakModerator: Reinis Aboltins, Riga Technical University, Latvia
- 19.00 Welcome event Scientific networking / Restaurant Neiburgs, Jauniela 25/27

THURSDAY, 16 MAY Faculty of Power and Electrical engineering, Azenes iela 12/1

8.30–9.00 Registration, morning coffee9.00–9.10 Conclusions about 1st day sessions

Plenary Session II

Moderator: Andra Blumberga, Riga Technical University, Latvia

- 9.10-9.30 Resource-emission nexus for a sustainable city **Bin Chen**, Beijing Normal University, China
- 9.30-9.50 Financial instruments for climate change risk resilience **Emanuele Vannucci**, University of Pisa, Italy
- 9.50-10.10 Aspects of the mutual influence in the system "environment nutrition human health" **Denis Baranenko**, ITMO University, Russia

Panel Session IV: Energy Efficiency of Buildings

Moderator: Ingo Weidlich, HafenCity University, Germany

- 10.10-10.25 Does energy efficiency-indoor air quality dilemma have impact on the gross domestic product?
 - Andra Blumberga, Liva Asere, Riga Technical University, Latvia
- 10.25-10.40 Is the high quality Baukultur* a monkey wrench in the global climate challenges? *Davos Declaration 2018
 Ruta Vanaga, Andra Blumberga, Sandra Treija, Edgars Bondars, Riga Technical University, Latvia
- 10.40-10.55On the imaginary accuracy of the LCA on the basis of the houseboat in HamburgMaria Grajcar, Kristina Rumiantceva, Ingo Weidlich, HafenCity University, Germany



10.55-11.10 Performance evaluation of an active PCM thermal energy storage system for space cooling in residential buildings

Sandris Rucevskis, Pavel Akishin, Aleksandrs Korjakins, Riga Technical University, Latvia

11.10-11.25 Coffee break

Panel Session V: Modelling Tools

Moderator: Dace Lauka, Riga Technical University, Latvia

11.25-11.40 Novel stacked modular open raceway ponds for microalgae biomass cultivation for biogas plants: preliminary design and modelling
 Francesco Romagnoli, Baiba levina, Weerasuriya Arachchige Anton Rayan Priyasad Perera, Riga Technical University, Latvia

Davide Ferrari, University of Brescia, Italy

- 11.40-11.55 Cost allocation model for net-zero energy buildings under community-based reward-penalty mechanism
 Yuehong Lu, Anhui University of Technology, China; University of Birmingham, United Kingdom
 - Zhijia Huang, Yang Zhang,Demin Chen, Changlong Wang, Anhui University of Technology, China Wei Wang, Bauhaus University Weimar, Germany
- 11.55-12.10Future transport policy designs for biomethane promotion: a system dynamics modelAiga Barisa, Alina Safronova, Vladimirs Krisanovs, Riga Technical University, Latvia
- 12.10-12.25 CFD modelling of biomass mixing in anaerobic digesters of biogas plants
 Fosca Conti, University of Padova, Italy
 Abdessamad Saidi, Markus Goldbrunner, Technische Hochschule Ingolstadt, Germany
- 12.25-12.40 Calculation of kinetic parameters of thermal decomposition of forest waste using the Monte Carlo technique
 Alok Dhaundiyal, Toth Laszlo, Szent Istvan University, Hungary

12.40-12.55 Analysis of multilevel socio-technical transition

- Einars Cilinskis, Dagnija Blumberga, Andra Blumberga, Riga Technical University, Latvia
- 12.55-13.10 Implementing user behavior on dynamic building simulations for energy consumption
 Carlos Jimenez-Bescos, University of Nottingham, United Kingdom
 Xabat Oregi, University of the Basque Country, Spain
- 13.10-14.00 Lunch

Panel Session VI: Bioeconomy and Climate Technologies

Moderator: Francesco Romagnoli, Riga Technical University, Latvia

14.00-14.15 The role of environmental evaluation within circular economy: an application of Life Cycle Assessment (LCA) method in the detergents sector
 Luisa Paolotti, Mariagiulia Lucchetti, Lucia Rocchi, Antonio Boggia, University of Perugia, Italy



