



**V International  
Economic Forum**  
June 30 | 2022

**THE CRISIS AS AN INCENTIVE  
FOR CHANGE:**  
Human being. Nature. Entrepreneurship

PATRON & SUPPORTER



## **V International Economic Forum**

### **THE CRISIS AS AN INCENTIVE FOR CHANGE: Human being. Nature. Entrepreneurship**

## **Agenda & Book of Abstracts**

**Riga 2022**

SUPPORTERS AND PARTNERS:



BALTIC  
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MAGAZINE







V International  
Economic Forum  
June 30 I 2022

THE CRISIS AS AN INCENTIVE  
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Human being. Nature. Entrepreneurship

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Editor: Nina Linde, Dr. assoc. prof., Director at the Institute of Economics at the Latvian Academy of Sciences

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## V International Economic Forum

### "THE CRISIS AS AN INCENTIVE FOR CHANGE: Human being. Nature. Entrepreneurship."

**June 30, 2022**

**Venue: Latvian Academy of Sciences, Akademijas laukums 1, Riga, Latvia**

**The aim of the V Economic Forum** is to analyse the crisis, which Latvia and the entire Europe faced during the globalization of the 21st century as an opportunity for qualitative changes in humans, nature and entrepreneurship, as well as discuss possible science-based and practical solutions in order to reach a higher level of welfare in our countries. The successful practice of the I, II, III and IV Economic Forum is continuing, that the Forum serves as **a platform for the exchange of experience and cooperation of scientists, entrepreneurs and politicians**, stimulating the entry of local and foreign investment and the development of an innovative economy in the long term.

## AGENDA

**June 30 (Thursday)**

**09.00 - 10.00**      *Registration & Early Morning Coffee*

### **10.00 - 10.40      OPENING CEREMONY**

- Musical Performance
- Address of the Member of the European Parliament, Member of the Committee on Economic and Monetary Affairs, prof., Dr. **INESE VAIDERE**
- Address of the Minister of Economics of the Republic of Latvia **ILZE INDRIKSONE**
- Address of the Minister of Education and Science of the Republic of Latvia **ANITA MUIZNIECE**
- Address of the Minister of Agriculture of the Republic of Latvia **KASPARS GERHARDS**
- Address of the President of the Latvian Academy of Sciences prof., Dr. **IVARS KALVINS**

**Host Moderator:** Director of the Institute of Economics of the Latvian Academy of Sciences, assoc. prof., Dr. **NINA LINDE**

### **10.40 - 12.00      PLENARY SESSION I**

- **THE ROLE OF THE LATVIAN SMART-STATE IN THE EUROPEAN CYBER SECURITY MAP**  
(Speaker: prof., Dr. **JURIS BINDE**, President of "Latvijas Mobilais Telefons", Vice-President of the Latvian Association of Information and Communication Technologies, Member of the Council of Employers' Confederation of Latvia, Latvia)

- **THE COVID CRISIS AND OPPORTUNITIES FOR HUMAN WELL-BEING. HOW HAS COVID CHANGED INTERNATIONAL BUSINESS, PHARMACY AND HEALTHCARE?** (Speaker: Dr. **KANNAN VISHWANATTH**, Entrepreneur, International Trade Specialist in Pharmaceuticals, Chemical Engineer, Corporate Research Scientist, India)
- **IMPACT OF THE CURRENT CRISIS ON EASTERN EUROPEAN COUNTRIES: LOOKING AHEAD** (Speaker: prof., Dr. **S. FREDERICK STARR**, Distinguished Fellow for Eurasia, Chairman of the Central Asia-Caucasus Institute, USA)

## 12.00 - 12.30      **OPENING CEREMONY OF SCIENTIFIC MONOGRAPHS**

- **CHALLENGES AND ACHIEVEMENTS OF THE INTERFRAME PROJECT OF THE STATE RESEARCH PROGRAM "LATVIAN HERITAGE AND FUTURE CHALLENGES FOR THE SUSTAINABILITY OF THE STATE"** (Speaker: Prof., Dr. habil. oec. **BAIBA RIVZA**, Academic of the Latvian Academy of Sciences, project INTERFRAME-LV project manager)

12.30 - 13.30      *Lunch Break, B2B<sup>1</sup>, B2S<sup>2</sup> and S2S<sup>3</sup> meetings*

## 13.30 - 15.00      **PLENARY SESSION II**

- **THE IMPACT OF THE RUSSIAN WAR IN UKRAINE ON THE EUROPEAN AND WORLD ECONOMY, POLITICS, SCIENCE** (Speaker: Ambassador Extraordinary and Plenipotentiary of Ukraine to the Republic of Latvia **H.E. OLEKSANDR MISCHENKO**, Ukraine)
- **GEOPOLITICS AND SECURITY: FUTURE PERSPECTIVES** (Speaker: Prof., Dr.sc.pol. **ANDRIS SPRUDS**, Chairman of the Board and Researcher of the Latvian Institute of Foreign Policy, Latvia)
- **LATVIAN AND THE BALTIC STATES DEVELOPMENT OPPORTUNITIES AND THREATS IN THE 21ST CENTURY** (Speaker: Dr.oec. **JANIS VANAGS**, professor at the Riga Technical University, lead researcher at the Institute of Economics of the Latvian Academy of Sciences, Latvia)

**PANEL DISCUSSION:** Vision, Assessment and Proposals for Overcoming the Crisis by Entrepreneurs, Scientists and Politicians: Human Being. Nature. Entrepreneurship.  
**Participants:**

- prof., Dr.philol. **SKAIDRITE GUTMANE**, Rector of the Christian Academy
- Dr. **KANNAN VISHWANATTH**, Entrepreneur, Corporate Research Scientist, India
- prof., Dr. habil. oec. **BAIBA RIVZA**, Academic of the Latvian Academy of Sciences, project INTERFRAME-LV project manager
- prof., Dr.oec. **JANIS VANAGS**, lead researcher at the Institute of Economics of the Latvian Academy of Sciences
- prof., Dr.sc.pol. **ANDRIS SPRUDS**, Chairman of the Board and Researcher of the Latvian Institute of Foreign Policy
- prof., Dr. habil. sc. ing. **NAMEJS ZELTINS**, Honorary Member of the Latvian Academy of Sciences and President of the Latvian National Committee of the World Energy Council

**Moderator:** entrepreneur **GERALD HOPPSTAEDTER**, Latvia/Austria

<sup>1</sup>B2B – Business to Business

<sup>2</sup>B2S – Business to Science

<sup>3</sup>S2S – Science to Science

**15.00 - 15.30**      *Coffee Break, B2B, B2S and S2S meetings*

**15.30 - 17.30**      **WORK IN PARALLEL SECTIONS**

**1. HUMAN. NATURE. ENTREPRENEURSHIP: IN THE CONTEXT OF THE INTERFRAME-LV PROJECT** (Moderators: Prof., Dr. habil. oec. **BAIBA RIVZA**, Academic of the Latvian Academy of Sciences, project INTERFRAME-LV project manager; prof., Dr. oec. **INNA ROMANOVA**, Vice-Dean of the Faculty of Business, Management and Economics, University of Latvia)

**2. ENERGY & GREEN ECONOMY** (Moderators: Prof., Dr. habil. sc. ing. **NAMEJS ZELTINS**, Honorary Member of the Latvian Academy of Sciences and President of the Latvian National Committee of the World Energy Council; prof., Dr.oec. **IRINA PILVERE**, Rector of the Latvian University of Life Sciences and Technologies)

**17.30 - 18.00**      **Conclusion, informal conversations**

**Venue of the Forum:** Latvian Academy of Sciences, the Portrait hall on the 3rd floor, Academy Square 1, Riga

**Working languages:** English (main language in plenary) and Latvian/ English (in sections)

**Information and registration:** Institute of Economics of the Latvian Academy of Sciences; e-mail: [info@economicforum.lv](mailto:info@economicforum.lv), phone: +371-20207092, [www.economicforum.lv](http://www.economicforum.lv)



## AGENDA OF THE SECTION I

### HUMAN. NATURE. ENTREPRENEURSHIP: in the context of the INTERFRAME-LV project

**15:30 – 17:30 | Thursday, June 30**

**Venue: 3rd floor Portrait Hall**

#### Moderators

**BAIBA RIVZA** (Dr. habil. oec., prof.), Academician of the Latvian Academy of Sciences, the Head of the state research program's project INTERFRAME-LV

**INNA ROMANOVA** (Dr. oec.) Vice-Dean of the Faculty of Business, Management and Economics of the University of Latvia

#### Presentations | Agenda

• **NATIONAL RESEARCH PROGRAM PROJECT INTERFRAME-LV FOR THE SUSTAINABILITY OF THE NATIONAL ECONOMY** (Dr. habil. oec. prof. **Baiba Rivza**, Academician of the Latvian Academy of Sciences, the Head of the state research program's project INTERFRAME-LV)

• **ENTREPRENEURS' ACTIONS DURING THE CRISIS AND PRIVATE BUSINESS POTENTIAL IN LATVIA** (Dr. oec., **Anzelika Berke-Berga**, Faculty of European Studies of Riga Stradins University, Dr. oec., prof. **Inna Dovladbekova**, Riga Stradins University)

• **THE NEW APPROACH TO THE ANALYSIS OF LATVIA'S SUSTAINABLE DEVELOPMENT INDICATORS** (Dr. oec., **Elita Jermolajeva**, leading researcher, Latvia University of Life Sciences and Technologies, PhD student, **Inese Trusina**, Latvia University of Life Sciences and Technologies)

• **EUROPEAN UNIVERSITIES AS DRIVERS OF INNOVATION IN THE EUROPEAN HIGHER EDUCATION AREA** (**Edmunds Jansons**, Interim Head of Information Technologies Master's Studies Programme)

• **DIGITALIZATION OF LABOR RELATIONS: TENDENCES AND ACTOR** (lecturer, **Oksana Skorobogatova**, Vice-Dean of the Faculty of Transport and Management, Dr. oec., prof. **Inna Stecenko**, Dean of the Faculty of Transport and Management)

• **WORK-BASED LEARNING AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION** (Mg. paed., **Ilze Brante**, research assistant at University of Latvia Institute of Economics and Management Research, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research)

• **TENDENCIES OF DEVELOPMENT OF INCOME INEQUALITIES AND POSSIBLE INCOME INEQUALITIES REDUTION OPTIONS** (Mg. oec., Mg. sc. admin., Mg. sc. math. **Rita Vanaga**, researcher at University of Latvia Institute of Economics and Management Research, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research)

• **SOCIAL ENTERPRISES AS A TOOL FOR POSSIBLE INCOME INEQUALITIES REDUCTION** (Mg. sc. admin., **Kristine Casno** research assistant at the University of Latvia Institute of Economics and Management Research, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research)

• **NEW PRODUCT PRODUCTION AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION**

(Mg. sc. admin., **Zaiga Ozolina**, research assistant at University of Latvia Institute of Economics and Management Research, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research)

• **ROLE OF FINANCIAL LITERACY FOR CONTRIBUTION TO VOLUNTARY PENSIONS AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION** (Mg. oec., Mg. sc. admin. **Evija Dundure**, research assistant at University of Latvia Institute of Economics and Management Research, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research)

• **LIFE-LONG EDUCATION AS ONE OF THE MOST IMPORTANT ASPECTS IN REDUCTION OF INCOME INEQUALITIES** (Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, Mg. sc. admin., Mg. hist., **Ginta Tora**, researcher at University of Latvia Institute of Economics and Management Research, Dr. sc. admin., **Ilze Buligina**, researcher at University of Latvia Institute of Economics and Management Research, Dr. chem., **Juris Dzelme**, leading researcher at University of Latvia Institute of Economics and Management Research)

• **THE FOURTH INDUSTRIAL REVOLUTIONS IMPACT ON THE DEVELOPMENT OF YOUNG PEOPLE'S SKILLS FOR EMPLOYABILITY** (Dr. oec. **Liva Grinevica**, senior expert in Latvian Council of Science, Dr. oec., prof. emeritus **Veronika Bikse**, Univeristy of Liepaja, Dr. habil. oec., prof. **Baiba Rivza**, Academician of the Latvian Academy of Sciences, the Head of the state research program's project INTERFRAME-LV, Dr. habil. sc. ing., prof. **Peteris Rivza**, Latvia University of Life Sciences and Technologies)

