IEEE

UKRAINE SECTION

Igor Sikorsky Kyiv Polytechnic Institute

2020 IEEE 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS

CONFERENCE PROGRAM

IEEE

May 12-14, 2020

http://ess.ieee.org.ua

ORGANIZERS AND PARTNERS

COMMITTEES

ORGANIZING COMMITTEE

Organizing committee general chairperson:

Prof. Serhii DENYSIUK	National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Ukraine

Honorary chairpersons:

Prof. Yuriy YAKYMENKO	Academician, First Vice Rector of Igor Sikorsky Kyiv Polytechnic Institute, IEEE Senior Member, Kyiv, Ukraine
Prof. Oleksandr KYRYLENKO	Academician of NAS of Ukraine, Director of The Institute of Electrodynamics, Ukraine

Technical Program Committee Chairpersons:

Prof. Janusz NIEZNAŃSKI	Gdańsk University of Technology, Poland
Prof. Henryk SOBCZUK	Polish Academy of Sciences Scientific Center in Kiev, Poland

Publication Chairperson:

Dr. Vasyl KOSTIUK	Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Finance Chairperson:

Dr. Oleg KOTSAR	Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

TECHNICAL PROGRAM COMMITTEE

Dr. Yuri ANOKHIN, SE «Ukrmetrteststandart», Ukraine

Prof. Algirdas BAŠKYS, Vilnius Gediminas Technical University, Lithuania

Prof. Carlos Alvarez BEL, Polytechnic University of Valencia, Spain

Prof. Hrzehorzh BENYSEK, University of Zielona Góra, Poland

Prof. Massimo BIANCHI, University of Bologna, Italy

Prof. Alexander BUTKEVYCH, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof.Oleksii CHORNYI, Kremenchuk Mykhailo Ostrohradskiy National University, Ukraine

Prof. Anthoni DMOWSKI, Warsaw University of Technology, Poland

Prof. Peter EKEL, Catholic University, Byelu Orizonti, Brazil

Prof. Mikhail GOROBETZ, Riga Technical University, Latvia

Prof. Svein Thore HAGEN, University of South-Eastern Norway, Norway

Prof. Stepan KUDRIA, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Prof. Volodymyr KULYK,Vinnytsia National Technical University, Ukraine

Prof. Nadezhda KUNICINA, Riga Technical University, Latvia

Prof. Oleksandr LAZURENKO, NTU "Kharkiv Polytechnic Institute", Kharkiv, Ukraine

Prof. Peter LEZHNYUK, Vinnitsa National Technical University, Ukraine

Prof. Irene LILL, Tallinn University of Technology, Estonia

Prof. Tommaso LUCCHINI, Politecnico di Milano, Italy

Prof. Mantas MARCIUKAITIS, Lithuanian Energy Institute, Lithuania

Prof. Morten Christian MELAAEN, University of South-Eastern Norway, Norway

Dr. Valerii MYKHALSKYI, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof. Heinz Joachim OPITZ, Energie Institute Hamm, Germany

Prof. Gennady PAVLOV, Mykolaiv National University of Shipbuilding, Ukraine

Dr. Vsevolod PAVLOVSKYI, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof. Serhii PERESADA, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Prof. Carlos PFEIFFER, University of South-Eastern Norway, Norway

Prof. Carlos Roldan PORTA, Polytechnic University of Valencia, Spain

Prof. Victor REZTSOV, Institute of Renewable Energy of NAS of Ukraine, Ukraine

Prof. Michael SEGEDA, National University «Lviv Polytechnic», Ukraine

Dr. Oleg SINCHUK, State Higher Educational Institution «Kryvyi Rih National University», Ukraine

Prof. Ievgen SOKOL, NTU "Kharkiv Polytechnic Institute", Kharkiv, Ukraine

Prof. Peter STAKHIV, National University «Lviv Polytechnic», Ukraine

Prof. Borys STOGNII, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof. Ryszard STRZELETSKI, Institute of Electrical Engineering, Poland

Prof. Victor SYCHENKO, Dnipro National University of railroad transport of academician Lazaryan, Ukraine

Dr. Yurii TUGAI, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Dr. Dmitry VINNIKOV, Tallinn University of Technology, Estonia

Prof. Igor VOLKOV, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof. Eugene VOLODARSKY, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Prof. Anatoly VOLOSHKO, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Prof. Stanislav VYPANASENKO, Dnipro National Mining University, Ukraine