- 14.15-14.30 Circular economy and bioeconomy interaction development as future for rural regions. Case study of Aizkraukle region in Latvia
 Jelena Pubule, Indra Muizniece, Dagnija Blumberga, Riga Technical University, Latvia
- 14.30-14.45 Single cell oil production from waste biomass: review of applicable industrial by-products **Kriss Spalvins**, Ilze Vamza, Dagnija Blumberga, Riga Technical University, Latvia
- 14.45-15.00 Potential of energy willow plantations for biological reclamation of soils polluted by 137Cs and heavy metals, and for control of nutrients leaking into water systems
 Aleh Rodzkin, Boris Khroustalev, Semjon Kundas, Evgenija Chernenok, Belarusian National Technical University, Belarus

Borivoj Krstic, University of Novi Sad, Serbia

- 15.00-15.15 A gap analysis of testing services for sustainable product development in the Baltic Sea Region
 Robert Philipp, Gunnar Prause, Hochschule Wismar, University of Applied Sciences:
 Technology, Business and Design, Germany; Tallinn University of Technology, Estonia
 Alise Ozarska, Riga Technical University, Latvia
- 15.15-15.30 Unintended spillover effects of regional air pollution policies **Delin Fang**, Beijing Normal University, China
- 15.30-15.45 Examining the impact of different technical and environmental parameters on the performance of photovoltaic modules
 Radwan H. Abdel Hamid, Adel Elsamahy, Helwan University, Egypt
 Youssef Elidrissi, Mohammed Regragui, Mohamed V University, Morocco
 Karim Menoufi, Beni-Suef University, Egypt
- 15.45–18.00Poster session II and coffee break
Moderator: Dzintars Jaunzems, Riga Technical University, Latvia
- 19.00 Social dinner / Restaurant Hercogs "Ķīpsala", Balasta dambis 70

FRIDAY, 17 MAY Meeting point - Faculty of Power and Electrical engineering, Azenes iela 12/1

- 09:00–13.00 Social Programme / Technical tour to Ltd. MADARA Cosmetics, modern factory of organic skincare products, and Guided tour to Old Riga. Additional registration is required.
- 13.00–14.00 Lunch



Poster session I – 15 MAY				
P1.1	Liga Rozentale, Dagnija Blumberga	Methods to evaluate electricity policy from climate perspective		
P1.2	Aiman Albatayneh , Mohammad N. Assaf, Yaqoub Al-Khasawneh, Mustafa Jaradat	Comparison of the overall energy efficiency for internal combustion engine vehicles and electric vehicles		
P1.3	Anda Jekabsone , Agris Kamenders, Marika Rosa, Jan Kaselofsky, Ralf Schule	Assessment of the implementation of Sustainable Energy Action Plans at local level. Case study of Latvia		
P1.4	Einars Cilinskis , Dagnija Blumberga, Armands Gravelsins, Andra Blumberga	Three targets in energy transition. Influence of policy tools		
P1.5	Yurii Skob , Mykhaylo Ugryumov, Eduard Granovskii	Numerical evaluation of toxic spill spot shape influence on degree of harmful effects on human		
P1.6	Karina Suharevska, Dagnija Blumberga	Progress in renewable energy technologies: innovation potential in Latvia		
P1.7	Dieter Meissner , Elham Kouhiisfahani, Tobias Morawietz, Michael Handl, Matthias Simolka, Renate Hiesgen	CZTS monograin membranes for water splitting: stepwise opening of ionically conductive channels		
P1.8	leva Pakere , Dace Lauka, Dagnija Blumberga	Estimation of carbon emission reduction from upgrading the DH network to the 4 th Generation. Multivariate linear regression mode		
P1.9	Vivita Priedniece, Elvis Kalnins, Vladimirs Kirsanovs, Mikelis Dzikevics, Dagnija Blumberga, Ivars Veidenbergs	Sprayed water flowrate, temperature and drop size effect on small capacity flue gas condenser performance		
P1.10	Vivita Priedniece , Elvis Kalnins, Vladimirs Kirsanovs, Dagnija Blumberga, Ivars Veidenbergs	Particulate matter emission decrease possibility from household sector using flue gas condenser		
P1.11	Ivan Postnikov , Ekaterina Mednikova, Valery Stennikov, Andrey Penkovskii	Development features of heat power industry legislation in Russia		
P1.12	Kristaps Locmelis , Uldis Bariss, Dagnija Blumberga	Energy efficiency obligations and subsidies to energy intensive industries in Latvia		
P1.13	Jaroslaw Losinski	An attempt to simulate the power-to-heat installation together with hot water storage		
P1.14	Ivan Postnikov , Valery Stennikov, Ekaterina Mednikova, Andrey Penkovskii	Optimization of the effective heat supply radius for the district heating systems		
P1.15	Ilze Polikarpova , Dace Lauka, Dagnija Blumberga, Edgars Vigants, Mikelis Dzikevics	Multi-criteria analysis to select renewable energy solution for district heating system		
P1.16	Zinta Zimele , Maris Sinka, Aleksandrs Korjakins, Diana Bajare, Genadijs Sahmenko	Life cycle assessment of foam concrete production in Latvia		
P1.17	Agris Kamenders, Bedri Dragusha	Energy transition in municipalities of Kosovo		
P1.18	Pawel Wujek, Piotr Sprawka	New PV micro-modules on standard roof tiles		