• **INCENTIVES AND DRIVERS OF UZBEK WOMAN PARTICIPATION IN DIGITAL BUSINESS ECONOMY** (Dr. oec., prof. **Inna Stecenko**, Dean of the Faculty of Transport and Management, lecturer, PhD student, **Maftuna Bulyaeva**, Riga Aeronavigational Institute)

• **THE IMPACT OF SOCIO-ECONOMIC FACTORS ON THE EMPLOYMENT OF PEOPLE WITH DISABILITIES** (Dr. oec., **Zaiga Oborenko**, scientific secretary of the Latvian Academy of Sciences, Dr. habil. oec, prof. **Baiba Rivza**, Academician of the Latvian Academy of Sciences, the Head of the state research program's project INTERFRAME-LV, Dr. oec. **Marga Zivitere**, State Emeritus Scientist, LATVIA)

• **LATVIA UNDER THE INFLUENCE OF THE COVID-19 PANDEMIC** (Dr. paed., **Anna Tatarinceva**, scientific researcher, an international expert of scientific research)

• **ANALYSIS OF THE HIERARCHY OF LATVIAN AMUSEMENT PARK** (MSc. **Uldis Plumite**, Latvia University of Life Sciences and Technologies)

• **OPPORTUNITIES OF KURZEME REGION DEVELOPMENT IN CONTEXT OF INNOVATION** (Dr. habil. oec, prof. **Baiba Rivza**, Academician of the Latvian Academy of Sciences, the Head of the state research program's project INTERFRAME-LV, Dr. oec., prof. **Biruta Sloka**, University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, PhD student, **Dace Stefenberga**, lecturer and researcher at the Ventspils University of Applied Science Faculty of Economics and Management)



## Report Posters | Agenda

• **INTERACTION OF BUSINESS, EDUCATION AND SCIENCES IN INNOVATIVE PROCESSES: CASE OF LATVIA** (Dr. sc. assoc. prof. **Daina Vasilevska**, Vice-Rector for Science and Academic Affairs of Turība University)

• **ZERO WASTE AND CIRCULAR ECONOMY PRINCIPLES' ADAPTATION IN THE TEACHING PROGRAMMES** (Dr. oec., prof. **Andra Zvirbule**, Dean of the Faculty of Economics and Social Development at Latvia University of Life Sciences and Technologies, Dr. oec., prof. **Gunta Grinberga-Zalite**, Latvia University of Life Sciences and Technologies)

• **CLASSIFICATION OF THE FACTORS AFFECTING URBAN AND PERI-URBAN AGRICULTURE** (Dr. oec., prof. **Andra Zvirbule**, Dean of the Faculty of Economics and Social Development at Latvia University of Life Sciences and Technologies, lecturer and doctoral student, **Madara Dobeļe**, Latvia University of Life Sciences and Technologies)

• **FOSTERING CITIZEN PARTICIPATION IN THE DECISION-MAKING PROCESS OF PUBLIC ADMINISTRATION IN LATVIA** (Dr. oec. **Eduards Lielpeters**, University of Latvia)

## AGENDA OF THE SECTION II

### ENERGY & GREEN ECONOMY

**15:30 – 17:30 | Thursday, June 30**

**Venue: 2nd floor Senate Hall**

#### Moderators

**NAMEJS ZELTINS** (Dr. habil. sc. ing.m, prof.), Honorary Member of the Latvian Academy of Sciences and the President of the Latvian National Committee of the World Energy Council

**IRINA PILVERE** (Dr. oec., prof.), Rector at the Latvian University of Life Sciences and Technologies

#### Presentations | Agenda

- **ENERGY AND SUSTAINABILITY: PROGRESS IN RENEWABLES AND ADVANCED "GREEN" NUCLEAR ENERGETICS** (Dr. habil. phys. **Andris Sternbergs**, Vice-President of Latvian Academy of Science)
- **NEW ENERGY CHALLENGES FOR THE LATVIAN ENERGY SECTOR** (Dr. oec., Dr.h.c. **Maris Balodis**, Director of Research and Development of Latvenergo AS)
- **ASSESSMENT OF CAPABILITY OF NATURAL GAS SYSTEM IN BALTICS TO PLAY A TRANSITIONAL ROLE IN RAPID DEPLOYMENT OF WIND AND SOLAR ELECTRICITY GENERATION BASED ON COMPARATIVE ANALYSIS** (Dr. sc. ing. **Uldis Bariss**, CEO of Conexus Baltic Grid AS)
- **BALTIC POWER SYSTEM AND ELECTRICITY MARKET EVOLUTION: CHALLENGES AND SOLUTIONS** (Dr. sc. ing. **Karlis Baltputnis**, Senior researcher at RTU Institute of Power Engineering; Dr. sc. ing. **Zane Broka**, Senior researcher at RTU Institute of Power Engineering)
- **IMPORTANCE OF WELL-BALANCED ENERGY TRILEMMA FOR SMART ENERGY POLICY** (Dr. oec. **Olga Bogdanova**, Deputy Chairwoman of the Supervisory board of the Power Transmission System operator of Latvia AS "Augstsprieguma tīkls" & Director of Tax Administration and Society Interests Policy department at the Ministry of Finance of the Republic of Latvia)
- **THE EU ENERGY TRANSITION FOR GASEOUS FUELS: MAIN TRENDS OF EMERGING RISK MANAGEMENT STRATEGY** (Dr. oec., prof. **Ineta Geipele** Director of the Institute of Civil Construction and Real Estate Economics and head of the Department of Civil Construction and Real Estate Economics and Management at the Riga Technical University (RTU); Dr. oec. **Sanda Lapuke**, Leading Researcher at Civil Engineering and Real Estate Economics, Faculty of Engineering Economics and Management, Riga Technical University; MBA **Leo Jansons**, Doctoral student at Institute of the Civil Engineering and Real Estate Economics, Faculty of Engineering Economics and Management, Riga Technical University)
- **ENERGY & GREEN ECONOMICS, RENEWABLE ENERGY ISSUES AND OPPORTUNITIES** (Mg. sc. ing. **Edgars Groza**, Head of wind park development at Latvenergo)
- **INSTITUTIONAL FACTOR IN THE ENVIRONMENTAL DAMAGE ASSESSMENT METHODOLOGY** (Dr. ing. **Dmitry Ulanov**, Senate President, docent – Riga Aeronautical institute)
- **METHODOLOGY FOR SELECTION OF PRIMARY ENERGY RESOURCES FOR ENERGY COMMUNITIES IN UNSTABLE ENERGY SUPPLY CONDITIONS** (Mg. sc. ing. **Tatjana Odineca**, Researcher at Riga Technical University/Institute of Heat, Gas, and Water Technology)

## ORGANISERS AND MODERATORS OF THE FORUM



**NINA LINDE** (Dr. asoc. prof.). Director of the Institute of Economics of the Latvian Academy of Sciences since 2014. She is an associated professor in economics (sub-sector – national economy), and specializes in interdisciplinary research, since she is convinced that it is at the junction and interconnection of sciences that innovations and a breakthrough scientific contribution to the development of society are born. She has a Bachelor of Engineering (Riga Technical University), PhD in Education (State University of Latvia), Business Education, as well as a Psychologist qualification (St. Petersburg University). Currently she is developing her second dissertation in Economics, exploring the influence of contemporary discoveries of psychological science on economic processes, on the development of entrepreneurship and society as a whole.

In 2015 Dr. Linde was awarded by the Antonio Meneghetti Scientific and Humanistic Research Foundation in Switzerland for the scientific project "Formation and Impact of the Image on Economy and Development of Entrepreneurship in knowledge-based society".

Main research areas of Dr. Nina Linde are national economy, entrepreneurship support and business economy, management psychology, social entrepreneurship. Being the initiator and developer of the EU Pilot Project for Identification of Social Enterprises and Estimation of Their Economic Impact in Latvia (European Commission: Internal Market, Industry, Entrepreneurship and SMEs; Economic impact of social enterprises), N. Linde provided elaboration of common research methodology of social enterprises. The study became one of the basic documents in the preparation of the concept of the Ministry of Welfare "On the Possibilities of Implementing Social Entrepreneurship in Latvia" and related legislation.

N. Linde also has more than 10-year of entrepreneurial experience and more than 15 years of experience as a research leader of international projects. At the moment, N. Linde is involved in EU Horizon 2020 project "EQUALS-EU: Europe's Regional Partnership for Gender Equality in the Digital Age (Horizon2020 Science with and for Society), where she is national expert, researcher and moderator on the implementation of gender equity in social innovation, academic cooperation and entrepreneurship.

Dr. Nina Linde is main organiser and host moderator of the annual International Economic Forum in the Latvian Academy of Sciences.



**BAIBA RIVZA** (Dr. habil. oec.). Professor, Academician of the Latvian Academy of Sciences, the Head of the State Research Program's project INTERFRAME-LV (LATVIA). Professor of Economics of Latvia University of Life Sciences and Technologies; ex-minister of Ministry of Education and Science of Latvia, President of the Academy of Agricultural and Forestry Sciences of Latvia, Member of the Presidium of the Academy of Sciences of Latvia; Foreign member of the Swedish Royal Academy of Agricultural and Forestry Science, of the Academia dei Georgofili and of the Lithuania Academy of Sciences. Directions of scientific activity: the digital economy, support politics and good practice of entrepreneurship in rural areas, market research. B.Rivza has taken several assignments for the European Council in the capacity of expert. She has experience in project identification, formulation, monitoring and evolution, troubleshooting, training and other types of services.



**NAMEJS ZELTINS** (Dr. habil. sc. ing.) Professor, Honorary member of Latvian Academy of Science. Namejs Zeltins working at the Institute of Physical Energetics since 1972. His academic interests include fuel and energy complex planning, the energy market and energy utilisation. Professor N. Zeltins is an author and co-author of more than 400 scientific articles and monographs. He is Chief-in-Editor of "Latvian Journal of Physics and Technical Sciences", Member of Advisory Editorial Board of Polish Academy of Science "Energy Policy Journal" and Member of editorial board of "Baltic Journal of Real Estate Economics and Construction Management". He is president of Latvian Member Committee/World Energy Council and expert of UN ECE Groups of on Gas and of Experts on Cleaner Electricity Systems. He is the Winner of the Cicerona Honorary Title of the Latvian Academy of Sciences in the nomination "Education and Science" for the multifaceted reflection of energy problems.



**INA ROMANOVA** (Dr. oec.) is a Professor of Finance and the Vice-Dean of the Faculty of Business, Management and Economics at the University of Latvia, the Director of the Scientific Institute of Economics and Management, and the Director of the professional Master degree study programme "Financial Economics". She is an expert in the field of Economics and Management of the Latvian Academy of Sciences. She has more than fifteen years of pedagogic experience both in Latvia and abroad, she is a visiting professor in several Universities in Europe. She has also professional experience in banking and finance, both in Latvia and Germany. Her research focus is on Financial Technologies and Financial Management. She is on the editorial board of several scientific journals and co-edited the 2017 and 2022 volumes of Emerald "Contemporary Studies in Economic and Financial Analysis". She has participated in a number of research projects, including the State Research Programme Project "Challenges and Solutions of Latvian State and Society in an International Framework" (head of the UL sub-project).



**IRINA PILVERE** (Prof. Dr.) Latvia University of Life Sciences and Technologies. Rector, professor, leading researcher at University of Life Sciences and Technologies. She has participated in 22 international and 75 national research projects, with scientific focus on: Agricultural and Rural Development, Land Use Efficiency, Common Agricultural Policy, Food Processing Development. Professor published 302 research works, including 195 scientific paper, 6 scientific monograph, 31 books or book parts, 70 other, in the SCOPUS data bases indexed 75 articles, in the Web of Science (Clarivate) are indexed 79 articles, h-index=4. She is the true Member of Latvian Academy of Science, True Member and Vice President of Latvian Academy of Agriculture and Forestry Science, BOVA university network Rector Board member, EU Standing Committee on Agricultural Research (SCAR) member and etc.



**GERALD HOPPSTAEDTER.** Entrepreneur and investor from Austria, is realizing many business projects in Latvia. Great experience in attracting investments from Asia and far East to Latvia. Owner and Managing Director of Ltd. "S-Baltic LV", "Baltic Magazine", Head of the Council of the JSC "LIGHTS" and other companies. Secretary of the Chamber of Commerce of India in Latvia.