Prof. Juliia YAMNENKO, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Prof. Alexander YANDULSKYI, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Dr. Oleg YURCHENKO, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Dr. Anatolii ZABOLOTNYI, Zaporizhia National Technical University, Ukraine

Prof. Michael ZAGIRNYAK, Mykhaylo Ostrogradski State University of Kremenchuk, Ukraine

Prof. Andrew ZHARKIN, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Prof. Valery ZHUIKOV, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

LOCAL ORGANIZING COMMITTEE

Local TPC Chairperson:

Prof. Volodymyr POPOV, Igor Sikorsky Kyiv Polytechnic Institute, Kyiv, Ukraine

Members:

Dr. Anatolii ZAMULKO, National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Ukraine

Dr. Igor BLINOV, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Dr. Vladislav KUCHANSKIY, Institute of Electrodynamics of NAS of Ukraine, Ukraine

Dr. Denys DEREVIANKO, National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Ukraine

Oleksandr ADANIKOV, National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Ukraine

Oleksandra ISHCHENKO, National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Ukraine

CONFERENCE STATISTICS

Submissions	**99**
Accepted	**82**
Acceptance rate	**0,83**

All sections will be available as a virtual conference 12-14 of May 2020 (http://ess.ieee.org.ua/virtual-conference).

Greetings from the Honorary Chairs to participants and guests of the 2020 IEEE 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS

Dear ladies and gentlemen!

We are pleased to welcome participants and guests of the 2020 IEEE 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS.

IEEE 7th International Conference "2020 IEEE ESS" is devoted to scientific, technical, and economic problems of a building Energy Smart Systems – Smart Grid, which plays an increasingly important role in improving energy efficiency across the country.

Conference "2020 IEEE Energy Smart Systems" is an international forum where academicians and industrial professionals will share new experiences and researches result in the area of construction and operation of Energy Smart Systems.

Countries around the world are united in transitioning to a future based on sustainable energy. The globally adopted 2030 Agenda for Sustainable Development and the Paris Agreement on climate change has provided us an ambitious framework to keep global warming within safe limits.

These global targets tell us what our energy systems need to look like in the future – low carbon, renewables-based, and high efficiency with universal access to all.

This global shift to low carbon and sustainable energy brings unprecedented opportunities.

First, the energy transition ushers in new infrastructure and technologies. Renewable energy and energy efficiency technologies are reliable, cost-effective, and make sense today.

Second, renewed energy policies and institutional frameworks will lay the foundations for a sustainable energy outlook.

Third, to enable countries to reposition themselves on energy transition, there is one element that we cannot overlook – successful cooperation. Working together in the energy transition is critical to achieving the Paris Agreement, as committed by countries at the UN Climate Action Summit last month.

The energy world is being transformed, new paradigms of its development are being formed. Here we want to note the formation of a number of global initiatives.

1. Sustainable Energy for All.

Sustainable Energy for All is the way of the future.

Ban Ki-moon, the UN Secretary-General, on 16 January 2012 (Abu Dhabi) noted, "We need to engineer a new energy future, a future that harnesses the power of technology and innovation in the service of people and our planet."

Sustainable Energy for All initiative calls for action on three complementary objectives, all to be achieved by 2030:

1) to provide universal access to sustainable energy.

2) to double the rate that energy efficiency is improved.

3) to double the percentage of renewables in the global energy mix.

2. Mission Innovation (MI)

Mission Innovation (MI) is a global initiative presently involving 23 countries and the European Union to dramatically accelerate global clean energy innovation. The power of innovation – driven by sustained public investment coupled with business leadership – can make clean energy widely affordable and bring fledgling ideas into the mainstream.

Mission Innovation was announced on November 30th, 2015, as world leaders came together in Paris to undertake ambitious efforts to combat climate change and it is organized in 8 Innovation Challenges. Innovation Challenges 1 is Smart Grids.

Innovation Challenges 1 on Smart Grids (IC1) aims to accelerate the development and demonstration of smart grid technologies in a variety of grid applications, including demonstrating the robust, efficient, and reliable operation of regional grids and distribution grids as well as microgrids in diverse geographic conditions, in order to facilitate the cost-effective uptake of renewable energy.