P1.19	Armands Gravelsins , Dagnija Blumberga, Andra Blumberga, Gatis Bazbauers	Power sector flexibility through power-to-heat and power-to-gas application – system dynamics approach
P1.20	Maksims Feofilovs , Ieva Pakere, Francesco Romagnoli	Life cycle analysis of different low-temperature district heating development scenarios: A case study of municipality in Latvia
P1.21	leva Pakere, Dagnija Blumberga	Solar energy in low temperature DH

Poster session II – 16 MAY

P2.1	Yuehong Lu , Zafar Khan, Hasan Gunduz, Jianing Li, Xiao-Ping Zhang	Economic performance of net-zero energy community under reward-penalty mechanism considering PV system reliability
P2.2	Ritvars Freimanis, Andra Blumberga	In-situ moisture assessment in external walls of historic building using non-destructive methods
P2.3	Raivis Sirmelis , Ruta Vanaga, Andra Blumberga, Ritvars Freimanis	Solar facade module for nearly zero energy building. Optimisation strategies
P2.4	Tamara Grizane , Julija Gusca	Tourist transportation generated carbon dioxide (CO ₂) emissions in Latvia
P2.5	Lauma Zihare , Indra Muizniece, Dagnija Blumberga	New vision on invasive alien plant management system
P2.6	Toms Prodanuks , Ivars Veidenbergs, Vladimirs Kirsanovs, Agris Kamenders, Dagnija Blumberga	Analysis of energy supply solutions of dwelling buildings
P2.7	Jelena Pubule , Antra Kalnbalkite, Dagnija Blumberga, Erika Teirumnieka	The use of multi-criteria analysis for an evaluation of the Environmental Engineering study programme at university
P2.8	Katarzyna Gladyszewska-Fiedoruk	Survey research of the Sick Building Syndrome (SBS) in an office building
P2.9	Dace Lauka , Dzintra Slisane, Linda Ievina, Indra Muizniece, Dagnija Blumberga	When bioeconomy development becomes as biomass energy competitor
P2.10	Zane Indzere , Maira Melvere, Dagnija Blumberga	The evaluation of factors affecting bioeconomy development by using transdisciplinary approach
P2.11	Laura Pastare, Francesco Romagnoli	Life cycle cost analysis of biogas production from Cerathophyllum demersum, Fucus vesiculosus and Ulva intestinalis in Latvian conditions
P2.12	Sergey Kuzmin , Olga Kadnikova, Gulnara Altynbayeva, Turbit Andrey, Khabdullina Zauresh	Development of a new environmentally-friendly technology for transportation of mined rock in the opencast mining
P2.13	Indra Muizniece, Lauma Zihare, Dagnija Blumberga	Analysis of factors affecting bioeconomy
P2.14	Sanita Sereda , Marika Rosa, Agita Gancone, Jelena Pubule	The role of energy management in the agricultural sector: key prerequisites and impacts
P2.15	Andrea Jonathan Pagano, Francesco Romagnoli, Emanuele Vannucci	Implementation of blockchain technology in insurance contracts against natural hazards: a methodological multi-disciplinary approach