## SPEAKERS AT THE OPENING CEREMONY



Dr. **INESE VAIDERE**, Member of the European Parliament, Member of the Committee on Economic and Monetary Affairs



**ILZE INDRIKSONE**, Minister of Economics of the Republic of Latvia



**ANITA MUIZNIECE**, Minister of Education and Sciences of the Republic of Latvia



**JANIS EGLITS**, Head of the Office of the Minister for Agriculture of the Republic of Latvia



Dr. **IVARS KALVINS**, President of the Latvian Academy of Sciences

## PLENARY SESSION I

### Juris Binde. **THE ROLE OF THE LATVIAN SMART-STATE IN THE EUROPEAN CYBER SECURITY MAP**

Technological capabilities are continually growing and improving, facilitated by the transition to the 5G network. Key elements of everyday life are increasingly being conducted online: remote working, data storage in clouds not physical servers, plus virtual money, etc. Smartphones have evolved from communication devices into multifunctional tools, facilitating user identification in just about every service storing important personal information. New networks are continually under development: IoT, smart transportation systems, smart cities and drone systems, etc. Concurrently, understanding of security and defense has changed. Threats are no longer just physical, but also virtual.

One of LMT's tasks is to promptly identify and neutralize potential threats. The tense geopolitical situation is resulting in the growing spread of hybrid warfare across state borders, where Latvia is among the first combatants on the invisible front line. Crucially LMT is helping to reinforce cybersecurity by participating in national defense projects, developing cutting-edge security technologies, fostering society's digital literacy, and joining Pan-European cybersecurity projects. Through its access to several technologies polygons, where it can test prototype IoT, drone, 5G mobility and other solutions, LMT facilitates inter-sectoral security cooperation.

A significant advance enhancing security is quantum technology development, producing quantum software algorithms, quantum hardware and quantum internet. LMT's future tasks include technology development, concurrently promptly recognizing and eliminating potential individual, commercial and national cybersecurity risks. Accordingly, we must provide a body of support measures and tools incorporating overall and in-depth public understanding of security issues, secure internet and intranet maintenance, upskilling of specialists and astute risk management.

**Key words:** cybersecurity; IoT; 5G; defense; remote working; hybrid warfare.



**JURIS BINDE** (Dr.oec.). President and CEO of Latvijas Mobilais Telefons SIA since 1992, Chairman of Management Board since 2004, Professor of Vidzeme University of Applied Sciences. From 1987 to 1992 was Chief Technologist and Head of Technology Department in the Scientific Research Institute VEF. From 1978 - Industrial Association VEF as Engineer – Designer. On 1978 graduated Riga Polytechnic Institute in the specialty of Engineer Designer-Technologist of Radio Electronic Equipment (Mg.sc.ing, Dipl.ing). Improved his knowledge in University of Columbia in USA (2000). In 2007 completed doctoral program in the University of Latvia with degree of Doctor of Economics (Dr.oec.). Author of more than 40 scientific publications. Vice-President of Latvia Information and Telecommunication Association (LIKTA) and Member of the Council of Employers' Confederation of Latvia (LDDK).

**Kannan Vishwanatth.**

## **THE COVID CRISIS AND OPPORTUNITIES FOR HUMAN WELL-BEING. HOW HAS COVID CHANGED INTERNATIONAL BUSINESS, PHARMACY AND HEALTHCARE?**

The regional and local impact of the COVID-19 crisis is highly heterogeneous, with significant implications for crisis management and policy responses. This presentation takes an in-depth look at the territorial impact of the COVID-19 crisis across its different dimensions: health, economic, social and fiscal. It provides a comprehensive overview of national and subnational government response measures to manage the vaccination campaigns across levels of government and mitigate the territorial effects of the crisis. Finally, the presentation offers a forward-looking perspective of the crisis' implications for multi-level governance, as well as points for policy-makers to consider as they build more resilient regions.

**Key words:** health crisis, economic crisis, subnational finance, vaccine, recovering from COVID-19, economic responses, key recommendations



**KANNAN VISHWANATTH** (Dr., prof.). Dr. Kannan is an academic researcher and entrepreneur. He has obtained his Bachelor's Degree in Chemical Engineering, Master's Degree in Business Administrations and Doctor of Philosophy in International Trade. He is currently the Managing Director of Hong Kong based pharmaceutical company engaged in manufacturing and exports of anti-cancer and anti-viral drugs. He has co-authored 15 Process patents in field of topical application of steroidal products and anti-cancer drugs. Dr. Kannan Vishwanatth is associated with Dr APJ Kalam University and Research Centre based in Coimbatore City in India: [www.akrc.res.in](http://www.akrc.res.in). In April 2022 Dr. Kannan received a Conferment of the Title Honorary Professor from the University of California, Berkeley.



## **S. Frederick Starr.   IMPACT OF THE CURRENT CRISIS ON EASTERN EUROPEAN COUNTRIES: LOOKING AHEAD**

Strategists toil mightily at their task, yet in the end we cannot know the future. What we can do however, is to scope out future possibilities, evaluate them, and devise policies that will respond to them. These notes focus on Russia's future, considered against the background of the war against Ukraine,

This war is the culmination of a consistent process that became noticeable in Russia's assault on Chechnya and then manifest itself in the 2008 war against Georgia, the failed 2010 attempt against the Kyrgyz Republic, and the 2014 seizure of Crimea. The consistent aim in all these cases was to reestablish Moscow's authority over all former Soviet territories.

In this sense, one can say that Russia since the late 1990s has been single mindedly focused on reversing the collapse of the USSR. This effort echoes the early Soviet attempt to reestablish Russian rule over the entire former Soviet territory. In the post-1917 years this effort was successfully led by Trotsky and his reconstituted army. Mr Putin sought at first to achieve the same ends through diplomacy, i.e., by establishing CSTO, by abolishing the successful Central Asia Union, and by replacing it with the Eurasian Economic Union. By 2021 it was clear that these and other efforts were flagging. Mr Putin therefore resorted to a desperate, ill-planned and chaotic frontal assault on the entire territory of Ukraine.

This unprecedented attack on a European state has led to the conquest of a fifth of Ukraine and the destruction of all infrastructure there and to tens of thousands of deaths, including some 30,000 Russian soldiers. It has also led to totally unexpected consequences on the diplomatic and security fronts. These include the revitalization and expansion of NATO, EU opening its door to Ukraine, Moldova, and Georgia, to a still incomplete turnabout in German policy, and to the reengagement of the US in European security; in short: to a range of developments that are absolutely opposed to Putin's own dreams and intentions.

What will happen now? Further aggression by Moscow is entirely possible, with the main targets being a weakened Moldova, Belarus, northern Kazakhstan, Georgia, and the Baltic states including Finland. Any of these efforts would be acts of utter desperation on Moscow's part and are bound to fail. But they are all real possibilities that must be planned for.

Why are all these possibilities bound to fail? Because the Russian army has depleted its manpower and equipment, and because the Russian economy faces a mounting internal revolt as the economy weakens and as news of the situation in Ukraine seeps into the Russian national psyche.

Bluntly, even if Putin wins, he loses. He lacks the resources to hold and develop conquered territory, which invites guerrilla actions that have already begun. The expenditure of capital on conquered territories will foster large-scale discontent on the home front.

Any strategic planning by the West and by the Baltic countries must consider the possibility of these developments and the profound consequences to which they give rise. These include the marginalization or removal of Mr Putin, i.e. the end of Putinism. This could give rise in the short run to a takeover by the humiliated Russian military and a desperate final "no holds barred" assault on Ukraine. This has already begun, but once more, one must note that even if Russia wins in the short run it loses.

These developments are already giving rise to widespread discontent with the Russian government and society, with many heretofore passive members of the intelligentsia now becoming engaged.

Among other possibilities, these developments could give rise to the collapse of the Russian state as it now exists and to a loss of control over many non-Russian territories within Russia's borders. In an important interview on Russian TV Putin himself acknowledged this possibility and railed against those many units of the Russian state that seek decentralization and self-government. In blunt language he warned that such a development would leave Russia in control of a territory smaller than Muscovy before Ivan IV.

Centrifugal forces are bound to prevail within Russia, at least in the short and mid-term. There will be calls for federalism, elected governors, etc., which will be yet more divisive.

What are the implications of such a development for Russia's neighbors? Since 1991 the three Baltic countries have led the way in defining a post-Soviet future. Meanwhile, the Central Asians have already struck out on their own, with Uzbekistan and Kazakhstan leading the charge and with Azerbaijan increasingly engaged in a new regionalism designed to prevent future Moscow efforts to "divide and conquer." They can be expected to reconstitute something akin to the Central Asia Union which Putin obliterated. Georgia meanwhile will seek to emancipate itself from Mr.Ivanshvili's control and forge closer links with the West.

The Baltic states, now joined by Finland, must consider this scenario, while perhaps not likely, as nonetheless a distinct possibility. This calls for a mentality that includes offense as well as defense, and the exercise of Baltic leadership within the former Soviet territories. Its goal should be the promotion of self-government, collaboration, and cooperation across the region and within Russia itself. This need not (and should not) feature ringing declarations but instead focus on the kind of quiet and persistent diplomacy at which Latvia, Lithuania, Estonia and Finland have long since shown themselves to be the European leaders and masters.



**STEPHEN FREDERICK STARR** (prof., Dr.) is the founding chairman of the Central Asia -Caucasus Institute and Silk Road Studies Program, a joint transatlantic research and policy center affiliated with the American Foreign Policy Institute (AFPC) in Washington and the Institute for Security and Development Policy in Stockholm. Dr. Starr is Distinguished Fellow for Eurasia at AFPC. Starr is author of the widely acclaimed *Lost Enlightenment: Central Asia's Golden Age from the Arab Conquest to Tamerlane*. *Lost Enlightenment* has been translated into 20 languages, and received widespread praise by regional leaders. He earned his PhD in History at Princeton, MA at King's College, Cambridge, and his BA at Yale, and holds five honorary degrees.

**Baiba Rivza. CHALLENGES AND ACHIEVEMENTS OF THE INTERFRAME PROJECT OF THE STATE RESEARCH PROGRAM "LATVIAN HERITAGE AND FUTURE CHALLENGES FOR THE SUSTAINABILITY OF THE STATE"**

The project "Challenges of the Latvian state and society and their solutions in the international context (INTERFRAME-LV)" is the part of the National Research Program "Latvian Heritage and Future Challenges for the Sustainability of the State".

The essence of the project is the following:

- first, the assessment of the impact of global developments on a sustainable Latvian economic and social model;
- second, the development of closer collaboration among science and practice by scientists in collaboration with the Ministry of Economics, LCCI, Union of Local Governments of Latvia, LDDK, LOSP, etc.;
- third, the formation of young scientists.

8 doctoral students had defended their PhD theses during the participation in the project INTERFRAME-LV8. The project INTERFRAME-LV has 3 research universities, Latvian Academy of Sciences, 2 regional universities and 3 higher education institutions as partners. The analysis of the Latvian intelligent sustainable development of the state and society includes the following:

- global security of nations and peoples;
- climate change;
- digitization as the phenomenon influenced the technical, economic and social development;
- the knowledge-based economy development in Latvia and regions;
- radicalization of society;
- population ageing;
- geographical stratification;
- the development of model of the readiness of Latvia for the most appropriate priority of sustainable development depended on factors and alternatives.

The main results of the study are summarized in the monograph "The strength of Latvia for the long-term development".

**Key words:** sustainable development, knowledge-based economy, digitalization, state



**BAIBA RIVZA** (Dr. habil. oec.). Professor works at the Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia. Full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences. Research interests are related to knowledge-based economy and smart growth in rural areas of Latvia and Baltic countries.



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THE CRISIS AS AN INCENTIVE  
FOR CHANGE:  
Human being. Nature. Entrepreneurship

## PLENARY SESSION II



### **Oleksandr Mischenko. THE IMPACT OF THE RUSSIAN WAR IN UKRAINE ON THE EUROPEAN AND WORLD ECONOMY, POLITICS, SCIENCE**

**H.E. OLEKSANDR MISCHENKO** (PhD in Law) is a veteran diplomat, having joined Ukraine's diplomatic service in 1993. In February 2019 he was appointed as Ambassador Extraordinary and Plenipotentiary of Ukraine to Latvia. Before his appointment in Latvia, he served as Ambassador at Large MFA of Ukraine (2002-2003), Chargé d'Affaires of Ukraine in Australia (2003-2004), Extraordinary and Plenipotentiary Ambassador of Ukraine to Australia (2004-2005), Extraordinary and Plenipotentiary Ambassador of Ukraine to the Republic of Turkey (2005-2008), Director General of the Forth Territorial Directorate General MFA of Ukraine (2008-2011) and Extraordinary and Plenipotentiary Ambassador of Ukraine to the Republic of Azerbaijan (2011-2019). He has also been awarded the Order of Merit of the 3rd degree.