Globally, the electric grid is today at the threshold of a paradigm shift. The electric grid is being modernized with the overarching goals of Decarbonization, Decentralization, Digitalization, and Disintermediation. It is noteworthy to say that a transformation of the energy system is taking place in many countries across the world. This transformation features the surge of renewable energy share in many countries, and makes the energy system prone to a dramatic reduction in greenhouse gas (GHG) emissions, higher energy, and economic efficiency, fostering wider independence from fossil fuels.

Today, the global energy transformation is well underway, and the Smart Grid is central to it. Smart Grids can be described as an upgraded Energy System enabling two-way information and power exchange between suppliers and consumers, thanks to the pervasive incorporation of intelligent communication monitoring and management systems.

The Internet of Things (IoT) with the Internet of Services (IoS), coupled with the Smart Grid, is a very powerful combination. IoT has the capability of revolutionizing the core of the electrical grid infrastructure and transforming it into a truly smart one. In combination with the IoS and the IoT, new applications and services can be realized, effectively tackling older problems and providing innovative solutions.

New scientific developments in the field of Smart Grid will play out at national, regional, and local levels. We can bring new Energy Trends:

– Deployment of distributed generation and microgeneration;

– Adoption of connected technologies;

– Expansion of energy efficiency;

– Installation of utility-scale storage;

– Embracing new market participants;

– Harnessing big data and visibility;

– Development of local energy markets.

For example, a digital layer coordinates and distributes both energy and information in real-time, enabling myriad interactive products and services to be traded. The same convergence that has swept across industries, is now coming to energy. Digital platforms will be adopted for use in energy markets.

Changes to the way the grid operates will create the conditions for new and very different business models to emerge. Today's Power Market is centralized, predictable, vertically integrated, and one way. Tomorrow's Power Market will be distributed, intermittent, horizontally-networked, and bi-directional.

The conference will focus on these scientific, technical, market, and regulatory issues.

We hope it will offer excellent opportunities for participants from diverse backgrounds to communicate a wide range of outcomes to the world and generate international exchange that leads to new business and research.

We also hope for the fruitful work of our conference, deep scientific discussions, pleasant communication.

Honorary Chairs

Prof. Yuriy Yakymenko,

Academician of NAS of Ukraine, First Vice-Rector of National Technical University of Ukraine "Kyiv Polytechnic Institute", IEEE Senior Member, Kyiv, Ukraine

Prof. Oleksandr Kyrylenko,

Academician of NAS of Ukraine, Director of The Insitute of Electrodynamics, NAS of Ukraine, Kyiv, Ukraine

Welcome speech from the Organizing Committee General Chairperson to participants and guests of the 2020 IEEE 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS

Dear colleagues, friends!

Let me congratulate you on the start of the 2020 IEEE 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS!

For the second time, the INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS is held with the support of the world leader in scientific advances in the energy sector, namely the Institute of Electrical and Electronics Engineers or IEEE.

At the 7th INTERNATIONAL CONFERENCE ON ENERGY SMART SYSTEMS 82 reports from specialized agencies from Ukraine, Canada, Czechia, Egypt, India, Jordan, Latvia, Mexico, Moldova, Norway, Poland, Spain, United Arab Emirates, United Kingdomwill be presented.

For the past few years, smart grids have been the main topic of fervent research and development at both industrial and academic level. The Smart Grid is envisaged to be the next-generation energy grid for Smart Cities. It enables the smart integration of conventional power generation, renewable generation, distributed generation, energy storage, transmission, distribution, and demand management. The benefits of the Smart Grid include enhanced reliability and resilience, higher intelligence and optimized control, decentralized operation, higher operational efficiency, more efficient demand management, and better power quality.

The growth of a decentralized generation, liberalized markets, modern power electronics, and the introduction of advanced integrated circuit technologies are leading to a dramatic change in the management and operation of energy grids worldwide.

The main goal of the conference is to bring together researchers, scientists, and experts from universities, companies, institutions, communities, agencies, associations, and societies to provide them a unique platform for sharing ideas on the recent developments related to these subjects.

Main Conference topics:

– Smart Energy power and energy engineering;

– Renewable energy systems and distributed generation;

– Smart cities and buildings;

– Smart industrial applications and consumers;

– Policies, markets, and challenges.