P2.16	Kaspars Ivanovs, Dagnija Blumberga	Low-temperature biogas reactor combined solar support system: feasibility study of technology
P2.17	Lisandra Rocha-Meneses , Timo Kikas, Jose Carlos Silva, Sandra Cota	Thermodynamic, environmental and economic simulation of an Organic Rankine Cycle (ORC) for waste heat recovery: Terceira Island case study
P2.18	Ieva Delvere , Svetlana Kuzhamberdijeva, Rudite Vesere, Dagnija Blumberga, Inese Tilla, Marija Iltina	Evaluation of polymer matrix composite waste recycling methods
P2.19	Reinis Aboltins, Dagnija Blumberga	Analysis of energy efficiency policy instruments for the real world
P2.20	Zanda Undine Ozola , Rudite Vesere, Silvija Nora Kalnins, Zanda Jansone, Dagnija Blumberga	Paper waste recycling. Circular economy aspects
P2.21	Aivars Rubenis , Aigars Laizans, Andra Zvirbule	Latvian electric vehicle fast charging infrastructure: the results of the first year of operation
P2.22	Anna Kubule , Kaspars Klavenieks, Rudite Vesere, Dagnija Blumberga	Towards efficient waste management in Latvia: an empirical assessment of waste composition
P2.23	Larissa Bozhko , Irina Turgel, Ekaterina Pracheva, Abdrakhman Naizabekov	Impact of zones with special status on the environment (experience of Russia and Kazakhstan)
P2.24	Danguole Bisikirske , Dagnija Blumberga, Saulius Vasarevicius, Gintautas Skripkiunas	Multi-criteria analysis of glass waste application
P2.25	Edvins Terehovics , Ivars Veidenbergs, Dagnija Blumberga	Single-stage and two-stage compressor exergy efficiency and destruction analysis. Case study in fish processing
P2.26	Nadeeshika Silva, Dagnija Blumberga	Why biopolymer thermal packaging materials are better
P2.27	Fabian Diaz, Einars Cilinskis	Use of multi-criteria TOPSIS analysis to define a decarbonization path in Colombia
P2.28	Olga Kadnikova , Gulnara Altynbayeva, Sergey Kuzmin, Arman Aidarkhanov, Medet Toretayev, Zauresh Khabdullina	Environmental feasibility of the proposed technology
P2.29	Anna Kubule, Dagnija Blumberga	The sustainability analysis of manufacturing industry
P2.30	Gatis Gaumigs, Dagnija Blumberga	Decarbonization impact on Baltic Power system
P2.31	Marta Delle , Iveta Civcisa, Valdis Vitolins, Dace Lauka, Dagnija Blumberga	Technology roadmap for integration of solar PV electricity into DH supply systems
P2.32	Dagnija Blumberga , Raimonds Gulbis, Valdis Vitolins, Girts Vigants, Jevgenijs Selivanovs, Dzintars Jaunzems	Empirical model of cost reduction in local DH systems. Low temperature approach
P2.33	Nino Inasaridze , Karlis Valters, Vaidotas Vaisis	Filling level measurements of paper waste bins using low power sensors of the internet of things and LoRa WAN technology
P2.34	Nino Tabatadze, Rasa Vaiskunaite, Sarma Valtere, Ausra Mazeikiene	Experimental study of tertiary treatment of wastewater using biochar
P2.35	Larissa Bozhko , Asset Khabdullin, Elizaveta Ulyanova, Irina Turgel	Management in the field of environment protection of cities as a Smart City element: the experience of Russia and Kazakhstan



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