### **Andris Spruds. GEOPOLITICS AND SECURITY: FUTURE PERSPECTIVES**

**ANDRIS SPRUDS** (Prof., Dr.sc.pol.) is a research fellow and the chairman of the Board of the Latvian Institute of International Affairs. He also holds the position of professor and dean at Riga Stradins University. Andris Spruds has an MA in Central European History from the CEU in Budapest, Hungary and in International Relations from University of Latvia. He has also obtained a PhD in Political Science from Jagiellonian University in Krakow, Poland. A. Spruds has been a visiting student and scholar at Oxford, Uppsala, Columbia and Johns Hopkins University, as well as the Norwegian Institute of International Affairs and Japan's Institute of Energy Economics. His research interests focus on international politics and security, transatlantic relations and energy security.



## SPEAKERS AT THE PANEL DISCUSSION



Prof., Dr. philol. **SKAIDRITE GUTMANE**, founder, rector and author of the strategic concept of the Latvian Christian Academy. For many years S. Gutmane has participated in the archaeological excavations in Israel organized by the Rockefeller Museum and developed an interdisciplinary research methodology in anthropology, theology and social work.



DHC, Dr. **KANNAN VISHWANATTH**, an academic researcher and entrepreneur. He is a Managing Director of Hong Kong based pharmaceutical company engaged in manufacturing and exports of anti-cancer and anti-viral drugs. He has co-authored 15 Process patents in field of topical application of steroidal products and anti-cancer drugs.



Prof., Dr. habil. oec. **BAIBA RIVZA**, full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences.



Prof., Dr. habil. sc. ing. **NAMEJS ZELTINS**, Honorary member of Latvian Academy of Sciences. He is president of Latvian Member Committee/World Energy Council and expert of UN ECE Groups of on Gas and of Experts on Cleaner Electricity Systems. He is the Winner of the Cicerona Honorary Title of the Latvian Academy of Sciences in the nomination "Education and Science" for the multifaceted reflection of energy problems.



Prof., Dr. sc. pol. **ANDRIS SPRUDS** is a research fellow and the chairman of the Board of the Latvian Institute of International Affairs. He also holds the position of professor and dean at Riga Stradins University. He has obtained a PhD in Political Science from Jagiellonian University in Krakow, Poland. A. Spruds has been a visiting student and scholar at Oxford, Uppsala, Columbia and Johns Hopkins University, as well as the Norwegian Institute of International Affairs and Japan's Institute of Energy Economics. His research interests focus on international politics and security, transatlantic relations and energy security.

## SECTION I

### HUMAN. NATURE. ENTREPRENEURSHIP: IN THE CONTEXT OF THE INTERFRAME-LV PROJECT

**Moderators:** prof., Dr. habil.oec. **Baiba Rivza**, Dr. oec. **Inna Romanova**

#### **Baiba Rivza. NATIONAL RESEARCH PROGRAM PROJECT INTERFRAME-LV FOR THE SUSTAINABILITY OF THE NATIONAL ECONOMY**

The research project "Challenges for the Latvian State and Society and the Solutions in International Context – INTERFRAME-LV" is one of the five projects of the national research programme "Latvian Heritage and Future Challenges for the Sustainability of the State" with the main goal of developing guidelines for sustainable development of Latvia. INTERFRAME-LV is implemented by the Latvia Academy of Sciences in cooperation with: Latvia University of Life Sciences and Technologies, the main research direction – business digitisation and climate change; the University of Latvia – economic consequences of public radicalisation; Riga Stradins University – the influence of personality and social structure factors on capacity and perceptions of security.

Analysis of structural change processes in the European Union is the focus for all the project scientists. There is an exchange of views among scientists from various institutions and research areas. Nearly half of the project team are doctoral and master students. For example, N. Kostrikova defended her PhD thesis "Opportunities for Blockchain Technology Adoption in the Economy of Latvia in the Context of Baltic States Region" in June 2021, but E. Lielpeters, I. Gudele and L. Azena will defend their theses this autumn. Seventy-nine reports on the INTERFRAME-LV project have already been presented at international conferences and 42 research papers have been published in the SCOPUS and Web of Science databases.

For getting feedback on particular problems from entrepreneurs, community leaders and inhabitants, we organized five regional forums "Digital Tools for Business and Education Support". Now the project team is working on a scientific monograph that will include scenarios for the sustainable development of Latvia.

**Key words:** Knowledge based Economy, Digital Tools, Cooperation.



**BAIBA RIVZA** (Dr. habil. oec.). Professor works at the Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia. Full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences. Research interests are related to knowledge-based economy and smart growth in rural areas of Latvia and Baltic countries.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

**Anzelika Berke-Berga, Inna Dovladbekova.** **ENTREPRENEURS' ACTIONS DURING THE CRISIS AND PRIVATE BUSINESS POTENTIAL IN LATVIA**

The aim of this research was to study the behavior of entrepreneurs in the impact of Covid-19 crisis and the attitude of population towards starting a private business. The impact of the crisis on business has been in the form of declining revenues and profits, with a sharp fall in consumption due to government restrictions imposed by the pandemic and more cautious spending by the population. This crisis also had a particularly severe impact on the existence of start-ups that were set up shortly before the pandemic. Most of them invested resources in business development without saving. Some did not qualify for state aid due to their short duration because they did not yet meet the criteria.

However, the crisis has also provided an impetus for business development: companies have changed their business models through cost-cutting measures, and new ways of doing business, delivering products and providing services have emerged. In times of crisis and recovery, innovation must be at the heart of business strategy. A business-friendly ecosystem is needed, that is able to adapt to shocks and new challenges. Policy makers need to respond to challenges of Covid-19, but also offer long-term development prospects and support. Long-term recovery planning and proactive crisis management are needed.

Proportion of population considering to start a business has increased during the crisis. The most important factors contributing to such attitude are related to personality traits - character, experience, skills and education. However, most significant obstacles for people who have negative attitude towards starting a business in Latvia are related to both personality and external factors - government policy, taxes, business-friendly environment, bureaucracy and excessive control of state institutions, which highlights the need to create an attractive business environment - suitable for both existing and start-ups.

**Key words:** entrepreneurship, start-ups, Covid-19, crisis, business environment.



**ANZELIKA BERKE-BERGA**, PhD in Economics, works at the Faculty of European Studies of Riga Stradins University since 2008, teaches study courses related to corporate finance, financial and securities markets, as well as conducts research. Research interests: securities market, employee share ownership and corporate finance.



**INNA DOVLADBKOVA**, PhD in Economics, Professor at Riga Stradins University. Research interests are related to the economic policy of the European Union, the functioning of the financial market, corporate finance, and social and human capital. Participated in the implementation of several international, including EU-funded, and national projects.

THE RESEARCH IS SUPPORTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"



**Elita Jermolajeva, Inese Trusina. THE NEW APPROACH TO THE ANALYSIS OF LATVIA'S SUSTAINABLE DEVELOPMENT INDICATORS**

Humanity is now entering one of the most important periods in its history. The ideas and models of neoclassicism are being replaced by the updated approaches of Joseph Schumpeter, the provisions of ecological economics are being introduced into the concept of sustainable development more actively. A new approach to assessing the development of socio-economic systems is proposed, using a stable energy flow coordinate system, which allows obtaining an objective picture. The study develops a new approach - a methodology for determining indicators of sustainable development, definitions, monitoring and formalized description, using a set of concepts of total and useful power in adaptive open unbalanced socio-economic systems. Main objectives: to give an idea of the country as a socio-economic system, using a different approach to the assessment of sustainable; to present some results of the formalization of sustainable development monitoring using the power analysis approach. The main strategic indicators of the Latvian strategy Latvia 2030 are analyzed. In the context of a considering approach, universal parameters were calculated using the data of Eurostat during the period 1990-2019. Results: (1) the analysis of systems within the framework of the theory of complex systems allows developing and apply dynamic nonlinear models for monitoring sustainable development; (2) the introduction of the concept of "power" makes it possible to establish a stable system of coordinates and units in watts; (3) quality of life is defined as the current state of the system and the potential for future development.

**Key words:** sustainable development, energy flows, power, quality of life.



**ELITA JERMOLAJEVA** (Dr.oec.) Leading Researcher, Latvia University of Life Sciences and Technologies, Jelgava, Latvia  
Economist by speciality, Doctor of Economics since 1993. Previous experience as Head of Development Department at Preiļi County, Latvia. Has worked as a vice-rector and associate professor in universities, teacher in schools, planning specialist and economist in state and municipal institutions. Since 2009 Expert of Latvian Council of Science in Economics, since 2010 Fellow Member of RSA (Regional Studies Association), RSA Ambassador to Latvia. There are more than 60 scientific publications, more than 50 different projects since 1997, including international projects.

**INESE TRUSINA** (PhD student), Latvia University of Life Sciences and Technologies, Jelgava

THE RESEARCH IS SUPPORTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

## Edmunds Jansons. **EUROPEAN UNIVERSITIES AS DRIVERS OF INNOVATION IN THE EUROPEAN HIGHER EDUCATION AREA**

Over the past decade the European Commission has been increasingly vary of the need for closer integration within the European Higher Education System, whilst addressing the need for skills of the future and need for innovation environment to increase the competitiveness of the European Union worldwide. The increased pace of evolution of education technologies and approaches dictated by digital transformation opens up new means for further integration.

Moreover the European Commission cohesion policies aim to address the increasing welfare, innovation and size-of-economy gap between the Europe and other global economic powerhouses. The uncertainty of future needs in both the industry and the higher education system brings about new challenges in the form of labour market offer-demand inconsistency. Meanwhile the available digital communication and learning technologies along with teaching platforms, create the perfect conditions for establishment of digital innovation education embassies.

In 2017 during Gothenburg Summit, EU leaders outlined a vision for future of education and culture resulting in establishment of the European Universities Initiative with the drafted aim of helping to boost the excellence dimension of higher education, research and innovation. This flagship initiative materialised in establishment of 41 European universities consisting of bottom-up networks of universities across the EU which enable students to obtain a degree by combining studies in several EU countries and contribute to the international competitiveness of European universities'. The initiative opens up new opportunities for closer integration of European Higher education institutions to create a universal system driving innovation and jobs-creation to provide globally competitive education.

**Key words:** EHEA, European University, Future Education, Digital Transformation.

**EDMUNDS JANSONS.** Interim Head of Information Technologies Master's Studies Programme, Vidzeme University of Applied Sciences (2019-2022), Senior Expert, Ministry of Economics (2020-2021), Consultant, Parliament of Latvia Saeima (2018), Assistant Information System auditor, International Relations specialist, State Audit Office of the Republic of Latvia (2014-2018)

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

**Oksana Skorobogatova,  
Inna Stecenko.**

## **DIGITALIZATION OF LABOR RELATIONS: TENDENCES AND ACTORS**

The relevance of the study is dictated by the fact that: digitalization and the pandemic have accelerated the transformation of the labor market. People around the world will now lose their jobs not only because of the spread of new technologies, as previously predicted, but also because of the economic crisis, according to the Future of Jobs 2020 report recently published by the World Economic Forum. According to the report, by 2025, new technology will have destroyed 85 million jobs and created 97 million new ones in its place. But these new jobs will appear much slower than previously expected, and old jobs will start to disappear faster. The aim of the research: to identify the key actors capable of influencing the modern Latvian labor market. The modern labor market is a balance of actors, and the number of actors is constantly increasing. In the framework of the research the authors set a task to determine the most important actors for the modern Latvian labor market. A comparative analysis of the goals of the main actors in the Latvian labor market can conclude that it is the coherence between the interests and actions of these groups that will determine the trajectory of the Latvian labor market evolution.