At the 1st Conference “ENERGY SMART SYSTEMS” in 2010 in the picturesque Transcarpathia, we, in Ukraine, formulated guidelines for the implementation of the Smart Grid concept in Ukraine, focusing on the issues of sustainable energy development in detailing the provisions of the Smart Grid concept.

Today, our scientists are faced with the task of successfully working in the common European space. We need to combine our efforts to collaborate within the framework of the new European Union Research and Innovation Program 2014–2020 -

the Horizons 2020 program **(**Enabling next-generation of smart energy services valorising energy efficiency and flexibility at demand-side; ID: LC-SC3-B4E-14-2020).

Since 2014, the strategy of the European Union has been clear: we need to drive a clean, secure, and efficient energy transition to face climate and energy challenges. This strategy has been reinforced by the strong commitment of the European Union towards the signature of the landmark 2015 Paris Agreement. This is also why the Commission proposed in November 2016 an ambitious "Clean Energy for All Europeans" package.

A rapid and orderly transition towards a cleaner, more sustainable, and less carbon-intensive energy future requires us to look at a multifaceted challenge:

– Moving towards a low carbon energy sector;

– Maintaining and extending global industrial leadership;

– Creating a pan European integrated energy system.

– Mobilizing public and private sectors towards the same objectives to finance the changes.

In June 2018, the European Technology and Innovation Platform "Smart Networks for Energy Transition", ETIP SNET, released its Vision 2050 for the Energy system, a vision of "systems of systems", in which the conversion from power to gas, from heat to liquid and back to power will be seamless. In such a vision, the maximization of the use of all types of renewables will be possible, allowing to meet environmental challenges, bringing affordable energy to societies while ensuring the security of supply.

Vision 2050 by ETIP SNET: A low-carbon, secure, reliable, resilient, accessible, cost-efficient, and market-based pan-European integrated energy system supplying all of society and paving the way for a fully carbon-neutral circular economy by the year 2050, while maintaining and extending global industrial leadership in energy systems during the energy transition.

Reliability and resilience for pan-European, regional and local systems must be ensured by:

1) Integrated energy systems, with the electrical systems as the backbone, designed and operated to prevent or minimize the effects of contingencies, with local/regional black-start capabilities activated within a few minutes.

2) Risk (weather and other hazards) assessment and mitigation measures, considered in system planning and operation.

3) Seamless (strongly automated) operation through fully interoperable and networked sub-systems allowing the coupling of all energy carriers in an optimal, integrated way.

4) Peer-to-peer transactions integrated with centrally- and locally-controlled electricity networks, supported by automated local grids together with network operator actions.

Vision 2050 advances a more unified Europe based on a: low-carbon, secure, reliable, resilient, accessible, cost-efficient, and market-based pan-European integrated energy system supplying the whole economy and paving the way for a fully CO2-neutral and circular economy by the year 2050, while maintaining and extending global industrial leadership in energy systems during the energy transition.

At the beginning of the XXI century, there have been significant changes in the strategy of energy development in the world, which meet the requirements of sustainable development. Energy smart systems became a vector of energy policy in many countries.

Energy Smart Systems provide higher performance of the electricity grid, which improves the reliability and efficiency of the entire system by regulating consumption, monitoring and dynamic control of bidirectional energy flows in real- time. The use of smart energy technologies provides improved adaptation to the dynamic nature of the grid of pulsed distributed generation and non–traditional renewable energy sources.

Creation of Energy Smart Systems – is a modernization of the whole complex of the generation and delivery of electricity through improved management, protection, optimization of power systems elements in their relationship – from centralized and distributed generation, power transmission at high voltage, its distribution, automation systems to end-users. Energy Smart Systems provide the higher performance of the electricity grid, which improves the reliability and efficiency of the entire system by regulating consumption, monitoring and dynamic control of bidirectional energy flows in real-time. The use of smart energy technologies provides improved adaptation to the dynamic nature of the grid of pulsed distributed generation and non–traditional renewable energy sources.

The tremendous advances in information and communications technology (ICT), as well as the embedded systems, have been led to the emergence of the novel concept of the internet of things (IoT). Internet of things (IoT) refers to an informatics network that connects various objects and elements of a system to each other using advanced ICT and advanced embedded systems including digitalized sensors, meters, and controllers. Internet of energy (IoE) represents an upgrade of IoT which deals with the combination of ICT and energy ecosystem.