**Key words:** digitalization, labor market, transformation, key actors, evolution.



**OKSANA SKOROBOGATOVA.** Current position – Lecturer of the Faculty of Transport and Management, Vice-Dean of the Faculty of Transport and Management. Experience – more than 10 years of academic and research experience. Research fields/domains – digital economy, marketing activities, personnel management



**INNA STECENKO.** Current position – Professor of the Faculty of Transport and Management, Dean of the Faculty of Transport and Management. Experience – more than 30 years of academic and research experience. Research fields/domains – region, ecological audits, transport, digitalization

THE RESEARCH IS SUPPORTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

## Ilze Brante, Biruta Sloka. **WORK-BASED LEARNING AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION**

Results of academic research in many countries has confirmed that there are innovative approaches and different policy solutions for income inequalities reduction using also work-based learning when several groups of inhabitants are involved in work-based learning gaining several advantages: getting modern and competitive vocational education being involved in real production situation and getting offers for professional work. Countries with big share of youth unemployment have introduced dual education or in some countries work-based education where big part of the vocational education is realized in real companies involving entrepreneurs. Aim of this research is to develop practical recommendations for income inequalities reduction taking into account tendencies of development of work-based learning development in Latvia and good experience in other countries in the EU countries. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of time series on development of work-based learning and expert views analysis of sustainability of work-based learning taking into account involvement of vocational education establishments in life-long learning with their experience in realization of work-based learning in Latvia and comparisons with other countries. Research results indicate that Latvia has reached good results in work-based learning and can this experience expand for life-long learning.

**Key words:** income inequalities reduction; work-based learning; entrepreneurs involvement; vocational education; vocational education students.



**ILZE BRANTE**, Mg. paed., research assistant at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research program, is participating in realization of international research project, research interests are related to development of different innovative solutions of work-based learning in Latvia, income inequalities reduction.



**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"



**Rita Vanaga, Biruta Sloka.**

## **TENDENCIES OF DEVELOPMENT OF INCOME INEQUALITIES AND POSSIBLE INCOME INEQUALITIES REDUTION OPTIONS**

Results of academic research in many countries has confirmed that there are innovative approaches and different policy solutions for income inequalities reduction. Countries with big share of elderly inhabitants are paying special attention to innovative approaches in income inequalities reduction especially of participants in silver economy and using findings of developed countries. Aim of this research is to develop practical recommendations for income inequalities reduction taking into account tendencies of development of income development in Latvia and good experience in other countries, as well as assessing the pillars of transnational cooperation and taking into account differences at national regional level. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of time series on development of income tendencies in Latvia and comparisons with other EU countries, analysis of EU-SILC data related to income in different groups: by statistical regions in Latvia, by household size and by territories (urban and rural), by access to housing for households. Research results indicate that Latvia has to do a lot in reduction of income inequalities especially in bigger households and in rural areas as many other developed countries have reached much better results in income inequalities reduction and the availability of housing.

**Key words:** income inequalities reduction; GINI coefficient; silver economy; regional differences in income; EU-SILC.

**RITA VANAGA**, Mg. oec., Mg. sc. admin., Mg. sc. math., researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research program, teaches several courses related to finance and accounting, research interests are related to importance financing of finance regulator, income inequalities reduction.

**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

## Kristine Casno, Biruta Sloka. **SOCIAL ENTERPRISES AS A TOOL FOR POSSIBLE INCOME INEQUALITIES REDUCTION**

Results of academic research in many countries have confirmed that there are innovative approaches and different policy solutions for reduction of income inequalities by the means of social entrepreneurship. When several groups of inhabitants are involved in social entrepreneurship initiatives, they receive, among others, the following advantages: personal satisfaction from meaningful work opportunities that contribute to the welfare of the society and fair pay, which means that they require less social support from public funds. Countries with a large share of elderly inhabitants and inhabitants with special needs are paying special attention to innovative approaches in income inequalities reduction and using findings of the more developed countries. The aim of this research is to develop practical recommendations for income inequalities reduction taking into account the tendencies of development of social entrepreneurship in Latvia and best practice cases from other countries around the globe, not only EU countries. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of time series on development of social entrepreneurship and expert views analysis of sustainability of social enterprises taking into account lack of skills in marketing including digital marketing in Latvia and comparisons with other countries. Research results indicate that Latvia has yet a long road ahead to achieve more prominent influence of social entrepreneurship in reduction of income inequalities, especially for some groups of the population.

**Key words:** income inequalities reduction; social entrepreneurship; silver economy; regional differences in social entrepreneurship; social enterprise.



**KRISTINE CASNO**, Mg. sc. admin., research assistant at the University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research program, is currently participating in realization of an international research project, research interests are related to development of social entrepreneurship in Latvia, income inequalities reduction.



**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.

THE RESEARCH IS SUPPORTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

**Zaiga Ozolina,  
Biruta Sloka.**

## **NEW PRODUCT PRODUCTION AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION**

Results of academic research in many countries has confirmed that there are innovative approaches and different policy solutions for income inequalities reduction using several new approaches in entrepreneurship development including blue mussel production in the Baltic Sea gaining several advantages: production of new innovative product for food and animal feed, cleaning of the sea water and getting less social support from public funds for producers. Countries with big share of elderly inhabitants and inhabitants living in areas with limited possibilities for employment are paying special attention to innovative approaches in income inequalities reduction and using findings of developed countries and developing entrepreneurship with several innovative approaches. Aim of this research is to develop practical recommendations for income inequalities reduction taking into account tendencies of development of new innovative products development in Latvia and good experience in other countries around the Baltic Sea. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of survey results in Baltic Sea region countries and comparisons with other countries. Research results indicate that Latvia has good possibilities for development of blue mussel production what could influence in reduction of income inequalities especially for some groups of the population living in costal areas of the Baltic sea.

**Key words:** income inequalities reduction; mussel production in the Baltic sea; silver economy; entrepreneurship development.



**ZAIGA OZOLINA**, Mg. sc. admin., research assistant at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research program, research interests are related to development of new products production in Latvia, income inequalities reduction.



**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

**Evija Dundure, Biruta Sloka.** **ROLE OF FINANCIAL LITERACY FOR CONTRIBUTION TO VOLUNTARY PENSIONS AS TOOL IN POSSIBLE INCOME INEQUALITIES REDUTION**

Results of academic research in many countries has confirmed that there are innovative approaches and different policy solutions for income inequalities reduction using also voluntary pension system and role of financial literacy in participation for voluntary pension contribution. Countries with big share of elderly inhabitants are paying special attention to innovative approaches in income inequalities reductions and contributions to person's income after active working life and using findings of developed countries already having successful voluntary pension contributions. Aim of this research is to develop practical recommendations for income inequalities reduction taking into account tendencies of development of voluntary pension system development in Latvia and role of financial literacy, good experience in other countries around the globe, not only EU countries. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of time series on development of voluntary pension contributions in Latvia and survey results on young persons financial literacy and comparisons with other countries. Research results indicate that Latvia has to do a lot for better development of voluntary pension savings influence in reduction of income inequalities.

**Key words:** voluntary pension savings; financial literacy; third pension level; income inequalities reduction.



**EVİJA DUNDURE**, Mg .oec., Mg. sc. admin., research assistant at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including project of national research program, research interests are related to financial literacy aspects and voluntary pension system development in Latvia, income inequalities reduction.



**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"



**Biruta Sloka, Ginta Tora,  
Ilze Buligina, Juris Dzelme.**

## **LIFE-LONG EDUCATION AS ONE OF THE MOST IMPORTANT ASPECTS IN REDUCTION OF INCOME INEQUALITIES**

Results of academic research in many countries has confirmed that life-long learning is one of the most important aspects to retain employees competitive and creative, especially in the rapid development of information technologies requiring new and updated skills in all fields of national economy. Practices in different countries show that older people are becoming more involved in the labor market, and that the mismatch between many years of education and being addressed, with particular emphasis on innovative approaches to lifelong learning to support the silver economy increasing skills requirements and using human resources as well as technical equipment of vocational schools. Vocational schools in Latvia were supported in infrastructure update and involvement in work-based learning. Aim of this research is to develop practical recommendations for life-long education update taking into account tendencies of developments of life-long learning in Latvia and good experience in other countries. Research methods applied: analysis of scientific findings reflected in scientific publications, analysis of policy documents, analysis of time series on involvement in life-long learning in Latvia and comparisons with other EU countries, analysis of Labour Force Survey data related to participation in education updated also after graduation of formal education. Research results indicate that Latvia has to invest much more to involve inhabitants in life-long learning, since many other developed countries have reached better results. Life-long education could be included in the system of social interactions between generations. The use of experience of seniors in the framework of silver economy and involvement of all generations in integral projects are effective tools to increase solidarity and to reduce the income inequality.

**Key words:** income inequalities reduction, life-long education, silver economy, vocational education infrastructure, skills.



**BIRUTA SLOKA**, Dr.oec. Professor at University of Latvia Faculty of Business, Management and Economics and leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, has delivered lectures also in other countries, was scientific supervisor of several doctoral students who have defended their doctoral dissertations, participates in European Statistical Advisory Committee (ESAC) of Eurostat, Statistics Council of Republic of Latvia, participates in activities of several professional organizations: Association of Latvia's Statisticians, Association of Econometrists of Latvia, Association of Higher Education Professors of Latvia, teaches several courses related to research methods and quantitative methods in decision making, research interests are related to importance of education including VET development, income inequalities reduction.



**GINTA TORA**, Mg. sc. admin., Mg. hist., researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, participates in activities of several professional organizations: research interests are related to importance of education including vocational education and training development, income inequalities reduction, social inclusion, several aspects of silver economy.



**ILZE BULIGINA**, Dr. sc. admin., researcher at University of Latvia Institute of Economics and Management, has participated in the implementation of several research projects, including projects of national research programs and international research projects. Participates in activities of several professional organizations and working groups in Latvia and internationally. Research interests are related to education policy and governance, including vocational education and training developments, income inequalities reduction, social inclusion, several aspects of silver economy, as well as adult education for competitiveness and labour market compliance.



**JURIS DZELME**, Dr. chem., leading researcher at University of Latvia Institute of Economics and Management Research, has participated in realization of several research projects including projects of national research programs, is participating in realization of international research projects, participates in activities of several professional organizations: research interests are related to importance of education including vocational education and training development, income inequalities reduction, social inclusion, several aspects of silver economy.

THE RESEARCH IS SUPPRTED BY NATIONAL RESEARCH PROGRAM "INTERFRAME-LV"

**Liva Grinevica, Veronika Bikse,  
Baiba Rivza, Peteris Rivza.**

## **THE FOURTH INDUSTRIAL REVOLUTIONS IMPACT ON THE DEVELOPMENT OF YOUNG PEOPLE'S SKILLS FOR EMPLOYABILITY**

The importance of this issue has increased nowadays because in the 21st century young generation will face with real consequences of the fourth industrial revolution: high demands on people's education, their professionalism and for all people to build up employability and digital competences/skills to be able to learn and implement new technologies. The aim of this research study is to perform an analysis of the consequences and the impact of the fourth industrial revolution on the development of employability skills and to identify the possible solutions to help overcome these challenges.

The research methodology: the monographic and descriptive methods, the Analytic Hierarchy Process (AHP) were used to analyze the possible development scenarios of young generations employability in the context of challenges of the fourth industrial revolution. The results of the AHP expert survey method show that close cooperation between educational institutions and entrepreneurs will promote the development of youth employability. To understand which competencies most are needed to successfully promote youth employability the authors have developed the framework with 21st century skills for youth employability support. This study expands and provides insights into the situation in Latvia on the impact of the fourth industrial revolution on the development of employability skills and is perform an analysis of the main possible solutions for successful development of employability skills in Latvia, that can be insured by investing in human capital and improving of business environment, the digital transformation of SMEs; modernization of education system and to promoting training and lifelong learning.

**Key words:** Analytic Hierarchy Process (AHP), fourth industrial revolution, framework, employability competencies/skills, sustainability.



**LIVA GRINEVICA** is Doctor of Economics. She is a senior expert in Latvian Council of Science and researcher in Latvian Academy of Agricultural and Forestry Sciences. Has experience as a researcher by participating in national and international research projects on topics such as the assessment of the diffusion and effects of youth inclusion policies, economic transformation, smart growth, governance, and legal framework for sustainable development of the state and society, youth employment perspective, etc.



**VERONIKA BIKSE** is Dr. oec., Professor emeritus at Latvian University, Leading researcher at Liepaja University, a member of the Department of Agrarian Economy of the Academy of Latvian Agriculture and Forest Sciences, and member of the Nordic Association of Agricultural Scientists. As well as expert of Latvian Ministry of education and science. She is the author of more than 27 scientific and text books (including some teaching aids) and 275 publications, including 112 scientific articles.



**BAIBA RIVZA** (Dr. habil. oec.). Professor works at the Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia. Full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences. Research interests are related to knowledge-based economy and smart growth in rural areas of Latvia and Baltic countries.



**PETERIS RIVZA** is the Doctor Habilitus of Engineering Sciences, professor, Latvia University of Life Sciences and Technologies, Faculty of Information Technologies, Expert in Multi-attribute decision making methods, including the Analytic Hierarchy Process (AHP). He has participated in several national and international level scientific projects related with socio-economic and regional development problems.

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**Inna Stecenko,  
Maftuna Bulyaeva.**

## **INCENTIVES AND DRIVERS OF UZBEK WOMAN PARTICIPATION IN DIGITAL BUSINESS ECONOMY**

The research on the topic is driven by the process of digitalization in workspaces and the role of women in it. In different countries changes from traditional to digital transformation of businesses have been adapted depending on many factors and participation of persons in ICT, STEM and other technological innovations become crucial one to succeed in career development. Thus, to analyze current situation about digital transformation among women in Uzbekistan, classify digital business opportunities and reveal incentives and drivers of females involvement in digital economy have been proposed by author to increase awareness and role of women in online space as an individual entrepreneurs. The aim of the study is to find correlation between several factors in tech sciences for women in order to reduce the future gap of gender roles in virtual labor market. To compare awareness and involvement of females in digital business transformation in Uzbekistan and Latvia by taking into account socio-cultural differences and common goals have been set as the tasks of the research. In the framework of the study the goals are supposed to be revealing of key indicators of active women position in digital economy transformation.

**Key words:** digitalization, women in ict, stem, entrepreneurship.



**INNA STECENKO.** Current position – Professor of the Faculty of Transport and Management, Dean of the Faculty of Transport and Management. Experience – more than 30 years of academic and research experience. Research fields/domains – region, ecological audits, transport, digitalization



**MAFTUNA BULYAEVA.** Current position – Advanced Mathematics Lecturer of the Riga Aeronavigational Institute, doctorate student. Experience – more than 8 years of academic and research experience. Research fields/domains – digital economy, mathematics, financial management

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**Zaiga Oborenko,  
Baiba Rivza,  
Marga Zivitere.**

## **THE IMPACT OF SOCIO-ECONOMIC FACTORS ON THE EMPLOYMENT OF PEOPLE WITH DISABILITIES**

The employment of people with disabilities is influenced by national and regional socio-economic development factors. In Latvia, there are large disproportions in the development of territories and significant differences in the labour market. In regions with higher economic development rates such as GDP per capita, number of economically active enterprises, with higher economic activity, higher employment rates and lower unemployment rates, people with disabilities have more employment opportunities. Employment of people with disabilities increases and unemployment decreases as a result of a favourable socio-economic factors. From 2010 to 2020, the share of employed persons from all adults with disabilities has increased from 20% to 27%, but the number of employed persons with disabilities of working age has increased from 30% to 46% (based on MoW data). It is more difficult for unemployed people with disabilities to enter the labour market than for other unemployment groups. The unemployment situation and the proportion of unemployed people with disabilities vary in Latvia's regions – in 2021 the average was 13.8%, in Riga – 8.2%, in Pieriga – 8.9 %, Kurzeme – 13.8%, in Latgale – 22.2%, Vidzeme – 14.2% and Zemgale – 11.3% of unemployed people with disabilities from the total number of unemployed (calculated according to SEA data). Latgale has the lowest level of economic activity and employment, while the highest unemployment rate with the highest proportion of unemployed people with disabilities. State-supported incentives for entrepreneurs and local governments in a regional context are needed to promote the employment of unemployed people with disabilities.

**Key words:** people with disabilities, employment, unemployment, regional differences.



**ZAIGA OBORENKO** has a PhD in economics and business. She is the scientific secretary of the Latvian Academy of Sciences, Division of Agriculture and Forestry, and Associate Professor at ISMA University of Applied Sciences. As a researcher, she has experience in national and international projects on topics related to the employment of people with disabilities and diversity management, the impact of employment of people of disabilities to economics, digital skills of people with disabilities, disability management in work place, vocational education etc.



**BAIBA RIVZA** (Dr. habil. oec.). Professor works at the Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia. Full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences. Research interests are related to knowledge-based economy and smart growth in rural areas of Latvia and Baltic countries.



**MARGA ZIVITERE** (Dr. oec.) is a State Emeritus Scientist, professor at ISMA University of Applied Sciences; chief researcher at the Centre for Entrepreneurship, Innovation and Regional Development (CEIRD) at Ventspils University of Applied Sciences.

Her main directions of research are: project management, human resources management, managerial economy. She is an author of approximate 200 scientific publications, research projects and methodological documents on higher education, innovation, employability, vocational counseling, etc.

**Anna Tatarinceva.**

## **LATVIA UNDER THE INFLUENCE OF THE COVID-19 PANDEMIC**

The author of the research investigates the influence of the Covid-19 pandemic on economy, education and human values in Latvia. The Covid-19 pandemic caused enormous damage for health, a lot of death and tragedies to a huge number of people, business and life not only in Latvia but throughout the world. In addition, significant damage was done to economy, science, education, culture, communication, feelings and human values. Limitations caused by the Covid-19 pandemic significantly deprived the opportunity to meet face to face, solve urgent important state problems. This pandemic crisis influenced on all various strata of population in societies as well. According to The UN Sustainable Development Goals Report (2022), there are the following evident negative effects of the Covid-19 influence:

- school closures kept 90 per cent of students worldwide, 1.57 billion out of schools;
- unemployment due to the Covid-19 hit about 1.6 billion workers - it is a half of the global workforce, their incomes decreased by 60 per cent;
- 71 million people would be pushed to extreme poverty, rising prices, hunger and limited social protection

**Key words:** capital, competitiveness, Covid-19, economy, influence, pandemic, values.



**ANNA TATRINCEVA** (Professor, Dr. Paed.) a scientific researcher, an international expert of scientific research, the organizer and participant of international scientific conferences, a scientific advisor of students' scientific works, the creator of more than 17 educational programs' and courses, Latvian Scientific Council's expert of social and educational sciences, the author of more than 250 significant scientific research and monographs published in the international scientific databases SCOPUS, SCIENCE INDEX, EBSCO, THOMSON REUTERS, WEB OF SCIENCE, OPENAIRE, WORLD CAT, the participant of international scientific projects such as ECEIN(Education for Citizenship and European Integration, LIFELONG LEARNING PROGRAMME - J.MONNET, LLP ERASMUS, "20 YEARS LATER", EFE (Education For The Future of Europe:Education and Culture), "The Arrangement And Conduct of Technical And Scientific Events Enhancing The International Recognition Of Scientists", and many others.

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**Uldis Plumite.**

## **ANALYSIS OF THE HIERARCHY OF LATVIAN AMUSEMENT PARKS**

The analysis of the hierarchy of Latvian amusement parks has not been studied. There are 14 amusement parks in Latvia, located near big cities and only a few of them belong to municipalities, the rest to private entrepreneurs.

The development of amusement parks is formed by multifunctional factors at both micro and macro levels, as the political, economic, regional, technological, international as well as geo-political aspects have a direct impact. In his work, the author will look at the basic factors for which the collection of survey data and expert opinions have been most important at both levels and are directly or indirectly related to the interaction.

The method of hierarchical analysis is suitable for assessing the development of the current situation and possible future directions of economic growth. The creation of the initial hierarchy involves the division of the researched problem into several sections. After filling in the hierarchy matrix, a priority vector is calculated for each of the elements of the hierarchy, which shows their significance in relation to the top-level criterion. All sections of the overall problem must be comparable. As a result of the research, the scenario promoting economic growth opportunities has been clarified, based on expert assessments, which gives an opportunity to determine the possible development scenarios of amusement parks from 3 to 5 years.

**Key words:** analysis of hierarchy, regional development, tourism, economics, economic of regional, amusement park.



**ULDIS PLUMITE** (PhD student). Master of Science in Finance of the Latvian University of Agriculture

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**Baiba Rivza, Biruta Sloka,  
Dace Stefenberga.**

## **OPPORTUNITIES OF KURZEME REGION DEVELOPMENT IN CONTEXT OF INNOVATION**

Over the last few years innovations have been shifting from the human perspective to the big data-driven machine-learning, going further, companies will need to reorganise the internal innovation culture, by drawing on machine-learning opportunities and using it in the process of data application, nevertheless there should be taken into account also human resource development. Because human capital is the one who inspires innovation through process of changes. Business is seen not only as a way of gaining individual benefit and profit, but also as an instrument of sustainability in the context of global challenges, because the high level of innovation in business contributes to an important domino effect across the economy. Research question: what factors are important for innovation and sustainable development of region. Research methods: scientific publication and previous conducted research results analysis. Methods used for survey data analysis: quantitative research methods – surveys, by using SPSS to process the results.

**Key words:** Innovations: Regional development; Entrepreneurship environment.



**BAIBA RIVZA**, Dr.habil.oec., professor works at the Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development, Latvia, Full member of Latvian Academy of Sciences, Latvia Further education and mobility in Norwegian University Life Sciences, Swedish University of Agricultural Sciences. Research interests are related to knowledge-based economy and smart growth in rural areas of Latvia and Baltic countries.



**BIRUTA SLOKA**, Dr.oec. professor works at the University of Latvia, Department of Management Sciences and Research Institute of Economics and Management at the University of Latvia. Research interests are related to quantitative analysis of different processes including civic and political engagement and use of the digital environment for educational and informative purposes.



**DACE STEFENBERGA**, PhD, lecturer and reseracher works at the Ventspils University of Applied Science, Faculty of Economics and Management, and project INTERFRAME at Latvian Academy of Science. Research interests are related to innovation and eeconomic development of regions.

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## **Daina Vasilevska. INTERACTION OF BUSINESS, EDUCATION AND SCIENCES IN INNOVATIVE PROCESSES: CASE OF LATVIA**

The development of an innovative environment implies significant changes in the system of higher education, which are aimed at improving the quality of educational services, the formation of practical and research competencies of specialists capable of creating innovative products. The strategic documents for the innovative development of Latvia form the basic preconditions for the practical implementation of cooperation between education, science and business. The implementation of these plans is impossible without providing high quality professional training for specialists of a qualitatively new level who are able to successfully implement the strategy of national and regional development; overcome the consequences of the economic crisis. The main problems of the chain "education - science - business - society", and the whole process of their interaction:

- low awareness of business about the achievements of scientists and their potential for solving strategic problems;
- lack of an information base on existing scientific and technical problems at enterprises in the field of infrastructure business support, in the social sphere of a particular city (region);
- lack of organizational and economic mechanisms of interaction in the considered chain;
- lack of funding for the implementation of innovative projects at various levels;
- the imperfection of the legal framework for the protection of intellectual property and the transfer of knowledge.

Science and business are the leading components of the innovation system, directly involved in the process of production and commercialization of innovations and knowledge, which makes it possible to use the intellectual resource as a factor in the economic development of business.

**Key words:** development, innovative economy, science, business, higher education.



**DAINA VASILEVSKA** (Dr. sc. assoc. prof.), author of more than 50 scientific articles, monographs, textbooks for university students and popular science articles. Since 2019, Vice-Rector for Science and Academic Affairs of Turība University, Member of Permanent Promotion Council in Economics and Entrepreneurship of Turība University. Professional activities: accreditation expert at the Higher Education Quality Assurance Agency in Latvia; Latvian Council of Science, expert in the field of Education, Management and Economy; Areas of Interest or Expertise: Education Management, Quality management, Bioeconomic, Regional Development, Innovation and Sustainable Development. She is a member of the editorial board of journals, including SWS Social Sciences & Art Reviewer.

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**Andra Zvirbule,  
Gunta Grinberga-Zalite.**

## **'ZERO WASTE AND CIRCULAR ECONOMY PRINCIPLES' ADAPTATION IN THE TEACHING PROGRAMMES**

Circular economy has become one of the mainstream concepts to deal with environmental issues. A circular economy seems to integrate the idea of justice in the utilization of resources among generations, which is understood in the concept of sustainable development. In this perspective, adoption of circular economy principles serves as an important driver of more sustainable business practices and thus requires new knowledge and skills for business managers. Despite the significance of the circular economy thinking among businesses across diverse industries, there is a gap in existing literature regarding the types of skills necessary for adoption of circular principles and application of zero-waste approach. Based on our research results, we identified specific types of knowledge and skills needed for adoption of circular economy principles, which will help to seize the opportunities to integrate circular economy systems into business strategy to pursue ecological-related activities aimed at achieving resource efficiency and waste elimination or reduction. The identified types of skills and knowledge necessary for implementation of zero-waste approach comply with environmentally-driven performance targets related to the systematic minimization of the toxicity and volume of waste and materials, decrease in energy consumption and thus can make businesses more environmentally friendly.