In the traditional electric grid, the ability to monitor power flows and control it in real-time is limited to high voltage networks that are equipped with automation systems. In the low voltage network, the power system operator has no visibility on who is consuming how much electricity when and where.

Smart Grid denotes an electricity supply network that uses digital communications technology to detect and react to local changes in usage.

The Smart Grid is the electric power system with advanced automation, control, information technology (IT) and operational technology (OT) systems that enables real-time monitoring and control of power flows from sources of generation to sources of consumption. Smart Grid solutions comprise a set of technologies to enable these functionalities and help manage electricity demand in a sustainable, reliable, and economic manner. Smart grids can provide consumers with real-time information on their energy use, support pricing that reflects changes in supply and demand, and enable smart appliances and devices to help consumers exercise choices in terms of energy usage.

The electricity system is in the midst of a transformation, as technology and innovation disrupt traditional models from generation to beyond the meter. Three trends, in particular, are converging to produce game-changing disruptions:

– Electrification of large sectors of the economy such as transport and heating;

– Decentralization, spurred by the sharp decrease in costs of distributed energy resources like distributed storage, distributed generation, demand flexibility, and energy efficiency;

– Digitalization of both the grid, with smart metering, smart sensors, automation, and other digital network technologies, and beyond the meter, with the advent of the IoT and a surge of power-consuming connected devices/

These three trends act in a virtuous cycle, enabling, amplifying, and reinforcing developments beyond their individual contributions.

In this regard, the 7th International Conference "Intelligent Energy Systems" is devoted to the scientific, technical, and economic problems of building energy-intensive systems – Smart Grid, which plays an increasing role in improving energy efficiency in each country. The presented materials of the conference deeply study and solve the problems associated with the transition from the traditional model of energy to a new innovation model, which will result in significant technological, economic, and social changes in the energy sector.

Dear colleagues,

On behalf of the Organizing Committee of our conference, I congratulate you once again and wish all of us a fruitful work.

Good luck in all your endeavors!

Organizing Committee
General Chairperson

Prof. Serhii Denysiuk,
National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», Kyiv, Ukraine

SECTION 1. SMART ENERGY POWER AND ENERGY ENGINEERING		
VIRTUAL SESSION		
Conference Virtual Stage #1 Section Chair: ***Petro LEZHNIUK***		
1	Serhii Bondarenko; Oleh Todorov; Olexii Bialobrzheskyi	Combined voltage control system of series single-phase filter-compensating device
2	Ivan Shapoval; Valerii Mykhalskyi; Mykhailo Artemenko; Vasyl Chopyk; Serhii Polishchuk	Compensation of Current Harmonics by means of Multiple Generation System with Doubly-Fed Induction Generators
3	J.A. Barrios-Gomez; F. Sanchez; Francisco Gonzalez-Longatt; Martha Acosta Montalvo	Framework for Real-Time Simulations of Hardware in the Loop applied to Primary Frequency Control
4	Ivan Stasiuk; Igor Khomenko	Investigation of the electromagnetic effect of asynchronous motor toothed harmonics on the operating mode of power supply systems
5	Oksana Dovgalyuk; Roman Bondarenko; Ivan Yakovenko; Eugene Dyakov; Yuriy Pryvalov	Power Transmission Mode 750 kV Optimization
6	Vladislav Kuchanskyy; Ievgen Zaitsev	Corona Discharge Power Losses Measurement Systems in High- and Extra-High Voltage Transmissions Lines
7	Olga Chernousenko; Tetyana Nikulenkova; Vitaliy Peshko; Anatolii Nikulenkov	Maintaining electricity production through a comprehensive approach to service life extension of steam turbines
8	Yevhen Kosariev; Andrii Antonov; Victor Sychenko; Vitalij Liashuk; Oleksiy Danylov; Nataliia Rudevich; Dmitry Belukhin; Vladimir Bozhko	Increased controllability of the distributed traction system in emergency mode
9	Martha Acosta Montalvo; Francisco Gonzalez-Longatt	Optimal settings of Fast Active Power Controllers: Nordic Case
10	Yurii Zaichenko; P Sergei eresada; Serhii Dymko	Selective estimation of three-phase mains current for shunt active power filter
11	Yevgeniy Trotsenko; Volodymyr Brzhezitsky; Vladislav Mykhailenko	Estimation of Discharge Current Sharing Between Surge Arresters with Different Protective Characteristics Connected in Parallel
12	Ryszard Strzelecki; Natalia Strzelecka	Single and Three -Phase PWM AC/AC Converters as Semiconductor Transformers
13	Vladislav Kuchanskyy; Denys Malakhatka; Ihor Blinov	Application FACTS for Increasing Efficiency of Bulk Electrical Power Systems
14	Madhusudhan Pandey; Bernt Lie; Thomas Øyvang	Parameters Optimization and Model Fitting of Thermal Models of Air-cooled Hydrogenerator
15	Ivan Golovan	Electromechanical Equipment for Integrated Use of Power Potential of Hydroelectric Power Plant Reservoirs
16	Mykola Pechenik; Sergey Buryan; Hanna Zemlianukhina; Mykola Pushkar	Investigation of the Hydraulic Pressure Stabilization Accuracy in the Conditions of Water Supply Cascade Pump System Operation
17	Olga Chernousenko; Vitaliy Peshko; Tetyana Nikulenkova; Dmitro Rindyuk	Extension of the Operating Time of High-speed Turbines of Nuclear Power Plants

18	Oleg Shutenko; Oleksii Kulyk; Serhii Ponomarenko	Informational and Analytical System for Diagnostics of the Electric Power Equipment Condition
19	Volodymyr Brzhezitsky; Yaroslav Haran; Andrii Derzhuk; Yevgeniy Trotsenko; Olexandr Protsenko	Amplitude-Frequency Characteristic of Broadband Voltage Divider with Ultimate Adjustment of Its Low-Voltage Arm

SECTION 2: RENEWABLE ENERGY SYSTEMS AND DISTRIBUTED GENERATION		
VIRTUAL SESSION		
Conference Virtual Stage #1 Section Chair: ***Vladimir POPOV***		
1	Navid Amiri; Seyyedmilad Ebrahimi; Juri Jatskevich	Efficient Modeling of Six-Phase Synchronous Machines for Simulations of Renewable Energy Generation Systems
2	Oleksander Burykin; Volodymyr Kulyk	Anticipatory Control of Transit Power Flows from The Renewable Energy Sources in Electric Power System
3	Vitalii Yanovych; Olena Rubanenko	Analysis instability generation of non-guaranteed power plants of renewable energy sources
4	Sergij Dudnikov	Analysis of the energy balance of the local energy supply system based on the bioenergy complex
5	Viktor Kaplun; Volodymyr Osypenko	Energy Efficiency Analyses in Polygeneration Microgrids with Renewable Sources
6	Vasyl Kostiuk; Mesbahi Abdessamad; Mykola Fedosenko	The Three-Point Probability Density Function Approximation of the Stochastic Parameter Applicable for Technical and Economic Modeling of Renewable Sources
7	Yuriy Varetsky; Volodymyr Konoval; Mykhajlo Seheda	Modeling Power Flow within a Microgrid for Energy Storage Sizing
8	Oleksandr Riabenko; Volodymyr Tymoshchuk; Dmytro Poplavskyi; Oksana Halych	Methods of Automated Full-scale Measurement of Wave Parameters in Water Reservoirs of Pumped Storage Power Plants
9	Serhiy Buryakovskiy; Artem Maslii; Danylo Pomazan; Vladyslav Panchenko; Liliia Overianova; Halyna Omelianenko	Multi-criteria quality evaluation of energy storage devices for rolling stock using Harrington's desirability function
10	Nataliia Suprunovska	Increasing Energy Efficiency of Charge Circuits of Supercapacitors from Voltage Source
11	Vyacheslav Komar; Petro Lezhniuk; Olena Rubanenko	Information Support for the Task of Estimation the Quality of Functioning of the Electricity Distribution Power Grids with Renewable Energy Source
12	Marina Rezinkina; Oleg Rezinkin; Igor Karpaliuk; Volodymyr Grabko	Control and Monitoring of Power Transmission Lines Condition over Wide Area with the Help of UAVs
13	Yara Hassan Moustafa; Amr Abou Ghazala; Nabil Abbasy	A Coordinated Recloser-Fusesaver Method for Reliability Enhancement of Distribution Networks
14	Vitalii Opryshko; Serhiy Denisyuk	Assessment of Electricity Consumption level Influence at System Lose