**Key words:** zero waste, skills and knowledge, circular economy.



**ANDRA ZVIRBULE** (Dr. oec, professor) is the Dean of the Faculty of Economics and Social Development at Latvia University of Life Sciences and Technologies. Her research interests are Regional and Rural Business Development, Urban Agriculture, Management Systems. She is a project leader in many International and National projects: Central Baltic Interreg projects; National Research Program Projects and EU-funded projects.



**GUNTA GRINBERGA-ZALITE** is a Professor of Marketing at Latvia University of Life Sciences and Technologies and a freelance writer, consultant and trainer of different marketing courses – Global Marketing, Social Marketing, Globalisation of Business, and Service Marketing. She has participated in several national and international level scientific projects related with socio-economic and regional development problems.

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**Andra Zvirbule,  
Madara Dobele.**

## **CLASSIFICATION OF THE FACTORS AFFECTING URBAN AND PERI-URBAN AGRICULTURE**

**Abstract:** Urban agriculture could primarily play an economic role: employment, income generation and less expenditure on food, yet in the areas where urban agriculture is not economically motivated, it could be more focused on environmental aspects and the social dimension. A number of research studies and strategic policy documents highlight the role of urban agriculture not only in theoretical but also in practical terms – in building a community, interest education and popularising "green" lifestyles. Urban agricultural activity could be differently motivated and have different scope and objectives, yet its territorial dimension is the most important one. Urban agriculture is generally defined as the cultivation of crops of different kinds in the urban environment. However, it is the territorial aspect that varies across the relevant literature and research studies, and the diversification and implementation of urban agriculture is fundamentally dependent not only on whether peri-urban agriculture is also considered to be urban agriculture but also on its role in sustainable urban development. An analysis of the factors summarised reveals that urban and peri-urban agriculture could be based on economic and social factors. In addition, an in-depth analysis of the significance of each of the factors in the context of the area under investigation could be carried out in the future. However, one can conclude that the factors examined considerably differ from those specific to conventional agricultural practice and, at the same time, require a new approach to business processes

**Key words:** urban agriculture, peri-urban agriculture, economics factors, social factors.



**ANDRA ZVIRBULE** (Dr. oec, professor) is the Dean of the Faculty of Economics and Social Development at Latvia University of Life Sciences and Technologies. Her research interests are Regional and Rural Business Development, Urban Agriculture, Management Systems. She is a project leader in many International and National projects: Central Baltic Interreg projects; National Research Program Projects and EU-funded projects.



**MADARA DOBELE** is a lecturer and PhD student at Latvia University of Life Sciences and Technologies. Her research interests are Urban Agriculture, Zero Waste principles and Management Systems.

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## **Eduards Lielpeters. FOSTERING CITIZEN PARTICIPATION IN THE DECISION-MAKING PROCESS OF PUBLIC ADMINISTRATION IN LATVIA**

In Latvia rates of citizen participation in elections are gradually decreasing, a small percentage of citizens are members of non-governmental organisations or political parties, and a small part of society is directly engaged in the decision-making process of public administration. The situation when most citizens are not actively participating in the decision-making process becomes a problem if decisions made by institutions are not accepted by citizens and citizens do not trust public administration in general. This problem exists also in Latvia, thus, there is a necessity to foster citizen participation. That can be done by actively promoting current participation opportunities or by developing new methods that can engage a larger part of society. To evaluate digital participation opportunities in Latvia, the current situation is analysed by content analysis of the Latvian ministries' social media pages (3181 entries from 6 months period). Citizen attitude toward digital participation is gathered by a survey to citizens who are already participating in the decision-making process (314 responses from representatives of the non-governmental, private and public sectors). To determine public administration's opinion and habits in the use of the digital environment a survey to representatives of Latvian institutions is conducted, representing 55 respondents from ministries, Parliament, Cross-Sectoral Coordination Centre and several other institutions. Considering the results of the research a methodology for fostering digital participation is developed. Implementation of the methodology would strengthen relations between public administration and citizens in Latvia and increase citizen participation in the decision-making process in a modern and citizen-centric manner.

**Key words:** Citizen participation, Decision-making process, Digital democracy, Public administration, Social media.



**EDUARDS LIELPETERS** obtained PhD in Economics and Business at the University of Latvia, Faculty of Business, Management and Economics in December 2021. The title of his doctoral thesis was "Opportunities and Limitations of Digital Democracy in Latvia". His scientific interests are citizen participation, digital democracy methods and digital development of the public and private sectors.

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THE CRISIS AS AN INCENTIVE  
FOR CHANGE:  
Human being. Nature. Entrepreneurship

## SECTION II

### ENERGY & GREEN ECONOMY

**Moderators:** prof., Dr. habil. sc. ing. **Namejs Zeltins**, prof., Dr. oec. **Irina Pilvere**

**Andris Sternbergs.**

#### **ENERGY AND SUSTAINABILITY: PROGRESS IN RENEWABLES AND ADVANCED "GREEN" NUCLEAR ENERGETICS**

With a focus on the transition to a zero-carbon economy, the energy crisis needs and energy independence issues to be addressed. As industry demands remain and even increase, the irregular nature of renewable energy has become a major problem. In this regard "green" nuclear energy as a long-term solution for baseload capacity is proposed as a complementary low-carbon renewable energy source. It is important that the development energy package in any country is based on the facts accumulated in the knowledge and experience.

**Key words:** zero-carbon economy, low-carbon renewable energy sources, nuclear energy.



**ANDRIS STERNBERGS** (Dr. Habil. Phys.). Graduated from the University of Latvia (Faculty of Physics and Mathematics), 1970. Worked at the Faculty of Physics and Mathematics of the University of Latvia - until 1975. Further at the Institute of Solid State Physics, University of Latvia (ISSP UL) since 1975; Director of ISSP UL 1999 –2016; Deputy Director for research of the Institute of Solid State Physics, University of Latvia, since 2016. Guest scientist (2-6 months) at the Atomic Institute of Austrian Universities, Vienna; at Siemens AG, Munich, Germany; at Shonan Institute of Technology and Kyoto University, Japan. Full member of Latvian Academy of Science; Vice-President of Latvian Academy of Science since 2021.



**Maris Balodis.**

## **DIRECTOR OF RESEARCH AND DEVELOPMENT, LATVENERGO AS**

There are correlations among living standard, electricity consumption per capita and some other economic indexes. Latvia gradually is moving on the average parameters of Europe Union, e.g., the electricity consumption per capita is increasing. However, in majority of European countries electricity composes more in the total energy balance.

One can expect significant RES development in the Baltic States. This trend, together with the enormous changes of natural gas markets, will create substantial readjustment of power markets in coming years. The future energy industry will integrate electricity accumulation solutions, flexible balancing capacity, as well as specific demand side management and other settlements. The potential of nuclear energy implementation in the future must be assessed in Latvia. Issues of more efficient use of natural gas resources will become even more important. In order to achieve the ambition objectives, it is important to educate and enlighten the policy makers, industry leaders and other stakeholders on the trends and optimal solutions of the future carbonless energy.

**Key words:** electricity; demand and supply, market changes; balancing capacity.



**MARIS BALODIS** is responsible for the planning of long-term technical development, pre-feasibility studies for investment projects in generation, research of electricity markets, preparing prognoses, research of new technologies, innovation. He has extensive experience in strategic research, financial planning and control, preparation and evaluation of investment projects in the power sector. Currently, Maris Balodis is a board member of the Latvian Association of Power Engineers and Energy Constructors, a member of the Electrification & Sustainability Committee of EURELECTRIC and responsible for cooperation with VGB PowerTech. Maris Balodis graduated from Riga Technical University. He obtained the Doctor of Economic Science.

**Uldis Bariss.**

## **ASSESSMENT OF CAPABILITY OF NATURAL GAS SYSTEM IN BALTICS TO PLAY A TRANSITIONAL ROLE IN RAPID DEPLOYMENT OF WIND AND SOLAR ELECTRICITY GENERATION BASED ON COMPARATIVE ANALYSIS**

The aim of the study is to assess a capability of natural gas sector in Baltic countries after stoppage of gas deliveries from Russian Federation not only to meet current demand but also to act in future as a transitional fuel for balancing of expansion of wind and solar electricity generation.

A comparative analysis is used as methodological approach selecting similar country based on the following criteria of electricity market – high renewable penetration, similar interconnections with bordering countries, developed gas market, similar market rules and participation in EU ETS. Based on the analysis Denmark is selected as a benchmark for the assessment purposes.

First, there was evaluated natural gas system in Baltics based on new circumstances assuming that officially announced infrastructure development will be carried out. The second, based on comparison with Denmark's generation data the potential future balancing demand was assess assuming the similar renewable penetration would be reached: 100% of peak demand and 45% of annual consumption that excludes existing hydrogeneration. The analysis conformed that the natural gas system can be a supplier of the balancing energy during transition period; however, this analysis focuses only on energy balancing of daily to seasonal variations. The electricity system should be in balance and robust to disturbances on national and local scale all times that requires much broader range of technical solutions to facilitate high levels of non-dispatchable generation.

**Key words:** Electricity, Natural gas, Renewable energy, Electricity market.



**ULDIS BARISS** joined Conexus Baltic Grid as CEO in 2020. Conexus is a unified natural gas transmission and storage operator in Latvia. Before he has 18 years of professional experience in the electricity utility business including working as the Chief Commercial Officer and the Member of the Management Board of AS "Latvenergo". Uldis Bariss earned degree of Doctor of Science in Engineering, Environmental Science from Riga Technical university, holds MBA from Stockholm School of Economics in Riga and MSc in Economics from University of Latvia. He is a part time leading researcher at the Faculty of Electrical and Environmental Engineering at RTU and author of more than 20 scientific publications. Main areas of his scientific research are electricity, gas markets and energy efficiency.

**Karlis Baltputnis,  
Zane Broka.**

## **BALTIC POWER SYSTEM AND ELECTRICITY MARKET EVOLUTION: CHALLENGES AND SOLUTIONS**

During the last decades, the evolution of power systems in Europe has been primarily driven by decarbonisation. The recent energy crisis has added additional challenges, raising concerns about the electricity market design and the viability of the current energy generation mix. However, for the Baltic states there is a further increased complexity related to the power system security, stability and reliability as the system is being prepared for synchronisation with the Continental European grid.

The synchronisation project will enable further integration of the Baltic power system in the European electricity market, but it also brings forth a requirement for new market types and products for system balancing to be provided locally, as for now these are being procured from the Russian power system. Moreover, the foreseen synchronisation approach mandates the Baltic power system to be able to also withstand operation in an isolated mode in case the synchronous connection line fails.

Therefore, we overview the techno-economic challenges faced by the Baltic electricity sector in light of pursuing its two main development goals – climate change mitigation through decarbonisation and energy independence reinforcement through the synchronisation project. We outline the measures planned by the power system operators to tackle these challenges. Additionally, we provide insights into the value of interfacing the industry with research institutions while addressing these major issues, also providing some specific examples of innovative solutions arising from such collaborations. Finally, we take a brief look into the ongoing energy crisis-driven debate on potential electricity market reforms in Europe.

**Key words:** electricity market, decarbonisation, power system, renewable energy, synchronisation.



**KARLIS BALTPUTNIS** (PhD) is a senior researcher at RTU Institute of Power Engineering. His research interests include energy storage, renewable energy integration, power production scheduling optimization, demand response and electricity market issues. Currently he is the principal investigator of the Latvian Council of Science project "Multi-functional modelling tool for the significantly altering future electricity markets and their development (SignAture)".



**ZANE BROKA** (PhD) is a senior researcher at RTU Institute of Power Engineering. Her research interests include demand response, aggregation, prosumerism, power system balancing and flexibility modelling. Currently she participates in several international and national projects, including the H2020 project "Sun Coupled Innovative Heat Pumps (SunHorizon)". Additionally, she is an external expert evaluator for the EC Horizon Europe research and innovation programme.