15	Vadim Tkachenko; Vladimir Popov; Mykola Fedosenko; Olena Yarmoliuk; Ivan Frolov	Optimal Distribution Networks Sectionalizing to Comply Smart Grid Concept
16	Vladislav Kuchanskyy; Sree Lakshmi Gundebommu; Olena Rubanenko; Iryna Hunko	Researching Approaches in the Simulation of Wind Power Plants with a PMSG

SECTION 3: SMART CITIES AND BUILDINGS		
VIRTUAL SESSION		
Conference Virtual Stage #2 Section Chair: ***Boris BASOK***		
1	Inna Bilous	Evaluation of differentiated impact of apartment building occupants' behavior on energy consumption
2	Inna Bilous	The Impact of Energy-Efficient Heating Modes on Human Body Exergy Consumption in Public Buildings
3	Michał Guzek; Konrad Świrski	Sizing energy storage for a wind farm powering partly independent housing estate
4	Serhii Denysiuk, Denys Derevianko	Optimisation features of energy processes in energy systems with Distributed Generation
5	Nickolai Bolotnyi; Volodymyr Lytvynchuk; Mykola Kaplin; Oleksii Karmazin	Implementation of General Under-frequency Load Shedding Scheme in European Network: challenges and opportunities
6	Vitaliy Kuznetsov; Valentina Molokanova; Mykola Tryputen; Vitaliy Petrenko; Viktor Artemchuk; Volodymyr Andriichuk	Implementation of Sustainable Urban Development Through Project Management
7	Boris Basok; Maryna Novitska; Ihor Bozhko; Victor Priemchenko; Myroslav Tkachenko	Smart Geothermal Ventilation System
8	Tetiana Kurbatova	Assessment of Electricity Generation Cost from Landfill Gas
9	Vladimir Burlaka; Sergey Gulakov; Svetlana Podnebennaya; Ekaterina Kudinova	Low-Cost Online Uninterruptible Power Supply with Input PFC and Wide Input Voltage Ran
10	Nikolay Grebchenko	Fault location method development at lines with trilateral feed
11	Denys Derevianko; Kateryna Hilevych	Reliability assessment in local power systems with renewables
12	Illia Diahovchenko	Optimal Composition of Alternative Energy Sources to Minimize Power losses and Maximize Profits in Distribution Power Network
13	Vadim Tkachenko; Vladimir Popov; Olena Yarmoliuk; Mykola Fedosenko; Andriy Zhuravlew	Optimal Placement and Sizing Sources of Distributed Generation Considering Information Uncertainty
14	Mykola Ostroverkhov; Danyl Trinchuk	Increasing the Efficiency of Electric Vehicle Drives with Supercapacitors in Power Supply
15	Vitalii Opryshko; Stefan Zaichenko; Stepan Shevchuk	Autonomous electric power source energy efficiency improvement by internal combustion engine gases distribution control

SECTION 4: SMART INDUSTRIAL APPLICATIONS AND CONSUMERS		
VIRTUAL SESSION		
A Conference Virtual Stage #2 Section Chair: ***Ryszard STRZELECKI***		
1	Mykola Antonov; Volodmyr Zinovkin; Iurii Krysan	Research of electromagnetic parameters of complex electromechanical system under hardly varying loads
2	Ihor Reva; Olexii Bialobrzheskyi; Oksana Usatiuk	Investigation of distribution a harmonic power in three phase transformer at idling mode
3	Oleksandr Plakhtii	Comprehensive Study of Cascade Multilevel Inverters with Three-Level Cells
4	Andrii Dymerets; Roman Yershov; Yuriy Denisov; Alexey Gorodny; Mykola Tryputen	Dynamic Characteristics of Zero-Current-Switching Quasi-Resonant Boost Converter under Variation of Resonant Circuit and Load Parameters
5	Sergei Peresada; Oleh Kiselychnyk; Dmytro Rodkin; Yevhen Nikonenko; Viktor Reshetnyk	Inductances determination of the interior permanent magnet synchronous motors considering saturation
6	Yevhen Monakhov; Mykola Ostroverkhov; Vadym Chumak	Robust control of hybrid excited synchronous machine
7	Mykola Pushkar; Nataliya Krasnoshapka; Mykola Pechenik; Sergey Buryan; Hanna Zemlianukhina	Approximation of Magnetizing Inductance Curve of Self-exited Induction Generator for Investigation of Steady-state Operation Modes
8	Maryna Antonova; Mykola Antonov	Mathematical Model of Electromechanical Compression System
9	Mykola Buryk; Mykola Ostroverkhov	Speed Control System of SPMSM Drives with Field weakening on Base the Concept of Inverse Problems of Dynamics
10	Vitaliy Kuznetsov; Viktor Khilov; Mykola Tryputen; Oleksiy Gorodny; Maksim Kovzel; Mykola Babyak	Effect of The Types of Drive Systems of Drilling Rigs on The Rock Breaking Dynamics
11	Denis Fedosha; Anatolii Zabolotnyi	Algorithm of Synthesizing Energy Effective Power Supply System of Industrial Enterprises
12	Victor Sychenko; Yevhen Kosariev; Oleksiy Danylov; Vitalij Liashuk; Petro Bekh; Tanya Drubetskaya	Asymmetric Power Supply Circuit Design for Electric Rolling Stock on the Electrified DC Rail
13	Oleg Sinchuk; Andrey Kupin ; Igor Sinchuk; Oleg Dozorenko; Roman Krasnopolsky	Algorithms Design for Fuzzy Controlling of Power Streams in Conditions of Underground Extraction of Iron Ore
14	Maksym Shcherba	Improving Wear Assessment Method of Inductor Thermal Insulation of Channel Furnaces for Ultra-Pure Copper Melting
15	Mykola Kozlenko; Ihor Lazarovych; Valerii Tkachuk; Vira Vialkova	JT65A Software Defined Demodulation using Convolutional Neural Network
16	Volodymyr Shymkovych; Veronika Niechkina	The Criterion for Determining the Buffering Time of the Measuring Channel for Smoothing the Variable Changes of the Sensor Signal

17	A. Yu. Pogosov; V.V. Levchenko; Yu. M. Bikovsky	Considering the Application of Wavelet Transform in Experiments Studying the Vibration Effect on the Operation of Digital Temperature Sensors in Intelligent Software at NPP
18	Maksym Shcherba	Mathematical Modeling of Electric Current Distribution in Water Trees Branches in XLPE Power Cables Insulation

SECTION 5: POLICIES, MARKETS AND CHALLENGES		
VIRTUAL SESSION		
Conference Virtual Stage #2 Section Chair: *Igor BLINOV*		
1	Sergii Saukh; Andriy Borysenko	Simulation model of new electricity market in Ukraine
2	Sergii Shulzhenko	Ukraine's generating capacities development keeping a large share of base load NPPs and variable renewable generation using the Mixed Integer Linear Programming technique
3	Iryna Shvedchykova	Simulation model of the photovoltaic system with a storage battery for a local object connected to a grid with multi-zone tariffication
4	Myroslav Strelkov; Halyna Strelkova	Penetration of renewable energy in the infrastructural system of the electricity market
5	Yurii Veremiichuk; Anatolii Zamulko; Anatolijs Mahnitko	Assessment of the potential electricity demand aggregation in the market of Ukraine
6	Volodymyr Nakhodov; Anatolii Zamulko; Mohammad Ibrahim Mohammad Alsharari	Motivating Control System of Electricity Consumption
7	Vasyl Kostiuk, Taras Kostiuk	Quasi-stationary Modeling of Unregulated Electric Power System Components
8	Madhusudhan Pandey; Bernt Lie	The Role of Hydropower Simulation in Smart Energy Systems
9	Galina Kryvoboka	Identification Methods for Smart Grid Management
10	Oleksandr Temchenko; Iryna Kryshtopa; Nataliia Shevchuk; Zhanna Breher	Istallation of Energy-Saving Technologies in the context of Improvement of the Financial Condition of Mining Enterprises
11	Larisa Tretiakova; Elina Rebuel; Vitalii Opryshko	Assessment of the working environment risks for the workers of electrical engineering industry
12	Liudmyla Davydenko	Control of the energy performance of production facilities
13	Anatolii Cherniavskyi; Andrii Hoienko	A multi-criteria Approach to Decision-making on choosing the Optimal Strategy for Implementing the Energy-Saving potential at Ukrainian dairies
14	Oleksandr Riabenko; Sergii Osadchyi; Oksana Kliukha; Serhii Sunichuk; Olha Yakovleva-Havryliuk	Increasing the Role of Hydro and Pumped Storage Power Plants in Energy Systems Operation Management