**Olga Bogdanova.**

## **IMPORTANCE OF WELL-BALANCED ENERGY TRILEMMA FOR SMART ENERGY POLICY**

Smart energy policy planning calls for a clearly dedicated aim reflecting a well-balanced targets of energy trilemma dimensions: sustainability, security, and affordability. Each country has its specific economic and political context predefining aspects of a particular attention for corrective policy measures. World Energy Council assesses a relative effectiveness of energy trilemma indicators of 127 world countries. Taking this methodology as a basis, there is a high potential for enriching it with country distinct factors. Relegation of "sleeping" factors having potentially high impact carries a risk of biased assessment of the reality. In 2022, due to geopolitical escalation the European Union realizes an extraordinary risk of energy deficit. This fact lights up underestimation of the importance of security factors in the trilemma methodology swinging the positions of other dimensions and bringing the total system to crisis. Due to trilemma disbalance, as a response to the gas supply disruptions Europe faces record high energy prices. Furthermore, several countries take a decision of reverting back to coal-fired powerplants pausing the sustainability progress. Another example could be a set of lifecycle sustainability components of renewable energy generation – in case the utilization of equipment and batteries is not reflected in the sustainable policy strategy, challenges of additional costs are to dive out at a later stage. The research demonstrates the crucial importance of comprehensive identification of the relevant to energy trilemma factors, as well as highlights the potential for adjustments of the WEC methodology to the national needs.

**Key words:** Energy Trilemma, security, sustainability, affordability.



**OLGA BOGDANOVA** is a Deputy Chair of the Supervisory board of the Power Transmission System operator of Latvia AS "Augstsprieguma tīkls". Director of Tax Administration and Society Interests Policy department at the Ministry of Finance of the Republic of Latvia; previously – Director of Energy Market and Infrastructure Department, Acting Deputy State Secretary for Energy at the Ministry of Economics. 15+ years in the governmental sector. Associate Professor at the University of Latvia. Since 2017, an expert of the Latvian Scientific Council in economics. Author of 3 scientific monographs. Member of the Studies Committee at the World energy Council, alumni of FEL-100 Program, and expert at the World Energy Council, Head of the Management Team of the Future Energy Leaders Latvia program. Siemens Excellence Award (2014) for the Doctoral Thesis "Latvia's Development Models in the Internal Market of the European Union".



**Leo Jansons,**  
**Ineta Geipele,**  
**Sanda Lapuke.**

## **THE EU ENERGY TRANSITION FOR GASEOUS FUELS: MAIN TRENDS OF EMERGING RISK MANAGEMENT STRATEGY**

A risk management strategy is a key part of the risk management lifecycle practically in every field of the national economy, including the energy sector. After identifying risks and assessing the likelihood of them happening, as well as the impact they could cause, a decision how to treat them is needed to be taken. An emerging concept of risk management in gaseous fuel diversification in the European Union (EU) in the period of the energy transition (2020s – 2050) is linked to several research trends, which include, but are not limited to: technological transformation, increasingly volatile global energy market situation, business environment changes, long-lasting dependency on high uncertainty geopolitical risk factors.

Sustainable risk management framework during vulnerable period of the EU energy transition is crucial in segment of gaseous fuels, as in mid-term period they will remain very important both for energy intensive industry and base load electricity generation. Disruption of gaseous fuel supply chains may challenge not only normal functioning of energy sector in many EU countries, but also interrupt corporate social responsibility frameworks as well.

Energy enterprises and system operators may find themselves in antilogous situation, where factors out of they reach would put an increasing stress on their daily operations and meeting the costs of these operations from one side, and maintaining stable, sustainable customer relations from the other. This aspect is very much applicable to all segment of energy sector, and it may rather likely form yet another risk management dimension in gaseous fuel diversification in the EU during its energy transition.

**Key words:** risk management strategy, energy transition, gaseous fuels, renewable gases, green hydrogen, diversification.



**INETA GEIPELE** (Professor, Dr. oec.) is an internationally recognized and respected expert of economics and management science. Over 10 years she is a professor, director of the Institute of Civil Construction and Real Estate Economics and head of the Department of Civil Construction and Real Estate Economics and Management at the Riga Technical University (RTU). Her current research interests include, but are not limited to: sustainable development of real estate market, construction industry, land use management and institutional economics.



**SANDA LAPUKE** (Dr. oec.) is the Leading Researcher at Civil Engineering and Real Estate Economics, Faculty of Engineering Economics and Management, Riga Technical University. She is an expert of the Latvian Science Council in economics and business, and political science, with working experience gained in both the private sector and public administration. Research interests are focused on real estate market sustainability development problems, household resource management, construction, including land use management and institutional economics. Sanda Lapuke is the author and co-author of more than 70 scientific publications, including several monographs.





**LEO JANSONS** is the Doctoral student at Institute of the Civil Engineering and Real Estate Economics, Faculty of Engineering Economics and Management, Riga Technical University. He is the author and co-author of more than 10 scientific publications in a fields of sustainable energy use, energy economics and role of gaseous fuels in the process of energy transition. His current research interests include, but are not limited to sustainable development of gaseous fuels sector during the EU energy transition, role of renewable gases in energy decarbonization, hydrogen and biomethane economy and risk management strategies

**Tatjana Odineca. METHODOLOGY FOR SELECTION OF PRIMARY ENERGY RESOURCES FOR ENERGY COMMUNITIES IN UNSTABLE ENERGY SUPPLY CONDITIONS**

According to the Renewable Energy Directive and the Electricity Market Directive, the development of energy communities in the EU should be widely supported, as for the community initiatives there are fewer organizational, planning, economic and other barriers than it would be in the large system. The needs, costs, and resources can be effectively shared among the community buildings.

In the case study, an existing Riga district with both residential, public, and technological buildings was analyzed to find the possibly cost-optimal, emission-neutral, secure, green, and overall effective balance of energy resources and technologies for the community energy supply.

Development of scenarios for the community (modeling based mainly on TRNSYS) includes: - analyzing the existing and future energy demand; - considering the potential for increasing the energy efficiency of existing buildings, thus reducing the energy demand; - Analyzing the existing energy system; - Simulating the scenarios for a new energy system with energy supply of separate buildings based on renewable energy production on-site, community supplying CHP plant with the smart grid, energy storage.

The methodology takes into account the contribution of different energy-efficient technologies using preferably local RES, as well as current legislation to check the possibility of achieving the nearly-zero energy target for the energy community on the basis of existing buildings.

**Key words:** energy community; energy efficiency; CHP; RES; nZEC.



**TATJANA ODINECA** has a master's Degree in Heat, Gas, and Water Technology. Since 2019 - Ph.D. student at the Building Faculty/Institute of Heat, Gas and Water Technology/Riga Technical University/Latvia. Positions: Researcher at Riga Technical University/Institute of Heat, Gas, and Water Technology (since 2022); Senior Office Manager at Riga Technical University Study Department (since 2012); Scientific Assistant at Riga Technical University, Energy Institute (2019-2021). Projects: Deployment of Smart Renewable Energy Communities, ID 108183 (2022); Trends, Challenges, and Solutions for Latvia's Natural Gas Infrastructure, VPP-EM-EE-2018/1-0003 (2019-2021), Innovative solutions and recommendations for increasing the acquisition of local and renewable energy resources in Latvia, VPP-EM-2018/AER\_3\_0004 (2019-2021).

Edgars Groza.

## ENERGY & GREEN ECONOMICS, RENEWABLE ENERGY ISSUES AND OPPORTUNITIES

The energy sector is in an unenviable situation amid geopolitical developments. Climate neutrality targets must be met without compromising energy security and availability. This includes diversifying energy sources to strengthen energy independence. In order to achieve the goals of climate neutrality, great attention is set to electrification and renewables. The transition is partially depreciated by the cleanest of fossil fuels – natural gas. At a time when European countries are saving gas, there are plans to bring previously decommissioned coal-fired power stations into operation, signaling that even faster RES development is needed. Although there is a clear upside in increasing the RES capacities in generation portfolios including lower operation and maintenance costs and replacing the fossils, several problems can be highlighted. For example increase in RES generation and the disconnection of existing synchronous generation capacities may lead to frequency maintaining problems because of no rotational inertia and stochastic nature of renewable resources. Excluding the technical issues, more attention is paid to other aspects of sustainability of the RES power plants – the life cycle of RES power plants including production and the end of life of the main components is a rising problem yet to face and resolve. These issues can be highlighted as a path to developing a climate-neutral energy sector on sustainable, competitive, cost-effective, safe, and market-based principles.

**Key words:** climate neutrality, diversified generation, RES life-cycle.



**EDGARS GROZA** has an experience in energy sector for more than 8 years in effort to shape the usage of energy. Started with design of distribution systems operators (DSO) network and optical network, continued with DSO planning, further focused on research and development in power engineering, implementing new innovative ideas in the field and finally becoming the Head of wind park development with focus on large wind expansion in Baltics. Participant of several international (WEC FEL-100", WEC Baltic, Eurelectric "Innovation and Digital", WindEurope, VGB GMBH " SF Wind) and national (Vēja enerģijas asociācija, LMC WEC National Future energy leaders, Innovation forum of Largest Latvian Companies) association workgroups and activities. Currently working on PhD in Electrical engineering. Professional and academic research has resulted in several publications and conference readings regarding renewable implementation, energy storage systems, microgrid solutions and sizing, electric machines and national trilemma index.

## **Dmitry Ulanov. INSTITUTIONAL FACTOR IN THE ENVIRONMENTAL DAMAGE ASSESSMENT METHODOLOGY**

The aim of the study is to develop a model of sustainable economic and social development, taking into account the institutional factor.

Using the scientific methodology of perspective reflection of reality and the method of system analysis, the author generalized the known models of sustainable development, including the Meadows-Forrester system dynamics method, the Massachusetts Institute of Technology model, etc.

As a basis, these models, within the framework of analysis and calculations, provide some possibilities for predicting the reaction of the environment to human activities and for assessing subsequent negative consequences.

At the same time, in the known models, the ecological problem of the environment does not take into account the social institutional factor, which cannot allow an objective assessment of the real situation.

This article presents a model that does not contain this drawback and provides a methodology, logistics and technology for applying the institutional factor.

In order to substantiate the quality of the proposed new model, the article presents algorithms that make it possible to numerically determine the effectiveness of the use of natural capital, taking into account the factor that is an integral part of the concept of sustainable world development.

As a result of the study, evidence was obtained that the existing models of sustainable development have a number of significant shortcomings and should include the most important social aspect. Under these conditions, the model proposed in the article will allow, from a scientific point of view, to more accurately predict and objectively solve not only environmental, but also economic and social problems.

**Key words:** institutional factor, ecology, economics, modeling, sustainable development.



**DMITRY ULANOV** (Dr. ing.) is a Senate President, docent – Riga Aeronautical institute, Docent of the study courses: Physics, Technical Mechanics, Traffic Management and Safety, Human and Environmental. Doctor of engineering – Riga Technical University. Conferences and seminars: Engineering and Transport Services-2014 RAI; Transportation systems, logistics and engineering – 2016RAI; Transport. Education. Logistics and engineering – 2018 RAI; 07/10/2020 – 08/10/2020 – Madrid Spain 3rd EBES Economics Society (EBES) 33 conference. 2020 – Modelling of technological processes in ecology;

## ABOUT THE INSTITUTE OF ECONOMICS OF THE LATVIAN ACADEMY OF SCIENCES

Institute of Economics of the Latvian Academy of Sciences (Latvijas Zinātņu akadēmijas Ekonomikas institūts – LZA EI) is registered in the Register of Scientific institutes of the Ministry for Education and Science of the Republic of Latvia as a scientific and research institute. The main activities of the Institute are oriented to studying economic problems significant for Latvia and the Baltic states, seeking and creating innovative and scientifically-based solutions, as well as elaborating recommendations related to development opportunities of economy.

At present, the Institute is one of the leading research centres for economy with wide partnership links in European and other countries of the World and being able to provide a research-based, competent opinion about ongoing processes in the economy of Latvia, Baltics and Europe, as well as to note the future progression.

### **The activities done by the Institute are the following:**

- creation of scientific research methods in social sciences;
- financial market analysis;
- scientific consultations on the development of research works, publications and dissertation theses;
- EU projects development and implementation;
- development of policy recommendations to policy-makers;
- round-table discussions and expert meetings organization;
- annual International Economic Forum organization.

### **Areas of studies of the Institute include:**

- investment attraction and entrepreneurship development;
- reduction of differences in the entrepreneurial environment for improving the investment climate;
- priority sectors of Latvian export;
- interaction of economics and culture to create knowledge-based society;
- opportunities for the development of tourism;
- regional development;
- social entrepreneurship;
- human resources development;
- gender equity in academia and research;
- study of the entrepreneurial environment in the Baltic States;
- increases in energy efficiency of different industrial processes;
- studies on national economic development, etc.

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### **Contact us:**

Phone No.: +371 20207092

E-mail address: ei@lza.lv

Web address: <https://www.eilza.lv>; <https://www.economicforum.lv>





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